| November/December - 2018 |

vegetables australia

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ISSN 1834-2493

Audited Media Association of Australia

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EDITORIAL

In this edition of *Vegetables Australia*, we'd like you to take part in a little reader experiment.

Below is a key finding from a levy-funded R&D project that features on page 44 of this edition.

The type of land use immediately adjacent to a vegetable crop strongly influences the numbers of pests and beneficials in the crop itself.

You may not have come across this strange typeface before – it's called Sans Forgetica and was specifically designed by researchers at RMIT University to help people retain information.

The aptly-named typeface was developed using the principles of cognitive psychology and typography. Specifically, the researchers found that information written in fonts that are too easy to read can fail to sufficiently engage our brains, and therefore limit the likelihood of effectively retaining and recalling the information.

It got us thinking – what is the best way to retain information about R&D in the vegetable industry? Is there a 'best way' at all?

We're not suggesting that every final project report should be written in Sans Forgetica – the researchers stress that this font works well when used in small portions, such as trying to remember key facts.

It may simply be the case that different strategies work for different people and their learning styles. Some of us take notes; others associate information with something that they already know; while some find that repetition helps to remember the facts.

Others learn by doing, or talking about the new information they have discovered. If this is something that works for you, have a look at this year's edition of *Vegetable Grower Success Stories*, distributed with this magazine, where growers from around the country tell their own stories of how the outcomes from different vegetable levy-funded R&D projects have delivered tangible benefits to their businesses. This important learning process not only highlights how growers have received a return on their levy investment, it also demonstrates how the wider industry can get involved in similar projects and adopt the key findings of R&D conducted for the vegetable industry.

Whatever your preferred method of information retention, there is value in taking the time to look at the R&D articles featured in this magazine, as well as the wider industry. If the fact above still sticks in your mind, you can always visit sansforgetica.rmit to download a copy of the unforgettable typeface and start a memory system of your own.

In this edition of *Vegetables Australia*, we are celebrating young growers and emerging leaders in the horticulture industry.

Firstly, I would like to congratulate the 18 participants who undertook Growing Leaders 2018, a strategic levy investment facilitated by Affectus. The group hailed from all corners of the country and represented a range of industry roles, from growers to agronomists and researchers.

This program develops the skills of future leaders with a mixture of theory, industry visits and discussions with horticulture experts. A key element of the program was the creation of a vision and mission for the vegetable industry and the development of four tangible strategies to improve our industry. This year's graduates once again proved the vegetable sector is in good hands and I am confident every participant will continue to have a positive impact on their businesses and foster meaningful change in the industry.

There are a number of ways for young growers and industry members to become more actively involved in the vegetable sector. This year, 11 emerging leaders attended the 2018 Young Grower Industry Leadership and Development Mission, where they visited a range of key vegetable producers and agribusinesses in New Zealand and the United States.

The mission allowed participants to develop their networks and gain an insight into current and emerging trends in global horticulture, including new technologies and business innovations; the latest in packaging, traceability and food safety; and the chance to witness the grand scale of vegetable production in countries such as the United States.

These are just some examples of the many opportunities that await young growers and emerging leaders in the horticulture industry. However, the exciting prospect of a career in horticulture is not always evident to the younger generation.

This was almost the case for Victorian organic mushroom grower Chris McLoghlin, who graduated with a Bachelor in Business (with a major in entrepreneurship) and narrowly avoided a career as an investment banker. After deciding to pursue his interest in mushrooms and their role in ecology, he has since established a successful career in horticulture as the owner of Mycelia Organics, a mushroom-growing operation in Victoria.

In October, Chris received the Kondinin Group and ABC Rural 2018 Young Australian Farmer of the Year award. This followed his Young Grower of the Year accolade at Hort Connections 2018 in June, and it is pleasing to see Chris' work and leadership acknowledged by both the horticulture and wider agriculture industry.

These are the success stories that the Australian horticulture industry needs to promote to attract more young people into the industry and regional communities, and secure the future productivity, profitability and competitiveness of our great sector.

Bill Bulmer
Chairman
AUSVEG

A roadmap for the Australian agriculture industry to achieve $100 billion in farm gate output by 2030 was unveiled at the National Farmers' Federation (NFF) National Congress in Canberra from 17-18 October.

The NFF 2030 Roadmap outlines the drivers of farm sector growth and the associated risks that would need to be addressed to achieve this ambitious goal, and sets industry targets for sustainability, farm safety, diversity, liveability, trade, innovation and investment.

Importantly, this roadmap called for coordinated action to accelerate the industry's growth and secure Australian agriculture as an innovative and sustainable sector. The NFF has asked industry and government to support its vision for the future, and it is unquestionable that Australian horticulture – a $12.9 billion industry in its own right, with the vegetable sector contributing $4.29 billion – will play a significant role in helping the wider agriculture industry achieve this goal.

For horticulture to reach its true potential, we need to ensure the industry can attract workers – whether it's through an Agricultural Visa or changes to existing visa systems – and AUSVEG along with other players in the horticulture industry have met with key politicians to ensure they clearly understand the complexities of the issue and the necessity of a long-term, sustainable solution.

The horticulture industry must also capitalise on the diversification of markets, both domestic and international, to strengthen individual businesses and generate positive outcomes for the industry. The Australian vegetable industry is currently in the middle of the biggest trade push in its history, with a goal of boosting fresh vegetable exports by 40 per cent to $315 million by 2020.

We also need a concerted effort to build the capacity of our industry to help meet this lofty goal.

Fortunately, the vegetable levy system delivers tangible outcomes to develop the skills, knowledge and capabilities of our industry and its members. The annual *Grower Success Stories* publication, which accompanies this magazine, showcases the achievements of several growers who have broadened their knowledge and implemented innovative ideas through their involvement in R&D projects under the Hort Innovation Vegetable Fund.

This booklet details how the levy can assist growers to build their business, with the profiled subjects already putting research findings into practice to experience real-world benefits in their growing operation. This includes growers who have increased their on-farm productivity, upskilled team members, better understood consumer purchasing trends, developed their leadership capabilities and attended local and international industry events to expand their knowledge.

As our grower profiles can attest, it is essential for all levy-paying vegetable growers to get involved in these vital R&D projects, not only to get a better return on their investment, but to ensure the Australian vegetable industry is well-equipped to sufficiently contribute to the goal of making Australian agriculture a $100 billion industry in 2030.

James Whiteside
CEO
AUSVEG

EGGPLANT

FACTS & DATA

1 When preparing eggplant, Veggycation® recommends removing the stem before use. Eggplant should be stored at room temperature, out of the sun and away from melons and bananas.

2 For the year ending June 2017, Australia produced 9,028 tonnes of eggplant with a wholesale value of $17.4 million. *Source: Australian Horticulture Statistics Handbook 2016/17.*

3 Trials conducted for Project VG13083 *Identifying and sharing postharvest best practice on-farm and online* found it may not always be necessary to cool product to the 'optimum' temperature to achieve the quality and shelf life required for transport and retail. A significant finding was that some chilling-sensitive products, including eggplant, could be stored for several days or even longer at low temperature before damage occurred.

4 Harvest to Home reports that in the 52 weeks ending 11 August 2018, the percentage of eggplant-buying households remained steady. The average dollar spend rose from $9.03 to $9.21, while eggplant rose in terms of average weight purchased (kg).

5 Project Harvest Wave 43 reports that key influences to purchase eggplant are taste and to use as an ingredient in dishes. Key barriers to purchase are price and wanting a variety of vegetables.

6 The Better Health Channel states that while eggplants were cultivated in China as early as 600 BC, they are thought to have originated in India. They were eventually grown throughout Europe following the expansion of the Ottoman Empire. Early varieties of eggplant were smaller and white, and looked like eggs, which led to the name 'eggplant'.

7 To increase perceived value for money, Project Harvest Wave 35 recommended educating consumers on the different varieties of eggplant. This included name, flavour, texture and colour that each variety will add to meals, as well as suitability for cooking styles and cuisines.

8 If baking whole, it is recommended to pierce the eggplant several times with a fork to make small holes for the steam to escape. If salting, rinse thoroughly before cooking. Avoid peeling to retain fibre and nutrients. *Source: Veggycation®*

R&D

IMPORTANT CHANGES TO VEGETABLE AND UNPROCESSED POTATO LEVIES FROM 1 OCTOBER 2018

There are changes to the Emergency Plant Pest Response levies that came into effect from 1 October 2018 to pay industry's share of costs to the tomato-potato psyllid biosecurity response and a 12-month Transition to Management program.

From 1 October 2018, the Emergency Plant Pest Response (EPPR) component of the vegetable and unprocessed potato levies and charges changed from:

- Nil to 0.01 per cent of the amount paid at the first point of sale for vegetables; and
- Nil to 10 cents per tonne for unprocessed potatoes.

The funds raised through the EPPR levy will be used to pay industry's share of costs to the tomato-potato psyllid biosecurity response and a 12-month Transition to Management program. Once the required funds have been accrued, the EPPR levy rate will return to nil for both vegetables and unprocessed potatoes.

The below table details the changes to the overall levy rates for vegetables and unprocessed potatoes that have taken place from 1 October 2018.

The new rate will need to be used when calculating your quarterly return for the October to December period.

If you are eligible to lodge an annual calendar year return, you will need to use the following rates for all vegetables and unprocessed potatoes sold from **1 January to 30 September 2018:**

- 0.50 per cent of sale value for vegetables; and
- 50 cents per tonne rate for all unprocessed potatoes.

You will need to use the following rates for all vegetables and unprocessed potatoes sold from **1 October to 31 December 2018:**

- 0.51 per cent of sale for vegetables; and
- 60 cents per tonne rate for all unprocessed potatoes.

GST does not apply to Australian Government levies and charges.

INFORMATION ON THE VEGETABLE LEVY AND CHARGE

You can access information about the vegetable levy and charge on the Department of Agriculture and Water Resources website: agriculture.gov.au/ag-farm-food/levies/rates/vegetables.

WHO CAN I CONTACT IF I HAVE QUESTIONS ABOUT THIS NOTICE?

If you have any questions about the vegetable levy and charge, your levies account or how to lodge your return, please contact the Levies Helpdesk on 1800 020 619 or at levies.management@agriculture.gov.au.

	LEVY COMPONENT	RATE FROM 1 JANUARY TO 30 SEPTEMBER 2018	RATE FROM 1 OCTOBER 2018
VEGETABLES	EPPR	nil	0.01% of sale value
	Research and Development	0.485% of sale value	0.485% of sale value
	Plant Health Australia	0.015% of sale value	0.015% of sale value
	Total	0.50% of sale value	0.51% of sale value
UNPROCESSED POTATOES	EPPR	nil	10 cents per tonne
	Research and Development	48 cents per tonne	48 cents per tonne
	Plant Health Australia	2 cents per tonne	2 cents per tonne
	Total	50 cents per tonne	60 cents per tonne

L-R: Artist Anne Langdon and Lucy create artwork out of vegetables.

Behind the scenes in the 'Quantiyum Classroom' at Melbourne's Press Club - Projects. Photography by Philip Myers.

Alice Zaslavsky. Photography by Philip Myers.

A NEW PHENOMENOM: CHANGING THE WAY CHILDREN THINK ABOUT VEG

With only a small percentage of Australian children reaching the Recommended Dietary Intake of vegetables, a project was procured by Hort Innovation to develop and deliver digital food education resources that promote healthier attitudes to food, with a focus on changing children's perceptions of vegetables. Project Lead Alice Zaslavsky spoke to *Vegetables Australia* about 'Phenomenom' and what its resources have to offer teachers and students alike.

The Australian Bureau of Statistics National Health Survey (2014-15) revealed only four per cent of kids are eating five or more serves of veggies, with almost half consuming just one serve of vegetables or less a day.

To assist in combating this societal issue, 2012 *MasterChef Australia* finalist, food personality and school teacher Alice Zaslavsky combined her passions – food media and education – to create 'Phenomenom', a free digital food literacy program for primary schools. Its main aim is to shift children's attitudes to vegetables by making them an exciting part of classroom lessons.

A team of up to 60 people worked together to create the Phenomenom resources, which are now available for teachers to download for free on its website (phenomenom.com.au). The team included consumer insights agency Colmar Brunton, Clear Horizon Consulting (for program logic design), curriculum specialist Beverley Laing and creatives from across the spectrum, including musicians, animators and researchers.

Educational opportunities around perceptions of, and aversions to, vegetables through digital media (VG16018) is a strategic levy investment under the Hort Innovation Vegetable Fund.

EDUCATION IS KEY

Targeted at 8- to 12-year-old children, Phenomenom consists of 25 'webisodes' – short videos primarily intended to be used by school teachers in their lessons. These are complemented by 50 lesson plans and activities developed to encourage positive behaviours, attitudes and outcomes around vegetables, and specifically designed for teachers of grades 3-6.

"We targeted 8- to 12-year-olds because at that age, they're old enough to start making their own decisions about what they eat but young enough to not be too set in their ways," Alice explained.

"The aim is to contribute to an increase in consumption of vegetables but that's something that's going to be a longer-term goal. At the moment, what we're fighting against is the fact that kids grow up expecting to not like vegetables, so I think it's an opportunity to reframe the language that we use around vegetables – reframing their attitudes so we see an attitudinal shift that helps spark behavioural change."

It is Phenomenom's creative execution that makes this project stand out from other healthy eating initiatives in Australia, according to Alice.

"A lot of resources in the 'healthy eating space' talk at kids about what they should be putting into their mouths, whereas Phenomenom talks with kids, and teaches them how to think about food, instead of what to think. This gives them control over their own choices, which means that moving forward, there's going to be a shift in the way that they think. We're already seeing that," she said.

Not only is this project aimed at empowering children to make their own eating decisions, it also enriches the teaching curriculum.

"Our research identified that teachers would use quality resources to help improve the wellbeing of their students if those resources were freely available to them and if those resources were relevant to topics that teachers were already teaching (such as numeracy and literacy)," Alice said.

CREATING A COMMUNITY

Growers got involved in this project too, with Torello Farm, located in Dromana on Victoria's Mornington Peninsula, featuring in a Phenomenom springboard video.

"Sophie O'Neile from Torello Farm was fantastic in opening up her farm gate to us and we've got a gorgeous segment with one of our Phenomenom kids, Billy, and Harry the Farmer taking Billy through the farm and showing him the process," Alice said.

"Billy was enthusiastically asking questions about how you make the soil good for growing vegetables and engaging with fresh vegetables straight from the source and I think that's absolutely beautiful.

"In future projects, I look forward to more grower engagement because the response from the growers contacting me directly and telling me how excited they are about it and what they would like to see has just been phenomenal, for want of a better word!"

Social media is also a powerful tool for Alice and her Phenomenom activities.

"Having a 55,000-strong following across my own socials, I've grown a great community of like-minded people, and they've been fantastic champions of Phenomenom," Alice said.

"Social media also attracts forward-thinking teachers – it's where they gain new ideas. We've used Phenomenom's Instagram and Pinterest accounts to offer teachers ideas of how they might use the resources in class and get real-time feedback from them about what they want to see in the next set of resources, and what they're really enjoying.

"I think it's really important for teachers in regional and remote areas especially to feel connected back to the source, and digital media plays a role in this. I personally look after the 'Phenomenom' social accounts because it's really important for me – the voice is authentic and it ensures the communication between us and teachers is open."

Since its launch in May 2018, Phenomenom has had over 100,000 views across different digital platforms.

"This is awesome, because it means that not only are teachers showing an interest, but kids are seeking the videos out as well. Being freely available on YouTube has been a real boost because YouTube Kids actually picked it up as a feature playlist on its app, which has over 2.8 million downloads in Australia alone," Alice said.

Phenomenom has also achieved success overseas for its ingenuity, receiving an education innovation award by Finnish organisation HundrED, a not-for-profit organisation that focuses in this space on a global scale. It has also reached greater heights – a feature episode is currently airing on all Qantas flights.

LOOKING AHEAD

Now that the project has concluded, Alice has expressed her desire to build on the Phenomenom movement and create further opportunities for education, such as gamification for the classroom.

"Phenomenom is the first time that food has been taught in this way in the world – that idea of integrating it into other subjects. Certainly, we might see resources where somebody's growing peas and then integrating that into a maths lesson. But this level of seamlessness is unprecedented; these are quality resources for maths that also happen to have fresh vegetables as their hero.

"Personally – for somebody who is always going to be teacher in some way, shape or form – to be able to encourage other teachers to think outside the square as to how they engage students is really important. I hope to inspire them to create their own resources featuring vegetables based on Phenomenom and create a community where people are sharing amongst themselves.

"I would love to see a grade six class create a Phenomenom video or teachers start to build their own veggie-centric activities or lessons."

Alice believes that this is an ideal time to share the information created by Phenomenom, but it's also content that will continue to stay relevant and engaging for years to come.

"We're all on the same page in believing that the stats are pretty grim: 95 per cent of kids in Australia aren't eating their recommended dietary intake of vegetables. And the only way that we're going to fix that is to find a fresh approach instead of just trying to do the same thing over and over again."

INFO R&D

For more information, please visit phenomenom.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: VG16018

Hort Innovation Strategic levy investment | VEGETABLE FUND

2019 Nuffield Scholars. Photography by Norman Krueger.

Western Australian horticulturist Bao Duy Nguyen.

NUFFIELD AUSTRALIA CONFERENCE SHOWCASES VALUE OF RESEARCH

From cyclone-proof greenhouses to machine vision sensors that could pick out mature produce from the back of your ute, this year's Nuffield Australia conference gave delegates an inspiring look at the innovations that could produce change in Australian agriculture. Jarrod Strauch reports.

In a rapidly changing world, agriculture could strike an unsympathetic observer as a little old-fashioned – bringing to mind the old images of a man sitting on a tractor in the middle of a field from sunrise to sunset, his wife back in the farmhouse and their children either farmers or farmers' wives.

Delegates at the Nuffield Australia National Conference 2018, however, would have seen a very different picture of our sector and its future.

Living up to its theme of "Produce Change", the conference presented a line-up of Nuffield Scholars and guest speakers who discussed the technological and cultural innovations transforming Australian and international agriculture.

From 18-20 September 2018, more than 25 speakers shared their research and offered new perspectives to conference delegates at the Crown Metropol Conference Centre in Melbourne.

GRAND PLANS FOR GREENHOUSES

Greenhouses were a hot topic at this year's event, with two scholars funded by Hort Innovation looking at global innovations in greenhouse technology – albeit with two very different approaches.

Western Australian horticulturist Bao Duy Nguyen investigated protected cropping in low-tech greenhouses with an emphasis on monitoring technology and water sustainability practices.

"I want the wider industry to benefit from what I learn – I wanted to find practical and efficient ways for farmers to apply a scientific approach to growing their crops," Bao said.

By taking a low-tech approach to the problem, Bao hoped to assist growers who have the same goals as their high-tech colleagues, but in a way requiring less technological expertise and execution. For example, when it comes to climate control in greenhouses, something as simple as passive control through opening the ends of a greenhouse during the hottest part of the day can have a positive impact on disease incidence in a crop.

On the other side of the coin, Ross Pirrone from Queensland looked at protected cropping systems for tropical horticulture that use the most advanced, cost-efficient technologies available across the world.

Given the location of his family business in Burdekin in north Queensland, Ross was particularly interested in managing the environmental stress caused by erratic weather by developing highly flexible and resilient greenhouses.

"This may allow us to take advantage of high commodity prices in the wake of weather events affecting field-grown crops and pave the way for year-round consistent supply of high-quality produce," he noted.

Ross has already put some of his research into action, sharing an on-farm evaluation of saw-tooth greenhouses on his property in Ayr – and while the initiative is only in the initial stages of commercialisation, Ross noted that viable protected cropping solutions have become an option in north Queensland.

CULTURE SHOCK

Of course, if agriculture is to continue to succeed into the future, it needs cultural changes just as much as it needs technological innovations.

Katrina Sasse, a Western Australian scholar funded by the Grains Research & Development Corporation, shared her research on "the way forward for daughters": strategies to encourage young women, particularly farmer's daughters, to play an integral role in the continuity of family farm businesses.

Investing in women can help to improve the survival and longevity of rural industries and businesses, so Katrina travelled internationally to look at how Australian agriculture can ensure it doesn't lose some of the best and brightest in the next generation of farmers.

"Women bring new ideas, creativity and leadership styles to any industry," she told the audience.

By creating farm succession options and strategies that involve young women as owners or managers of multi-generational family farms, businesses have a greater chance of keeping these knowledgeable and experienced women in our industry.

Later on, Matthew Gunningham, a Tasmanian scholar supported by the Australian Dairy Conference and Nuffield Australia, discussed the more immediate problems of people management on-farm.

Matthew took particular interest in how to align the day-to-day actions of the people working within a farm business with the goals of the business itself. One key factor Matthew found to be effective in his travels was the use of scorecards, or easily digestible summaries of how individual activities are progressing.

In his words, "people need to know if they're winning or losing" – so providing live information helps employees to gauge their own success and frames their work in terms of the business' overall needs.

Matthew also found that for some operations, hierarchies have a direct and negative impact on team motivation, leading to a simple recommendation: "Replace positional power with knowledge power and personal power."

BALANCE OF POWER

In the midst of inspiring presentations of global innovations, conference delegates also received a pragmatic perspective on automation in horticulture from Queensland horticulturist Matthew Fealy.

Matthew's research was sponsored by Woolworths, and his investigation into emerging technologies was shaped by one simple principle.

"The ultimate goal isn't another machine – it's about sticking technology onto your existing machinery to increase production value," he said.

Some of the most exciting innovations highlighted by Matthew were automation systems that growers can plug into their own tractors, or sensor modules that fit in ute trays.

No matter what (or where) the technology was, the biggest attraction was the chance to shift the balance of power and the ability to control production back to the grower, instead of continuing the dependency on manual labour.

With protectionist politics becoming more popular, migrant workforces are not a reliable long-term solution – whether that's due to a net outflux of Mexican labourers from California, or our own industry's ongoing struggles with accessing reliable labour.

At the heart of this two-day celebration of innovation in production, Matthew's presentation was a sobering reminder of the paradox at the heart of our sector: "We spend all that money right up to the point of harvesting, then rely on backpackers to pick it."

INFO R&D

Nuffield Scholarships for the Australian vegetable industry are funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

To learn more about all current and previous Nuffield Scholars, including the 2019 Scholars announced at the start of the 2018 conference, visit nuffield.com.au.

Project Number: VG14065

Hort Innovation Strategic levy investment | VEGETABLE FUND

Photography by Anna Osetroff

MOFFATT FRESH PRODUCE: STILL GOING STRONG

Armed with a rich family history of farming that spans almost 100 years, Steve Moffatt and his team at Moffatt Fresh Produce are well-equipped to achieve their goal to produce the best carrots and onions in Australia. As Dimi Kyriakou found out during a visit to the company's headquarters in Tarome, Queensland, there is plenty of family history left to be written.

In a picturesque pocket of south-east Queensland, a bright blue sky shines down on the Fassifern Valley, effortlessly creating postcard views of the mountain ranges that hug the surroundings of Moffatt Fresh Produce.

The loamy creek soil flats typical of the Tarome area are as rich as Moffatt's family history, which traces back to 1924 when Robert Moffatt and his son Allan (better known as Scotty) planted their first crop as share-farmers.

Today, Moffatt Fresh Produce is fast approaching its 100-year anniversary, and the successive generation of farmers shows no signs of slowing down the family trade.

"We're a fourth generation family farming operation and we have a fifth generation coming through the business now. We started from pretty humble beginnings – this far down the track, you would consider us to be a large-scale horticultural operation," Moffatt Fresh Produce Managing Director Steve Moffatt says.

Scenic backdrop aside, Tarome was chosen as the home of Moffatt's all those years ago thanks to its favourable climate, alluvial soils, reliable water supply and proximity to key markets, providing a solid foundation on which to build the business.

While Moffatt's has dabbled in growing various vegetables over the years, its flagship commodity – carrots – have been a staple of the business since the 1960s when they were grown on just 10 acres. Today, Moffatt's carrots are produced across three regions in Queensland, including the Fassifern Valley, Southern Downs and Granite Valley, allowing the business to produce a year-round supply to the tune of 25,000 tonnes a year.

"Everything we have here today is the result of the generations before us. We're quite proud of the fact that we've been able to manage succession within our business – the benefits are that each generation improves, and off the back of that the farm improves," Steve says.

"After the floods in 2011, 2013 and 2017, we re-evaluated and got back to doing what we do best – carrots and onions. We could see that there was an opportunity to become a leader in what we do."

A FAMILY AFFAIR

Family is at the heart of everything at Moffatt's. Relatives are scattered throughout the business, with Steve at the helm, his wife Jenny in administration and his cousin and business partner Mitch in the paddock, Nicholas in the factory and Krissie on reception. They are part of a team of 55 full-time employees and around 40 casual workers in the peak season.

"There was never a doubt that we would be here," Steve says. "Even though we're a large operation, there is not one part of our business that the family doesn't touch. We're only as good as the people we have working for us, and we're still very much hands-on. I can confidently say, we grow it, we pick it, we pack it, we freight it."

With so many years of farming behind them, it is understandable that the scale and structure of Moffatt Fresh Produce has changed significantly since its inception in the 1920s. As Steve points out, that is largely due to the family's vision for the future and access to technology.

"We had a focus of where we wanted to be. We needed to get better at what we do, not just in the farm but in the factory. We drive efficiencies on a daily basis here; we record those efficiencies and we judge ourselves on our own scorecard to continually become better," he says.

These efficiencies are weaved through every facet of the farm, to the point where carrots are delivered to customers within 24 hours of harvesting, and product can be traced from seed to plate.

"We have internal processes in place to follow the produce from the farm to the factory, and that's a program that we've built on-site over the last decade to suit our own needs and our customers' needs," Steve explains.

It takes an outsider to recognise that Steve's description of these efficiencies is modest, to say the least. The newly-developed washing and packing facility at Tarome runs like a well-oiled machine under – quite literally – the watchful eye of team Moffatt, who have a view of the production floor from the office.

While electronic grading is a key feature of the production facility and its quality management system is HARPS- and Freshcare-accredited, there are other plans in the works.

"There's a lot of discussion around packaging at the moment, and I would have to say that's probably our key focus right now – we're still working on that," Steve hints.

EXPANDING MARKETS

An increase in on-farm efficiency goes hand in hand with increased production, and to avoid an oversupply in the domestic market it is natural to look abroad for potential customers. Carrots are king in the vegetable export space and with a booming Asian middle-class on our doorstep, there are plenty of opportunities available for growers like Moffatt.

Through the *Vegetable Industry Export Development Program* (VG16061), a strategic levy investment under the Hort Innovation Vegetable Fund and facilitated by AUSVEG, Moffatt Fresh Produce has relished the opportunity to build its knowledge on exporting produce to international markets. The team has attended export readiness training, seminars, showcased their produce at international trade shows including Asia Fruit Logistica in Hong Kong and Foodex in Tokyo, and met buyers from key markets overseas.

Moffatt's was also a pit stop on the recent 2018 Reverse Trade Mission, which allowed 40 international buyers from Asia and the Middle East to tour regional Queensland. The mission culminated with the Taste Australia Fresh Produce Showcase, where a collection of export-ready growers, including Steve, displayed their produce and networked with the international delegation.

"We liked that we could show all of the delegates first-hand what we do on the farm so they could understand the scale of our business. A picture is as good as a thousand words, especially when it comes to things like scale – you don't appreciate it unless you see it yourself," Steve says.

"There will be a good outcome from both the farm visit and also the showcase. Export in general is a great home for Australian produce and I think there is a lot of potential there."

SHARING THE STORY

A visible shift in the latest chapter of Moffatt Fresh Produce is how they have shared their family history and vision for the future, particularly through branding, online and social media.

"We're humble people from humble beginnings. We don't like to tell everyone how great we are, but our Business Development Manager Brei Montgomery managed to convince us that it's about helping people to understand and appreciate our story, and allowing Australian consumers to be part of it," Steve explained.

The farm is active in the local community, donating excess produce to Foodbank Queensland and participating in events such as the Scenic Rim's Eat Local Week and Winter Harvest Festival, where its popular carrot ice-cream was a hit with consumers.

"We're about the future, and building long-term sustainable relationships. We've got a good customer base and obviously we've got a great team working behind us here," Steve says.

"Our greatest achievement is that we can continue to be a wholly Australian-owned family business heading towards 100 years of operation. It's a testament to the generations before us that we're still going this strong."

2018 Growing Leaders participants with National Farmers' Federation CEO Tony Maher (front left).


2018 Growing Leaders participants with Federal Minister for Agriculture and Water Resources the Hon. David Littleproud (front centre).

GROWING LEADERS 2018: FOUR TANGIBLE WAYS TO STRENGTHEN OUR VEGETABLE INDUSTRY

After a challenging yet rewarding six-month leadership journey, the Growing Leaders cohort of 2018 has planted the seeds of change and delivered four strategies to ensure the Australian vegetable industry remains sustainable, ethical and a quality producer into the future.

One of the most striking aspects of the Growing Leaders program is the clear increase in confidence, higher-level thinking and passion to improve the Australian vegetable industry that is witnessed in participants within a short timeframe, sometimes in as little as a few weeks.

The program captures 18 vegetable growers and industry members on the cusp of their full potential and mentors them on leadership development over a six-month period. Through three separate three-day workshops, the participants step outside of their comfort zones, develop their networks and transform into an engaged and passionate group with a clear vision and mission for the industry's future (see box-out).

Ahead of their graduation ceremony in Canberra in September, the participants held a final workshop where they presented their mission and strategies to improve the sustainability, productivity and profitability of the Australian vegetable industry.

Below is an outline of the four projects developed as part of Growing Leaders 2018.

Growing Leaders 2016-2018 (VG15030) is a strategic levy investment under the Hort Innovation Vegetable Fund.

GROW YOUR SCHOOL

Nick De Felice (Bulmer Farms), Jason Goodall (Butler Market Gardens), Natalie O'Donnell (Plant Health Australia), Jake Shadbolt (Scotties Point Farm) and Celia van Sprang (Queensland Department of Agriculture and Fisheries)

Driven by the fact that one third of Australian children don't know where their fruit and vegetables come from, 'Grow Your School' is an initiative to encourage growers to work with schools (mid- to upper-primary) to implement horticulture programs, such as school vegetable gardens. It attempts to bring growers and their knowledge into the classroom rather than an excursion to a farm, in the hope that this will instigate a stronger understanding of horticulture in future generations, promote healthy eating and entice them to consider a career in the industry.

The group made a concerted effort to remove the barriers and effort required for growers to take part in such a program, while simultaneously making sure that the initiative maintained students' enthusiasm, passion and engagement to learn more about the horticulture industry.

The group developed a detailed and practical handbook that outlines information about the program, the legalities of working with children, key areas of setting up a garden, example lesson plans, templates and other resources for both the grower and the school.

The program is freely available and recently secured donations of seedlings and garden construction items for schools that take part in the initiative. It will be trialled in one Victorian primary school by the end of 2018 and two more in 2019. There are also plans to develop a communications strategy and promote the program through three grower advocates.

SEED TO SALE

Anthony De Ieso (Thorndon Park Produce), Jeremy Hauser (Barden Produce), Hannah McArdle (AUSVEG SA) and Willem Myburgh (Koala Farms)

While there are opportunities across Australia to study agriculture at a tertiary level, there are very few courses that focus specifically on horticulture or offer comprehensive information about career pathways into the industry.

Seed to Sale aims to overcome this challenge by providing university students studying agricultural science with an insight into the horticulture industry and its potential career opportunities. The program can also provide horticultural businesses with access to potential employees following their graduation.

In July 2018, a pilot program was undertaken with Bachelor of Agricultural Science students at the University of Adelaide. Twelve applications were received and two students were selected to take part in the pilot.

The five-day itinerary exposed the students to a broad range of horticultural businesses to illustrate that there was more to the industry than farming. This included meetings with agronomists, growers, technology advocates, government, researchers and a wholesale market.

The group received positive feedback from the students who said they developed a clearer understanding of the industry and were interested in considering a career in horticulture. The hosts were happy to participate in a similar program again and appreciated the opportunity to meet prospective employees.

Discussions are underway to run a similar tour through the University of Adelaide twice a year, potentially as a scholarship program. There are also plans to extend the program to 10 Australian universities that offer agriculture courses, as well as other industries.

AUSTRALIAN VEGETABLE FARMERS GROUP

Ravi Chand (One Harvest), Camilla Humphries (E.E. Muir & Sons), Nicolas Huvelle (Coolibah Herbs) and Marie-Astrid Ottenhof (Schreurs & Sons)

The self-described 'Team Germinators' presented a strategy that aims to upskill the industry and drive cultural change through grower-to-grower interaction. The team suggested developing an Australian Vegetable Farmers Group (AVFG), which targets owners and senior decision makers within horticultural businesses who can adopt and enforce practices that inspire the wider industry.

Following a review of current literature and a case study of a similar group in Argentina, it was found that the participatory "bottom-up" approach, driven by growers and grower champions, was shown to be the most effective for the vegetable industry.

Within the AVFG, groups of 6-10 growers are formed where participants rotate through farm visits and discuss news/industry information that may be of general interest. The host farmer also presents specific issues they face on their farm and business and the group can discuss possible solutions. External experts may also be invited to these meetings and the program can also collaborate with existing industry groups.

The team conducted a cost-benefit analysis and interviewed 11 male farmers from across Queensland, Tasmania and East Gippsland in Victoria. They found that 91 per cent were happy to participate in such a program and all were willing to share general information with the group.

The team noted it would be difficult to engage those who aren't active in the industry and it was important to get young people involved. There is also potential to expand the program across Victoria and interstate.

CHAMPIONING CHANGE

Mitchell East (Willarra Gold), Jacinta Fong (Freshcare), David Kohler (Peracto) and Stephanie Tabone (Kalfresh)

The goal of the Championing Change team is to encourage and influence people to make positive changes in their business and the wider industry through a series of articles that showcase the success stories of industry members. The topics can target the entire supply chain, focusing on change and industry best practice such as sourcing ethical labour and implementing business efficiencies and sustainability.

The team recognised a need to encourage and influence others by breaking down barriers and sharing positive stories that provided others with the tools and inspiration to achieve the same success. Traditional print media was seen as a strong platform to share these articles; however it could also be extended to other media platforms.

Initially, the team researched the theories behind change and the ways to adopt change. They discovered the key barriers to change include cost, time, knowledge and culture.

They also conducted surveys to collect information about growers' challenges in the industry, their views on change and examples of changes they have made within their business. Through the interviews, the team found that while growers were open to discussion, they were unwilling to share their success stories with a wider network that could compromise their competitive edge.

Despite these challenges, the team believes there is potential to further develop this idea, and encourage and influence everyone along the supply chain to make positive changes for the future of the vegetable industry.

GROWING LEADERS 2018

Vision:
Producing clean and green vegetables for everyone, everywhere.
Mission:
Planting the seed of change to mobilise Australians to cultivate sustainable, ethical and safe practices in the vegetable industry.

INFO R&D

For more information on the Growing Leaders project, please contact Affectus Managing Director Jill Briggs on 0409 455 710 or jill@affectusaus.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: VG15030

Hort Innovation Strategic levy investment | VEGETABLE FUND

REGIONAL OUTLOOK CONFERENCE: PUTTING WEATHER ON THE MAP

Every year, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) organises a set of Regional Outlook Conferences in different regions of Australia. In September, AUSVEG members attended the conference held in the Barossa Valley, South Australia, and heard about a pilot automatic weather station network to combat spray drift. AUSVEG Industry Communications and Project Officer Nikita Chawla reports.

Around 70 delegates from the Barossa Valley region came together on 26 September for the 2018 Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) Regional Outlook Conference.

This was one of a series of conferences held around Australia. ABARES works with local organisations of the region where the conference is being held to develop a tailored program and address key local agricultural issues and commodities. The conference in the Barossa Valley consisted of three sessions, each followed by a panel discussion, which addressed three of the biggest issues affecting the future of our industry:

- Creating value in an increasingly connected world.
- Technology: changing the way we do agriculture.
- Farming in a changing environment.

A range of topics was discussed in the technology segment of the conference, ranging from digital agriculture to the use of automatic weather stations.

WEATHER PREDICTION

The presentation on Mesonet, by Warwick Grace from Ag Excellence Alliance, proved to be the most popular on that day, engaging many of the delegates. Mesonet is a pilot automatic weather station network for the mid-north, northern Adelaide Plains and northern Yorke Peninsula of South Australia. It aims to provide accurate information to prevent crop damage and rainwater contamination resulting from spray drift.

Delegates heard that a number of factors contribute to spray drift, including:

- Product formulation (volatility).
- Incorrect choice of spray droplet size.
- Inappropriate weather conditions.

The presentation outlined that a significant effort has been made to reduce the use of volatile pesticides in agriculture, and highly volatile herbicides are no longer permitted to be purchased or applied across most of regional South Australia. A concentrated education program has also been developed for spray operators on achieving optimum droplet size, choice of nozzle types and operating pressures to reduce drift.

The missing piece of the puzzle is the provision of accurate weather data and warning systems that detect the presence or potential conditions that are likely to result in spray drift (this being mainly temperature inversions and sea breezes). If this issue isn't addressed, the potential loss in value of production and market access from spray drift in this area is estimated to be $178 million per annum.

ASSISTING GROWERS

To help combat spray drift, Mesonet will deliver a weather monitoring and warning system that will provide highly accurate and targeted data on the development and presence of adverse conditions for spraying crop protection products.

Grains and cotton industry funded research has identified and quantified the complex factors that lead to a high concentration of pesticides drifting close to the earth's surface for long distances. The research has developed specialised profiling of automatic weather stations to detect inversions and report hazardous spray conditions. This is the instrumentation that is being used in the development of the mid-north Mesonet.

> ... the network will give spray applicators accurate local weather information to reduce the risk of spray drift.

The extensive communications and data collection from the network will give spray applicators accurate local weather information to reduce the risk of spray drift. It will also help deliver better water quality in rivers, streams and dams, and reduce crop and pasture contamination to preserve South Australia's reputation of producing high-quality food and wine.

The network of 40 automatic weather stations will be spread across the Barossa Valley region, stretching to Jamestown and Port Pirie in the north through the Clare Valley and near Two Wells in the south. It will be operational from mid-2019.

INFO R&D

For more information on Mesonet, please visit mesonet.org. You can also keep track of the progress of the project on the Ag Excellence Website: agex.org.au.


Sutherland Produce Compliance Manager Kylie Faulkner speaking with the young grower group in New Zealand.


Parsley harvesting at Rio Farms in Salinas, California.


Participants of the 2018 Young Grower Industry Leadership and Development Mission.

THE NEXT GENERATION OF VEG GROWERS HEAD TO NZ, U.S.A.

The 2018 Young Grower Industry Leadership and Development Mission provided the opportunity for 11 emerging leaders of the Australian vegetable industry to visit some of the key vegetable producers and agribusinesses in New Zealand and the United States, where they gained new knowledge and networks to bring to their businesses back home and further develop the local industry. AUSVEG Mission Leader Shaun Lindhe outlines the key outcomes from the mission.

A group of 11 young, energetic and passionate vegetable growers from across the country took part in the 2018 Young Grower Industry Leadership and Development Mission to New Zealand and the United States from 9-23 April 2018.

The project *Young Grower and Women's Industry Leadership and Development Missions* (VG15703) was a strategic levy investment under the Hort Innovation Vegetable Fund.

The two-week mission provided a tremendous amount of value to participants, who will share their experiences and lessons learned with their network and the wider industry. Below are some key outcomes from this mission that can be adopted by growers across Australia.

TECHNOLOGY, INNOVATION AND AUTOMATION

One of the main highlights from the mission was the chance to witness some of the latest technologies and business innovations that are being used around the world.

- The group had a lesson in fighting frost from New Zealand fruit and vegetable grower Kevin Bayley, who uses helicopters (at a cost of between $50k and $100k per day) to propel hot air from nearby controlled burnoffs down to the crop and prevent frost on his fruit. Multiple windmills also operate in his fields to push hot air onto the produce to prevent frost.
- Innovative business arrangements were discussed with the group, including a field-sharing arrangement between two farms in New Zealand that do not concurrently grow similar commodities. A mutually-beneficial relationship has been developed to ensure good crop rotations and increase productivity in fields that would otherwise be left empty during the season.
- The group was fortunate to view some of the leading coolstore arrangements in both countries, which included the latest technology (including large-scale vacuum coolers), world-leading approaches to food and employee safety and machine maintenance. A.S. Wilcox & Sons in New Zealand employs 11 engineers and two mechanics among its 200 full-time employees to regularly service farm machines and its sorting and processing equipment, while the coolhouse at Tanimura & Antle (T&A) in California transports one million boxes of produce per week and operates 24 hours a day.
- Participants also learnt about PlantTape, an automated planting system owned by T&A that holds seedlings on a tape. This is fed through a tractor that can plant the seedling directly into the ground at a quicker speed than other modes of planting.
- During the visit to T&A, the group also witnessed Robovater, an automated weeding machine that can differentiate the size of the plant in the row, then automatically and mechanically remove smaller-sized weeds. This is particularly effective when paired with the PlantTape technology, as the PlantTape seedlings are usually taller than the weeds and are less likely to be accidently removed.

EXAMPLES OF PRODUCT AND PACKAGING DEVELOPMENT FOR CONSUMERS

Consumer testing

- A.S. Wilcox & Sons uses customer focus groups to identify consumer trends and predict new products that will work in the market.

Product packaging

- Potato packs that include 'windows' for consumers to look at the product before they purchase it.
- Coriander in zip lock bags designed to retain freshness and allow the product to breathe.
- 'Pack your own tomatoes' – empty plastic containers that allow consumers to pack their own cherry/baby tomatoes and customise their tomato purchases.
- Vacuum-sealed cooked corn on a cob and beetroot.

Value-added product

- Snacking vegetable products such as baby carrots and cucumbers.
- Pre-peeled red onions (brown onions were trialled but as the flesh is white, consumers did not know what it was or how to use it for their cooking).
- Pre-made soup products that promoted the locality of its ingredients.

Farm-based food experiences

- Bostock's Kitchen – the cafeteria at Bostock's Farms, one of the biggest farms in Hawke's Bay in New Zealand – is open to staff and the general public, and includes a single item on its menu using seasonal produce that changes daily.

TRACEABILITY AND FOOD SAFETY

Incorporating technology and processes to improve traceability and increase transparency in the supply chain has been a big focus in the New Zealand and American vegetable industries. Many of the farms visited had comprehensive traceability systems in place to accurately track products to their unique times of planting and harvesting, the field it was grown in and date of packing and shipping. The group was given multiple examples of when these systems helped to resolve disputes with retailers and other customers.

SCALE

It was clear that the scale of vegetable production in New Zealand and Australia was very different to the United States, which far outweighed both countries.

It was a point of interest that scale did not necessarily equate to increased adoption of technology and automation – the cheaper cost of labour for some American farms meant that increasing automation was not necessarily the cheapest way to reduce costs in the short-term – one farm even had a team employed to hand-weed all of their fields. This attitude is slowly changing with the realisation that automation is becoming the way of the future.

WORKER DEVELOPMENT AND TREATMENT

A couple of the large-scale farms that the group visited placed a very high emphasis on worker treatment and providing workers with opportunities for professional and personal development.

- A.S. Wilcox & Sons stated "its biggest asset is its people" and invests significantly in its staff as a priority to ensure they are engaged and provided ample development opportunities.
- Due to housing affordability and accessibility issues in Salinas, California, T&A has spent over US$17 million to create a housing complex for around 800 workers, as well as a shop, laundry facilities, recreational areas and sporting fields that are available for workers, and a bustling social community that engages staff within the workplace culture.

COMMON ISSUES

One of the biggest insights for the group was that no matter where they went, farmers across the world were all facing the same issues, including:

- Cost and accessibility of labour and water.
- Urban encroachment.
- Increased pest and disease issues due to globalisation.
- Increased regulation that can impede efficiency.
- Weather and dealing with a more volatile environment as a result of climate change.

It is important for the group to understand that the issues they are facing on-farm and as a wider industry are by and large universal, so there can be many lessons learned from their peers, young and old alike, across the globe.

NETWORKS

The networks developed with some of the world's leading vegetable growers was an invaluable component of the mission. Each grower and industry member that the group visited were exceedingly generous with their time and happy to help the young growers with any questions they had. These networks will help in the years ahead as they develop their careers in the industry.

However, the networks that the participants forged with the other growers on the mission may be the most valuable outcome of the mission. These growers will keep in touch and will form a vital part of their local industry network for the future.

INFO R&D

AUSVEG would like to thank those who gave their valuable time to meet with the delegation, particularly Andrew Yung, Woodhaven Gardens, Lawson Organic Farms, Bostock's Farm, Bayley Farms, A.S. Wilcox & Sons, Sutherland Produce, Toro, Bolthouse Farms, Grimmway Farms, Rio Farms, Tanimura & Antle, Nathan Dorn, Monsanto and Bayer.

Special thanks to Dianne Vesty from Hawke's Bay Fruitgrower's Association, Peter Wright from Plant and Food Research New Zealand and Emily White from Boomaroo Nurseries for their help in organising site visits.

The final report for this project will be made available on the InfoVeg database at ausveg.com.au/infoveg.

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

Project Number: VG15703

Hort Innovation Strategic levy investment | VEGETABLE FUND

University of Queensland agricultural biotechnologist Professor Neena Mitter. Image courtesy of QAAFI.

BUILDING A SOLID FOUNDATION FOR PEST AND DISEASE MANAGEMENT

The fight against crop pests and economically-significant diseases has received a boost with the introduction of a clay-based, sustainable crop protection platform. Professor Neena Mitter from the University of Queensland spoke to *Vegetables Australia* about this platform, known as BioClay, and the potential long-term benefits it can provide to the vegetable industry.

According to Hort Innovation, an estimated 40 per cent of food grown is lost to crop pests and pathogens globally. As vegetable growers in Australia know well, pest and disease management is a persistent challenge for the industry, particularly given the additional threats of climate change, pesticide resistance and chemical use limitations.

This has led researchers at the University of Queensland, Professor Neena Mitter and Professor Gordon Xu, to investigate novel and sustainable methods of pest and disease control. They have developed a non-toxic, biodegradable clay-based 'vaccine', known as BioClay, which could prevent pest infestation and diseases that cause widespread losses in both the vegetable and cotton industries.

The project, *Novel topical vegetable, cotton virus and whitefly protection* (VG16037), a strategic levy investment under the Hort Innovation Vegetable Fund, has been commissioned following four years of research into developing the vaccine. It is being led by the Queensland Alliance for Agriculture and Food Innovation (QAAFI), a research arm of the University of Queensland.

DEVELOPING RESISTANCE

BioClay's point of difference is that it is the first technological advancement that targets viruses specifically, including the group of viruses that can be carried by whitefly.

It uses a plant defence mechanism known as RNA (ribonucleic acid) interference, or gene silencing, which has been used to develop genetically-modified, transgenic, disease-resistant crops. In this project, it is used in conjunction with a clay that acts as a carrier for the biological active. Together they are sprayed onto the plant and there is no genetic modification, as Professor Mitter explained.

"We look at these viruses, take RNA from the virus itself and use clay as the carrier to target the specific pathogen. We then spray the combination on the plant so it is pre-armed and ready to fight these viruses when they come along," she said.

"It's almost like a RNA vaccine – it's vaccinating the plant, but with a spray rather than an injection."

So far, Professor Mitter and her project team have conducted glasshouse trials using BioClay on capsicum, cowpea and beans, which have produced promising results.

"We have been spraying these plants on day zero with our spray formulation and then challenging them with viruses, 10 or 20 days after the spray to see whether they are protected from viruses. As controls, we also have plants which are not sprayed.

"We have been getting wonderful protection – the plants that have been sprayed have showed no virus infection."

In phases two and three of the project, the spraying will progress to small- and large-scale fields in Queensland.

With Nufarm as a commercialisation partner on the project, it is hoped that the platform will be developed into a registered product for growers in Australia following the conclusion of the project. If this were to happen, growers could use the platform with existing spray technologies.

WIDESPREAD BENEFITS

Professor Mitter's engagement and passion towards delivering an applied outcome for growers has driven her to persist with this project, and she can see its potential value to the vegetable and cotton industries.

"This particular project is really aimed at delivering industry-relevant outcomes and not just looking at the fundamental science. It's taking fundamental science towards application that can make a difference on the ground," she said.

Another attraction to BioClay is its clean, green and safe approach to plant protection from viruses.

"We are not using any chemicals; there's no residue left on the plant and this is really important for vegetable crops. This clay is absolutely biodegradable," Professor Mitter said.

This technology can also be used to support growers who are currently exporting or thinking of showcasing their produce on the world stage.

"Consumers these days are really looking at provenance now – they want to know how their crop has been grown and what was used to protect it," Professor Mitter said.

"I believe this will impact on increasing our export potential, increasing the value of our premium produce, and giving us that niche for a step forward in that space."

INFO R&D

For more information, please contact Professor Neena Mitter at n.mitter@uq.edu.au. More information can be found at uq.edu.au/research/impact/stories/spray-on-protection.

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

Project Number: VG16037

The South Australian farm walk was hosted by Braham Produce in Virginia.

SHEDDING A PRACTICAL LIGHT ON CHALLENGING SOILBORNE DISEASES

The Soil Wealth and Integrated Crop Protection (ICP) projects work with growers nationally to put soil management and plant health research into practice. This edition provides an update from a demonstration site in South Australia, as well as an overview of new resources that provide practical tips and tools on managing soilborne diseases in a range of vegetable crops.

FARM WALK RECAP: VIRGINIA, SOUTH AUSTRALIA

In September, growers and industry service providers descended on Adelaide for the fourth Soil Wealth and Integrated Crop Protection (ICP) Soilborne Disease Master Class.

The Master Class provided and discussed the core principles and cutting-edge knowledge for managing soilborne diseases in different vegetable production systems.

As part of the Master Class, participants visited a demonstration site in Virginia, South Australia hosted by Braham Produce. Braham Produce grows capsicums in soil under greenhouse systems.

> The Master Class provided and discussed the core principles and cutting-edge knowledge for managing soilborne diseases in different vegetable production systems.

The key messages from the field visit were:

- Use soil fumigation strategically in a monoculture; actively manage soil biology via compost and biological products; and be strict about hygiene and biosecurity.
- Monitor all inputs and their effects via soil, plant and water testing for nutrients and diseases, and adjust management according to results.
- Keep on top of new technology by working with suppliers and researchers through on-farm trials.

You can find out more about the demonstration site on the project website (soilwealth.com.au).

MANAGING FUSARIUM DISEASES IN VEGETABLE CROPS

Fusarium is a genus of common soilborne fungi. Most live as saprophytes on decaying plant matter while a few are also important plant pathogens.

While there are many different pathogenic *Fusarium* species, some of the most damaging diseases are caused by strains of one species complex, *Fusarium oxysporum*. They cause vascular wilt diseases by entering the roots and colonising the water-conducting tissue (xylem). This causes older leaves to yellow and plants eventually wilt and die.

The team has written a useful fact sheet on fusarium wilt diseases, factors that favour fusarium diseases and management strategies.

CLUBROOT MANAGEMENT IN BRASSICA VEGETABLES

Clubroot is one of the most potentially devastating soilborne diseases affecting brassica vegetables (e.g. cabbages, cauliflower, broccoli, kale and Brussels sprouts) in Australia. Once plants are infected, there are no effective control measures.

A practical fact sheet has been developed that assists with identifying clubroot; clubroot management strategies including integrated approaches; and evaluating clubroot risk.

SOILBORNE DISEASE VIDEO SERIES: PRACTICAL TIPS AND TOOLS

A series of six videos providing practical guidance on the identification, causes and management of soilborne diseases have been produced and are now available on the project website. These short videos feature plant pathologist and expert Dr Len Tesoriero, and cover:

- Basel plate rot in leeks.
- Big vein in lettuce.
- Black rot in brassicas.
- Bottom rot in lettuce.
- Club root in brassicas.
- Summer root rot in parsley.

INFO R&D

You can access all the resources in this article, as well as news and events from around the country, at soilwealth.com.au. 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

vegetablesWA Vietnamese Vegetable Industry Development Officer Truyen Vo.

AUSVEG SA Industry Development Officer Hannah McArdle.

SPOTLIGHT ON WA AND SA VEG INDUSTRY DEVELOPMENT OFFICERS

In this edition of *Vegetables Australia*, we continue our profile of Vegetable Industry Development Officers from the National Vegetable Extension Network (VegNET). Truyen Vo, based in Western Australia, is the first Vietnamese-speaking extension officer in the project, while Hannah McArdle is following her passion for food and education in her role in South Australia. VegNET is a strategic levy investment under the Hort Innovation Vegetable Fund.

TRUYEN VO: BRIDGING THE COMMUNICATION GAP

As one-third of vegetable growers in Western Australia are either first- or second-generation Vietnamese, language has traditionally been a barrier to engagement for vegetablesWA, the state's vegetable grower association. However, the employment of a Vietnamese-speaking extension officer has helped to bridge the divide, enabling this large proportion of growers to benefit from vegetableWA's programs and initiatives.

Vo The Truyen (Truyen) joined vegetablesWA in 2012. As the association's first Vietnamese-speaking field extension officer, his role has focused on building relationships with growers in key areas including Albany, Manjimup, Donnybrook, Busselton, Perth, Geraldton and Carnarvon.

"Truyen applied for the role from New Zealand, where he was working as a lab and field technician with Land Care Research," vegetablesWA Chief Executive Officer John Shannon said.

"We're incredibly lucky to have him given his professional and academic experience, which includes working for 11 years as a research scientist with Vietnam's Southern Fruit Research Institute and a Master of Science in Pomology (fruit science)."

With much of the research and development provided for the national vegetable industry occurring in the eastern states, historically Western Australian growers have had little access to this information. For growers with English as a second language, this access is further compounded.

A GROWING VOICE

A member of the National Vegetable Extension Network (VegNET) since 2016, Truyen's role is essential to bridge extension of research and development with growers nation-wide.

"We've found through experience that educating growers on new research and development initiatives often requires more than providing information at a single setting," John said.

"However, quite often new research is introduced to the vegetable growing community at a one-off forum. But to feel confident in implementing new practices and technology, growers generally need more ongoing support and the level of support needed is even greater for growers from different cultural backgrounds."

Industry response to Truyen's role has been overwhelmingly positive, according to John.

"His ability to provide translation services has enabled Vietnamese growers to participate for the first time in a range of industry meetings.

"This has led to a number of improvements to growing practices, from the introduction of pH soil testing and farm biosecurity planning and implementation, to more complex pest and disease management. He has been instrumental in helping to achieve greater control of stable fly, cucumber green mottle mosaic virus and tomato-potato psyllid, which are significant problems for our industry and the broader community in many parts of the state."

As testament to Truyen's early success in the role, a community forum on water efficiency attracted more Vietnamese-speaking growers than English-speaking growers.

"This is a first for us and is very encouraging given the importance of encouraging greater water use efficiency across the industry," John said.

With English as his second language, Truyen understands first-hand the challenges facing many of the growers he works with.

"It is difficult to participate in research or benefit from research outcomes and advances in technology when English is not your first language," Truyen explained.

"Surprisingly, a lot of the growers I have met with since taking on the role didn't even know that as growers, they were members of vegetablesWA and had no idea about the research being undertaken on their behalf. Now that this is all changing, I hope to also work with growers to gain an understanding of their issues and challenges."

This information will then be fed to vegetablesWA to ensure the broader industry and research providers are kept aware of issues important to growers.

"This way the industry can more quickly and more effectively address emerging issues," John said.

To get in touch with Truyen, please call 08 9486 7515 or email truyen.vo@vegetableswa.com.au.

INTRODUCING AUSVEG SA'S HANNAH MCARDLE

I grew up on a small sheep farm in a small town called Naracoorte, located in the south-east region of South Australia.

I have a passion for education and the food production industry. Linking those two together, I found myself studying a Bachelor of Agricultural Science after finishing high school. Since beginning the degree in 2013, I have worked for Coles in quality assurance, the South Australian Research and Development Institute (SARDI) on a research project for oat breeding and Peracto SA (now known as AgXtra) as a Field Assistant. This path led me to my current role with AUSVEG SA as an Industry Development Officer for the VegNET project. My role involves assisting with the extension of industry research and development to South Australian vegetable growers.

I have been in this role since July 2016 and have really enjoyed working with growers. Just this year we have held courses on negotiations, irrigation, VegInnovations and consumer alignment.

In March this year, we hired two part-time Vietnamese Extension Officers – Kevin Le (also known as 'Aussie Kev') and Tim Lai. Kevin is also a grower and Tim has qualifications in environmental management. The Vietnamese Extension Officers work part-time with us and have proven to be assets to the VegNET SA team.

Project updates, upcoming events and summaries of the latest R&D can be found in the AUSVEG SA newsletter. To sign-up for events or to become an AUSVEG SA member or to hear more about VegNET in South Australia, please contact me at hannah.mcardle@ausveg.com.au.

You can also get in contact with us on 0408 475 995 (Hannah), 0433 219 249 (Kevin) or 0450 737 579 (Tim). Follow us on Twitter: @AUSVEG_SA, @HannahMcArdle11 and @Tim86843548.

INFO R&D

For more information on the National Vegetable Extension Network and upcoming events, please contact Adam Goldwater on 02 8627 1040 or adam.goldwater@ahr.com.au.

Regional capacity building to grow vegetable businesses – national coordination and linkage project has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

Project Number: VG15049

L-R: Jo van Niekerk, Maree McPherson, Emma Germano, Dr Nicola Watts, Dr Jessie Horton and Kate Wallis at the Gippsland Women in Horticulture event.

UPDATE ON VEGETABLE EXTENSION NETWORK ACTIVITIES

Recently, the Tasmanian branch of the National Vegetable Extension Network (VegNET) collaborated with the Tasmanian Institute of Agriculture (TIA) to deliver the Vegetable Research Facility Open Day, while in Churchill, Victoria, the second annual Gippsland Women in Horticulture event brought women together to celebrate participation, productivity and innovation in the region.

The Tasmanian Institute of Agriculture (TIA) Vegetable Research Facility once again held its Open Day, with delegates arriving at the Forthside site on 10 October 2018 to hear from speakers and see the latest in field R&D.

This year's event was hosted by TIA in conjunction with the National Vegetable Extension Network (VegNET Tasmania – VG15046) project.

The discussion throughout the day focused on farm production practices including research into seed management; biosecurity; soil health; and strip tillage.

Mark Boersma from TIA and Dr Doris Blaesing from RM Consulting Group opened the biosecurity discussion with an overview of managing risks on-farm. This included the importance of soil health and the value of knowing the difference between good seed and bad seed.

Harvest Moon Agricultural Director Mark Kable shared his on-farm experiences of improving soil health, such as the process of fixing the soil's organic matter and pH as well as the positive impact that the change to controlled traffic farming has delivered.

Blue Moon Potatoes Director Darryl Smith – the first Western Australian grower to find tomato-potato psyllid (TPP) on his property – described the impact that the TPP incursion had on growers in the initial stages. Meanwhile, AUSVEG Biosecurity Adviser Dr Kevin Clayton-Greene dissected the lessons learnt from the response to the incursion.

After lunch, attendees headed to the field to hear from researchers about a range of projects, including integrated weed management in vegetable production; biofumigation and cover crops in one of the world's longest-running research trials; and the impact of row spacing on processing pea production.

The paddock walk was a fantastic opportunity for growers and agronomists to see R&D in action, talk to researchers about their projects, and network with other industry members who are interested in agronomy.

WOMEN IN HORT: PUTTING LEADERSHIP ON THE AGENDA

Held on 23 August 2018 in Churchill, VegNET Victoria – Gippsland (VG15047) hosted the annual Gippsland Women in Horticulture event. Around 30 members of the local vegetable industry were in attendance and they heard from a number of inspiring speakers.

Each presenter highlighted past challenges and opportunities for female leaders in the Gippsland region, as well as the importance of understanding and recognising what drives people to lead.

The event also highlighted that leadership is not simply a position in an organisation, but a way of thinking and an approach to every aspect of life. It helped attendees think about how to identify situations in their workplaces where they should take initiative and lead, as Boomaroo Nurseries Territory Manager Jo van Niekerk observed: "We all step in and out of leadership every day."

I Love Farms Managing Director and Victorian Farmers' Federation Horticulture Group President Emma Germano told her story of overcoming challenges in the horticulture industry, and her advice for the audience was simple: just do it.

"Don't think about the reasons you should be counted *out*, think about the reasons why you should be in counted *in*," Emma said.

Many speakers, including East Gippsland Food Cluster Chief Executive Officer Dr Nicola Watts, discussed the importance of telling provenance stories around seeds, plants and food from Gippsland.

After lunch, participants broke into groups to discuss special interest areas including health and wellbeing; leadership and advocacy; and organic and local food. For 30 minutes, the groups discussed things that were being done well, highlighted areas that require improvement and brainstormed ways to overcome issues affecting future success.

There were many ideas to emerge from these varied groups, including ways to engage with growers in the mental health space; encouraging people to attend extension events so they can understand what is happening in their industry; and ideas around supporting and mentoring local businesses to develop their own local systems.

Once again, this event gave participants the opportunity to reflect on and celebrate Gippsland's horticulture industry and raise awareness of the opportunities available for women in the industry, as well as provide valuable networking opportunities for industry members.

INFO R&D

Regional capacity building to grow vegetable businesses – national coordination and linkage project 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: VG15049

Hort Innovation Strategic levy investment | VEGETABLE FUND

IMPLEMENTING TECHNOLOGY TO MEET FRESH PRODUCE REQUIREMENTS

There are many challenges facing the fresh produce sector, including increasing costs and compliance requirements as well as fewer resources. To assist producers in their decision-making, a resource planning system has been developed with a focus on efficiency, reducing labour costs, meeting quality assurance requirements and ensuring traceability throughout the supply chain.

Since its humble beginnings in Haymarket, Sydney in 1956, N&A Group has expanded to include growing, packing, distribution and export of fresh produce, including organics.

As the company can attest, the fresh produce industry is notoriously fast-paced and dynamic. Often, customer orders come through in the morning and need to be delivered that day. To meet these changing needs – and to make accurate pricing decisions amid this volatility – producers need the ability to think on their feet.

N&A Group was finding it difficult to keep up with the pace of change.

"We were very top-heavy on the admin side of things, weighed down by a manual, paper-based system where multiple employees handled transactions multiple times. It wasn't efficient, nor was it sustainable," N&A Group Chief Information Officer Duncan Ritchie said.

Stock control suffered as a result, as did quality control. Without visibility into where orchard deliveries were sitting, the holy grail of 'first in, first out' was difficult to achieve. It was also taking too long to produce management reports, making it difficult to react to problems and rectify them.

"We needed a single touch data entry system to reduce labour costs, greater traceability for compliance with our quality assurance obligations and better visibility throughout our supply chain," Mr Ritchie said.

MEETING EXPECTATIONS

When it comes to technology, the fresh produce industry has unique requirements. The attributes of fresh produce are complex – with classes, sizes and colours dictating price and order quantity. Throw in a multi-faceted operation that covers growing, pre-packing, distribution and more, and the complexity grows.

Given this, N&A Group Chief Financial Officer Tony Kelly set to work exploring Enterprise Resource Planning (ERP) solutions that would cater to the company's specific needs. The company eventually engaged Dialog to implement LINKFRESH™ – a real-time ERP system that provides complete visibility, traceability and accountability for all goods on an ongoing basis.

Dialog worked with the company to initially deploy the system in the wholesale distribution division. Next, it was deployed into its pre-pack business. The organics and export businesses followed, as did the orchards.

"With the support of LINKFRESH™ and Dialog, the implementation was very doable. It was easy to get information into the databases and get up and running," Mr Kelly said.

Since implementing the suite, N&A Group has experienced significant savings and efficiencies. Previously, eight clerical staff were inputting orders each day and labour costs have more than halved through increased automation. Stocktakes also take less than an hour, compared to over four hours previously.

"What we have now is a single-entry system – a transaction is entered once, and that's it. It flows right through all of our stock control and financial systems, giving us information that's current, reliable and up-to-date. We can react quicker to changing conditions and fix things like margins in real-time," Mr Ritchie said.

"Plus, the traceability allows us to track a product from harvest through to storage on a farm, and then to packing and distribution to the end user. It is a true end-to-end system."

INFO

For more information, please visit dialog.com.au or linkfresh.com.

Vegetable grower Daniel Hoffmann has implemented Integrated Pest Management practices onto his farm in South Australia.

A tomato crop on Daniel Hoffmann's farm. Images courtesy of IPM Technologies.

DANIEL HOFFMANN: CONTROLLING PESTS USING AN INTEGRATED APPROACH

South Australian vegetable grower Daniel Hoffmann spent three years adopting Integrated Pest Management practices onto his farm. Dr Paul Horne from IPM Technologies has captured an insight into Daniel's experiences and challenges, including the need to build his soil health and insect knowledge throughout the transition.

Daniel Hoffmann is a vegetable grower on the Northern Adelaide Plains, near Virginia in South Australia. He has a farm that totals 11 acres but has polytunnels with a total area of 14,400 square metres.

In the past Daniel has grown crops including tomatoes, capsicum, eggplant, zucchini and cucumbers, however now he concentrates mostly on Roma tomatoes. The tomatoes are produced for sale to supermarkets via intermediate suppliers.

In addition to the main crop of tomatoes which are grown in polyhouses, he also grows crops such as spinach, broccoli, cabbage, Asian greens, spring onions, snow peas, various beans, chillies and herbs (mostly grown outdoors). These crops are grown for sale at local farmers markets. Daniel is also carrying out small-scale trials on growing other crops such as pumpkin, rockmelon, long melon and dragon fruit.

Daniel now controls insect, mite (and nematode) pests using an Integrated Pest Management (IPM) approach. Before this, he used a chemical-based approach that involved fumigating the soil with products such as metham sodium and then spraying an insecticide or miticide weekly for each pest as required. Sometimes one product would be active on more than one pest, which reduced the number of sprays required.

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

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

A CHANGING APPROACH

The first step was to stop using broad-spectrum products that were designed to kill a wide range of invertebrates. Instead of fumigating the soil, Daniel used break crops such as sorghum and mustard or radish crops in rotation with his fruit and vegetable crops.

Instead of spraying products that killed beneficial insects and mites, he used more selective products and began buying and releasing commercially-produced beneficial insects and mites. These were predators or parasites of the key pests in his crops. In addition, he began brewing up his own microbe mixes and using natural fish fertilisers, worm fertilisers and soil conditioners.

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

To achieve this, Daniel received advice from biological experts, bug experts and agronomists. However, it was not an easy transition – 30 years of farming a certain way does not change overnight and in the beginning, there were problems. There were soil disease problems and beneficial species could not get established because of chemical residues. Daniel had to be patient and keep working on improving the soil health and biology, as well as using different insecticides to keep pest numbers down until their predators and parasites could establish.

Daniel emphasised the need to look after soil health as the starting point for the whole process.

"The benefits to a commercial crop following a well-grown cover crop are amazing. This includes incredible increases in production for crops such as capsicum, cucumber and tomato," he said.

Doing this has shown good soil pathogen and nematode control and also a benefit in putting organic matter back when the cover crop is mulched in. This approach also ensures a carry-over of beneficial soil-dwelling insects and mites instead of killing them with metham sodium.

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

BENEFICIAL RESULTS

Daniel said that his patience has paid off – he is rarely spraying at all; only when certain fungicides are needed.

"I have grown entire crops of tomatoes over five months and have only needed to spray once or twice the whole time and that's mostly for powdery mildew or to bring down whitefly numbers slightly until *Nesidiocorus* (a whitefly predator) can get back in control," he said.

"I haven't bought chemicals for over a year; the plants' roots are far stronger than ever creating super-strong crops; fruit set is fantastic; and any old problems such as Botrytis are basically gone. I've found that when you don't spray at all then your plants are super strong and happy all the time; nature has taken over."

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

"About three years ago I stopped doing any contracted releases of commercially-produced insects and mites and only used small top-ups with capsicums and tomatoes, to the point where I haven't done a release in over a year in tomatoes.

"I've managed to keep a healthy supply of beneficial insects maintained at my farm using host plants throughout my property and almost cutting back on chemical use entirely. Every time I plant a new crop the good guys just move in naturally and begin protecting my crops from the get go."

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

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

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

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

INFO R&D

For more information about Integrated Pest Management, please contact Dr Paul Horne and his team on 0419 891 575 or email info@ipmtechnologies.com.au.

REGULATORY UPDATE FOR INDUSTRY STAKEHOLDERS

In this edition, National Tomato Potato Psyllid (TPP) Coordinator Alan Nankivell discusses the latest on the proposed movement plans of potato tubers should TPP be discovered on the eastern seaboard, and provides an update on the reinstatement of market access for potato growers in Western Australia.

With the potato planting season soon to be in full swing, industry stakeholders are seeking reassurance from the various state regulators on the preparedness plan for the movement of potato tubers within and between the states of New South Wales, Queensland, South Australia and Victoria should the tomato-potato psyllid (TPP) be discovered on the eastern seaboard.

At its meeting held on 4 October, the Plant Health Committee (PHC) reviewed the proposed movement conditions if TPP was detected in either New South Wales, Queensland, South Australia or Victoria. This was to incorporate previous industry comment and feedback. The outcome is that the PHC is to prepare a communique to industry providing a way forward. As soon as this communique becomes available, it will be circulated to all industry stakeholders.

During their discussions, PHC members identified that each jurisdiction has the necessary powers within their respective legislation to maintain business continuity while mitigating the risk of the spread of TPP. It was acknowledged by PHC members that potato tubers were not a vector for TPP, but were potentially a repository for *Candidatus* Liberibacter solanacearum (CLso).

ONGOING SURVEILLANCE

With TPP now considered endemic in Australia but free of CLso, it is important for Australia's international trading reputation that it demonstrates that it remains free of CLso.

To this end, DPIRD commenced trapping for TPP at the beginning of October 2018 for an initial four-week period. The task is to test 1,690 TPP for CLso, and it is occurring in locations where high numbers of TPP were trapped last spring and autumn. Further trapping of TPP and testing for CLso will take place in autumn 2019.

There has been much debate if, and when, there will be another incursion of TPP. It has been considered that TPP will come directly from Western Australia or it could arrive on the eastern seaboard from another country. As a result, all jurisdictions are going to be involved in further surveillance for TPP during the coming spring/summer/autumn.

A collaborative project led by Plant Health Australia and involving the Department of Agriculture and Water Resources, Hort Innovation, AUSVEG, individual growers and all jurisdictions, will be reviewing "gaps" in surveillance at a meeting in early November and then seeking to direct resources to fill the gaps for the coming season's surveillance.

> ... it is important for Australia's international trading reputation that it demonstrates that it remains free of CLso.

As Australia is now recognised internationally as CLso-free, it is important that all stakeholders, industry and government undertake strong biosecurity practices to minimise the risk of a CLso incursion. Finally, members of the PHC acknowledged the industry need for certainty of potato tuber supply to ensure business continuity can be maintained.

MARKET ACCESS DISCUSSIONS

Western Australian industry stakeholders have become concerned at the delay that respective state jurisdictions have taken to make the necessary arrangements for market access since Western Australia has been declared CLso-free.

All jurisdictions received a certificate of area freedom from the Western Australian Department of Primary Industries and Regional Development (DPIRD) in early August 2018. It is pleasing to report that as of 26 October, all jurisdictions except South Australia had finalised their respective processes and have granted market access for Western Australian potato tubers.

If you are undertaking private surveillance, we would appreciate adding your data to the bigger picture. This can be done by contacting AUSVEG Project Officer Shakira Johnson at shakira.johnson@ausveg.com.au. This important project is to assist the Federal Government and demonstrate that Australia has the evidence to maintain area freedom.

INFO R&D

For more information, please contact National TPP Coordinator Alan Nankivell at alan.nankivell@ausveg.com.au.

Tomato potato psyllid (TPP) National Program Coordinator has been funded by Hort Innovation using the fresh potato, potato processing and vegetable research and development levies and contributions from the Australian Government.

Project Number: MT16018

L-R: John Matakaiongo and David Hogan.

L-R: Nic Schembri, Karl Miller, John Matakaiongo, Satendra Kumar, Martin Horwood and David Hogan.

BIOSECURITY CHAMPION RECOGNISED

The quick-thinking of a western Sydney warehouse manager in reporting one of the top threats to the $1 billion New South Wales horticultural industry was officially recognised in September.

John Matakaiongo from Hager Electro was awarded for immediately reporting the discovery of the brown marmorated stink bug (BMSB) in a shipping container from Italy at the company's Glendenning warehouse late last year.

The sighting prompted a response campaign led by Greater Sydney Local Land Services (LLS) in partnership with the New South Wales Department of Primary Industries (NSW DPI).

Greater Sydney LLS Plant Biosecurity Officer Martin Horwood said the quick thinking and ongoing cooperation from John and the Hager team was critical to the success of the response.

"Thanks to John's vigilance, we were able to launch an immediate response which saw our team work tirelessly, contributing about 4,500 hours spraying vegetation around the detection site; inspecting almost 2,000 traps; scouring more than 300 hectares of bushland, industrial areas and homes; and deploying more than 180 pheromone traps within a five-kilometre zone," he said.

"This led to another detection of BMSB at Horsley Park two months later but thankfully, following an exhaustive six-month campaign, the response has been declared a success with no further detections recorded."

Mr Horwood added that ongoing vigilance from biosecurity officers and the community was critical.

NSW DPI Director Plant Biosecurity and Product Integrity Satendra Kumar and Greater Sydney LLS General Manager David Hogan presented certificates to John and the Hager team.

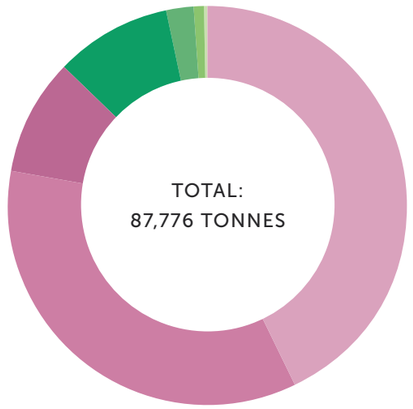
"It is an honour to receive this recognition. The LLS staff involved in the response were extremely professional and worked collaboratively with our team and it's great that we were able to stop the spread of the pest," John said.

Mr Hogan said that with the Greater Sydney region home to significant ports and airports, along with large imports of freight, it's imperative everyone played a role in protecting our environment and the economy from the threat of pests and diseases.

INFO

Any unusual plant pest should be reported immediately to the relevant state or territory agriculture agency through the Exotic Plant Pest Hotline on 1800 084 881. More information on the brown marmorated stink bug can be found at dpi.nsw.gov.au/biosecurity/plant/insect-pests-and-plant-diseases/brown-marmorated.

VEGGIE STATS: CUCUMBER

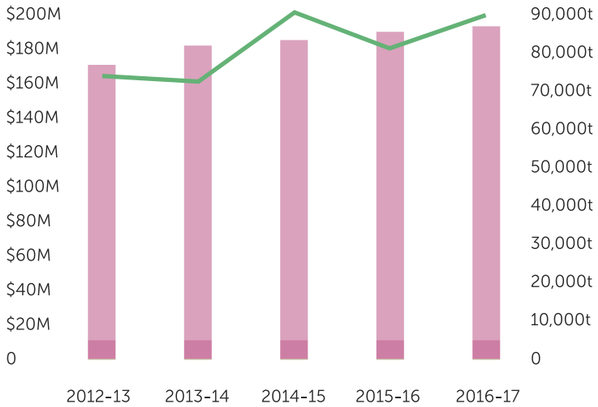


PRODUCTION BY STATE 2016-17

- Australia produced around $182 million worth of cucumber in 2016-17, up from around $164 million in 2015-16 but below the 2014-15 production value.
- The majority of Australian cucumbers are grown in protected cropping environments, with the largest producers in Bowen and Bundaberg in Queensland and the Riverland region in South Australia.

Source: Australian Horticulture Statistics Handbook - Vegetables, Hort Innovation, various years.

SA QLD WA NSW NT VIC TAS



KEY STATISTICS

- Australia produced nearly 88,000 tonnes of cucumber in 2016-17, continuing the steady increase in production of around 13 per cent since 2012-13.
- The overall value of Australian cucumber production has fluctuated over the same period, likely due to the impacts of weather events on supply windows and consequent price increases.

Source: Australian Horticulture Statistics Handbook - Vegetables, Hort Innovation, various years

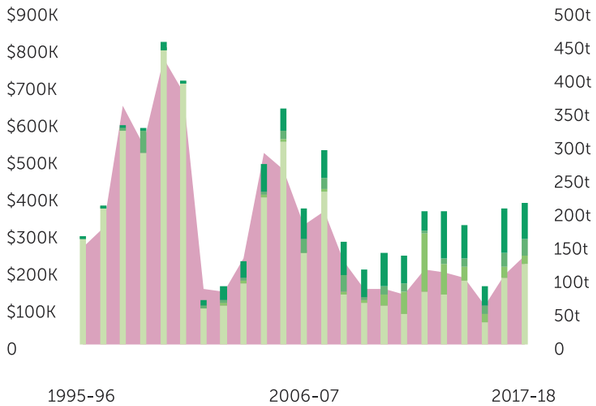
Value Fresh export volume Fresh supply volume Processing volume

EXPORTS OF CUCUMBERS AND GHERKINS (FRESH OR CHILLED)

- Australian exports of cucumbers and gherkins (fresh or chilled) are lower in overall volume and value than during the late 1990s and early 2000s, which is likely tied to the strengthening Australian dollar affecting overall vegetable exports.
- Australia only imports small volumes of cucumbers, and even then only intermittently, with no imports in 2017-18 and under 2.5 tonnes imported in total since 2006-07.

Source: Global Trade Atlas, accessed October 2018

New Zealand Papua New Guinea Singapore Fresh or chilled export quantity All other nations

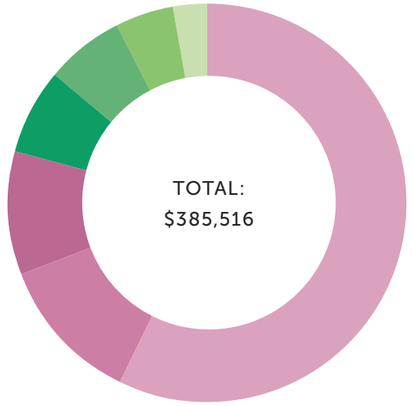


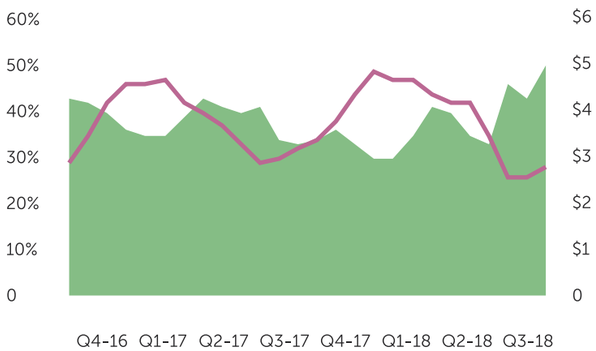
KEY EXPORT MARKETS IN 2017-18

- Exports of fresh cucumber earned around $385,000 in 2017-18. While recent years have seen an improvement in the overall value of exports compared to volume moved, this is still a negligible amount compared to overall production value.

Source: Global Trade Atlas, accessed October 2018

New Zealand Nauru Singapore Malaysia All other nations Hong Kong Papua New Guinea





HOUSEHOLD SPEND ON CUCUMBER

- For more insights into market performance and shopping behaviour for fresh vegetables, see the levy-funded Harvest to Home dashboard at harvesttohome.net.au.

Source: Harvest to Home dashboard, Nielsen Australia, accessed October 2018

Average amount spent Percentage of buying households

Two people share the world record for the most cucumbers sliced from a person's mouth with a sword. Both André Ortolf and Ashrita Furman have cut 46 cucumbers in one minute.

Veggie Stats data provides a broad indication of the performance of the profiled commodity and should be interpreted carefully. The data is presented at the national level and therefore does not account for differences among jurisdictions and individual growing operations. This communication has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government. Project Number: VG15027

Hort Innovation Strategic levy investment | VEGETABLE FUND

UPDATE ON PILOT CERTIFICATION PHASE AND SOCIAL AUDIT FINDINGS

The pilot phase of the Fair Farms training and certification program has been established to help growers meet the necessary legal requirements that demonstrate fair employment practices. Growcom's Fair Farms Initiative team provides an update on the next phase of the program as well as the lessons learned from recent social and ethical audits in farm businesses.

The Fair Farms training and certification program commenced a "proof of concept" pilot phase in October 2018.

The program will support fresh produce growers to understand what is required of employers to meet the Fair Work Act and other relevant laws, provide training, and a pathway to audit and certification for those who need to demonstrate fair employment practices to their customers.

Up to 10 farm businesses around Australia will participate in the pilot to test each of the key elements of the program.

These businesses will complete an online practice assessment, participate in training and then proceed to an independent audit of their employment practices and procedures. After addressing any required corrective actions, these businesses have the opportunity to become Australia's first certified "Fair Farms".

LEARNING FROM RECENT AUDITS IN FRESH PRODUCE BUSINESSES

Growcom is working closely with auditing firm AUS-QUAL to help shape the audit and certification process for the Fair Farms program.

While scrutiny of employment practices on fruit and vegetable farms may seem new to many growers, direct suppliers to large companies such as McDonalds or Coles have needed to demonstrate compliance with social or ethical standards for some years now. Over the last two years, AUS-QUAL has completed over 1,000 social audits with farm businesses.

AUS-QUAL General Manager of Corporate Services Terry O'Brien has reviewed these audit results to identify matters that commonly trigger corrective actions or findings. The most common include:

- Safety and administration issues (60%).
- Insufficient written policies and procedures (10%).
- Harsh treatment of farm workers (7%).
- Farm workers required to work excessive hours (6%).
- Child labour or poor management of young workers/ minors (6%).

Essential administrative matters that auditors check for include:

- Written policies and procedures.
- Current certificates of insurance and licenses.
- Contracts, for example with labour hire agencies.
- Employment records, particularly for induction and training.

The key issues of concern around health and safety include:

- Inadequate assessment of health and safety risks by farm managers (16%).
- Poor emergency procedures and equipment:
  - Evacuation maps, signage, drills or training (22%).
  - Nominated fire wardens, fire-fighting equipment or drills (15%).
  - Qualified first aiders for each shift, first aid kits or out-of-date first aid supplies (15%).
  - Blocked emergency exits (7%).
- Insufficient "tag and test" of electrical equipment.

It is worth conducting a review to check that these matters are well managed in your own business. Many of these issues are legal requirements, with significant penalties for non-compliance. Paying attention to health, safety, training and good record management also contributes to building a positive business culture and high job satisfaction among staff.

As 'responsible sourcing' policies are rolled out more widely across the retail and food service sector, the fresh produce industry must have mechanisms in place to verify that farm workers are employed correctly and that farm businesses have appropriate policies, procedures and record-keeping systems in place. In the short-term, direct suppliers are being requested to demonstrate their employment practices; however, in time, second and third tier suppliers will also face greater scrutiny.

INFO R&D

Further information regarding your obligations as an employer is available at fairwork.gov.au and growcom.com.au.

The Fair Farms Initiative is delivered by Growcom, in collaboration with industry and supply chain stakeholders. It is supported with seed funds from the Fair Work Ombudsman community engagement grants program.

TAKE CONTROL OF WEED RESISTANCE

Herbicides are a crucial tool for growers, however the increasing reports of herbicide-resistant weeds appearing on vegetable farms is cause for real concern. Most recently, growers have been reporting an increase in Group A Herbicide resistance, and reports of resistant annual ryegrass in particular are escalating. Syngenta Senior Technical Services Lead Scott Mathew provides an update.

The Group A Herbicide group is used for selective grass weed control and is classified as being at high risk of developing resistance. It includes three sub-groups: the fops (e.g. Fusilade Forte, Verdict), the dims (e.g. Sertin) and dens (e.g. Axial).

This mode of action has been readily available since the early 1980s but its repeated use may select for grass populations that are naturally tolerant or resistant.

Herbicide-resistant weeds can also be brought onto the property quite easily with other seed. Legumes or cereals acquired for cover crops can be contaminated with resistant ryegrass seeds. The practice of sowing cereal cover crops to give the crop early protection from the elements can also cause a problem if the cereal seed contains resistant ryegrass seed.

Be aware of the potential of weed seed contamination and inspect any seed before it is sown. If it is contaminated, particularly with ryegrass seed, don't sow it!

When planning weed control, it is important to appreciate the broader picture. There have been no new herbicide modes of action developed since the 1980s, when the Group B sulfonylureas were developed. That's a long time and highlights the importance of maintaining the effectiveness of the herbicide options we currently have.

The bottom line is that we all need to be good custodians of the herbicides we currently have registered. The best way to do this is by adopting integrated weed management.

SOME RECOMMENDED PRACTICES TO DELAY HERBICIDE RESISTANCE

- Use certified seed or source seed of known quality. Don't buy in and sow contaminated seed.
- Control weeds before they set seed. Encourage weeds to germinate but control them before they produce more seeds. Your aim is to lower the weed seed bank.
- Always plant crop seeds or transplant seedlings into weed-free ground. You want to give your crop the best possible start and not need to compete for plant resources. It will also reduce the need for, and pressure on, selective in-crop herbicides.
- Have a plan for herbicide use. Know the weeds present and what herbicides can control them, but also consider crop safety, plant-back restrictions and withholding periods. Record all applications and weather conditions.
- Rotate your herbicide chemistry. Make sure that products with different modes of action are continually rotated.
- Use mechanical means wherever appropriate to control weeds and stop them from setting seed. Don't just rely on herbicides to control problem weeds.
- Employ best crop management practices, such as:
  - Elements that stimulate crop growth. Healthy crops outcompete weeds.
  - Appropriate crop/plant numbers to cover the soil quickly and outcompete the weeds.
  - Suitable row spacing and row direction (if possible) to shade the interrow and reduce weed growth.
  - Plant crops suited to the conditions and choose planting dates that suit the crop. Weeds establish quickly in crops that establish slowly.
  - Fertiliser placement such as deep banding nutrients will advantage crop seedlings and reduce weed uptake.
- Green manure crops will enrich the soil and enable alternate methods of weed control.
- Growers should scout their crops after herbicide application. Begin about seven days after application; observe and record weed species, spatial patterns of weeds and herbicide symptoms on weeds. If weeds are still present after an application, determine the reason. If resistance is suspected, contact your local agronomist for help.

INFO R&D

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

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

L-R: Sarah Noack, Lisa Brassington, Nikita Chawla and Anna Baum at the Hart Field weather station in South Australia.

The iMapPESTS program comprises a series of sub-projects seeking to uplift surveillance-related capabilities, including:

- A South Australian Government initiative to develop advanced surveillance trapping and sampling devices and install them on mobile surveillance units (sentinels) for deployment across Australia. This initiative is also looking to develop a scalable, long-term pest diagnostics solution for air-based field samples;
- A Victorian Government initiative to investigate application of novel pest diagnostics techniques for broadscale detection of exotic pests and diseases;
- A CSIRO initiative to develop computerised models that predict the abundance and spread of pests to enable growers to better target their pest management efforts; and
- A Western Australian Government initiative to establish and operate a smart surveillance network across the Western Australian Grainbelt.

It also includes a system integration role being filled by Plant Health Australia, a not-for-profit organisation focused on Australian biosecurity, and an extension role being filled by AUSVEG.

INFO R&D

For further information, please call AUSVEG on 03 9882 0277 or contact Extension and Engagement Coordinator Shakira Johnson at shakira.johnson@ausveg.com.au or Project Officer Nikita Chawla at nikita.chawla@ausveg.com.au.

For background information on the iMapPESTS program, see page 46 of *Vegetables Australia* July/August 2017 at ausveg.com.au/news-media/publications.

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

Project Number: ST16010

INDUSTRY COLLABORATES FOR PLANT PEST AND DISEASE SURVEILLANCE ACROSS AUSTRALIA

A national, cross-industry plant pest surveillance program has recently commenced and aims to provide a framework for a coordinated system that can rapidly monitor and report the presence of high-priority airborne pests and diseases affecting major agricultural sectors, including grains, cotton, sugar, horticulture, viticulture and forestry. *Vegetables Australia* provides an update on the project.

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

Over a five-year period (2017-2022), the iMapPESTS program will research, develop and validate advanced pest and disease surveillance, diagnostics, and forecasting technologies, including custom-designed and built mobile surveillance units (termed 'sentinels') that incorporate specialised trapping equipment and technology. The sentinels will be deployed at various locations across the country and will capture samples for laboratory identification and analysis. Computer models will then predict the abundance and spread of target pests and diseases. The data and information generated across the program will be transitioned and extended to its stakeholders in the form of tailored information products, an activity being led by AUSVEG, in collaboration with the extended research and industry network.

Specifically, AUSVEG's communications and engagement activities include establishing a vast extension network to raise awareness, build support and promote adoption of the program's outputs and outcomes across each industry. It will focus on the program's target audience: growers and their advisers involved in the major cropping agricultural sectors of cotton, forest products, grain, horticulture, sugarcane, wine grape and emerging plant crops.

GROWER IMPACT AND FEEDBACK

Towards the end of 2018, the AUSVEG project team will begin regional consultation workshops across Australia to gather information, raise awareness and provide updates and information on the different components of the program, including when and where the sentinel units will be deployed. During these discussions, the team would also like to understand the preferred presentation and delivery of the pest and disease reports and alerts for each region.

Visit ausveg.com.au/imappests/ for the information brochure, which graphically describes the program and the roles and responsibilities of the government, research and industry partners involved in this unique research initiative.

Growers and agronomists are also strongly encouraged to have their say and fill in the survey on the iMapPESTS website to share the priority airborne pests and diseases that affect your region and related field crops. Please keep in contact with the project team for announcements and updates, including dates of when the team will be in your area in early 2019.

INDUSTRY IN THE MEDIA

The continued debate over a dedicated agriculture visa heated up in October and subsequently dominated media coverage in the industry.

AUSVEG CEO James Whiteside appeared in print and on broadcast media following Prime Minister Scott Morrison's statement that his government is committed to delivering an agriculture visa as a medium- to long-term solution. Mr Whiteside said while the statement was welcome, more action was needed to bring more foreign workers onto Australian farms now.

After the Australian Government announced its planned initiative to force social welfare recipients to work on Australian farms, Mr Whiteside called the plan "a slap in the face" to Australian farmers, and said the announcement suggested that the government wasn't listening to farmers and regional and rural communities about the severity of their labour problems.

Mr Whiteside added that the industry is looking for support from the government to help meet its labour needs, whether that results in the government introducing a new visa class or simply restructuring existing visa schemes.

INDUSTRY NEWS

In October, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) released its latest data on the economic performance of Australian vegetable-growing farms, which showed that vegetable farm profits have increased to an average of $189,000 per farm. Mr Whiteside said that there were a number of factors influencing vegetable farm profitability and cash flow, including growing conditions and the consolidation of some farms.

Fresh from his recognition as the Young Grower of the Year at Hort Connections 2018, organic mushroom grower Chris McLoghlin was also awarded the Kondinin Group and ABC Rural 2018 Young Australian Farmer of the Year award in October. Mr Whiteside said that during his relatively short time in the industry, Chris has proven himself as an innovative businessman and strong advocate for the Australian organic industry.

Mr Whiteside also appeared in stories covering a new Melbourne technology start-up which is trialling the use of sensors and robots to prevent theft at self-service checkouts in supermarkets. He noted that while fresh produce is the most commonly stolen item in supermarkets, this issue is a matter for the supermarkets to manage.

INFO R&D

Communication of R&D projects in the Australian vegetable industry has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

Project Number: VG15027

2018 AgriFutures Victorian Rural Women's Award winner Melissa Connors. Photography by Jackie Cooper.

2018 AgriFutures Rural Women's Award finalists. L-R: Jillian Kilby (NSW/ACT), Allison Clark (TAS), Linda Blackwood (NT), Krista Watkins (QLD and National Winner), Darrylin Gordon (WA and National Runner Up), Alex Thomas (SA) and Melissa Connors (VIC). Photography by Rachael Lenehan.

THIS FARM NEEDS A FARMER: SHARING KNOWLEDGE AND CONNECTING COMMUNITIES

After moving to regional Victoria in 2012, Melissa Connors identified a knowledge gap between the older generation of farmers and 'tree-changers' such as herself. To bring the two groups together, Melissa established *This Farm Needs a Farmer* and was recognised for her contribution to agriculture by taking home the 2018 AgriFutures Victorian Rural Women's Award.

It has been well-reported that Australia's major capital cities are growing rapidly. In 2017, the Australian Bureau of Statistics stated that Melbourne experienced the largest growth of all greater capital cities (125,400), followed by Sydney (101,600) and Brisbane (48,000).

However, despite these rising figures, there are families who are shunning city living for a quieter existence in regional areas. Six years ago, Melissa Connors and her family moved from Melbourne to live on a 10-acre property in Kyneton, located in Victoria's Macedon Ranges. It wasn't an easy transition and with little farming experience, the Connors struggled.

In 2015, Melissa struck up a conversation with a neighbouring retired farmer. Following this chance meeting, she realised that there could be an opportunity for collaboration.

"Here we are (my husband and our kids), moved onto a property where we don't know anything and then we've got these retired farmers, walking around our regional towns at a lost end and not sure what to do with themselves," Melissa says.

"I just thought that this is the perfect opportunity to tap into that knowledge that they have; give them that opportunity to retire on the farm; and share the knowledge and the wisdom that we actually need."

FINDING A HELPING HAND

Inspired by her conversation with the retired farmer, Melissa established *This Farm Needs a Farmer* to assist other families making a tree-change. It also allows farmers to have the option of retiring on the farm and sharing their knowledge with those who need it.

Getting involved in the project is a simple process. Any farmers or tree-changers can log on to the website (thisfarmneedsafarmer.com.au) and submit their details which are then captured on a national database.

"This is so we can have a record of who needs what and who's offering what in every area. That is consistently growing stronger every day which is really exciting; it's completely organic growth – I really haven't had to push it at all which tells me that it's such a needed service in a lot of areas," Melissa says.

"This is especially the case in commuter towns, where people are still commuting to Melbourne or a capital city and are living on these properties that they want to work or manage. And a lot of the time, they eventually want to transition full-time to their property."

The project's Facebook and Instagram pages are other ways of connecting with Melissa, while she is also available to be contacted directly via mobile.

"I highly value and encourage experienced growers to get in contact because it not only grows the network, it grows the community. At the end of the day, that is what it's all about – people connecting with people and doing what they love," she says.

OVERCOMING CHALLENGES

Establishing the project hasn't been all smooth sailing – the farmers have been a "tough nut to crack", according to Melissa.

The feedback on the project has been mixed, although current working farmers (both established and new to the industry) see a lot of value in the tree-changers and are willing to help them.

"Some of the older generation say, and I'll quote, 'those greenies; we don't have time for them, coming in to take over.' But that's just not the case. They actually want to learn, they're thirsty for knowledge and want to do the right thing and really develop their property so that future generations can benefit," she says.

"It's still a work in progress, but that hasn't stopped the project itself from developing and evolving in other areas. There's a real movement with people making the tree change and becoming aware of how their food is being treated, where it's come from and what is on the plate in front of them.

"I am finding that it is primarily a lot of families with young children – they're becoming more conscious of what's going into their body, and just wanted to make that change away from the rat-race and offer their children a better way of life."

As a result, *This Farm Needs a Farmer* is being rolled out in other regions beyond the Macedon Ranges, which will open opportunities for people to gain experience on working farms.

"Or they could have a mentor come to their farm and go through what they think would be best, or discuss how they want to work their property and how they go about it," Melissa says.

Anyone interested in the project should mark 24 February 2019 in their diary, with a field day for *This Farm Needs a Farmer* taking place in Kyneton, Victoria.

"It's an opportunity for people to come and talk, and just be in a comfortable environment where no knowledge is assumed, everything will be explained, and you will be fully supported," Melissa says.

"It's a welcoming, friendly and inclusive community that I'm creating. Kids are more than welcome. That's the other thing – our working mothers are so undervalued and so underestimated in terms of what they can achieve, and working your property in agriculture – what better way than to work from home?"

REWARD FOR EFFORT

This year, Melissa was recognised for her tireless work when she received the 2018 Victorian AgriFutures Rural Women's Award. She joined other recipients from around the country in the running for the national accolade, which was awarded to Queensland banana grower and food innovator Krista Watkins. The finalists are all champions in their respective fields and offer a range of innovative ideas to promote and safeguard the future of Australian agriculture.

Melissa almost didn't apply for the award, believing her project wasn't worthy of a nomination. She is now glad she did.

"No matter what the outcome is, I really encourage people to give these sorts of things a go," she says.

"It makes you sit down and think about how you want to go about your project or your idea, and what sort of plan you want to put in place. It gives clarity to your idea and helps to get it off the ground or progress it further – and that's never a waste of time."

The AgriFutures award experience has been a positive one for Melissa.

"The alumni that I'm now part of for the AgriFutures Rural Women's award is such a valuable tool in being able to launch this project in other regional and rural areas," she says.

"I've already got trusted connections that I can contact and use, and with the support of AgriFutures and their focus on the alumni, it is a powerful tool. It's exciting because I can tap into these women and bounce my ideas off them; I can put a call out and say, 'I need someone who knows this in this area' and the alumni can respond to me; I can get mentoring personally and professionally – it's a necessary part of trying to operate and create a business."

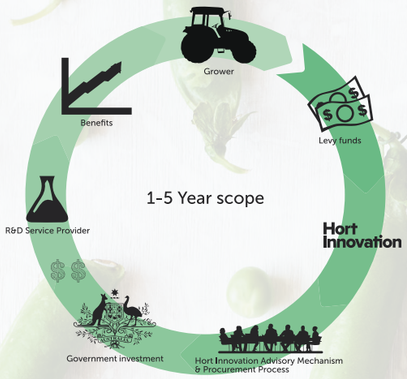
INFO

For more information, please contact Melissa Connors on 0402 815 367 or email contact@thisfarmneedsafarmer.com.au.

More information about *This Farm Needs a Farmer* can be found at thisfarmneedsafarmer.com.au; facebook.com/ThisFarmNeedsAFarmer; or by searching 'This Farm Needs a Farmer' on Instagram.

THE VEGETABLE R&D LEVY AT WORK

STRATEGIC LEVY INVESTMENT



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.

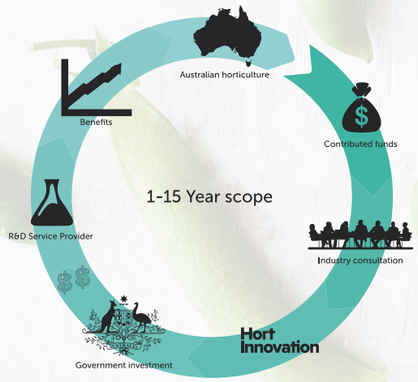
HOW IS LEVY MONEY INVESTED?

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/grower-focus/vegetable.**

HORT FRONTIERS



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 **horticulture.com.au/hort-frontiers.**

HOW CAN GROWERS GET INVOLVED?

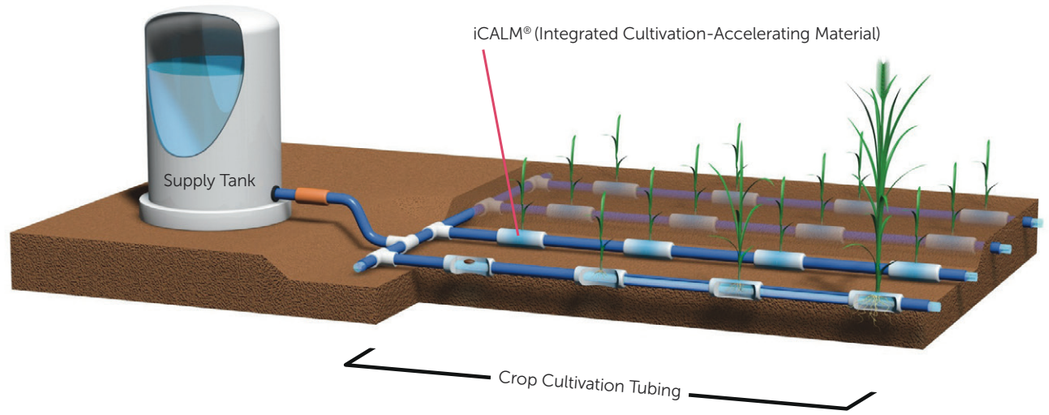
All vegetable growers are encouraged to share their thoughts and ideas for the research they want to see, both within the levy-specific Vegetable Fund, and within the wider Hort Frontiers strategic partnership initiative.

Ideas can be submitted directly to Hort Innovation through the online Concept Proposal Form at **horticulture.com.au/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

iCAST® (INTEGRATED CULTIVATION-ACCELERATING SYSTEM)



NEW SYSTEM TO SUPPORT VEGETABLE CROP GROWTH

A novel crop cultivation system has been released to the Australian market, featuring a supply tank and tubing that allows a crop to grow at the desired rate with increased nutrient and water absorption.

According to the *World Population Prospects: The 2017 Revision*, published by the United Nations Department of Economic and Social Affairs, the current global population sits at 7.6 billion. This figure is expected to reach 8.6 billion in 2030, 9.8 billion in 2050 and 11.2 billion in 2100.

With this rapid rise in population, it is essential for the agriculture industry to implement stable and sustainable food production practices to effectively feed the world. However, the industry continues to face additional challenges, including access to water for agricultural use and the need to reduce the excessive use of fertilisers and other crop protection products. Labour and production costs are also rising, opening up an opportunity for technology to help growers produce higher value crops at a lower cost.

DEVELOPING A QUALITY CROP

To assist with growing premium quality produce on a larger scale, Mitsui Chemicals has developed iCAST® (Integrated Cultivation-Accelerating System), a simple system consisting of a supply tank and crop cultivation tubing (see illustration above). This tubing contains the Integrated Cultivation-Accelerating Material, known as iCALM®.

This accelerating material can retain water or a nutrient solution from the supply tank for as long as crop growth is required. It also allows a plant to absorb more water for longer, and lessen the impact on soil and groundwater.

Due to its unique structure, the crop roots developed in and out of iCALM® can obtain the ingredients essential for crop growth as required, such as water, nutrients and oxygen.

Over the past three years, Mitsui Chemicals has conducted field trials involving iCAST® with rural development partners in Australia and the United States. Table 1 outlines the results obtained from trials in Victoria involving broccoli, processing tomato and trio lettuce crops.

Additionally, the development of the machines required for installing/uninstalling crop cultivation tubing in the fields is ongoing and a prototype is expected to be available in the field soon.

A PRODUCTIVE FUTURE

According to Mitsui Chemicals, this type of crop cultivation system can allow vegetable growers to harvest higher quality crops at higher yields, and in turn, maximise their return on produce.

It can also help growers contribute to sustainable growing practices, save water and minimise the use of fertilisers, chemicals and energy on-farm; and ultimately reduce the cost of labour.

INFO

For more information, please contact Mitsui Chemicals New Agribusiness Development Leader Hirozumi Matsuno at hirozumi.matsuno@mitsuichemicals.com.

TABLE 1	BROCCOLI		PROCESSING TOMATO		TRIO LETTUCE
	Head Weight (g/plant)	Visual Quality (See below)	Lycopene (mg/100g)	Sweetness (Brix, %)	Vitamin C (mg/100g)
iCAST®	307.6	4.1	35.0	7.1	4.7
DRIP IRRIGATION	304.1	2.5	20.0	5.3	3.0
ADVANTAGE			x 1.8	x 1.8 (+ 1.3)	x 1.6

Visual Quality Rating: 1 = Very Poor, 3 = Fair but Saleable, 5 = Very Good. **Water Consumption:** 50-60% of that by drip irrigation.

L-R: Michael Coote (AUSVEG), Mohamed Marir (Qemmat Alharamla Trading) and Andrea Lin (AUSVEG).

AUSVEG International Trade Specialist Kiyoko Ozawa with 2018 Reverse Trade Mission delegates from Japan.

VEGETABLE EXPORTS CONTINUE TO CLIMB IN 2018

It has been a strong year of growth for the fresh vegetable export industry, both in export volume and value as well as industry capability and culture. *Vegetables Australia* reports on the current market outlook and highlights from AUSVEG's export program in 2018.

The 2017-18 financial year saw a nine per cent growth in volume of Australia's fresh vegetable exports to 208,000 tonnes, and a three per cent growth in value to $262 million.

Eighty-five percent of the industry's export volume comprised of carrots, potatoes and onions, with carrots remaining the industry's number one traded commodity in both value and volume, demonstrating steady year-on-year growth. Asparagus, while only contributing two per cent to export volume, is the second largest exported vegetable commodity by value (11 per cent), at over $28 million in 2017-18.

The industry's top three export markets by value were Singapore ($50 million), the United Arab Emirates (UAE; $37 million) and Japan ($30 million), and by volume were UAE (40,000 tonnes), Singapore (28,000 tonnes) and Malaysia (22,000 tonnes).

The performance in the past year puts the fresh vegetable industry on target to reach the *Vegetable Industry Export Strategy 2020* export growth of 40 per cent to $315 million by 2020. AUSVEG will continue to deliver the *Vegetable Industry Export Program* (VG16061), a strategic levy investment under the Hort Innovation Fund, to ensure this momentum continues.

The following is a wrap-up of some of the key activities and outcomes from 2018.

EXPORT READINESS

With a culture shift occurring in the industry and more growers looking to export, the export readiness program continues to be a key tool for growers in developing their export plans and expanding their knowledge on the export process.

In 2018, AUSVEG redeveloped the training program into two different workshops. The first is a half-day "introductory" workshop designed for growers at the very early stages of considering export. This workshop provides an overview of the export process and the types of factors growers need to consider to introduce exporting to their business.

The second is a two-day workshop, which steps growers through the process of export and is aimed at those growers who are ready to start implementing practices to make their business export-ready. Throughout the year, AUSVEG held seven of these workshops across the nation, delivering a mix of half-day and two-day workshops, and partnering with the new *Export Facilitators* (VG16085) project to ensure that growers from even remote Australia have access to these programs.

MARKET ACCESS

In 2018, AUSVEG covered all market access priorities outlined in the *Vegetable Industry Export Strategy 2020*. The four market access applications submitted to the Hort Innovation Trade Assessments Panel for review late last year were all approved and now sit with the Department of Agriculture and Water Resources, ready for discussion upon realising negotiation priority.

AUSVEG will be looking for market improvement and access cases to ensure a growing market for Australian vegetables into the future.

MARKET DEVELOPMENT

Reverse Trade Mission

June 2018 saw the successful delivery of the Australian vegetable industry's Reverse Trade Mission. Forty international delegates from seven countries visited the growing regions surrounding Brisbane and Bundaberg in Queensland. The markets represented included Japan, South Korea, Taiwan, Indonesia, Philippines, Thailand and the UAE.

The group visited seven vegetable production sites, one treatment facility, one research and development facility and participated in the first Taste Australia Fresh Produce Showcase, held in Brisbane alongside Hort Connections 2018. This event saw 40 growers and producers exhibit their produce exclusively for the delegates and provided the opportunity to have some quality one-on-one discussions.

Once again, the mission was a success, with new relationships built and orders being processed already. This success is not limited to Queensland, with relationships developed with growers from around the nation. Feedback from the international delegates was positive, demonstrating the success of the program in expanding their knowledge of Australia's production capabilities and building strongly on the fresh, clean and green image of Australia's produce.

Outbound trade events

This past year, 67 growers have been involved in international trade events via the AUSVEG-facilitated program. This enables growers to further develop their understanding of supply chain logistics and advance their knowledge of international markets, with a market insight and supply chain tour for participants organised in addition to the trade show.

This year, the Taste Australia brand continued to develop and establish itself on the global stage. This unified position has seen an increase in quality visitors to the trade show stand and has provided a strong platform for Australian vegetables to further develop their positive image and build a strengthened position on the world market.

INFO R&D

Any growers interested in discussing export opportunities can contact the AUSVEG Export Development team on 03 9882 0277 or export@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: VG16061

Hort Innovation Strategic levy investment | VEGETABLE FUND

Insect surveys have taken place in vegetable crops in South Australia, Western Australia, Tasmania, Queensland and New South Wales. Image courtesy of G. Napier.

Ladybirds feed on many types of pests. This was one of the most common beneficial insects in surveys of vegetable crops in Australia. Image courtesy of Syed Rizvi.

SUPPRESSING VEGETABLE PESTS ON YOUR FARM

A strategic levy investment project involving research and horticultural industry groups is currently underway, with a focus on promoting beneficial insects in vegetable crops. The project team has provided *Vegetables Australia* with the latest pest and beneficial survey results from around the country.

Pressure is mounting to reduce reliance on insecticide spraying to control vegetable pests. Consumer preferences, changes in maximum residue limits in export markets, the reduced availability of insecticide products as a result of registration restrictions and pests becoming resistant are all drivers for change.

A project initiated earlier this year by Hort Innovation aims to help growers rise to this challenge by developing ecological approaches to boost beneficials and check pest build-up. The team, led by Professor Geoff Gurr from the Graham Centre for Agricultural Innovation at Charles Sturt University, is determined to help growers by developing methods that are simple to implement, compatible with mainstream farming operations and can help drive down costs.

The project *Field and landscape management to support beneficial arthropods for IPM on vegetable farms* (VG16062) is a strategic levy investment under the Hort Innovation Vegetable Fund. It has already involved surveying insect pests and beneficials (predators and parasites of pests) in corn, lettuce, carrot and brassica crops across South Australia, Western Australia, Tasmania, Queensland and New South Wales.

INITIAL FINDINGS

Early results are providing useful pointers as to what factors influence the abundance of beneficials and the pests they attack. First, among the sites that were under organic production, beneficials were much more numerous than in conventional crops where synthetic insecticides were used. This enhancement of beneficials kept pests in check as effectively as insecticide spraying in the conventional crops – it shows the potential of biological control. But organic farming is not for everyone; so, what else might farmers try as a more integrated pest management approach?

The second major finding from the field surveys is that the type of land use immediately adjacent to the crop strongly influences the numbers of pests and beneficials in the crop itself, sometimes to the benefit of growers, sometimes to their detriment! This is an important finding because other work, recently published in the American journal, *Proceedings of the National Academy of Sciences*, showed that simply having lots of natural vegetation in the wider landscape was no guarantee of lower pest numbers (that article can be accessed at pnas.org/content/early/2018/08/01/1800042115).

It seems that local management may be a more important influence on pest numbers than landscape scale vegetation patterns. This is actually good news for growers because it implies that the things directly under their control – like pesticide use patterns, the layout of crops in relation to each other and features such as roads and dams – are what really matter.

In the Hort Innovation project, surveys showed that the numbers of beneficials in sweet corn, brassica, lettuce and carrot crops vary markedly according to the adjacent land use. Compared with densities in field centres (taken to serve as a 'baseline' in each field), beneficials were more common in the margins of these crops if adjacent to riparian vegetation, shelterbelts or sweet corn.

Densities of pests, in turn, were low in the margins of crops adjacent to riparian vegetation or sweet corn. Pests also tended to be scarce in vegetable crop margins close to canola, carrot, pasture, roads and farm dams. Conversely, pests tended to be more abundant in crop edges adjacent to brassica crops. This preliminary analysis of 'pooled' data needs to be interpreted with caution because it covers the period March to August 2017. As a consequence, brassicas were well represented and sweet corn scarce compared with other crop types. Our final data set will cover all four seasons and give more equal representation of crop types.

GROWER IMPACT

These preliminary results illustrate how the final data set might be used to inform decision making. First, by providing guidance on where it may be best to position a vegetable crop. Assuming you have a choice, it may be better to grow brassicas, sweet corn, lettuce and carrots well away from other brassica vegetables and close to carrot, sweet corn, canola, pasture, roads, dams or riparian vegetation.

Second, these results provide pointers to ecological factors that might be exploited more actively to suppress pests. For example, farm dams and roads might constitute barriers to pest movement into adjacent areas of crops. Other land uses, such as riparian vegetation, may contain perennial vegetation or flowering plants that boost beneficials by serving as shelter or nectar sources.

Finally, the reason that some types of crops tend to drive down pest densities in adjacent crops may relate to them maturing earlier so that beneficials move out of them and into adjacent crops. Further work is required to get to the bottom of these types of effects; and that's exactly what the team will be doing in the next phase of the Hort Innovation project.

INFO R&D

This article was supplied by Geoff Gurr, Anne Johnson, Olivia Reynolds, Jianhau Mo, Syed Rizvi, Ahsanul Haque, Mike Furlong, Jessica Page, Scott Munro, Terry Osbourne, Maria Hurtado and Vivian Sandoval.

If you would like to be involved in the next phase of this project, please contact Geoff Gurr at ggurr@csu.edu.au or 0417 480375; Mike Furlong at m.furlong@uq.edu.au or 0418 159 762; or Olivia Reynolds at olivia.reynolds@dpi.nsw.gov.au or 0438 276 803.

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

Project Number: VG16062

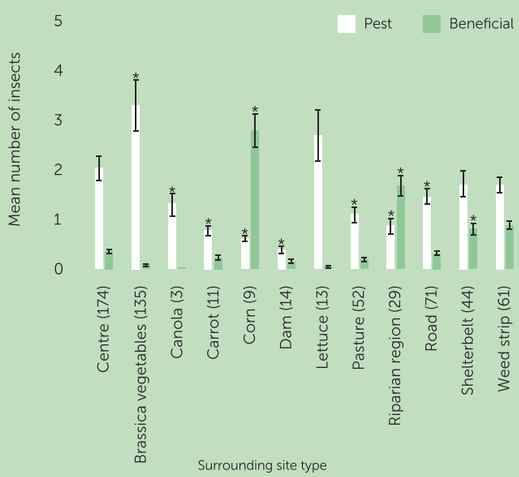
Hort Innovation Strategic levy investment | VEGETABLE FUND

FIGURE 1

Numbers of pests and beneficials in vegetable crops under 'conventional' management (i.e. with use of synthetic insecticides, and organic production). Pests are no more common in the organic crops than in conventional crops, largely as a result of the significantly greater numbers of beneficial insects (predators and parasites). Here the average numbers are shown for a survey of 174 crop fields in Australia. Stars show where averages are statistically significantly different when comparing 'conventional' and organic beneficial insect means. Numbers in brackets show the numbers of sites of each type of management.

FIGURE 2

Numbers of pests and beneficials in vegetable crops are strongly affected by the type of adjacent land use. Here the average numbers are shown for a survey of 174 crop fields in Australia. Stars show where averages are statistically significantly different to the corresponding average of the centre of the fields. Numbers in brackets show the numbers of sites of each type.



Photography by Andrew Beveridge.

DEVELOPING AN EFFICIENT, ENVIRONMENTALLY-FRIENDLY GROWING OPERATION

NAME: Damien Manno
AGE: 37
LOCATION: Kudla, South Australia
WORKS: Quality Harvest Pty Ltd
GROWS: Herbs, lettuce, Asian vegetables, strawberries

HOW DID YOU FIRST BECOME INVOLVED IN THE VEGETABLE INDUSTRY?

I grew up on my father's vineyard so growing produce was always there. I think that initial exposure to farming at a young age and the great work ethic we were brought up with led me to be curious about how other produce is grown and can be produced. So hydroponics was a great place to start, whether it's nutrient film technique or growing in substrate.

WHAT DOES YOUR ROLE AT QUALITY HARVEST INVOLVE, AND WHAT ARE YOUR RESPONSIBILITIES?

As the Director of Quality Harvest, my role involves the day-to-day running of the company, but mainly focusing on the growing side of things.

WHY DID YOU DECIDE TO ESTABLISH A HYDROPONIC GROWING OPERATION?

The main reason for establishing a hydroponic growing operation was to produce a cleaner, better product. As consumer awareness on food production is growing, we wanted to bring a product that has fewer pesticides than other practices and to farm with minimal impact on the environment.

WHAT ARE THE BENEFITS OF HAVING A HYDROPONIC GROWING OPERATION AS OPPOSED TO AN OPEN FIELD?

Hydroponics is a highly efficient way to provide water and nutrients to plants. By maintaining the desired balance of nutrients, water and oxygen to the plant roots, plants grow faster, plant density can be increased and with a faster turnaround which produces greater yields per square metre.

WHAT ARE THE BIGGEST CHALLENGES YOU FACE WORKING IN THE INDUSTRY, AND HOW DO YOU OVERCOME THEM?

Finding people with good work ethic is always a challenge. We have great employees that are an asset to the company, and we definitely couldn't have achieved what we have in such a short time without them (they know who they are).

ARE THERE ANY CHALLENGES THAT YOU, AS A HYDROPONIC GROWER, FACE (THAT OTHER GROWERS MAY NOT)?

One of the challenges as a hydroponic grower is consumer awareness of hydroponic produce. Some presume that it is chemically grown and artificial where, in fact, all we are doing is giving the plant the optimal nutrients to grow with less pesticides than other farming practices, resulting in a healthier, edible plant.

WHAT DO YOU ENJOY MOST ABOUT WORKING IN THE VEGETABLE INDUSTRY AND HOW DO YOU MAINTAIN YOUR ENTHUSIASM?

I love to hear feedback on our products, whether it's good or bad. It's the bad feedback that pushes you harder to achieve a greater product. It's an ever-changing industry, so planting new products and varieties always keeps it interesting.

WHERE DO YOU RECEIVE YOUR ON-FARM PRACTICE ADVICE AND INFORMATION FROM?

I receive on-farm practice advice from industry consultants, suppliers and conferences run by industry specialists.

WHERE DO YOU SEE YOURSELF IN FIVE YEARS?

Expanding our operations and growing more quality produce. I would like to play around with aquaponics, which is a system that uses aquaculture (the raising of fish) with hydroponics (the growing of plants) in a soilless integrated system. The waste in the water from the fish is used to feed the plants, therefore it doesn't require any fertilisers to be added to the system.

WHERE DO YOU SEE OPPORTUNITIES FOR GROWTH IN THE AUSTRALIAN VEGETABLE INDUSTRY?

Depends on market demand. I feel as a hydroponic grower more niche markets would be a good place to start.

WHAT NEW INNOVATIONS, RESEARCH AND/OR PRACTICES HAS YOUR BUSINESS IMPLEMENTED RECENTLY? WHAT ARE YOU DOING DIFFERENTLY TO OTHER GROWING OPERATIONS?

Recently we have implemented Integrated Pest Management into our Asian veg and lettuces to help with disease pressure, which is working extremely well.

HOW DO YOU THINK MORE YOUNG PEOPLE AND WOMEN COULD BE ENCOURAGED TO STUDY AND TAKE UP JOBS IN THE VEGETABLE INDUSTRY?

I believe our industry is under-marketed and under-supported by our tertiary education providers. There is very limited information to support young people and women who may wish to study and take up jobs within the industry.

Hydroponics is a highly efficient way to provide water and nutrients to plants. By maintaining the desired balance of nutrients, water and oxygen to the plant roots, plants grow faster, plant density can be increased and with a faster turnaround which produces greater yields per square metre.

Green peach aphid *M.persicae*. Images courtesy of Rothamsted Research.

ENHANCING CROP SELF DEFENCE AGAINST APHIDS

Widespread resistance to pyrethroids makes management of the green peach aphid, *Myzus persicae*, challenging. Heather Briggs investigates some of the latest European research on novel methods to control the pest.

Many plants have the defences necessary to defend themselves against attack. In a resistant variety, the plant quickly recognises that it is being attacked and triggers its defences. In a susceptible variety, the plant fails to recognise that it is under attack and as a result, its defences are not triggered.

However, it is possible to bypass this need for pest recognition and to trigger the plant's defences artificially, using naturally-derived materials known as elicitors.

According to Dr Mike Birkett from Rothamsted Research, this can be done by manipulating plant semiochemicals with the use of plant elicitors. Dr Birkett is a senior research scientist in chemical ecology, and has been exploring the behaviour of the potato aphid *M. euphorbiae* – the second most important aphid after *M. persicae* – when exposed to potatoes.

"To locate host plants, aphids employ sophisticated behavioural mechanisms," he said.

"Meanwhile, plants have evolved highly effective defence mechanisms to resist being consumed by herbivorous insects and aphids in particular."

These defensive mechanisms are mainly regulated by phytohormones such as jasmonic acid and cause the release of volatile organic compounds. A new study looked at the impact of the natural plant stress signal and elicitor cis-jasmone on the interaction with aphids.

Dr Birkett said cis-jasmone elicits potato defences similar to that observed for other important staple crops.

"This suggests it may be possible to use it to enhance the potato's defences," he said.

TRACKING APHID ACTIVITY

Aphid management using repellent and attractant odours are another option. These work by imitating a naturally-occurring odour without the chemical instability and volatility of the original one.

Dr Birkett co-led a team which devised the similar smelling odour compounds by providing the enzyme, which creates the smell and trialling the compounds on aphid behaviour.

"Tiny electrical conductors were attached to the antenna of live aphids and every time the aphids detected an odour, the electrodes recorded their response," he said.

"We found a number of the newly-produced imitation odours had repellent activity against aphids.

"The surprise was discovering one of the odours we produced attracted aphids rather than repelling them, but it could also prove useful by luring the pest into a 'trap-and-kill' device."

This novel approach may be useful for other insect pests, and the ability to guide or manipulate the pest represents an alternative management tool which could be used to lessen the reliance on conventional pesticide control measures.

"This novel rational approach to discovering behaviour-modifying substances (semiochemicals) is already unearthing molecules with unexpected activity, and we can modify precisely the enzymes to enable clean, efficient production. This has major implications for practical deployment of semiochemicals in crops," Dr Birkett said.

INVESTIGATING ESSENTIAL OILS

Aphid control in the future may include essential oils, according to Harper Adams University Entomologist Professor Simon Leather.

Formulations, including those using cumin and eucalyptus, may have a future in outdoor crops.

"Essential oils have a relatively low toxicity to non-target organisms compared with conventional pesticides," Professor Leather said.

Work is being undertaken to ascertain the modes of action; some formulations function as aphicides, while others are repellents.

"For example, citronella is already well-known as an insect repellent but these need to work at field scale, so a team is seeking formulations which will work in a commercial situation for growers with a low phytotoxicity threat."

Essential oils are already being used in Bulgaria, Poland and Hungary, and no adverse effects have been documented by entomologists. However, Dr Birkett said the scale of agricultural operations in these countries are smaller than the United Kingdom.

FURTHER RESEARCH

Fertilisers may also play a role in the number of aphids feeding on a plant, if work undertaken on brassicas can be shown to translate to other crops such as potatoes. This research is being led by the Centre for Ecology and Hydrology Applied Community Ecologist Dr Joanna Staley.

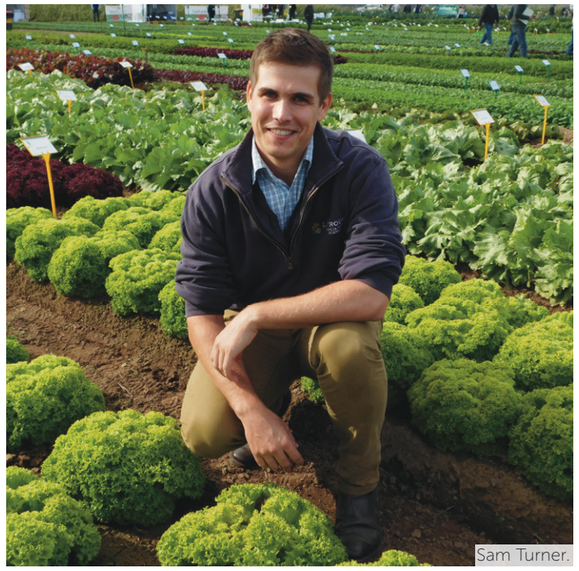
A three-year field trial assessing the different effects on aphids when organic and classic synthetic mineral fertilisers are applied, showed *M. persicae* to be present in greater abundance under regimes using synthetic fertilisers. Trial plots received 200kg/ha and 100kg/ha of fertiliser prior to planting.

"Fertiliser affects the chemistry of the foliage by increasing nitrogen levels; in brassicas synthetic mineral fertilisers resulted in lower levels of glucosinolates," Dr Staley said.

"Our results suggest the generalist aphid *M. persicae* is less able to cope with glucosinolates, whereas there were higher numbers of the specialist aphid *Brevicoryne brassicae* on plants with high levels of glucosinolates."

INFO R&D

For more information, please contact Dr Mike Birkett at mike.birkett@rothamsted.ac.uk.


Sam Turner.


Jane Wightman.

FORGING A RELATIONSHIP TO DELIVER OUTCOMES FOR VEGETABLE GROWERS

Hort Innovation, using the vegetable research and development (R&D) levies and contributions from the Australian Government, invests in a range of R&D projects that aim to ensure the long-term productivity, profitability and competitiveness of the vegetable industry. *Vegetables Australia* spoke to Hort Innovation Relationship Managers Jane Wightman and Sam Turner about their roles in grower and industry engagement.

JANE WIGHTMAN: THE RETURN OF A FAMILIAR FACE

Following a three-year break from the horticulture industry, Jane Wightman returned to Hort Innovation in April 2018 to manage the fresh potato, potato processing, sweetpotato and vegetable (Drive Train; and Farm Productivity, Resource Use and Management) portfolios.

Part of Jane's role is to work closely with the vegetable industry's Strategic Investment Advisory Panels (SIAPs) to achieve the industry's Strategic Investment Plan outcomes, including delivering the investments for the benefit of growers.

Another key component is developing strategic relationships with key external stakeholders, particularly growers in the potato, sweetpotato and vegetable industries. As a Relationship Manager, Jane leads the industry account planning cycle, which involves developing and implementing a planning discipline that prioritises the investment needs of the industries within their respective portfolios.

INDUSTRY INSIGHT

Jane worked for Horticulture Australia Limited (HAL, now known as Hort Innovation) from 2010 for five-and-a-half years as an Industry Services Manager with the tropical fruit industries. She said a major motivating factor for re-joining Hort Innovation in 2018 was the job satisfaction she received while working with industry advisory committees.

"Now working with the SIAPs allows me to have a great insight into industry needs and to play a part in helping levy investments meet growers' R&D needs," Jane said.

"I am enjoying getting to know the industries I work with and the projects their levy is invested in. This also includes the extension that is required to assist growers in adopting new techniques and management practices from the outcome of R&D projects that can lift their productivity."

As growers are often time-poor due to the demands of operating a business, Jane said Hort Innovation appreciates the input from growers who are on the SIAPs to advise on strategic levy investments in their industry.

"It is important to ensure we appropriately update the SIAP members and growers in general on the vegetable R&D portfolio and project outcomes so new technologies, techniques and management practices can be adapted and adopted by growers," she said.

"As all growers are busy and have differing needs, ensuring we do this well can be challenging. We always welcome feedback from growers on how we communicate in relation to the levy investment."

SAM TURNER: STRENGTHENING RELATIONSHIPS

Sam Turner joined Hort Innovation in April 2017 where he worked within two of the four strategic investment pillars that guide levy investment in the vegetable industry: Farm Productivity, Resource Use and Management; and Drive Train.

Sam now manages the vegetable industry's Market and Value Chain; and Consumer Alignment pillars as well as supporting the onions, apple and pear, and processing tomato industries.

In addition, Sam has managed Hort Innovation's advisory system where it receives advice from growers and industry stakeholders through a formal SIAP process. Over the past 18 months, he has also represented Hort Innovation at various conferences and grower days as well as talking to growers on-farm.

Behind the scenes, Sam has been involved in overseeing the implementation of the SIP for the vegetable industry and ensuring that levy investments deliver strategic impact for growers.

BUILDING KNOWLEDGE

Since becoming a Relationship Manager, Sam has been much more closely involved in the strategic direction of industry – a role he has relished.

"Learning how to best manage the often-conflicting priorities of different stakeholders across the industry is also something I have enjoyed," Sam said.

"Being able to listen and understand different points of view is an important part of the job and something that I am hoping to continue to develop."

At times, Sam said it can be difficult to understand and prioritise the needs of around 150 different crops within vegetables across all different production systems.

"Also trying to communicate the great work that the levy is producing to growers is a challenge, but it is something we hope to continue to improve on," he said.

For Sam, there have been positive outcomes to emerge from the past 18 months as a Relationship Manager.

"The most rewarding aspect of the role for me is seeing levy investments having a real impact on-farm. Being in a position to positively impact the lives of growers and progress Australian agriculture is a real privilege," he said.

Sam can see a bright future for the vegetable industry, describing it as "an interesting and dynamic sector of agriculture".

"The Australian vegetable industry is really well-placed to take full advantage of global macro trends in agriculture.

"Increasing implementation of data and precision agriculture in vegetable businesses will help operations become more efficient and profitable; the reduction in labour cost through advanced technology as well as exploiting new and growing export markets will help good growers become more profitable."

GETTING IN TOUCH

Both Jane and Sam are the "first port of call" for growers who want to find out about how the vegetable research and development levy is being invested and they encourage growers to submit ideas for R&D projects going forward.

"We have a section on the home page of the Hort Innovation website to submit project ideas. If growers would rather explain their needs by talking to someone, I am only a phone call away; or come and have a chat when you see me at some of your industry events," Jane said.

"If a grower has an issue or an idea that they would like Hort Innovation to invest in, I can help direct those ideas into our innovation system," Sam added.

"I am always available to answer any questions that growers have about vegetable levy investments."

Jane also advises vegetable growers to support their SIAP members who represent them in relation to vegetable levy investments. Additionally, growers can become a member of Hort Innovation and receive updates on vegetable levy investments and R&D project outcomes.

STRATEGIC INVESTMENT ADVISORY PANELS FOR THE VEGETABLE INDUSTRY

Market and Value Chain
Michael Coote – AUSVEG
Kelvin Free – Duralgai Horticultural, VIC
Emma Germano – Germano Produce, VIC
Nick Macleod – Queensland Department of Agriculture and Fisheries, QLD
Michael Nixon – Riverlodge Assets, WA
Jim Trandos – Trandos Farms, WA
Kees Versteeg – Qualipac, QLD
Michael Vorrasi – DSA Produce, SA
Independent Chair: Bob Granger

Farm Productivity, Resource Use and Management
Bill Bulmer – Bulmer Farms, VIC
Andrew Craigie – Craigie Brothers, TAS
Ed Fagan – Mulyan Farms, NSW
Rob Hinrichsen – Kalfresh, QLD
Mike Keller – University of Adelaide, SA
Rachael Lancaster – Environmental and Agricultural Testing Services, WA
Jeff McSpedden – JW & FJ McSpedden, NSW
Michael Radcliff – Rhebanvale, TAS
James Whiteside – AUSVEG
Sharron Windolf – Windolf Farms, QLD
Calum Wilson – Tasmanian Institute of Agriculture, TAS
Independent Chair: Bob Granger

Consumer Alignment
Belinda Adams – Coastal Hydroponics, QLD
Leisa Carniel – Mulgowie Farming, QLD
Trent De Paoli – AustChilli, QLD
Jason McNeill – Premium Fresh, TAS
Greg Owens – NT Farmers, NT
Steven Roberts – Rijk Zwaan, VIC
Scott Samwell – Samwell and Sons, SA
Chris Schreurs – Schreurs & Sons, VIC
Jarrod Strauch – AUSVEG
Matt Zagami – Avagrow Farms, VIC
Independent Chair: Bob Granger

INFO R&D

For more information on strategic levy investments being delivered through Hort Innovation, please visit horticulture.com.au or contact Hort Innovation Relationship Managers Jane Wightman on 0427 142 046 or jane.wightman@horticulture.com.au or Sam Turner on 0403 093 227 or sam.turner@horticulture.com.au.

Details of the SIAPs can be found on Hort Innovation's Vegetable Fund webpage at horticulture.com.au/grower-focus/vegetable.

Hort Innovation Strategic levy investment | VEGETABLE FUND

ON-FARM BIOSECURITY: PREVENTING THE (SEEMINGLY) INEVITABLE

In this edition, AUSVEG Biosecurity Adviser Dr Kevin Clayton-Greene discusses how a robust on-farm biosecurity system can protect Australian vegetable growing operations from the threat of pests and diseases, particularly those that seem inevitable to spread or arrive on our shores.

I have heard it often said that it is inevitable that pest 'X' will arrive. This is particularly true in discussions around the tomato-potato psyllid; the wisdom being that it will make it to the east. I don't necessarily subscribe to this view. While it is prudent to prepare for this eventuality, it is not inevitable and the use of this phrase can lead to a self-fulfilling prophecy.

Although some things such as death are inevitable, most are not, particularly those that are human-mediated. However, if we adopt the position that an event is inevitable human behaviour, it suggests that we will automatically become less careful about prevention. Alongside this, many also despair at the apparent lack of interest among the public about biosecurity, adding to the feeling of 'inevitability'.

There are many things we can do to prevent so-called inevitable occurrences and in this month's article I want to look at this in the context of on-farm biosecurity. This topic has a particular resonance with vegetable and potato production due to the relationship between soilborne pathogens and pack out.

CONTROLLING THE THREAT OF DISEASE

In Australia and elsewhere in the world, there have been tens of millions of dollars expended on soil disease research on a number of what I would term 'intractable' soilborne diseases such as powdery scab, *Fusarium* and *Rhizoctonia* spp. While we have made great strides in our understanding and detection of these diseases, it is also true that their control remains problematic.

In the case of powdery scab in potato, this disease (once found) persists for a very long time in the soil and is something that no-one wishes to introduce onto their property. Furthermore, it is not just bacteria and fungi that can persist in soil, but many viruses also have this ability. As producers we are on the front line of trying to control these threats to our livelihood, but we are also pitting ourselves against millions of years of evolution that has equipped these pathogens and pests with very sophisticated breeding systems to help overcome barriers to their existence.

This manifests itself in resistance to plant protection products and the ability to exploit new hosts when these pests are introduced into a new region/country etc.

SO WHAT DOES ALL THIS HAVE TO DO WITH BIOSECURITY?

As producers, we have limited or no control over what happens in the broader community; however, we do have complete control over what happens on our property and also what enters and leaves it via human activity. This is where on-farm biosecurity is important and also one of the 'cornerstones' of a robust biosecurity system.

Curative and prophylactic control of pests/pathogens can be a significant cost and every new pest adds to that burden. It is true that having a good on-farm biosecurity system has a cost, but it is also true that, in most cases, this is repaid by lower pest and disease input costs.

Good on-farm biosecurity can greatly reduce the potential for the introduction of new pests and diseases from elsewhere, but it can also significantly reduce pest pathogen pressure by removing reservoirs of pests. Many weed species proliferate because they are closely related to the cropping species and therefore have the same or similar herbicide profiles as the crop (e.g. nightshade and potatoes, wild radish and other brassicas). Persistence of these weeds will ensure there is a ready source of disease or pests for the next time a closely-related crop is planted, ensuring the 'inevitability' of re-infection.

Similarly, vehicles and people entering the farm or moving around carry a host of diseases on their surfaces.

By implementing biosecurity on our properties which will interact with all visitors, we can also greatly increase awareness among not only our peers but also others such as contractors; friends and family; transport operators; utility providers etc. This can only have a broader beneficial impact by raising general awareness of biosecurity as well as improving our own circumstances.

There are good and comprehensive resources available to assist in developing a biosecurity plan at farmbiosecurity.com.au, a joint effort by Plant Health Australia and Animal Health Australia.

INFO R&D

For more information, contact AUSVEG on 03 9882 0277 or email info@ausveg.com.au.

The project *Consultancy Services for Strengthened Biosecurity of the Vegetable Industry – Phase 2* 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: VG15023

Hort Innovation Strategic levy investment | VEGETABLE FUND

Eat Well Tasmania Inc State Manager Leah Galvin. Photography by Karen Brown.

PROMOTING SEASONAL FRESH FOOD CHOICES TO TASMANIAN CONSUMERS

Eat Well Tasmania has been operating for 20 years, however since early 2017 it has shifted its focus to promoting healthy eating by consuming locally-grown, seasonal produce. Working with many industry sectors and using social media to promote its activities, the organisation has experienced increased interest in its work and the benefits of eating seasonal Tasmanian food.

It is widely known that Australians do not eat enough vegetables. In 2017, the *Fruit, Vegetables and Diet Score Report* found one in two adults (51 per cent) were not eating the recommended intake of fruit, while two out of three adults (66 per cent) were not eating enough vegetables. This was Australia's largest ever fruit and vegetable survey produced by CSIRO and commissioned by Hort Innovation.

An organisation in Tasmania is aiming to boost these numbers by not only focusing on promoting fruit and vegetable consumption but encouraging people to eat seasonally.

Eat Well Tasmania is a not-for-profit organisation and receives its core funding from the Tasmanian Department of Health and Human Services. Eighteen months ago, the organisation undertook a strategic review and has since become more industry-focused; partnering with peak bodies such as Fruit Growers Tasmania, local government including Brand Tasmania, growers, producers, value-adders, retailers, wholesalers and the wider hospitality industry to champion healthy eating and promote opportunities to enjoy Tasmanian seasonally-grown, produced and value-added food.

BECOMING SOCIAL

Eat Well Tasmania has implemented a range of ways to connect with consumers. Its main communication channel is social media, including Facebook and Instagram, and these pages have been used to drive various activities.

"From December 2017 through to April 2018, we ran quite an extensive campaign to learn a little bit more about how we can engage with everyday Tasmanians through social media (what posts are interesting and tools we should use) and we wanted to grow our community, which we continue to do," Eat Well Tasmania State Manager Leah Galvin said.

During that period, Tasmanians were urged to #Getfruity and #VegItUp, with Eat Well Tasmania joining forces with independent retailer Hill Street Grocer to promote seasonal fruit and vegetables.

Along with retail promotion, community organisations, cafes and schools were encouraged to share images of meals created using seasonal produce.

"The response we had was amazing. In those two weeks, we noticed a large increase in traffic to our website, which was a great outcome," Ms Galvin said.

Social media has certainly boosted awareness around Eat Well Tasmania and its messages around eating seasonal produce. It also enhanced engagement by telling the story of where the food comes from, how it is produced and who has grown it.

"From this campaign, we discovered that Tasmanians are very interested in the stories of our growers and value-adders," Ms Galvin said.

"One of the things we think is important is to connect Tasmanians with what's happening on-farm. It's important for people to understand what's involved in the food system. We think that creates some value around how they view the food, what it's worth to them and also makes them prouder and want to eat more Tasmanian food."

CONTINUAL ENGAGEMENT

In addition to its consumer-facing work, the organisation has been working with the University of Tasmania and a consultant to gather updated data about the seasonal variation of food in Tasmania across the year, with over 600 data points of seasonal foods identified.

Now that this research has concluded, the next plan is to conduct a 12-month campaign where Eat Well Tasmania is constantly engaging with the community along with businesses and organisations, to tell the story about that seasonality.

"We will also need to make sure that we can close the knowledge gap in the hospitality, catering and events area around seasonality of Tasmanian food," Ms Galvin added.

Vegetable growers are encouraged to get in touch with Eat Well Tasmania to share their story.

"It's the storytelling and creating a very positive vibe around production and what growers see the value in. The smaller-scale growers, such as market growers, have seen significant value – they know that people are coming to them and asking for their product. We know we're driving sales, which is what we need to do," Ms Galvin said.

INFO

For more information about Eat Well Tasmania, please contact Leah Galvin at leah@eatwelltas.org.au or visit eatwelltas.org.au.

PhD student Dianfan Zhou. Image courtesy of the Tasmanian Institute of Agriculture.

UNDERSTANDING THE SUSTAINABILITY OF GREENHOUSE PRODUCTION

Greenhouse production is a popular alternative cropping system to conventional field production that can help to address consumer demand for consistent, high-quality produce. Tasmanian Institute of Agriculture PhD student Dianfan Zhou is currently undertaking a project that aims to understand the current sustainability of greenhouse systems in temperate Australia. She spoke to *Vegetables Australia* about her research.

The Australian Research Council (ARC) Training Centre for Innovative Horticultural Products is training up to 10 PhD candidates to develop new ways to increase shelf life and improve the quality of fresh produce, with the research spanning across horticulture, food science and market analysis.

Dianfan Zhou is a Centre PhD candidate contributing to this research, with a focus on assessing the sustainability of greenhouse vegetable production in Australia. This research is investigating the resources used and their consequences, such as crop productivity (mass of crop yield per mass of resource used) and environmental impacts (greenhouse gas emissions). Dianfan is working with greenhouse growers who are providing information on their greenhouse production and infrastructure.

PROJECT APPROACH

Tomato was chosen as a case study for this research project as it is the most widely-grown vegetable crop in greenhouses in Australia.

Dianfan has been using a life-cycle approach to evaluate the resource use and environmental impacts of greenhouse production. This involves collecting information on all inputs of greenhouse production, such as the quantity of raw material; for example, glass, steel and metal used for constructing greenhouse infrastructure, as well as resources and electricity used for crop production and greenhouse operation, such as energy, water, seedlings and fertilisers.

This information will be calculated based on the equivalent quantity of parameters (carbon dioxide, nitrous oxide and sulfur dioxide) that are related to the environmental impacts (global warming, ozone depletion and water scarcity) through a modelling study.

"An interesting observation so far is the diversity of energy sources used by greenhouse operations in Australia. Growers can flexibly choose the energy source depending on the availability and price of energy sources," Dianfan said.

NEXT STEPS

As part of her research, Dianfan is also looking at water and nitrogen use efficiencies of tomato production systems globally. Her PhD is run in conjunction with Wageningen University and Research in the Netherlands, the world's leading agricultural science institution. In 2019, Dianfan will spend time at the institution working on simulation programs that model the resources needed in vegetable greenhouse production, including environmental factors.

"In the long-term, I hope to increase the understanding of the environmental impacts and resource use efficiencies of Australian vegetable greenhouses," she said.

Dianfan expects that the research will provide baseline information on the sustainability of current greenhouse vegetable production for greenhouse growers. This will help identify the environmental impacts of the different stages in the production chain and will potentially be used by greenhouse growers and policy makers to improve the current greenhouse production industry in Australia.

Additionally, with limited studies focusing on the environmental performance of greenhouse production, Dianfan is hoping to fill the knowledge gaps that exist within the rapidly-growing industry.

"There is no doubt that greenhouse cultivation is a promising way to regularly supply fresh, good quality produce. However, there is a shortage of employees trained with knowledge in crop physiology and greenhouse management," Dianfan said.

"Also, the labour cost for greenhouse production is fairly high in Australia compared to other countries, such as China, which is a major constraint to enhancing the competitiveness of Australia's greenhouse production in international markets."

Dianfan is hoping to continue working in the agricultural field once she completes her PhD.

"I hope to continue to work on the sustainability of agricultural systems and contribute towards feeding the world's increasing population in a sustainable way. In particular, I'm interested in helping grow the connections between academia and industry."

INFO R&D

For more information please visit utas.edu.au/arc-training-centre or follow @InnovativeHort on Twitter, or email innovativehort.arc@utas.edu.au.

Dianfan Zhou is a PhD candidate of the ARC Training Centre for Innovative Horticultural Products, located at the Tasmanian Institute of Agriculture, a joint venture of the University of Tasmania and the Tasmanian Government.

The ARC Training Centre for Innovative Horticultural Products is funded by the Australian Government through the Australian Research Council Industrial Transformation Research Program (project number IC140100024), Woolworths and the University of Tasmania, with contributions from industry partners and research collaborators.

ESTABLISHING CAREER PATHWAYS INTO THE VEGETABLE INDUSTRY

The vegetable industry's education and training initiative, VegPRO, is winding up in mid-June 2019. Project Coordinator Sophie Lapsley reflects on the insights she has gained since the project began in 2016, and the challenges the vegetable industry needs to overcome to provide more prominent career pathways for potential students.

As phase 1 of the vegetable industry's education and training project will be coming to a close in June 2019, I would like to share some interesting points that have come to light during the project from an educational perspective.

We are all aware that there are fewer and fewer courses and qualifications available specific to production horticulture, and those that are available are not well-attended. These figures reduce further if you remove amenity horticulture and landscaping from the offerings.

I had believed that this was because the units and skill sets were not available. During working with skills impact, it was found that there is an extensive range of skill sets and units available that apply to horticulture over the full range of levels, from Certificate II up to degree level. So why are these not available?

Unfortunately lack of numbers has seen many courses disappear, but how do we get the courses made available in the first place? Another misconception is that universities, TAFEs and educational bodies promote these courses. This promotion, however, only occurs if it is industry-led and the resources are provided by the industry. Some sectors of agriculture that successfully raise awareness and promotion of courses are the dairy industry, forestry, grains and wool.

Understanding this does not resolve the whole issue, even if the industry puts together skill sets and courses that best meet their needs. This does not ensure that people will actually attend and again, they risk disappearing.

ADDRESSING ENGAGEMENT

The issue of lack of attendance can be basically split in two: 1) the image of the industry; and 2) clear and promoted career pathways. This too has to be addressed by the industry, not the educational bodies. These issues are not only experienced by the vegetable industry but right across horticulture and the wider agricultural sector. Without the image of the industry being addressed, along with continual promotion and the establishment and promotion of a career pathway for the vegetable sector, it will always struggle to get people engaged in courses and into the industry. The worst-case scenario is we could see production horticulture totally disappear as an offering from educational organisations.

To start to address these issues, VegPRO is putting together a careers pathway resource. If you would like to highlight the role you do to be used as an example in the publication, please contact VegPRO Coordinator Sophie Lapsley and let her know your pathway into the industry. It is the passion of those already working in the industry that we want to try and promote. This resource will be handed out to anyone interested in working in the vegetable sector, as well as schools and educational services to help promote the courses they offer or the industry as a career.

INFO R&D

For more information, please contact VegPRO Coordinator Sophie Lapsley on 0426 200 996 or sophiel@rmcg.com.au or visit vegpro.com.au.

Vegetable Industry Education and Training Initiative (VegPRO) 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: VG15028

Hort Innovation Strategic levy investment | VEGETABLE FUND


A Biosecurity Queensland officer inspecting tomato plants for disease. Images courtesy of Biosecurity Queensland.


Biosecurity Queensland's Plant Biosecurity Laboratory maintains a large insect collection to support the diagnosis of suspect exotic plant pests.


A Biosecurity Queensland officer conducting tomato-potato psyllid surveillance.


Biosecurity officer inspecting a bee hive for bee pests and disease.

STATE BIOSECURITY UPDATE: BIOSECURITY QUEENSLAND

Plant biosecurity protects our economy, environment and community from plant pests, diseases and weeds. State and territory governments are responsible for the management of biosecurity incidents within their jurisdiction. In this edition of *The Front Line*, AUSVEG Biosecurity Intern James Healey speaks to Biosecurity Queensland's Salvo Vitelli about the department's roles and responsibilities as well as past challenges and future opportunities in biosecurity.

According to Biosecurity Queensland Acting General Manager for Plant Biosecurity and Product Integrity Salvo Vitelli, the state is experiencing unparalleled challenges to its capability and capacity to respond to the increasing number, scale and scope of exotic biosecurity pests and diseases.

"Increasing global trade, e-commerce and movement of people are just some of the trends that are increasing the potential for pests and diseases to be introduced to Queensland," he said.

In order to identify gaps and determine what a future biosecurity system should look like to meet these increasing challenges, an independent panel was established to complete a review and present a report to government. The program had a major aim of ensuring that all Queenslanders have the tools and knowledge they need to deal with biosecurity threats that are under their control.

The review found that a new approach was needed to optimise Queensland's biosecurity system. In response to the report, the government announced increased funding of $10.8 million over four years to implement the findings of the review and strengthen Queensland's biosecurity capability and capacity.

"Moving forward, the Queensland Biosecurity Strategy has been co-developed by the Queensland Government, more than 30 peak industry organisations and members of the community," Mr Vitelli said.

"In operating the system together, the partners committed to protecting Queensland's ecosystems, industries and way of life; maintaining Queensland's national and international reputation for product safety and integrity; and ensuring ongoing market access for our commodities."

Six strategic themes were identified to underpin the vision for the system over the next five years. The themes are:

1. Collaborative Governance and Leadership.
2. Every Queenslander plays their part.
3. Empowered to act.
4. Bright ideas and better way.
5. Valuing and building on our investments.
6. Better intelligence systems.

Action plans will be co-developed for each of the themes to align and build on the goals outlined in the strategy. For these plans to be successful, they will need to ensure they are monitored and reported in an accountable way.

"Critical to the success of the Queensland Biosecurity Strategy will be continued monitoring and reporting against the action plans that are developed with partners to ensure the system improves," Mr Vitelli said.

ROLES AND RESPONSIBILITIES OF QUEENSLAND'S BIOSECURITY OFFICERS

In order to ensure that the state government is playing its part in shared responsibility, Biosecurity Queensland Officers coordinate efforts to prevent, respond to, and recover from pests and disease incidents that threaten the economy and environment.

Plant Biosecurity Officers work to ensure continued market access and reduce the risk of chemical contaminants within agricultural and environmental systems. Field officers communicate and engage with target audiences to improve biosecurity practices, assist with detecting pests and ensure compliance with legislation.

Officers also work with growers and industry to facilitate market access to other states. This includes providing accreditation services to help growers meet interstate biosecurity entry requirements for products under the Interstate Certification Assurance (ICA) scheme.

Another key area of focus for Biosecurity Queensland is plant biosecurity surveillance. Surveillance activities include detecting exotic pests, defining the extent of spread of a pest, and monitoring pest populations to better understand the pest's characteristics.

"The early detection of pests can increase the chances of eradication, reduce the costs of eradication and impacts to industry, the community and environment," Mr Vitelli said.

"Surveillance activities when joined with industry surveillance also assists with supporting pest freedom in order to contribute to national and international trade negotiations."

A SHARED RESPONSIBILITY

While the Federal Government administers many biosecurity management functions, effective biosecurity management requires shared responsibility by all parties including land owners/managers, the community, industry groups and state governments.

"It is important that everyone does their bit. Those who create the risks associated with pest species introduction or spread and those who benefit should help minimise the impacts of these pests and contribute to their management," Mr Vitelli said.

"By working together, we ensure Queensland will have an efficient and sustainable biosecurity system into the future."

INFO R&D

For more information on pest management strategies, visit daf.gov.au.

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

For further information, contact AUSVEG Biosecurity Officer Madeleine Quirk on 03 9882 0277 or madeleine.quirk@ausveg.com.au. The Farm Biosecurity Program is funded by the Plant Health Levy.

ABOUT THE QUEENSLAND BIOSECURITY ACT 2014

The Queensland *Biosecurity Act 2014* commenced on 1 July 2016 to replace the many separate pieces of legislation that were previously used to manage biosecurity.

"The Act provides comprehensive biosecurity measures to safeguard our economy, agricultural and tourism industries, environment and way of life from serious plant pests such as tomato-potato psyllid, animal diseases such as foot-and-mouth disease and contaminants such as lead on grazing land," Mr Vitelli said.

The Act is a consistent, modern, risk-based and less prescriptive approach to biosecurity in Queensland.

Under the Act is the *Biosecurity Regulation 2016*, which sets out how the Act is implemented and applied. The regulations provide a number of ways in which people can meet their general biosecurity obligation. For more information, visit daf.qld.gov.au/business-priorities/biosecurity/about-biosecurity/biosecurity-act-2014/biosecurity-regulation-review.

GENERAL BIOSECURITY OBLIGATION

Under Queensland's *Biosecurity Act 2014*, all Queenslanders have a 'general biosecurity obligation' (GBO).

"This means that everyone is responsible for managing biosecurity risks that are under their control and that they know about, or should reasonably be expected to know about," Mr Vitelli said.

Under the GBO, individuals and organisations whose activities pose a biosecurity risk must:

- Take all reasonable and practical steps to prevent or minimise each biosecurity risk;
- Minimise the likelihood of causing a 'biosecurity event' and limit the consequences if such an event is caused; and
- Prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse.

MINOR USE PERMITS

PERMIT NUMBER	CROP	PESTICIDE GROUP	ACTIVE	PEST/ PLANT DISEASE/ TARGET WEED	DATE ISSUED	EXPIRY DATE	STATES
PER13031 VERSION 5*	Capsicums (protected and field grown crops)	Insecticide	Maldison	Queensland fruit fly, Mediterranean fruit fly and cucumber fly	6-Oct-11	31-May-19	All states except Vic
PER82039 VERSION 3	Cabbage, cauliflower and Chinese cabbage	Insecticide/ Miticide	Bifenthrin	Symphyla	20-Nov-15	30-Sep-23	NSW only
PER14765 VERSION 4	Selected vegetables. Please refer to the APVMA website for the full list.	Miticide	Hexythiazox	Tomato russet mite, broad mite, two-spotted mite, tomato red spider mite and tomato red mite	21-Feb-15	30-Sep-23	All states except Vic
PER12506 VERSION 7	Eggplant	Systemic insecticide	Dimethoate	Queensland fruit fly and Mediterranean fruit fly	30-Jan-13	31-Aug-23	All states except Vic
PER81131 VERSION 3	Leafy or open-head lettuce (field only)	Fungicide	Prochloraz present as the manganese chloride complex	Anthracnose	02-Feb-16	31-Dec-23	All states

INSECTICIDE NOW REGISTERED FOR DIAMONDBACK MOTH LARVAE CONTROL IN BRASSICA VEGETABLES AND BRASSICA LEAFY VEGETABLES

Diamondback moth (*Plutella xylostella*; DBM) has traditionally been a difficult pest to control in brassica vegetable crops. Resistance has been detected in the past, especially to older chemistry such as organophosphates and synthetic pyrethroids.

Movento® 240 SC now offers a new Mode of Action (Group 23) for DBM control and is highly effective against young DBM larvae. As the only Group 23 insecticide registered in Australia, the introduction of this product for DBM control provides an additional resistance management tool to growers. This label extension comes in addition to the existing registrations for the control of sucking pests including green peach aphid, grey cabbage aphid and silverleaf whitefly.

Since its introduction in 2009, Movento has been providing growers and advisors with a broad-spectrum insecticide targeted at the immature stages of many insect pests in a wide range of fruit and vegetable crops as well as in cotton. The two-way systemicity of this product allows the active ingredient spirotetramat to be transported in both the xylem and the phloem of the plant, and reach insects where they are feeding. Good coverage is recommended. The product has a good Integrated Pest Management (IPM) fit as it is soft on most beneficial species including parasitic wasps, pirate bugs, hoverflies and lacewings when used as directed. It works best when targeted around DBM egg lays and first instar larvae, so good crop monitoring is also recommended.

The new Movento brassicas crop guide and the updated product label are available to download at crop.bayer.com.au/movento. For further information on the use of this product in brassica vegetables and brassica leafy vegetables, please contact your local Bayer representative.

Movento® is a Registered Trademark of the Bayer Group.

Hort Innovation is the permit holder for all permits listed. 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: apvma.gov.au/permits/search.php. This communication has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government. Project Number: VG15027. *The use pattern for cucumbers has been removed from PER13031 by the APVMA as this is now a registered label use pattern. The permit has been extended for capsicums in field and protected cropping for six months only to allow time for this use to proceed to a label registration. Fyfanon 440 EW Insecticide Label is approved for field and protected crops, including cucumbers and capsicums. The capsicum withholding period (WHP) on the label is three days and PER13031 allows for a one-day WHP. Residue data has been generated by Hort Innovation to support a one-day WHP for capsicums and it will work with FMC/Cheminova to reduce the WHP on the attached label in the coming months and prior to the permit expiry.

Hort Innovation Strategic levy investment | VEGETABLE FUND

AROUND THE STATES

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VGA trading as AUSVEG VIC

The AUSVEG VIC Annual General Meeting was held on Friday 12 October at Fresh Select in Werribee South, with 27 people in attendance. The meeting ran smoothly, with President Paul Gazzola and State Manager Tom Cohen outlining the organisation's achievements for the past year.

AUSVEG Chairman Bill Bulmer gave an update on the national body's activities, and the challenges that it has faced. He also explained the future direction of AUSVEG.

The election for Executive Committee members was successful. Mr Gazzola was re-elected as AUSVEG VIC President, while committee members remained the same.

The AUSVEG VIC Executive Committee that represents its members are:

- Mr Paul Gazzola – President
- Mr Rick Butler
- Mr Vince Doria
- Ms Deborah Corrigan
- Mr Bill Bulmer
- Mr David Wallace
- Mr Frank Lamattina
- Mr Peter Cochrane
- Mr Sam Taranto

Registrations for Hort Connections 2019 are now open, and next year's convention will be hosted in Melbourne from 24-26 June. Having Hort Connections 2019 hosted in Melbourne gives local growers an advantage to attend and learn about cutting-edge technology that is shaping the vegetable growing sector. The event is not to be missed – save the date now or contact AUSVEG VIC for more information.

Jordan Brooke-Barnett
AUSVEG SA
Chief Executive Officer
South Australian Produce Markets, Burma Road
Pooraka, SA 5095
Phone: 08 8221 5220

It has been a busy few months for AUSVEG SA in the agri-political space and the association is currently undertaking a broad range of advocacy activities on behalf of South Australian growers. Key developments include:

- AUSVEG SA was recently involved with state-wide reforms pushing for greater skilled and unskilled visa access for South Australia in order to address sector-wide skills shortages. AUSVEG SA has long worked in partnership with Adelaide company Migration Solutions and the Primary Industry Skills Council in pushing for reform.
- AUSVEG SA recently participated in policy discussions with AUSVEG and other state groups around policy issues including AgVET Chemical Harmonisation and the development of an Agricultural Visa, which is being developed through the National Farmers' Federation Horticulture Council. We also provided a state-based submission calling for increased off-label chemistry access for producers in line with what is available for South Australian bunch line growers under the current legislated exemption. Similar models are in place in Victoria and AUSVEG SA would like to see this approach adopted across all horticultural commodities in the state.
- A significant amount of work is currently being conducted to advocate on behalf of growers to the western side of Port Wakefield Road who face salinity issues caused by a rising water table. AUSVEG SA recently brought out an interstate salinity expert to examine the problem and has identified a number of infrastructure issues which are currently being raised with local government. We are now looking at potential infrastructure investments and production trials as a way to address the issue.
- AUSVEG SA is working with leading businesses and transport companies on the Northern Adelaide Plains to facilitate greater road train transport access to improve freight efficiencies for member businesses.
- AUSVEG SA met with senior trade officials from the Department of Investment and Trade and will be supporting a number of inbound delegations of high-level buyers and trade officials over the coming year from key Asian and Middle Eastern markets.
- AUSVEG SA joined South Australian Premier Steven Marshall, the Minister for Primary Industries and Regional Development Tim Whetstone and Senator the Hon. Anne Ruston to officially announce the commencement of construction for the $150 million Northern Adelaide Irrigation Scheme. We continue to advocate on behalf of grower interests with regard to this scheme and are working closely with members as part of the current commercial negotiation process engaged in with SA Water.

AUSVEG SA welcomes any feedback from our growers into our campaigns and activities and looks forward to delivering exciting new initiatives in the coming months for our industry.

AROUND THE STATES

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A worldwide debate over the potential status of glyphosate as a possible carcinogen has inspired testimonies from Australian growers in defence of the popular herbicide. Fruit and vegetable producers have been contacting MPs in their electorates to highlight the importance of glyphosate to their businesses and the broader agricultural sector.

Currently there are over 500 products in the Australian market that contain glyphosate which are used across a wide range of agricultural industries, from broadacre crop production and sugarcane production to intensive horticulture.

Growcom supports the findings of our national regulator, the Australian Pesticides and Veterinary Medicines Authority (APVMA), which has pronounced glyphosate is safe for human, animal and environmental health when used according to its label instructions.

Despite clear and overwhelming scientific evidence supporting its safe use, a recent court ruling in America backed the State of California's push to list the herbicide, the active ingredient in weed killer Roundup, as a possible cause of cancer.

On 19 April 2018, a Californian court of appeal ruled against chemical juggernaut Monsanto and enforced the state's prohibition against discharging it into public waterways. The decision sparked intense discussion among industry, with most growers claiming glyphosate is an essential part of their grazing and cropping operations to manage noxious weeds.

Since the product's launch 40 years ago, glyphosate has made it possible for the Australian broadacre cropping sector to adopt conservation tillage and move away from cultivation to prepare the soil. This means farmers do not disrupt the root system via tillage, therefore minimising soil disruption and enhancing water use efficiency. It also means less machinery operation which reduces emissions and is good for the environment.

Most Australian farmers stand by the product and claim they wouldn't use it in a manner that they believed would be harmful to their health.

In the past three years alone, science-based regulators in the European Union, South Korea, Japan, Australia, New Zealand, Canada and the United States have publicly reaffirmed that glyphosate does not cause cancer.

In addition, the APVMA and Food Standards Australia New Zealand set science-based guidelines to govern crop Maximum Residue Limits to ensure the safety of consumers.

Robert Hardie
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St Leonards, NSW 2065
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In 2018-19, the NSW Farmers Horticulture Committee has agreed to address four key priority areas:

Competition and labour policy: Following the introduction of the Horticulture Code of Conduct, there is still work to be done in ensuring that it is properly understood and enforced. NSW Farmers will work with the Australian Competition and Consumer Commission and other industry bodies to ensure that compliance activities are adequately funded. Labour and industrial relations will remain a high priority, and NSW Farmers will continue to feed into national discussions on horticultural industry labour issues.

Biosecurity: With the *Biosecurity Act* now firmly in place in New South Wales, growers are seeking better funding of biosecurity activities in the state. Neglected and abandoned orchards remain a major biosecurity risk, and fruit fly programs require sustainable ongoing funding and coordination to safeguard our produce. Increased investment in biosecurity and improved quality assurance will help us open new markets for our horticulture industry. NSW Farmers will continue to work with the NSW Department of Primary Industries on programs that increase market access, such as new opportunities for the export of cherries to China.

Food safety and accreditation: The recent strawberry food safety issue highlighted the need to develop shared solutions across the supply chain. Quality assurance is critical but responsibility can't be placed solely on farmers; responses to food safety incidents must be shared across industry, processors, retailers and government to prevent serious losses in any one sector. NSW Farmers will urge governments to improve communication with industry to ensure there are no negative market impacts.

Planning: NSW Farmers will continue to advocate for the best possible business environment for growers, including appropriate land use and zoning and continued access to critical chemicals. We are calling for a recognised 'Right to Farm' policy to ensure that our productive, high-value horticultural areas aren't negatively impacted by changing land use and urban sprawl.

Nathan Richardson
Tasmanian Farmers and Graziers Association
Vegetable Council Member
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While the ongoing dry weather throughout Tasmania has provided some advantages to vegetable producers in terms of unhindered planting seasons, it has also seen irrigation begin up to a month earlier than usual in many areas. This trend is forecast to continue, with the Bureau of Meteorology predicting that large parts of south-eastern Australia are likely to be drier than average from November to January.

A dry September presented an unhindered planting season for the state's pea and bean growers, which has been supported by good demand from processors for area and tonnes this year.

Potato growers also enjoyed an unhindered planting season thanks to the weather, but the dry conditions have since seen many growers forced to irrigate crops to either aid cultivation or prior to crop emergence.

Potato growers are expecting to see better returns next year due to the dry conditions throughout Europe and the consistently low Australian dollar. Yields across Europe reached as low as 20 tonnes per hectare, in comparison to our 60 tonnes. This will have a big effect on the global French fries export market. Prices across Europe and North America have spiked in recent months, also due to the dry conditions.

Despite reasonable export conditions, carrots and onions continue to be in massive oversupply across the country with some crops left in the ground due to the increasingly strict quality demands of the major supermarkets. This forces more "second-grade" product onto the fresh market. This kind of wastage, based on appearance rather than cooking or eating quality, remains an ongoing concern for our industry.

CALENDAR

23 NOVEMBER 2018: HORT INNOVATION'S ANNUAL GENERAL MEETING

Where: Brisbane, Queensland

What: All levy-paying members of Hort Innovation are invited to attend the Annual General Meeting on 23 November in Brisbane. Hort Innovation is charged with investing more than $100 million per year into research, development and marketing activities using industry levies, contributions from the Australian Government and other sources.

Further information: horticulture.com.au/annual-general-meeting-2018

19-20 FEBRUARY 2019: AGRIFUTURES EVOKE[AG] FOOD FARM FUTURE

Where: Royal Exhibition Building, Melbourne

What: evoke[AG] will attract a range of groups including leaders, farmers, start-ups, innovators, researchers, businesses, government and investors to gain an insight into agri-food tech and related research in Australia, New Zealand and Asia. It will also create a platform for start-ups to display their technologies and create deal flow and investment into Australia.

Further information: evokeag.com

27-28 NOVEMBER 2018: VEGNET PROCESS MAPPING TRAINING

Where: Richmond and Deloraine, Tasmania

What: Are you looking to increase the efficiency of your business? VegNET Tasmania will be running two half-day process mapping training workshops for vegetable businesses. The main objective of the training is to help you to assess how each job is done and how it contributes to your overall business success.

Further information: Contact Theresa Chapman at theresac@rmcg.com.au or 0413 039 733.

5 MARCH 2019: FSANZ BIENNIAL STAKEHOLDER FORUM

Where: Sydney Olympic Park, New South Wales

What: Food Standards Australia New Zealand (FSANZ) is hosting its first Biennial Stakeholder Forum with the theme *Fit for purpose—food regulation now and in the future.* Experts representing its key stakeholders will explore topics relating to the FSANZ food regulation system and will take a look into the future of food regulation, food safety and food science.

Further information: foodstandards.gov.au

AROUND THE STATES

Greg Owens
NT Farmers Association
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The Northern Territory's vegetable season is slowing down as the weather heats up. It was a very cool and long Dry season which is good for vegetable production, but quickly changed to hot and dry in September. This has made for a very short and sharp mango season in the Darwin region and an early start to the Katherine mango season. The growers are now all looking to the heavens for the start of our Wet season and the Monsoon, which we need each year to replenish our underground aquafers that drive horticulture in the Top End.

This year was one of those rare years for cucumber producers in the Top End. Lebanese and continental cucumbers are grown under shade cloth in the Northern Territory, either in the ground or as hydroponics. There is no need for heating during our Dry season, which is the southern winter, so input costs are kept to a minimum. NT growers usually receive good prices for their cucumbers in the southern wholesale markets until other regions kick in their production, which brings the prices down. It only takes six weeks from seed to production, so this happens on a regular basis. This didn't happen at all this season for some reason and growers received excellent prices for as much as they could produce. I don't expect this will happen next year, but it was good for our growers this year.

NT Farmers has employed a young local farmer from one of the original Vietnamese vegetable growing families in the Darwin region to assist in engaging the vegetable growing community in our Northern Australian Quarantine Strategy surveys. These surveys are carried out along the north coast of Australia and through Indonesia, Timor Leste and Papua New Guinea. Our vegetable growers produce a wide range of tropical vegetables, fruits, herbs and spices, and it seems there is always something in their market gardens that is affected. Products used as vegetables or herbs, such as banana leaf and flower, kaffir lime leaves and all the Asian melons, get caught up in these responses and are difficult to maintain or renegotiate market access to the interstate markets.

The continuing impact of biosecurity incursions such as cucumber green mottle mosaic virus, banana freckle and citrus canker on our growers can be reduced by early detection and broader knowledge and preparedness with our improved on-farm biosecurity and more targeted surveys.

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A key priority for vegetablesWA has been meeting with industry and growers and getting feedback about the State Government's proposed water licence fees. vegetablesWA is strongly opposed to any cost recovery for water licence permits, and we've attended meetings held by the Department of Water and Environmental Regulation to express this view.

I have also been working hard with the Federal Government and our friends at the National Farmers' Federation on getting better access to labour for growers.

Our Field Extension Officers Sam and Truyen travelled to Tasmania for the VegNET annual meeting in mid-September. They had a great tour of the Harvest Moon farm and the owners shared some very valuable industry insights, which Truyen and Sam will be happy to share with WA growers.

Our Market Development Manager Claire also travelled to Hong Kong for Asia Fruit Logistica and World of Perishables in Dubai. This provided WA vegetable growers with great opportunities to meet with exporters and trade contacts.

Bryn has been all over the state this month with Planfarm facilitating workshops from Albany all the way up to Geraldton. They've been sharing findings from the state's first Industry Benchmarking Report, released in August, and giving growers tips on creating and maintaining a sustainable business.

We also held an extremely successful industry summit again in October. This year we had a range of events including a grower tour, industry summit, cocktail function and HortConnectWA brunch, aimed at young horticulture growers and professionals. There were also educational talks on soil health and water use, and interesting panel discussions about food innovation and ag tech.

NEW REGISTRATION

Diamondback moth
(*Plutella xylostella*)

Green peach aphid
(*Myzus persicae*)

Silverleaf whitefly
(*Bemisia tabaci* biotype B)

Grey cabbage aphid
(*Brevicoryne brassicae*)

BAYER

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Collect the set.

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 beneficials, when used as diected

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

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

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