

# vegetables

australia

| Spring - 2019



JOSH LANGMAID | YOUNG GROWER ON THE RISE

HARVEST TO HOME | PARSLEY CONSUMER DATA

PROJECT UPDATE | NATURALLY NUTRITIOUS PURPLE SWEET CORN



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Green peach aphid  
(*Myzus persicae*)



Grey cabbage aphid  
(*Brevicoryne brassicae*)



Silverleaf whitefly  
(*Bemisia tabaci* biotype B)



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# Editorial

The forecast is in – we are heading for a hot, dry spring.

The Bureau of Meteorology has released its spring outlook and it is not good news for anyone who is looking for relief from the drought. The rainfall outlook for spring is dry, with all of the country (with the exception of some parts of Western Australia and Tasmania) expecting below-average rainfall and hotter-than-average maximum temperatures.

What does this mean? Bushfires, drought, dust, heatwaves and frost are more likely, and it is unclear whether this will ease up in the following seasons.

Australia recorded its ninth driest winter, and the Murray-Darling Basin experienced its driest winter since 1982.

It was also the driest January to August on record for the southern half of Australia.

Year-to-date maximum temperatures for Australia are the warmest on record, and this winter was the sixth warmest on record.

Growing conditions are tough all around the country. Root zone soil moisture remains below average in many key agricultural areas.

This all highlights the struggles that all farmers have been telling industry, politicians and the public for years.

While we cannot control the weather, we can make an effort to look after each other and check in with friends, neighbours and family who are doing it tough.

It is vital to be honest with yourself and the people around you and talk openly about all aspects of your health, including your mental wellbeing. It is critical to seek help if you or someone you know is experiencing difficulties.

There are mental health organisations that provide resources and advice on how to deal with personal mental health issues or those that arise in your workplace, communities, friendship groups or families. Some of these resources can be found on the AUSVEG website: [ausveg.com.au/mental-health-industry](http://ausveg.com.au/mental-health-industry).

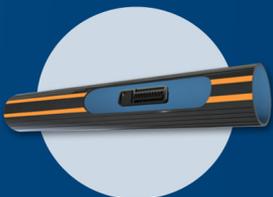
When the conditions are as tough as they are right now, we cannot afford to neglect our community, our friends or our families – but we also cannot afford to neglect ourselves. As we all deal with the weather, let's not forget that we need to look after ourselves as well.

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## Message from the Chair

The horticulture industry is at a breaking point.

Hardworking, law abiding, and award paying growers are being pressured to a point that their businesses are being severely compromised to service and be profitable. Some are seriously considering exiting the industry.

Changes to the Horticulture Award, a lack of access to a competent and reliable workforce, supermarkets and market buyers knowingly purchasing product from non-ethical supply chains, and stories of worker exploitation that tarnish the industry's reputation are all pushing growers who do the right thing to a point of no return.

While it is difficult to measure the size of the problem, some educated estimates are that we need tens of thousands of workers to make up this shortfall.

The Government's recent announcement that it is in discussions about expanding the working holiday visa to people from an extended list of countries is a welcome acknowledgement that there is a problem and that it is willing to listen and help. However, if they also expect that this will significantly improve the chronic shortage of skilled and unskilled labour that the industry faces, they simply don't understand the magnitude of the problem.

Australian growers will always prefer to hire local workers, but the reality is that not enough locals want to work on farms and forcing them to do so has failed to address the situation.

The consequence of the labour shortage is that growers are held captive by unscrupulous operators who profit from the mistreatment of workers.

This cannot continue. This is why we need a national labour hire accreditation scheme rolled out nationally. The industry's support of the Fair Farms workplace training and certification program is a step in the right direction but needs more buy-in from the broader industry, and greater support from Federal Government.

The government must also acknowledge that the current visas and programs available to attract farm workers are not meeting the industry's needs and must be reconsidered.

Good growers will be driven out of the industry unless we see change before it's too late.

**Bill Bulmer**  
*Chair*  
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## Commodity Profile:

# Parsnip

**\$11.2 million**

The value of Australian parsnip production for the year ending June 2018.

**3,367 tonnes**

of parsnip produced, with 3% sent for processing.

**13%**

of Australian households purchased parsnip, buying an average of 131 grams per shopping trip.

Source: Australian Horticulture Statistics Handbook Vegetables 2017/18.

**Two-in-five**

(40%) households purchasing parsnip attributed their purchase decision to their health benefits; this rates low compared to other vegetables like carrots (75%).

Source: Harvest to Home.

A Harvest to Home case study found Australian household consumption of parsnips is relatively low compared to carrots, which bear a high resemblance in terms of shape to parsnips: shoppers claim to consume parsnips 3.6 times on average in a month; this is compared to carrots at 11.6 times.

Veggycation® reports that diseases of importance during parsnip storage, transit and marketing are parsnip canker, grey mould rot, bacterial soft rot and watery soft rot. Some cultivars are resistant to parsnip canker.

According to Harvest to Home findings, the high versatility of parsnip becomes apparent when examining how shoppers cook and prepare the vegetable: they are most commonly prepared roasted as stated by 62% of shoppers, followed by its use in soups (36%), and being baked (28%).



Project Harvest Wave 44 recommends that greater focus needs to be placed on encouraging Millennials into the parsnip purchaser category. Further research is required to understand barriers for these consumers.

In 2013, a final report was released on the strategic levy investment *Identification of IPM strategies for Pythium induced root rots in Apiaceae vegetable crops (VG08026)*, which examined disease development in parsley and parsnip and evaluated a number of disease management options in parsley, coriander, parsnip and carrot crops. To find out more, search 'VG08026' on the InfoVeg database: [ausveg.com.au/infoveg/infoveg-database](http://ausveg.com.au/infoveg/infoveg-database).

Veggycation® states that rapid cooling to 5°C or below immediately after parsnip harvest is essential to minimise decay and moisture loss during extended storage. Roots can be stored 4–6 months at 0–1°C with 98% relative humidity.



Project Harvest Wave 36 reports that the main motivations for purchasing parsnip include adding variety and taste. Wanting variety and expense are the key barriers to purchase.



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## Providing a snapshot of the Australian vegetable industry

Project VG15077 is a strategic levy investment under the Hort Innovation Vegetable Fund that results in the production of annual economic surveys of the vegetable industry, which include comprehensive production and financial performance data, production intentions and issues of interest to industry stakeholders. *Vegetables Australia* reports on some of the findings.

Every year, Hort Innovation funds the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to profile the economic performance of Australian vegetable-growing farms.

This data helps create an accurate picture of the vegetable industry. In September 2018, ABARES published the latest information covering the performance of vegetable-growing farms in 2016-17. The results were for farms included in the Australian vegetable-growing industry survey, which has been conducted annually by ABARES since 2007.

### A food source

Vegetable growing is the fourth highest value agricultural industry in Australia, accounting for around six per cent of the gross value of agricultural production (\$3.9 billion) in 2016-17.

Over the past 10 years, the total number of vegetable-growing farms has fallen by 31 per cent. Most of this decline was largely a result of a decline in the number of small vegetable-growing farms planting less than 20 hectares. In 2016-17 an estimated 2,600 Australian farms were classified as vegetable-growing farm businesses. Around 25 per cent of these farms were in New South Wales, 24 per cent in Queensland, 19 per cent in Victoria, 11 per cent in South Australia, 11 per cent in Tasmania and 10 per cent in Western Australia.

From 2007-08 to 2016-17, average unit prices received for vegetables and unit costs of production both increased, but the average margin received has fluctuated slightly over time. The cost of labour makes up a considerable proportion of total costs for all vegetables, ranging from around 26 per cent for potatoes to over 42 per cent for tomatoes.

### Selling produce

In 2016-17, nearly one-half of all vegetable growers sold their produce to a wholesale vegetable market in their state. Around 27 per cent of vegetable-growing farms across all states sold their produce direct to processors. Tasmania also had a relatively high proportion selling vegetables direct to food service channels (30 per cent).

Very large vegetable-growing farms with more than 70 hectares of vegetables crop under production were more likely to sell their produce directly to processors or retailers than other vegetable growers. Smaller vegetable-growing farms with less than five hectares planted to vegetables sold most of their produce at wholesale markets or directly at the local markets.

Growers were also asked about value adding to their products. Value adding includes a wide range of activities, including pre-packaging, pre-processing or pre-prepared meals in response to changing consumer habits.

An estimated 56 per cent of vegetable-growing farms engaged in some level of value adding to their produce in 2016-17. However, only eight per cent of vegetable-growing farms indicated an intention to undertake more value adding activities on their farms in the future compared to one-third of farms a decade earlier.

### Further opportunities

Improved technical and farm management skills through education and training can generate substantial returns when organisations employ the new skills and knowledge productively. Around two-thirds of vegetable-growing farmers were involved in training and education-related activities to improve their farm management and technical skills over the year from 1 July 2016 to 30 June 2017.

Attending demonstration sites or field days was the most popular training choice among vegetable-growing farms during this period. An estimated 62 per cent of vegetable growers attended field days to improve their farm management and technical skills.

Around 21 per cent of vegetable-growing farms attended workshops and around 18 per cent attended conferences, while approximately six per cent of vegetable growers attended other activities like agronomist visits, discussions with input suppliers such as seedling, fertiliser and chemical providers, and overseas trainings/research. A higher proportion of larger vegetable growers attended training activities compared with small vegetable growers.

Research on pest and disease management and higher-yielding varieties were most commonly identified as important to vegetable growers in 2016-17. Around 40 per cent of vegetable growers perceived high quality products as a key growth opportunity.

#### Find out more

For further details, please visit [agriculture.gov.au/abares/research-topics/surveys/vegetables](http://agriculture.gov.au/abares/research-topics/surveys/vegetables).

*Financial performance of Australian vegetable farms 2016-2017 to 2018-2019* has been funded by the vegetable research and development levy, with co-investment from the Department of Agriculture and Water Resources and contributions from the Australian Government.

Project Number: VG15077



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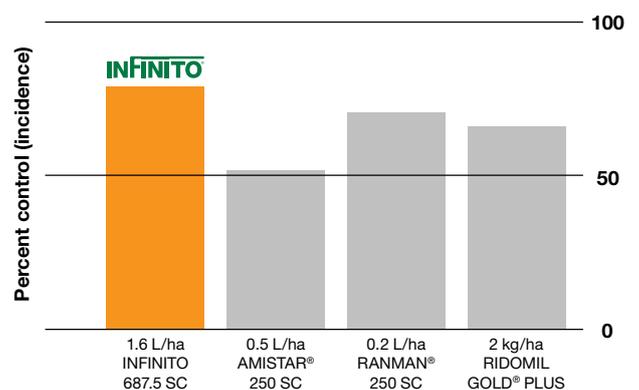
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Data summary from 5 replicated trials



Trial reference: QB42, QB43, QB78, QB80, QB81

## vegetablesWA releases second benchmarking annual report

Beginning in 2017, a strategic levy investment is engaging with Western Australian vegetable growers to identify production and financial benchmarks and to uncover the drivers of best practice performance, with the aim of enabling a culture of continuous improvement on-farm. *Vegetables Australia* reports on the latest findings.

The second-ever annual report into the financial and production performance of Western Australia's vegetable growing businesses continues to shed light on the state of the industry.

The WA Vegetable Industry Benchmarks Report was produced by vegetablesWA together with Planfarm, with funding from the Department of Primary Industries and Regional Development's Agribusiness Innovation Fund and Hort Innovation.

vegetablesWA Benchmarking Lead Bryn Edwards said the report contains data supplied by growers from six of the state's seven vegetable growing regions.

"This builds on the foundation of information we established with last year's report and is the start of us being able to track industry performance over time," Mr Edwards said.

"Western Australian vegetable growers achieved an average return on capital of six per cent in the 2017-2018 financial year.

"The top 25 per cent had a return on capital of 15 per cent while the bottom 25 per cent had a return on capital of three per cent, highlighting the varied performance of vegetable growers around the state.

"Importantly, the data in the report showed the vegetable industry can generate great returns comparable with any other industry or investment type."

### Profit and cost focus

Planfarm Director Paul Omodei has been involved in the most recent report, which was outlined in a recently recorded webinar.

"Interestingly, the most profitable growers (as measured by vegetable operating profit per hectare) were not those from a particular area or of greater scale or a particular vegetable type, but those that were able to achieve a higher income per hectare while keeping costs as a percentage of income below 65 per cent," Mr Omodei said.

"The key to keeping costs below 65 per cent was controlling labour spend through focused, well-organised and efficient workflow processes. The most profitable growers were also focused heavily on vegetable production, allocating 100 per cent of their area to growing vegetables."

Overall, there was a 10 per cent increase in sold vegetable production between 2017-2018 and the two preceding years 2015-2016 and 2016-2017.

vegetablesWA Chief Executive Officer John Shannon said the report is starting to paint a detailed picture of the operations in the vegetable industry, allowing the organisation to more effectively address issues on its behalf.



vegetablesWA Benchmarking Lead Bryn Edwards provides an update to the horticulture industry.

"This data means we can identify areas of need within the industry so we can focus on those and boost the industry overall," Mr Shannon said.

Hosted by Mr Edwards and Mr Omodei, the webinar also discussed the following topics from the **2017-18 financial year**:

- Key insights from the 2017-18 financial year benchmarking initiative.
- General overview of vegetable production across WA.
- Key vegetable business financial performance metrics and findings.
- Insights in the performance of the top 25 per cent most profitable growers.
- Comparison of the 2017-18 financial year against the 2016-17 financial year.
- Questions and answers – this also included tips for how to improve performance for the bottom 25 per cent.

This free service is now open to all Western Australian vegetable growers to review the 2018-19 financial year. To get involved, please contact Bryn Edwards via the details below.

You can watch the webinar and download a copy of the report at [vegetablesWA.com.au](http://vegetablesWA.com.au) in the 'Business Management' section in the Resources section.



Bryn Edwards and Planfarm Director Paul Omodei discuss the benchmarking report's latest findings.

### Find out more R&D

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

*Vegetable business benchmarking* 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: VG17000

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## Veg growers reaping rewards from IPM

In this edition of *Vegetables Australia*, Paul Horne from IPM Technologies reports on how committing to an integrated approach has benefited the growing practices of the 2019 Syngenta Grower of the Year Jason Shields and Corteva Young Grower of the Year Daniel Hoffmann.

Members of the Australian horticulture industry were recognised at the Hort Connections 2019 National Awards for Excellence Gala Dinner in Melbourne on Wednesday 26 June.

Two of the most prestigious awards each year are the Syngenta Grower of the Year and the Corteva Young Grower of the Year. In 2019, Jason Shields from Plunkett Orchards in Victoria's Goulburn Valley received the grower accolade, while Daniel Hoffmann, a vegetable grower from Virginia in South Australia, was honoured with the Young Grower award.

One thing that both these growers have in common is a commitment to Integrated Pest Management (IPM), and both have worked in recent years with entomologists from IPM Technologies to develop and implement suitable strategies for their farms.

The reasons for wanting to take this approach are also similar for Jason and Daniel. It is not primarily about saving money on insecticides (although that has certainly happened), but achieving sustainable pest control and achieving high quality product with reduced reliance on insecticides and miticides.

Daniel runs a farm that totals 11 acres, but has polytunnels with a total area of 14,400 square metres. He has grown many vegetable crops including tomatoes, capsicum, eggplant, zucchini and cucumbers, but now concentrates mostly on Roma tomatoes, which are produced for sale to supermarkets via intermediate suppliers.

In addition to the main crop of tomatoes, which are grown in polyhouses, Daniel 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. He is also carrying out small-scale trials on growing other crops such as pumpkin, rockmelon, long melon and dragon fruit.

"Insects like western flower thrips are basically impossible to control with insecticides in Virginia now," Daniel says.

First using commercially-reared beneficial insects and mites, Daniel developed methods of management to

now maintain a balance between pests and their natural enemies on his farm (this is described on page 28 of the November/December 2018 edition of *Vegetables Australia*). This includes a predatory bug, *Nesidiocoris*, which can also be a pest requiring management.

"While growing tomatoes, I've found a way to maintain *Nesidiocoris* numbers without commercial releases by planting host crops such as Vietnamese winter melon, which the good guys love. Not spraying now has given me the time needed to enjoy the farm rather than work against the odds," Daniel says.

Both Jason and Daniel face some of the same key pests, including two-spotted mite. In the last 12 months, neither grower has used any miticides against this pest. This is a very different scenario for both than what was commonplace 10 years ago.

### Plunkett Orchards: Forging ahead

At Plunkett Orchards, Jason would have previously used one application everywhere and sometimes two or three applications in hot spots. In Virginia, Daniel had previously been spraying for two-spotted mite on a fortnightly basis over the warmer months.

Plunkett Orchards is a farm in the Goulburn Valley with around 150 hectares of apples and pears, and Jason was interested in trying an IPM approach.

"It seemed like every year we were using more and more chemistry and not getting any benefit – and, in some cases, getting worse results," he says.

Using an IPM approach at Plunkett Orchards meant more than simply adjusting the spray program. Cultural (management) controls were extremely important and involved serious decisions about tree-height, canopy management, inter-row vegetation and spraying equipment delivery.

### What are the benefits now?

"We have had amazing results with 100 per cent control of secondary pests – mites, mealybug, woolly aphid and scale – without needing to use any target

chemistry towards these pests. In the past, we could use up to 3-5 mealybug sprays and still not have adequate control. This has also led to a saving of around 65 per cent in insecticide cost with improved control," Jason says.

"We have changed approach from reactive to consequence driven. A great example of this was scale in the previous season. Over the last five years, scale had slowly built up by the end of the season and we sprayed due to our reactive approach.

"The severity was getting worse each year, so in the long-term this approach wasn't working. We bit the bullet and didn't react and spray, believing the consequence of this would be the predators would build up and do the job.

"In the end, we had the same level of, or slightly higher, damage as the previous year but this season the problem was non-existent. In the last 12 months I was asked many times what I was going to do to control scale because it had become a big problem. In the end, not reacting was the best option and it gave us the best results in five years."

Even in the extreme heat of last summer, these two growers made great use of naturally-occurring biological control and with significant efforts on cultural (management) methods they maintained control of pests with minimal use of pesticides.



Syngenta Grower of the Year, Jason Shields.



Jason Shields accepting the Syngenta Grower of the Year award.



Corveva Young Grower of the Year, Daniel Hoffmann.



Daniel Hoffmann with his tomato crops.

Find out more 

Please contact Dr Paul Horne and his team on 0419 891 575 or email [info@ipmtechnologies.com.au](mailto:info@ipmtechnologies.com.au).

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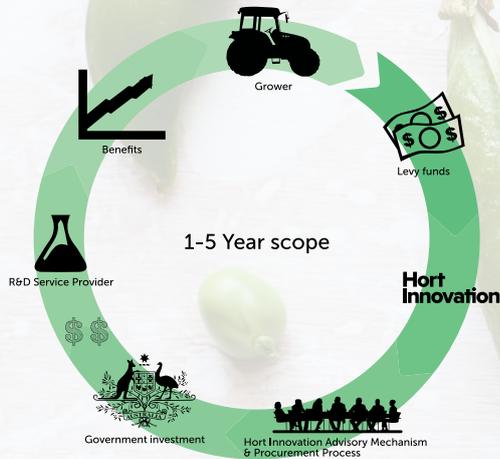
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# THE VEGETABLE R&D LEVY AT WORK

## 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.

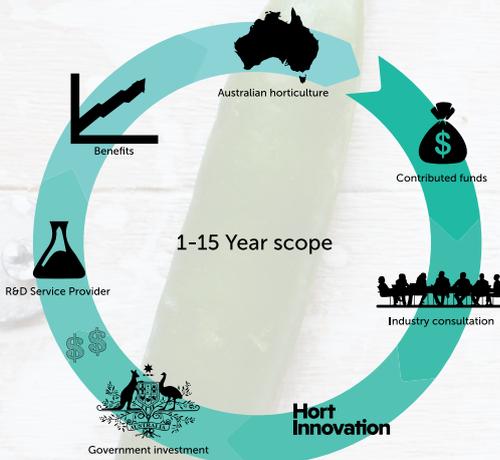
Strategic levy investments have a one- to five-year scope and the R&D is designed to directly benefit growers in the vegetable industry. Project topics range from pest and disease management to biosecurity matters, with findings communicated through a variety of channels, including *Vegetables Australia*.

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/growers/vegetable-fund/](http://horticulture.com.au/growers/vegetable-fund/).

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

You can read more about Hort Frontiers and the seven funds within it at [hortfrontiers.com.au](http://hortfrontiers.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/about/investing-is-our-business/concept-proposal-form/](http://horticulture.com.au/about/investing-is-our-business/concept-proposal-form/). Growers are also encouraged to reach out to the SIAP panellists for the industry (available from the Vegetable Fund page).

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## Matthew Johnson: Going from plate to paddock pays dividends

Coolibah Herbs' Wemen Farm Manager Matthew Johnson moved to Australia from England in 2007, having worked in the agricultural sector and qualifying as a chef upon leaving school. Today, Matthew can be found busily working between two leafy vegetable and culinary herb growing operations in Victoria's north. Michelle De'Lisle reports.

Matthew Johnson is a qualified chef from England; however, his preference to be outdoors rather than in the kitchen saw him swap the cutting board for the tractor to grow vegetables for others to cook.

Back in England, Matthew was involved in egg production and worked intermittently on lettuce and potato farms. In 2007, he and his wife Sarah moved to Melbourne where Matthew pursued his passion for horticulture, finding a job driving tractors for Coolibah Herbs, a large-scale family-owned leafy vegetable and culinary herb growing operation that has farms in Pearcedale in Melbourne's south-east and Wemen, in north-eastern Victoria.

Eighteen months ago, Matthew advanced his career after accepting the Coolibah Herbs' Farm Manager position at its Wemen operation located 110 kilometres south of Mildura in Victoria's Mallee region. He oversees 700 acres of conventional irrigated ground that produces baby leaf spinach; wild rocket; lettuce; culinary herbs such as coriander, dill and parsley; Asian leafy vegetables; and salad vegetables. In addition to this, Matthew must travel 16 kilometres down the road to look after 400 acres of organic farmland that produces the same vegetables and herbs as the conventional farm, with a few seasonal variations.

Sarah takes care of the office and administration work, and the couple have three daughters: 11-year old Caitlin, nine-year old Zoe and Amelia, who is seven.

### Facing challenges

As Farm Manager, Matthew has to be highly organised. He needs to ensure planting is occurring in the right areas, that the nutrition and spray programs are all up-to-date and that all the harvesting is done in the right areas in a timely manner before produce is sent to Coolibah Herbs' Pearcedale operation for processing.

These responsibilities do pose challenges, including finding workers to assist Matthew on the farm.

"Because we are quite far out of town – we're half an hour from Robinvale and about an hour from Mildura – it's very hard to get staff," he explains.

"We keep advertising and hopefully we get the odd member come through. And when we get a good staff member, we have to look after them to try and keep hold of them."

Meanwhile, the weather is also a challenge; particularly in summer when temperatures can soar up to 50 degrees Celsius.

"We don't produce over the hot summer months – that goes back down to our farm in Melbourne. During that time, we get everywhere green manure cropped and work the paddocks to get them ready for the following season," Matthew says.

"It's good winter growing weather."

## Gaining knowledge

While lettuce production in England is similar to that in Australia, Matthew has had to learn about irrigation techniques, particularly since relocating to the Mallee where conditions are dry, even in winter.

"Back in England, you didn't have to irrigate for a start. Mother Nature always did that for you. Irrigating is a big job over here in itself," Matthew says.

Matthew learnt about different growing practices while based in the Melbourne growing operation for the first decade, while there is regular help at hand.

"We have an agronomist who comes through once a week and we also have our agronomist from Pearcedale who comes to visit probably every 2-3 weeks," he says.

"I've read a lot and learnt, and there's always the phone and internet for anything else that I need to find out.

"The neighbours and surrounds have been very helpful, making me feel welcome up in the area – it was a big move for myself, my wife and three kids to move from down in Pearcedale to the Mallee."

## A greener approach

To maintain the farm's ongoing sustainability, Matthew uses beneficial insects, as well as Trichoderma (fungi) to keep those beneficial populations steady.

"It's vital to do this – you don't want to keep punishing the ground, you've got to respect it and reduce the use of high-level insecticides, pesticides and fungicides, and try the user-friendly approach rather than hard-core chemicals," he says.

"We have to keep R&D ongoing to develop better ways of farming without aggressive chemical usage. We're adopting R&D as best as we can up here in the harsh climate. A lot of it is going on down in Melbourne at the main farm, and then we do different trials, as well as bring in new equipment that's not as damaging to the soils. There's also increasing green manure cropping for different crops."

Matthew says growing produce in a more organic way is a future focus for Coolibah Herbs. Currently, the Wemen operation has been growing its organic produce for 6-7 years and this will only continue to grow.

In the meantime, Matthew is happy to remain in the paddock rather than working in the kitchen.

"I enjoy growing a good crop that I'd be willing to eat, so I'm sure everyone else would be willing to eat too. And then to send it down for production and see it on the shelves in the shops is rewarding. It means that people are buying the produce and eating it, which is a good thing."



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## Reflecting on the last three years of industry communications

In February 2016, AUSVEG began a three-year project to communicate the outcomes of industry-funded research to levy-paying growers and the wider industry. This project included the publication of *Vegetables Australia*, as well as a number of other old and new communications materials to promote the benefits of the levy investment system. Project Lead Shaun Lindhe provides an overview of the project.

Communicating research outcomes effectively is essential to increase awareness and adoption of research outcomes by horticulture levy payers to improve productivity, competitiveness and profitability. As Australian horticulture transitions to meet the challenges of operating in a globally competitive marketplace and faces other challenges such as rising costs and competition in domestic markets, it is important that grower levy payers are given every opportunity to learn about innovations and improvements that can enhance their businesses.

A strategic levy investment under the Hort Innovation Vegetable Fund, *Vegetable Industry Communications Program 2016-2019* (VG15027) was undertaken by AUSVEG to increase awareness of the outcomes of research projects.

By communicating research results to growers and highlighting the practical on-farm benefits that can be gained from adopting the findings of relevant levy-funded projects, the program aimed to inspire Australian growers to take advantage of the ground-breaking and world-leading research taking place in the industry to gain real-world benefits on-farm and encourage business innovation, with the ultimate aim of improving profitability for the Australian vegetable industry.

### How did AUSVEG communicate to growers?

VG15027 was an amalgamation of four previous communications projects:

- VG12006 – *Production of Australian Vegetable Industry Vegenotes series*
- VG12014 – *National Vegetable Industry Communication Strategy (VICS): management and implementation*
- VG12033 – *Vegetables Australia (continuation of VG09095)*
- VG12071 – *Coordinated Knowledge and Industry Development Program*

The amalgamated project ensured that vegetable levy-paying growers and industry members had a cost-effective and efficient model for research communication.

The project's outputs included the production and distribution of a number of hardcopy, online and social media communications materials to ensure that the outcomes of industry-funded research reached as many growers and industry members as possible to maximise the impact of the project. The communications materials produced by AUSVEG as part of VG15027 included:

#### Traditional hardcopy publications:

- *Vegetables Australia*
- *Vegenotes*
- *Vegetable Grower Success Stories*
- *Vegetable Industry Annual Report 2014/15*

#### Online and other communications:

- The management, maintenance and promotion of the InfoVeg national R&D database
- InfoVeg TV videos
- InfoVeg Radio podcasts
- The AUSVEG Weekly Update e-newsletter
- Media and social media relations to promote industry-funded research and related news items to growers and the wider industry.

#### What R&D was communicated to growers?

In total, 290 separate industry-funded projects featured in vegetable industry communications across all of its different communications platforms during the life of the project.

- **21 editions** of *Vegetables Australia* published **588.7 pages** dedicated

to industry research (an average of **28 pages** per edition), as well as a re-design of the publication to modernise its look, increase readability and more clearly promote industry research.

- **176 Weekly Update editions** published over 1,000 vegetable industry-related articles covering **105 R&D projects** funded by the vegetable levy and other Hort Innovation-funded sources.
- **Three editions of *Grower Success Stories*** highlighted **18 growers** who have benefited from levy-funded research and development.
- **76 Final Reports** from industry-funded projects were uploaded to the InfoVeg R&D database.
- Media releases and direct media engagement that resulted in **1,890 media mentions** on vegetable industry-related research (an average of **45 per month**).
- Social media promotion of levy-funded and industry-related research, news and events resulted in **1,550 tweets published (8 per week)**, a 239 per cent increase in Twitter followers, as well as the increased output of other social media channels to promote vegetable industry-related content.
- 15 videos highlighted levy-funded research projects for the AUSVEG YouTube page, which achieved an average of **213 views**.
- 14 podcasts highlighted levy-funded research projects for the AUSVEG Soundcloud page, which achieved an average of **106 views**.

#### Grower feedback

AUSVEG regularly surveyed growers and industry members to monitor the effectiveness of project VG15027.

In the final project survey, when growers were asked if they had implemented R&D that they learned through AUSVEG's communications, 43 per cent of grower respondents had indicated that they had implemented some research outcomes. This is particularly high, given that VG15027 does not incorporate any extension element. It is expected that with the vegetable industry investigating more resources into extension that the two components of research adoption can achieve significant practice change in the industry.

AUSVEG industry communications have been highly successful in improving industry understanding of how Hort Innovation's Strategic Levy Investment system works, with over 80 per cent of respondents from AUSVEG's most recent annual survey indicating that they have a greater understanding of the levy investment process (and Hort Innovation's role) through information produced by AUSVEG.

Furthermore, growers and the wider industry are more informed on how the Hort Frontiers investment system operates, with over 60 per cent of respondents from AUSVEG's most recent annual surveys indicating they have a greater understanding of the Hort Frontiers Funds and investment system through industry communications.

### Next steps

AUSVEG recently commenced work on the *National Vegetable Industry Communications Program (VG18000)*, which is the next iteration of industry communications projects. This project includes:

- *Vegetables Australia* and *Vegenotes*
- InfoVeg Radio podcasts
- InfoVeg TV videos
- Media and social media promotion of levy-funded R&D
- The Weekly Update

AUSVEG will also link its communications materials closely with VegNET to ensure that the industry's communications and extension projects are collaborating and working well together for the benefit of Australia's vegetable levy-paying growers.

### Find out more

For further information on this project, please contact Project Lead Shaun Lindhe at [shaun.lindhe@ausveg.com.au](mailto:shaun.lindhe@ausveg.com.au) or on 03 9882 0277.

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

Project Number: VG15027



## A guide to effective inductions

In this edition, the Fair Farms team discusses inductions to the workplace and business, plus provides an overview of the information that needs to be made available to new workers and potential issues to consider when hiring workers from overseas, including language barriers.

An induction is a process of introducing workers to their job and to the business. When workers fully understand their role, surroundings and relations to co-workers, they will have all the information necessary to perform their job confidently, effectively and safely.

The Fair Farms Standard promotes that businesses have a well thought out and documented induction procedure. Businesses need to induct workers they

hire directly as well as workers hired through a labour hire provider.

### What to include in an induction procedure

Every business is different, and therefore every business' induction process will cover different areas. However, at a minimum the induction procedure should cover:

## Meet the Fair Farms team



**Thomas Hertel**  
Fair Farms Program Manager

As Program Manager, Thomas has overall responsibility for the successful implementation of the Fair Farms Initiative.

Before joining Fair Farms, Thomas led the contracting and legal department of a global international development project management firm. He is skilled in complex contract negotiations, government, effective stakeholder engagement, management and leadership, with more than a decade of professional experience as a commercial lawyer, policy advisor, project and operations manager, tutor and mentor.

Thomas completed undergraduate law at Humboldt University of Berlin and holds a Master of Laws degree in international law and dispute resolution from the University of Queensland.



**Lucy Kluck**  
Fair Farms HR Officer

After growing up and working on a tomato farm in the Lockyer Valley, Queensland, Lucy studied a Bachelor of Psychology and a Bachelor of Business at Queensland University of Technology. Lucy specialised in Human Resources and statistical analysis, and is experienced in providing employment relations advice and support to growers across the horticulture industry.



**Donna Mogg**  
Fair Farms Trainer

With over 25 years' of workplace relations experience, Donna Mogg was responsible for the management of Growcom's Workplace Relations unit, with a focus on understanding the horticulture industry and its workplace challenges as well as providing support and training to assist growers to meet their legal and ethical workplace obligations. Donna has been engaged with matters at the national level, e.g. both development and review of the 'modern' Horticulture Award, and in making submissions to, and appearances at key inquiries, including the Senate Education and Employment References Committee Review, the 457 Integrity Review, the National Forum on Overseas Workers, and the Migrant Worker Taskforce.

Donna holds a Bachelor's Degree in Communications, a Certificate IV in Training and Assessment, and the Associate Certificate in Applied Management and is leading the development of the training program for the Fair Farms Initiative.

- Workplace information, such as the location of break rooms and toilets.
- Worker role, such as job descriptions and general duties.
- Employment terms and conditions, including probations and piecework arrangements (where relevant).
- Worker rights and entitlements, including a copy of the Fair Work Information Statement and the Fair Work My Employment Checklist.
- Work health and safety risks, requirements, policies and procedures.
- Other workplace policies and procedures.
- The reporting structure of the business.
- Process for handling of disputes and grievances.

When deciding what other topics to cover in your induction process, think about the unique features that contribute to your business values (e.g. always sending out deliveries on time) and workplace culture (e.g. having morning tea together once a week).

## Inducting overseas workers

It is important to consider that workers from overseas may have limited English skills and experience in horticulture businesses. When designing your induction process, keep these issues in mind and create a procedure for communicating induction information to those workers. This may include photos and diagrams, physically showing and demonstrating topics or teaming new workers up with experienced employees who speak the same language.

## Documenting the process

Use a checklist to ensure every aspect has been covered. Ensure workers sign the checklist to acknowledge they have received an induction and understand the information they were given. Make sure to keep the signed checklist with the rest of their employee records.

## Keep in mind

Some employers make the mistake of not paying workers for the time they spend on inductions. However, being inducted is a mandatory work activity and therefore workers are entitled to their normal rate of pay.

These, and other important topics, are covered in the Fair Farms Standard, which sets out the accepted principles of fair and ethical employment in horticulture. For more information, including how to become a Fair Farms certified employer, visit [fairfarms.com.au](http://fairfarms.com.au) or email [fairfarms@growcom.com.au](mailto:fairfarms@growcom.com.au).

### Find out more R&D

Visit [fairwork.gov.au](http://fairwork.gov.au) and [growcom.com.au](http://growcom.com.au) for more information regarding your obligations as an employer.

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.



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## Meet the VegNET IDOs



**Theresa Chapman**  
Tasmania

I am a soil ecologist who is happy to be living and working on some of the best soils in Australia. I'm proud to be delivering extension in the unique, vibrant and innovative Tasmanian vegetable industry. My time in the role has included event management, resource development, podcasting and farm visits. My favourite thing about the work is meeting the growers and industry members, who so generously share their incredible collective knowledge and experience.

### Get in touch:

Contact Theresa on 0413 039 733 or 03 6437 2264, or email [theresac@rmcg.com.au](mailto:theresac@rmcg.com.au). Keep up to date on Facebook: @VegNET.Tas and Twitter: @VegNET\_Tas.



**Laura Cunningham**  
Northern Territory

I'm from south-west Victoria and agriculture is my passion. This started at a young age and has continued to grow over my career. Working in the livestock industry saw me gain valuable knowledge and hands-on experience in ag.

I have lived in the Northern Territory for almost 10 years, furthering my career in the rural services sector comprising of horticulture, agronomy and irrigation sales and forestry.

The NT Farmers' IDO role allows me the opportunity to learn and support plant-based industry in the Northern Territory.

### Get in touch:

Contact Laura on 0405 287 344 or 08 8983 3233, or email [ido@ntfarmers.org.au](mailto:ido@ntfarmers.org.au). Keep up to date on Facebook: @NTFarmersAssociation and Twitter: @NTFarmers.



**Yanyu Liang**  
South Australia

I am extremely happy to introduce myself to you all as the new IDO for VegNET SA.

I have just graduated from the University of Adelaide. Before commencing work with AUSVEG SA, I worked in the Department for Trade, Tourism and Investment in South Australia.

My role is to find issues and knowledge gaps within the horticulture industry and fill them in by periodic communication with growers and researchers. This is achieved partly through workshops and field days with experts in fields throughout the year.

### Get in touch:

Contact Yanyu on 0432 742 896 or email [yanyu.liang@ausveg.com.au](mailto:yanyu.liang@ausveg.com.au). Keep up to date on the AUSVEG SA Facebook page: @ausveg.sa.39 and Twitter: @AUSVEG\_SA.



**Truyen Vo**  
Western Australia

I am the Vietnamese Vegetable IDO with vegetablesWA, and an accredited agricultural consultant who looks after about 220 Vietnamese Australians in WA. My role includes establishing and maintaining linkages between growers and other stakeholders and organisations within the R&D community and commercial suppliers; engaging with the language other than English community to contribute and share information and experiences as well as ensuring the grower base is well-understood and well-represented on all issues. I am also involved in the extension of relevant research into practicable materials for Vietnamese growers as well as uptake of advanced growers' practices to spread out to other grower communities as appropriate, and I provide spoken and written translation services.

**Get in touch:** Contact Truyen on 0457 457 559 or 08 9486 7515, or email [truyen.vo@vegetableswa.com.au](mailto:truyen.vo@vegetableswa.com.au). Keep up to date on Facebook: @vegetablesWA.



**Sam Grubiša**  
Western Australia

I was a third-generation vegetable grower on a 50-acre property in Perth's north, where I worked full-time with my father and uncle. Their main crop is rhubarb, with spring onions as a secondary and silverbeet/capsicums as their rotated seasonal crops.

I commenced working for, rather than in, the vegetable industry in early May 2017, as the IDO at vegetablesWA. Having a lifetime of practical experience, and a dedicated commitment to supporting the industry, has made me a valuable ambassador for vegetables. Having an impassioned nature and curious mind I will often "disappear down the rabbit hole" of R&D while in the office and wander along pointing at produce asking growers, "can I eat that?" while out in the field.

**Get in touch:**

Contact Sam on 0427 373 037 or 08 9486 7515 or email [sam.grubisa@vegetableswa.com.au](mailto:sam.grubisa@vegetableswa.com.au). Keep up to date on Facebook: @vegetablesWA.



**Cherry Emerick**  
North Queensland

I am hosted by the Bowen Gumlu Growers Association – Bowen and Gumlu are the largest winter vegetable producing regions in Australia and I've lived in the area since 2002.

I was a hands-on vegetable grower for over 10 years across Queensland and Victorian growing regions. My learning has been straight from the paddock to the shed, and each day in my conversations with growers and stakeholders I often draw on experiences. My strengths lay in food safety quality; supply chain management; facilitating projects; and fostering vital relationships locally and nationally within the industry. As well as working closely with growers, I find myself advocating and providing a growers' perspective often to stakeholders.

**Get in touch:**

Contact Cherry on 0427 701 225 or 07 4785 2860, or email [idm@bowengumlugrowers.com.au](mailto:idm@bowengumlugrowers.com.au). Keep up to date on Facebook: @bowen.growers and Twitter: @idmCherry.



**Zara Hall**  
Southern Queensland

Zara Hall (far right) discussing the benefits of grafted seedlings at Withcott Seedlings.

I have recently been employed by the Lockyer Valley Growers Inc. as the IDO for Southern Queensland. I want to thank the Lockyer Valley Growers Inc. for giving me this opportunity, and I am looking forward to working with the grower group and industry to maintain and grow the profitability of our industry.

My background is in research in vegetables, grains and cotton, and I have mostly worked on insects. I think we have a great industry with a bright future, and in my position as IDO, I hope that I can help to maintain the strong connections that our growers and industry already have; address any challenges as they may arise; and maintain and grow the profitability of vegetable production in southern Queensland. I am looking forward to working with you all.

**Get in touch:**

Contact Zara on 0456 956 340 or email [ido@lockyervalleygrowers.com.au](mailto:ido@lockyervalleygrowers.com.au). Keep up to date at [lockyervalleygrowers.com.au](http://lockyervalleygrowers.com.au); Facebook: @IndustryDevelopmentOfficer or Twitter: @LVGrowers\_Inc.



**Bree Grima and Hannah Lemon**  
Wide Bay Burnett (Queensland)

Bundaberg Fruit and Vegetable Growers (BFVG) deliver the VegNET Wide Bay Burnett program. The Project Manager is Bree Grima, BFVG Managing Director and chief advocate for the industry in the Wide Bay Region of Queensland.

Hannah Lemon is the VegNET IDO and has previous experience in fruit fly community awareness and regional data and statistical analysis programs. Hannah will continue the great work of previous IDOs in the role through one-one-one contact with vegetable producers and coordinating forums and workshops of interest to regional producers.

**Get in touch:** Contact Hannah on 0428 716 218 or 07 4153 3007 or email [vegnet@bfvg.com.au](mailto:vegnet@bfvg.com.au). Keep up to date on Facebook: @BFVG4670 and Twitter: @fruitveggrowers.

## Meet the VegNET IDOs



### Carl Larsen, Clinton Muller and Ken Orr Victoria

### Shayne Hyman Gippsland (Victoria)

Carl Larsen, Clinton Muller, and Ken Orr are the VegNET IDOs for the South-Eastern, Western and Northern regions of Victoria respectively. Carl is the project director and has a passion for science communication and sustainable agriculture. These passions are supported by Carl's extensive background in resource management in agriculture, land use and regional development.

Clinton is the project manager and primary point of contact. Clinton has been involved in a range of fields, specialising in horticulture, intensive production systems and building resilience in smallholder farmers. A key theme throughout Clinton's work has been enhancing partnership engagement, knowledge transfer and input support for crop and animal production.

Ken is the northern region field officer and has extensive experience in horticultural production and agronomy, specialising in nutrition in perennial and annual crop production.

Carl, Clinton and Ken work with vegetable growers, advisors, agribusiness service providers, industry associations, researchers and other important stakeholders in their respective regions on several priority areas that align with the strategic priorities of the Victorian vegetable industry. The top five industry

R&D needs in order of priority include water, profitability, pest and disease, cost of production and soil. More specifically, these include water availability and quality; reducing input costs, value adding and consumer alignment; integrated pest management and spray application; automation, robotics, and labour savings; and soil health and improving organic matter and structure.

The IDOs have a service-based approach to delivering news, events and resources to the relevant regions of Victoria. This includes producing online content such as e-newsletters ([ausvegvic.com.au/e-news](http://ausvegvic.com.au/e-news)), Twitter posts and posting on AUSVEG VIC's website; producing resources such as videos, factsheets, and posters; coordinating farm walks and workshops with researchers, advisors and producers; organising study tours; providing one-on-one support; and promoting existing levy funded resources.

#### Get in touch:

Contact Carl on 0419 622 393 or email: [carll@rmcg.com.au](mailto:carll@rmcg.com.au); Clinton on 0498 192 596 or [clintonm@rmcg.com.au](mailto:clintonm@rmcg.com.au); Ken 0428 502 936 or [ken.orr@bigpond.com](mailto:ken.orr@bigpond.com). Keep up to date on Twitter: @GrowingVegBizs.

My name is Shayne Hyman and I'm the IDO for VegNET Victoria Gippsland.

I was born in Orbost in East Gippsland, where the Snowy River often broke her banks back then to share the goodness of rich soils. My grandmother sorted beans on the flats for a time and one of my earliest memories is the joy of shelling peas with her.

I love eating vegetables and enjoy the versatility they bring to meals. So, working in capacity building with Gippsland's hardworking vegetable growers has been like coming home. This project, hosted by Food & Fibre Gippsland, has just been extended until March 2020 enabling me to play a key role in the East Gippsland Vegetable Innovation Days and the 10th International Spinach Conference in May 2020.

#### Get in touch:

Contact Shayne on 0417 330 081 or email [shayne.hyman@foodandfibregippsland.com.au](mailto:shayne.hyman@foodandfibregippsland.com.au). Keep up to date on Facebook: @FoodandFibreGippsland and Twitter: @gippy\_growers.

#### Find out more

Please contact your state-based Industry Development Officer for further details.

*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



## Matthew Plunkett and Sylvia Jelinek New South Wales

Matthew Plunkett has over 25 years' experience in agricultural extension with skills in soil management, irrigation management and protected cropping.

Matthew was recognised as a finalist in the Researcher of the Year award at Hort Connections 2018. He is currently the Project Leader for the NSW VegNET project and a Director with the Protected Cropping Australia (PCA).

The NSW VegNET project has undertaken the following outputs:

- 113 events.
- Engaged 50 per cent of all vegetable growers in NSW.
- Extended over 48 vegetable R&D projects.
- Engaged with 1,950 people through the project.
- Reached 18,600 people through social media.

Sylvia Jelinek has over 20 years' experience in horticulture, with particular skills in pest and disease management in vegetables, as well as citrus virology and tissue culture.

Sylvia has extensive experience in Integrated Pest Management (IPM) extension and implementation. Her earlier years of employment in horticulture include working within the flower industry.

The NSW VegNET project has undertaken the following outputs:

- 266 new subscribers added to the VegNET network.
- 133 growers and industry representatives surveyed about practice change results and future directions for VegNET.
- 99 per cent of surveyed growers learnt something new at VegNET events.
- 86 per cent of surveyed growers have implemented, or plan to implement practice change as a result of their VegNET learnings.
- 75 per cent of growers have reduced their business input costs and improved productivity and profitability by applying VegNET learnings.

### Get in touch:

Contact Matthew on 0428 978 390 or email [matthew.plunkett@lls.nsw.gov.au](mailto:matthew.plunkett@lls.nsw.gov.au); or Sylvia on 0427 086 724 or email [sylvia.jelinek@lls.nsw.gov.au](mailto:sylvia.jelinek@lls.nsw.gov.au). Keep up to date on Facebook: @GreaterSydneyLLS and Twitter: @lls\_sydney. Project-related videos can be found on YouTube: search 'Greater Sydney Local Land Services'.



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Scott Mathew.

## Rotations and plant-back recommendations

With vegetable growers busy planting a wide variety of crops including lettuce, spinach, brassicas, carrots and eggplant, it's timely to revisit the topic of herbicide use and plant-back recommendations.

Growers should be planning crop and chemical rotations over the long-term with the aim of rotating herbicide groups to reduce herbicide resistance risk, as well as selecting effective products that do not impact on subsequent crops.

Herbicides without plant-back restrictions, such as the well-known knockdown products of SPRAY.SEED® (Group L herbicide) and glyphosate (Group M herbicide), allow great flexibility with successive plantings. Each of these herbicides have their own agronomic and weed strengths.

However, the reality is that no matter how good your knockdown herbicide application is, weeds will continue to emerge in crops. Wise use of soil residual herbicides and/or foliar absorbed post-emergent products can be a huge labour saver and helps growers secure yields.

A consequence of high land values is back-to-back cropping and, with more intensive rotations, growers need to pay close attention to any herbicide plant-back restrictions. That's because some soil-applied post-emergent herbicides may persist in the soil and can still be

As planting gets underway for multiple vegetable commodities across Australia, Syngenta Technical Services Lead Scott Mathew provides an overview of what growers can do to avoid herbicide residue carryover in their crops.

taken up by subsequent newly-planted sensitive crops, causing damage.

Common symptoms of herbicide residue carryover are diverse and can include plant stunting, yellowing of foliage, whitening or bleaching of foliage, malformed roots, leaf puckering, distorted growth, leaf speckling and plant death.

### Advice for growers

To avoid this scenario, crop plant-back restrictions appear on labels where soil residues have been shown to adversely affect the growth of sensitive rotational crops. Therefore, growers should make sure they always read and understand the label before use.

Herbicide carryover can be influenced by a number of factors such as application timing and rate, rainfall or irrigation management, soil composition, texture and pH, and tillage practices in the preceding crop.

As horticultural crops continue to expand and be grown in more traditional broadacre farming areas, growers need to be aware that plant-back restrictions for horticultural crops may not be listed on products designed for broadacre use and broadacre crop rotations.

Of the more common plant-back issues I see in some vegetable growing regions

is carryover from the use of sulfonylureas (e.g. Glean, LOGRAN®, Ally) or clopyralid (e.g. Lontrel). These herbicides are widely used on cereal crops and their residues can, under some circumstances, be very persistent in the soil.

Growers intending to plant horticultural crops into otherwise broadacre situations need to gather the paddock herbicide history and consult with a knowledgeable agronomic advisor.

And finally, keep records of all chemical use and conditions. Records are your best tool for reviewing and understanding what's really going on.

### Find out more R&D

For more information or to ask a question, please contact your local Syngenta Territory Manager, the Syngenta Advice Line on 1800 067 108, visit [syngenta.com.au](http://syngenta.com.au) or email *Vegetables Australia*: [info@ausveg.com.au](mailto: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.



# Latest Nielsen consumer data update: Parsley

Hort Innovation has worked with global information and measurement company, Nielsen, to bring growers the largest series of insights into market performance and shopping behaviour yet. The latest update is on the Australian parsley industry.

## Parsley purchasing statistics

In the 26 weeks to 18 May 2019, there was an increase in the consumption of fresh herbs compared to the same time in the prior year. While volume (kg) sales increased by 3.9 per cent, a lower average price/kg meant dollar sales decreased by 4.3 per cent. It has been suggested that cooking shows like *My Kitchen Rules* and *Master Chef* have contributed to household interest in herbs. With Australia's multicultural population growing, we can also expect the consumption of herbs to increase due to their importance in ethnic dishes such as curries, tabouli and guacamole.

Seventeen per cent of Australian households purchased parsley twice on average during the 26 weeks to 18 May 2019. This is relatively low considering that 39 per cent of households purchased other fresh herbs such as basil, mint, coriander, dill and chives at an average of 3.5 times in the same time period. This highlights an opportunity for the parsley category to grow through the acquisition of new buyers. A one-percentage point increase in buying households could add an incremental \$610,000 to the category over a six-month period.

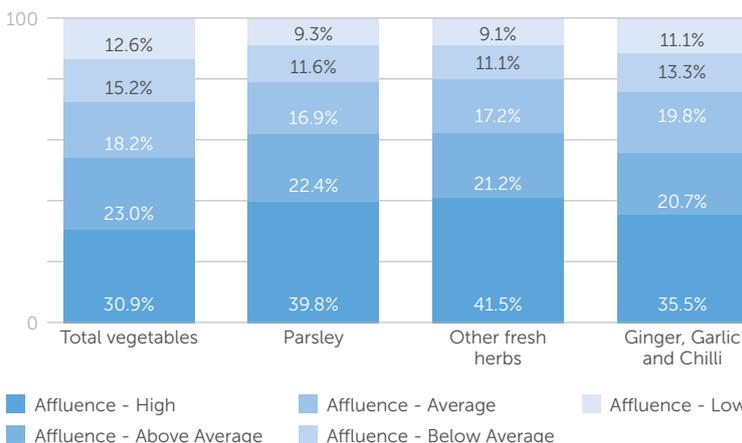
- Major supermarkets are defined as the sum of Woolworths, Coles and Aldi.
- Other supermarkets are defined as all other full-service supermarkets.
- Non-supermarkets are defined as greengrocers, markets and speciality stores.
- Opportunity calculation: based on a population of 9.5 million households and an average spend of \$6.34 in 26 weeks.

## Who is currently buying parsley?

Parsley is skewed to households with higher purchasing power: high affluence households account for a sizeable 39.8 per cent of parsley dollar sales. This compares to just 30.9 per cent for total vegetables, but in line with other leafy herbs at 41.5 per cent.

Both the flat-leaf and curly-leaf varieties of parsley are well-known. Almost two-thirds of shoppers (65 per cent) claim that they always/mostly choose a specific variety when purchasing parsley.

Figure 1  
Contribution to Dollar Sales by Affluence Group



Source: Nielsen Homescan | 26 Weeks to 18/05/2019

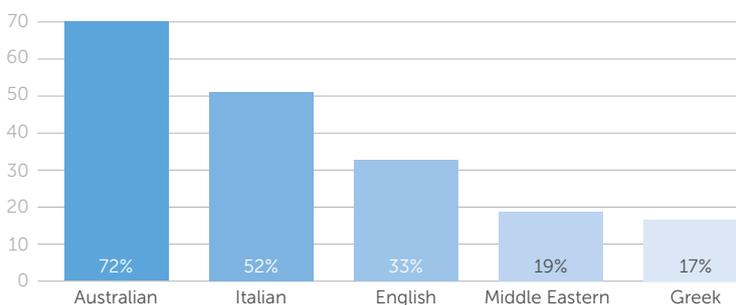
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It is important to note that price and promotion are less influential factors for parsley purchasing – only 24 per cent and 31 per cent of shoppers, respectively, always/mostly choose to purchase based on these factors, with reports that quality and freshness are the key priorities in supplying herbs.

Recipes are the key trigger for purchasing parsley – almost nine-in-ten shoppers (85 per cent) who purchase parsley do so because a recipe calls for it. Promoting the use of parsley with recipes in-store and on-pack as well as in food magazines could encourage more shoppers to purchase and keep it top-of-mind.

Although parsley is native to the central Mediterranean region, it is enjoyed across a variety of cuisines including Australian, Italian, English, Middle Eastern and Greek. Meanwhile, the top two reasons shoppers claim they do not purchase more often is because "I don't want to waste any" (31 per cent of shoppers) and "I grow my own" (30 per cent of shoppers).

Figure 2  
Cuisines cooked when using parsley | % of shoppers



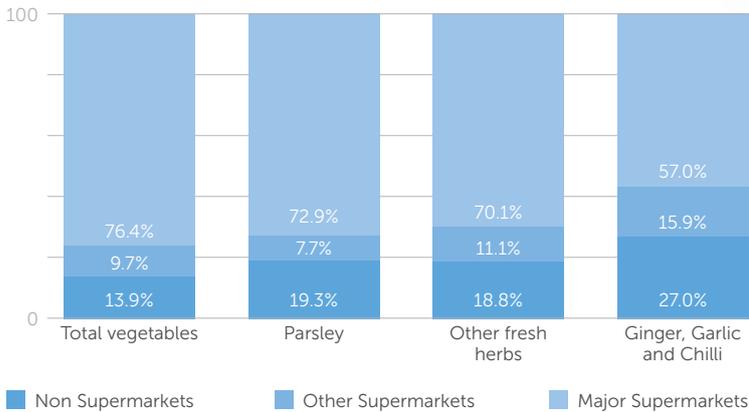
Source: Attitudinal reports prepared by Nielsen for Hort Innovation, survey sample minimum n=200, fieldwork from 24/04/2019 to 30/04/2019 for the Australian market. Copyright © 2019 Horticulture Innovation Australia.

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## Where do people currently buy parsley?

Major supermarkets make up 72.9 per cent of dollar sales for parsley. However, other retail channels are also important. Similar to other leafy herbs, parsley over-trades (1.4 times more than expected) in non-supermarkets (greengrocers and markets). Other supermarkets generate a smaller than expected dollar share (7.7 per cent) considering their share in total vegetables (9.7 per cent) as well as total herbs (12.4 per cent); suggesting that this is an under-utilised retail channel for parsley. Meanwhile, non-supermarkets account for 19.3 per cent of parsley dollar sales compared to 13.9 per cent for total vegetables making this a strong channel for parsley sales.

Figure 3  
Retailer Share of Trade | Dollar Sales



Source:  
Nielsen Homescan | 26 Weeks  
to 18/05/2019

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Sources: Nielsen Homescan for the 26 weeks to 18 May 2019. Attitudinal reports prepared by Nielsen for Hort Innovation, survey sample minimum n=200, fieldwork from 24/04/2019 to 30/04/2019 (Parsley) and January to April (other vegetables) for the Australian market.



## What does this mean for growers?

Parsley is skewed to high-affluence households and recipes are the most influential factor in the purchase of parsley. Promoting the use of parsley through in-store and on-pack recipes, as well as in food magazines, will help to encourage new buyers and remind existing buyers of the herb's diversity. Demonstrating the variety of cuisines and dishes parsley can be used in could also sway current buyers to purchase more.

With wastage as the number one barrier to purchase, education around the storage, handling and shelf life of parsley could give buyers more confidence and alleviate wastage concerns. Inspiring buyers with the range of dishes parsley can be in could also minimise the likelihood of the herb being wasted when purchased.

Non-supermarkets are an important retail channel for parsley, with 19.3 per cent of parsley dollar sales compared to 13.9 per cent for total vegetables. In order to maximise sales, it is crucial that parsley continues to be supplied across a variety of channels – not just major supermarkets to appeal to the widest customer base.

### Find out more R&D

Find out more: Please contact Chanel Day at [chanel.day@nielsen.com](mailto:chanel.day@nielsen.com).

The Harvest to Home dashboard is an initiative of the *Vegetable Cluster Consumer Insights Program* and is funded by Hort Innovation using the vegetable, sweetpotato and onion research and development levies and contributions from the Australian Government.

Project Number: MT17017

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## Gaining a wealth of knowledge around healthy soils

Strategically managing cover crops, crop residues and reducing tillage with strip till is a current focus for Ed Fagan and his growing operation, Mulyan Farms in Cowra, New South Wales. Ed speaks to *Vegetables Australia* about his involvement in phase one and two of the Soil Wealth and Integrated Crop Protection projects, and what he has achieved as a result.

For the past decade, New South Wales vegetable grower Ed Fagan has been conducting soil trials and cover cropping programs at his Cowra property.

In 2014, Ed's investigations branched out further when he became involved in the *Soil Wealth and Integrated Crop Protection* (ICP) extension projects (VG13076 and VG13078), strategic levy investments under the Hort Innovation Vegetable Fund. These projects proved successful and have led to the current

five-year investment – *Soil Wealth ICP Phase 2* (VG16078), which is aiming to respond to increasing economic, consumer, environmental and technological demands on vegetable producers. It's currently delivering integrated, independent, research-based information to growers (such as Ed) and advisors to support business decisions on soil management and plant health. Phase two is due to end in 2022.

### Getting involved

Mulyan Farms covers 1,600 hectares and produces a variety of vegetables, including baby leaf spinach and lettuce, beetroot, asparagus, cucumbers and popcorn, as well as broadacre crops and sheep. The soils have been used for horticulture crops continuously since 1943, and this has led to a reduction in the fertility and structure of the soil over time.

"We'd see soil on tree lots that were untouched, and it was beautiful; then in the fields it was starting to look degraded. So, we were keen to get on-board with the Soil Wealth and ICP projects from the start," Ed says.

"We were using composting and a few other things like that, but when this project came along we saw it as a natural fit for some pretty depleted soils."

During the last 10 years, Ed has been watching his least performing paddock flourish as a result of earlier trials and

subsequent involvement in the Soil Wealth and ICP projects.

Performances and results across a variety of cover cropping programs have proved beneficial and Ed has enjoyed seeing the results recorded over many years, rather than just one or two.

"Water infiltration rates are much better than what they were. Soil fertility tests generate similar results with nutrient levels, but we get a much better plant response there than what we had before," Ed says.

"The plants are able to access the nutrients that are within the soil better and the structure of the soil is completely different. Before it was raw dirt, now it's a soil that plants love."

### Soil impact

Ed says the trial that will have the most impact on Mulyan Farms is cover cropping and using strip tillage (strip till) for minimum soil disturbance, while still getting good plant establishment and soil cover retention on the remainder of the ground.

"It's beneficial in multiple ways: we're not disturbing the soil and we're tram-tracking. There's controlled tracking of all of our equipment," he says.

"Quite often as a grower, you don't see huge differences. We know that there are differences, but you've got to get out and measure and weigh to see the change.



Vegetable grower Ed Fagan and Marc Hinderager from Applied Horticultural Research.

“With strip till and cover crop, it is chalk and cheese [compared to no cover crop] – you can see the results as plain as day. It’s a cheaper crop to grow and we get better yields at the end.”

Ed first saw strip till being used in 1999 in Nebraska and Kansas, and says the adoption rate in the corn belt was significant.

“It seemed that you’d go to any farm in the US and you’d see a strip tiller in their machinery yard. And yet it wasn’t here at all – there were none at that time in Australia. I’m not surprised by the results that we’ve recorded. I’d been championing this for quite some time, and it was gratifying to see it work as well as it did.”

Turn to page 44 to read about the promising results from Ed’s latest trial involving cover crop, rolled ground cover and strip till in cucumber crops.

## Communication is key

While not every on-farm trial has worked for Ed during the Soil Wealth project, there have been certain aspects of it (such as the cucumber crop case study) that have worked very well. Ed encourages growers who are interested in the project’s results to get in touch to discuss further.

“I know as a grower I look at articles and read publications where people say, ‘we’ve got these results.’ The industry is fairly small, and if you’ve got any doubts just ring the grower themselves who did it and find out if it worked.

“The reason we undertake these projects is so that the industry becomes more sustainable and profitable, so when growers do things, we certainly don’t want to go out and say they work when they don’t. But when they do, we really want people to know.”

### Find out more

Please contact Ed Fagan on 0407 848 066 or visit [mulyan.com.au](http://mulyan.com.au).

More about Mulyan Farms and its involvement can be found at [soilwealth.com.au/demo-sites/cowra-nsw](http://soilwealth.com.au/demo-sites/cowra-nsw) or [facebook.com/SoilWealthCowra](https://www.facebook.com/SoilWealthCowra).

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

Project Number: VG16078



## Fresh vegetable exports increase on the back of strong Asian, Middle Eastern growth

The value and volume of fresh Australian vegetable exports have increased in 2018/19, following increased demand for Australian-grown vegetables in key export markets in Asia and the Middle East; strong trading conditions in the region; and increased activities and investment in securing the exporting capabilities of the industry's growers. Shaun Lindhe reports.

According to the latest data from Global Trade Atlas, the value of fresh Australian vegetable exports increased by 14 per cent to AUD\$287 million in 2018/19, continuing the recent trend of the rising value of vegetable exports that is ensuring the vegetable industry is well-placed to meet its goal of 40 per cent growth to AUD\$315 million in fresh vegetable exports by 2020. In this time, the volume of fresh vegetable exports also increased by 15 per cent to 253,000 tonnes.

The top five markets for fresh vegetable exports in 2018/19 were Singapore; the United Arab Emirates (UAE); Japan; Malaysia; and Hong Kong, which make up just over 55 per cent of Australia's total fresh vegetable export volume.

AUSVEG National Manager – Export Development Michael Coote said that the vegetable industry has experienced solid growth in exports across a variety of fresh vegetable products in recent years, with the whole vegetable category averaging over 10 per cent year-on-year growth over the past four years.

"Around 86 per cent of Australia's fresh vegetable export volume is comprised of carrots, potatoes and onions. Carrots remain the highest traded fresh vegetable commodity by both volume and value, with strong international demand for Australian carrots contributing to steady year-on-year growth over a sustained period of time," Mr Coote said.

Consistent growth was recorded for carrots, potatoes, celery, broccoli and cauliflower, with onions overtaking potatoes in terms of value and volume in 2018/19 after a significant decline of its export volume in 2017/18. The strong return of onion exports was the result of a range of factors including increased short-term European demand, but the industry is hopeful that it indicates improved export market conditions and a positive outlook for Australian onion growers who are looking to export.

Asparagus, which is a high-value, low volume vegetable export commodity, is now ranked the fourth largest exported

vegetable commodity by value (10 per cent of the total fresh vegetable export category), at over AUD\$29 million in 2018/19.

### Vegetable Industry Export Program

Through its work in developing the exporting capabilities of the Australian vegetable industry, AUSVEG undertakes a wide range of activities to help the industry improve its exporting capabilities, including:

- Taking grower-exporters to key export markets on outbound trade missions to increase the capability for emerging and existing grower-exporters through in-market trade activities and knowledge-sharing among growers.
- Delivering export workshops to provide attendees with practical and tailored knowledge about the export process.
- Developing new market access applications for different vegetables into Asian markets.

"The industry has increased its focus on boosting the value and volume of its vegetable exports, with work being undertaken by AUSVEG, Hort Innovation and other groups in building the exporting

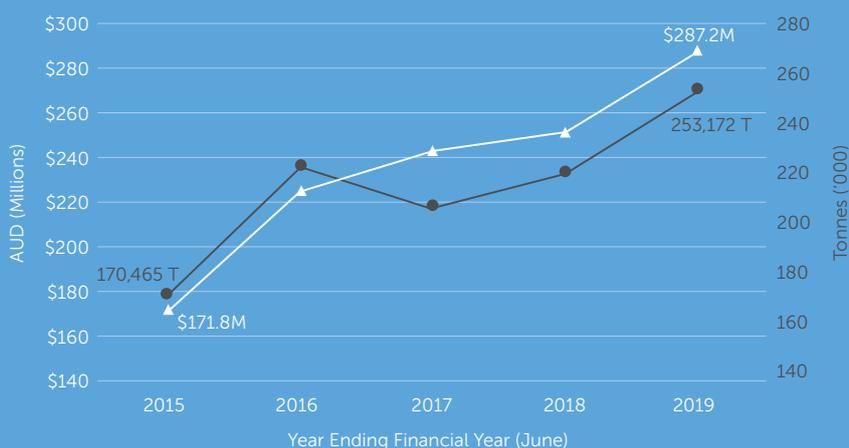
skills of Australian growers and providing opportunities to build relationships with foreign buyers, as well as supporting the Taste Australia trade program," Mr Coote said.

"The Australian vegetable industry is currently in the middle of the biggest trade push in its history, so there has never been a more crucial time to showcase the high-quality vegetables that our growers are renowned for around the world.

"We are working with growers to ensure they have the skills and knowhow to improve their ability to export their produce and capitalise on increasing demand for fresh, Australian-grown produce. We are also working closely with the Australian Government and international trading partners to open market access for more vegetable commodities so that our growers can increase their exports into key export markets across Asia and the Middle East.

"We are confident that our attendance at Asia Fruit Logistica in 2019 has effectively showcased Australia's high-quality vegetable produce to overseas buyers, and will enable Australia's vegetable export industry to continue its drive towards \$315 million in 2020 and beyond."

Value and Volume of Australia's fresh vegetable exports – 2014/15 to 2018/19



Total Vegetable Export Data - by Product 2018/19

| Commodity                 | Value   | Volume   |
|---------------------------|---------|----------|
| Carrots                   | \$96.6M | 119,178T |
| Onions                    | \$39.2M | 49,395T  |
| Potatoes                  | \$30.6M | 47,373T  |
| Cauliflowers and Broccoli | \$21.7M | 9,940T   |
| Lettuce                   | \$10.9M | 1,771T   |

Total Vegetable Export Data - by Country

| Market               | Value   | Volume  |
|----------------------|---------|---------|
| Singapore            | \$50.9M | 33,440T |
| United Arab Emirates | \$33.2M | 45,260T |
| Japan                | \$30.8M | 10,561T |
| Malaysia             | \$25.6M | 26,432T |
| Hong Kong            | \$20.3M | 10,622T |

Source: Global Trade Atlas.

Find out more 

The Vegetable Export Development Program is funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government. Project Number: VG16061



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The yellow form of adults, and nymphs, of tomato-potato psyllid (*Bactericera cockerelli*).



The eggs of tomato-potato psyllid (*Bactericera cockerelli*, Triozidae). Images courtesy of Western Australian Agriculture Authority, 2017.

## Know where TPP is... and where it isn't: The 2018-19 edition

The second year of surveillance for tomato-potato psyllid and testing for the bacterium it can vector, *Candidatus Liberibacter solanacearum* has been completed. National TPP Coordinator Alan Nankivell reports on the 2018-19 results from each Australian state.

Tomato-potato psyllid (TPP) was found in Western Australia in February 2017. As a result, an initial surveillance program was established and within weeks. It was found that TPP was over an extensive area in WA – and that it would not be possible to eradicate. Testing of trapped TPP for the existence of *Candidatus Liberibacter solanacearum* (CLso) which causes zebra chip complex was undertaken. The importance of the link between TPP and CLso is that TPP is the only known vector of CLso.

All jurisdictions agreed to undertake trapping for TPP during the Transition to Management (T2M) to ascertain if TPP is absent. The programs conducted last season found no TPP in other jurisdictions apart from WA and found no CLso.

A second round of TPP monitoring was carried out by jurisdictions during the 2018-19 growing season.

### Western Australia

As a follow up to last year, a focused trapping program was undertaken in Local Government Areas where TPP numbers were highest compared to the previous season. A total of 1,171 traps were put out and 10,454 TPP collected. Of these, 2,600 TPP were tested for CLso. No CLso was found. In addition, the infested zone was expanded to include Albany and Esperance districts.

Three seasons of TPP trapping and testing have now been conducted in WA. While TPP continues to be found, there has been no CLso detected.

### South Australia

South Australia's surveillance strategy is based on targeting host crops that are susceptible to attack. Properties have been sampled across the state.

The objectives of this Surveillance Strategy remain the same as last year:

- To confirm that neither TPP nor CLso are known to be present in South Australia.
- To inform national decision-making by following up identified links to known infestations in Western Australia.

Surveillance in SA monitored 102 sites in commercial growing regions during the 2018-19 season and importantly, no TPP was detected. The program in SA was conducted with the support of growers.

### Victoria

During summer and autumn 2018-19, Agriculture Victoria worked with the Australian Processing Tomato Research Council (APTRC), the Australian Seed Potato Industry Certification Authority (AuSPICA) and community gardeners to undertake TPP surveillance.

A total of 79 properties were surveyed across metropolitan and regional areas of Victoria. Properties underwent two rounds of surveillance (with four sticky traps per surveillance round). No TPP was detected.

### Queensland

Queensland continues to undertake area freedom surveys for TPP.

During the 2018-19 financial year, 29 properties have been surveyed for TPP across Queensland. The majority of the properties surveyed are in production areas, with some urban and peri-urban properties also inspected.

Surveillance is being conducted on properties growing TPP host plants using a range of techniques including yellow sticky traps and visual surveillance. On commercial properties, at least four yellow single-sided sticky traps are being installed, with a minimum of one trap installed on each side of the crop. Visual surveillance is also utilised at other sites such as community gardens.

A range of other general surveillance activities are also undertaken for TPP, including provision of awareness information on the DAF website, social media posts and investigation and diagnosis of suspect emergency plant pests and diseases.

No TPP has been detected in Queensland.

### New South Wales

New South Wales has completed two seasons of TPP sticky trap surveillance in host production areas (broad acre and protected cropping), nurseries, community gardens and backyards across the state since 2016 (242 sites in 2016-17 and 245 sites in 2017-18). TPP has not been detected.



Adults, eggs and exuvia of tomato-potato psyllid (*Bactericera cockerelli*) adults on the underside of a tomato leaf.

With industry highly engaged and educated on this pest, TPP surveillance in NSW focused on community gardens and nurseries primarily in the Sydney Basin in late 2018, with supporting surveillance on the north coast in early 2019. Twelve community/school garden sites in Sydney have had sticky trap surveillance completed, with no TPP or other exotic psyllid species detected. Three retail nurseries and nine community gardens along the NSW north coast from Mullumbimby to Coffs Harbour were also surveyed with sticky traps near host plants, with no TPP or other exotic psyllid species detected.

### Tasmania

During the 2018-19 season, 90 urban traps were deployed near TPP hosts and there were a further 100 traps that were deployed at urban sites and nurseries for the purpose of also looking for the glassy-winged sharpshooter.

Although these were not in the immediate vicinity of TPP hosts, there were hosts on the property. Forty-one potato growing sites were also covered. The urban survey was conducted by requesting volunteers within the Department of Primary Industries, Parks, Water and Environment take part in the survey. Kits were sent out with traps, labelled bags to collect them in, instructions, field records and information about the pest and why we are doing the survey.

The entire TPP survey took place over the period of 22 December 2018 until 29 April 2019. Some *Triozidae* that are known to occur were present, but no *Bactericera cockerelli* were found. No exotics were found.

#### Find out more

For more information on this program, please contact AUSVEG 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 vegetable, fresh potato and potato processing research and development levies and contributions from the Australian Government.

Project Number: MT16018



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## Josh Langmaid

**Age:** 32

**Location:** Forth, Tasmania

**Works:** Langmaid Harvesting

**Grows:** Potato, cauliflower, peas, beans, pyrethrum, poppies, carrot (seed), cabbage (seed), parsley (seed), onions

### How did you first become involved in the vegetable industry?

I work on the family farm, and now lease the farm and have bought land beside the property. I spent a lot of time on the farm prior to deciding to officially making it my career.

### What does your role in the business involve, and what are your responsibilities?

The primary focus is vegetables, poppies, pyrethrum and seed crops. There are 160 breeding ewes too.

I'm involved in every element possible from decision making to planting, to husbandry and harvest.

Employed labour has been until now limited to sheep shearing, planting and hand harvesting activities. As my schedule has increased in demand, I've had a young man doing work around the farm.

### What do you enjoy most about working in the vegetable industry and how do you maintain your enthusiasm?

The ability make a range of decisions and changes to achieve and improve the crop each year. There is a lot of satisfaction in producing your own crop, especially when the results are good. Also, I enjoy the farming lifestyle. It's exciting to implement new technologies, such as GPS to get things looking the best they can and squeeze an extra one per cent in rewards. There is always new technology and ideas to keep things interesting.

### What are the biggest challenges you face working in the industry, and how do you overcome them?

Again, the lifestyle. It's not always a good thing. If you want to succeed, sometimes you are torn from what you would like to do and what you have to do. The livelihood depends on this and it can't be treated as a 9-5 job.

Another challenge is a push for larger yields and quality in an expense-increasing industry. This is managed by implementing the right people in the sector to aid in making the right choices. The rest could be luck.



Images courtesy of Tamara Langmaid Photography.

**Where do you receive your on-farm practice advice and information from?**

Mainly my agronomist, Tim Walker from Walker Ag Consultancy. I got to know Tim well in the past in his previous agronomy roles while working on the farm. Since I've been growing myself, Tim has also branched out in his own business. Tim's knowledge is very valuable in assuring products are applied correctly and timely. Tim also recommends a fertiliser program based on the soil tests that he conducts.

**What new innovations, research and/or practices has your business implemented recently? What are you doing differently to other grower operations?**

I've just installed centre pivot irrigation. This is very exciting for me as everything is currently under soft hose irrigation, which is very labour-intensive.

I conduct my own trial work regarding fertilisers and chemistry and set out to trial something of my choice each year, based on attending events displaying new techniques and products. I've conducted fertiliser trials in potatoes and biological products on onions.

**Where do you see yourself in five years?**

Hopefully doing the same job. I can't complain with recent results and it would be great to further upgrade irrigation systems, potentially including solar systems to assist with pumping costs.

I also run three combine harvesters, and there will definitely be upgrades soon. I would like to expand further on the precision side of things, and this would include machinery such as fertiliser spreading with automation and scales.

**How do you think more young people and women could be encouraged to study and take up jobs in the vegetable industry?**

This is hard because it can be hard and potentially unrewarding. Risk and investment is a headache in an underpaid industry. My advice is to focus on the lifestyle of the industry, and also the reward and challenge of striving for an exceptional crop.

**You were nominated for the Corteva Young Grower of the Year award at Hort Connections this year. What does this recognition mean to you?**

It's great to be recognised for all the midnight irrigation shifts, stresses and challenges. It was an honour to be nominated. Hort Connections in general was amazing. The trade show was incredibly eye-opening. The awards night was elaborate and it was exciting to be part of the awards section.



Irrigation during flowering, pod set and seed fill is critical to take advantage of higher stand densities.



Dr Alistair Gracie (TIA, Project Lead) with industry partners Leon Hingston and Jo Tubb from Simplot.

## Safeguarding the future of the Tasmanian pea industry

Over the past three years, researchers at the Tasmanian Institute of Agriculture (TIA) joined forces with Simplot Australia to undertake an investigation that focused on improving the productivity and profitability of processing peas in Tasmania. Project Lead Associate Professor Alistair Gracie discusses the fundamental findings of the 'Precision Peas' project.

The processed green pea industry in Tasmania is focused on increasing its economic competitiveness in a global market through increasing production efficiencies.

Green peas are an important crop within the intensive vegetable cropping system in the state. Each year, Tasmanian vegetable growers produce approximately 24,000 tonnes of green peas from about 4,000 hectares for processing worth an estimated \$10 million at the farm gate. The Australian Bureau of Statistics reported that the volume of green peas produced in Tasmania accounted for around 95 per cent of total production of green peas for processing in Australia. The vast majority of these peas are frozen and sold in domestic markets.

Crop establishment practices have been identified as key areas for improvement. A strategic levy investment under the Hort Innovation Vegetable Fund, *Precision seeding benefits for processing pea production* (VG15039) aimed to evaluate the effect of spacing arrangement and stand density on pea yields. It also sought to better understand how individual plant structure within crops influences yield and how water availability at key stages of crop development interacted with the plant spatial arrangements and density to affect overall crop performance. These understandings have been used to inform agronomic recommendations.

The project was undertaken by the Tasmanian Institute of Agriculture, in partnership with Simplot Australia. Simplot contract-grows all green peas

for processing in Tasmania, which accounts for around 95 per cent of the total production in Australia. The support and advice from Simplot staff is gratefully acknowledged by the project team.

### In-field findings

Field trials were undertaken across three production seasons (2016/17, 2017/18 and 2018/19) in commercial crops in northern Tasmania and at the Forthside Vegetable Research Station (FVRS) in Forth, where trials reflected standard industry practices.

From the benchmarking of industry practices, stand densities in commercial crops mostly fell between 80 to 120 plants/m<sup>2</sup>, but ranged from ~60-140 plants/m<sup>2</sup>. Detailed trials at FVRS across three production seasons indicated that a stand density of approximately 110 plants/m<sup>2</sup> was an ideal target. Although slightly higher gross returns can be achieved at higher stand densities, there is a trade-off between the marginal increase in yield and the cost of seed for sowing, which accounts for about one-third of the cost to pea growers.

Field trials investigating the interaction between irrigation pre- and post-flowering and stand density (80, 100, and 120 plants/m<sup>2</sup>) demonstrated that appropriate soil water availability to crops both before and after flowering is required to maximise crop performance. While gross returns (and thus yield) generally increased with higher stand density (from 80 to 120 plants/m<sup>2</sup>), this was not the case when irrigation was insufficient during

flowering, pod set and pod fill, which resulted in lower returns as stand density increased. This highlights the importance of higher inputs for higher stand density crops throughout the crop lifecycle to realise the benefits.

Planters used to establish crops are usually based on either 125mm or 200mm inter-row spacings. Field trial comparisons showed that pea returns were on average seven per cent higher (\$348/ha) in 125mm than 200mm row spacing at the same stand density. This seven per cent increase associated with reducing the inter-row spacing represents a net benefit with no additional costs. Perfect spatial arrangements by hand sowing seed at equal distances within and between rows demonstrated a further benefit of up to nine per cent. Significant investment in precision technology would be required to capture this benefit.

### Further results

Surveys of commercial seeders used in industry identified significant variability in achieving the target stand density and plant spacing within and between rows, with target intra-row spacing achieved less than 50 per cent of the time in the majority of crops. Variability arose through double seed drops, and due to large gaps along rows because of misses. The survey outcomes highlighted the importance of maintaining drills, calibrating equipment and soil preparation to achieve consistent planting and thus plant structure.



Consistent spacing within the row improves gross return.



Well-irrigated healthier crops prior to flowering retain more pods and yield more peas.

Images courtesy of the Tasmanian Institute of Agriculture.

Plant size and health at the time of flowering is a key determinant of yield. This was identified in a survey across commercial crops and from field trials investigating the effect of timing of irrigation. Severe water deficit pre-harvest led to shorter plants and low yield that could not be overcome by high levels of irrigation post-flowering.

The majority of peas that contribute to harvested yield arise from the first two nodes to flower on plants. Attempts to modify plant structure, and thus harvested yield potential, was explored using sub-lethal doses of herbicide or the physical removal of the apical meristems at key stages. While multiple reproductive branches could be stimulated, the plants appear to adjust resource partitioning and the number of peas produced.

This project has produced new knowledge on the establishment factors of plant spacing and density in commercial settings, and highlights the importance of achieving target densities and the prevention of crop water stress. This knowledge will facilitate the achievement of the 8t/ha target collectively set by the industry.

#### Find out more R&D

Please contact Alistair Gracie at [alistair.gracie@utas.edu.au](mailto:alistair.gracie@utas.edu.au).

The final report for this project will be made available on the InfoVeg database: [ausveg.com.au/infoveg/infoveg-database](http://ausveg.com.au/infoveg/infoveg-database).

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

Project Number: VG15039



## Precision peas: Key recommendations

This project has identified optimal conditions for plant establishment and irrigation. The following recommendations will assist the processing green pea industry to achieve the yield target of 8t/ha:

- Narrow rows improve plant health and vigour: aim for planting in 125mm rows.
- Higher densities can improve gross returns: adopt a target density of 110 plants/m<sup>2</sup>.
- Consistent intra-row spacing improves gross return and maximises the use of seed: equipment calibration, drill maintenance and soil preparation are low-cost ways to optimise establishment.
- Healthier crops prior to flowering were able to develop and retain more pods and had higher yields; reduce water stress by irrigating adequately during the vegetative growth stage.
- Irrigate after flowering to produce longer pods with more peas and increase crop pea yield.

## Bao Duy Nguyen: Focusing on a sustainable farming future

Nuffield Scholar and Sun City Produce Managing Director Bao Duy Nguyen has released his report on the findings from his scholarship, which was undertaken in 2017. *Vegetables Australia* spoke to Bao about his Nuffield experience and the opportunities that it has presented within the industry as well as his own professional development.

A desire to improve his greenhouse growing operation, as well as a search for further mentoring, drove Western Australian greenhouse vegetable grower Bao Duy Nguyen to apply for a Nuffield Scholarship in 2017.

Bao is Managing Director of Sun City Produce, a family-owned business in Walkaway, which is located about 30 kilometres south of Geraldton. It produces tomatoes, cucumbers and capsicum in a low-tech greenhouse operation.

The vegetable grower was successful in his application, and as a result travelled to Singapore, Indonesia, Japan, the United Kingdom and the United States as part of his Global Focus Program. He also travelled specifically to Brazil, Israel, Italy, Canada, Spain and the Netherlands to investigate how low-tech greenhouse operators can become more efficient within their existing systems. Bao released his comprehensive report *Efficient Practices in Low Technology Greenhouses: Surviving as a small family farm* in July this year.

The *Nuffield Scholarship* is a strategic levy investment under the Hort Innovation Vegetable Fund.

### Seeking knowledge

Six years ago, Bao took a break from engineering and returned to the family farm to work alongside his brother Bao La. Upon his return, Bao observed that the operation's efficiency needed to improve. While Sun City Produce was able to expand by purchasing additional land, Bao and his family soon realised that the business' production levels had plateaued. They were working long hours each day and not seeing the return on investment.

This prompted Bao to search further afield for ways to improve their growing practices, so they didn't get left behind.

"I could see in the long run that we could not sustain a living if we were to continue the way we were. I was sure there were people around the world in similar operations who would have been able to increase their efficiency with restricted low-tech greenhouses," he said.

### Global insights

The opportunity to travel to several continents strengthened Bao's professional and personal networks, increased his confidence in introducing new technology into Sun City Produce, as well as enriching his understanding of how greenhouse vegetables are produced and how Australia can improve its protected cropping practices.

"I learnt that applying simple technology will save you time and effort, and inform your decision making. Temperature, humidity and soil moisture sensors can be recorded in real-time on your phone, which really helps in informing you whether to irrigate or open vents," he says.

"As a result, I have implemented some temperature and humidity sensors that

allow me to make observations on what the crop is doing so I can change my fertiliser applications.

"I have put some fans and vents in that reduce heat and humidity; however, the cost to install them on the rest of the farm is too large."

### Key recommendations

Bao's report also defines factors that affect low technical greenhouse management and provides recommendations to vegetable growers operating in these systems, as well as key decision-makers in Australian horticulture.

"There is production where there are competitive prices for water. Any regional areas that want to continue producing need cheap or competitive price and access to water to sustain their business. In areas of Israel, the Government has helped in accessing bores, recycled wastewater and desalinated water (the overflow from cities using desalinated water)," Bao said.

"In Australia, the Department of Agriculture and Water Resources needs to prioritise water allocation for vegetable producers to keep us sustainable.

"There must also be a market for your produce. Europe has a huge market – that's why their greenhouse industry in Spain's Almeria region can have 30,000 hectares of greenhouse.

"We need to focus on growing things that have a market access and export can be an option. However, there must be quality and collaboration between growers to get the consistency and supply all year round."

Bao acknowledged that those recommendations could be out of vegetable growers' control. Therefore,



Bao Duy Nguyen visiting a greenhouse tomato growing operation in Israel.

he has focused on practical steps growers can take on-farm that do not require too much capital. The report also provides advice around where businesses can direct their efforts to make sure they are not losing profit because of mismanagement of their technical growing practices.

### Opening doors

Bao strongly recommends that other members of the vegetable industry apply for the Nuffield Scholarship, as it opens the communication lines with other growers and provides the opportunity to adopt practices and exchange knowledge with leaders in their own field.

Over the past 12 months, Bao has joined vegetablesWA as a committee member and is the Chairman of the newly established Mid-West Horticulture Grower Group Inc. that he helped to establish with other growers in the Geraldton area.

Bao is also considering undertaking an entrepreneur course following his Nuffield studies.

"I now realise that farming is a business and we need to add value to what we produce. However, at this stage, I would like to stay on the farm and continue putting what I've learnt into practice.

"I really enjoy growing and it's great when you are improving each season."

#### Find out more R&D

To read Bao Duy Nguyen's report *Efficient Practices in Low Technology Greenhouses: Surviving as a small family farm*, please visit [nuffieldinternational.org/live/Report/AU/2017/bao-duy-nguyen](http://nuffieldinternational.org/live/Report/AU/2017/bao-duy-nguyen).

For more information, please visit [nuffield.com.au](http://nuffield.com.au).

The *Nuffield Scholarship* has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

Project Number: VG14065



Bao visited Roquetas De Mar in Spain.

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Strip-tilled carrot crop in Tasmania.



Members of the project team with a strip-till unit at Hort Connections. Images courtesy of RM Consulting Group.

## How has your strip-till New Year's resolution progressed?

The Soil Wealth and Integrated Crop Protection (ICP) projects work with growers nationally to put soil management and plant health research into practice. The Project Team tracks progress against implementing strip-till, a system of cultivation that works strips of soil where the crop will be planted or sown and leaves most of the soil covered and undisturbed. *Soil Wealth ICP Phase 2 (VG16078)* is a strategic levy investment under the Hort Innovation Fresh Potato, Potato Processing and Vegetable Funds.

### Casting your mind back

Each year comes around, and we all make a New Year's resolution. What was yours? How are you tracking? Or, like many, have you forgotten what it was entirely?

Back in December 2018, the Project Team wrote an article – *Make 2019 the year you have a serious look at strip-till*. This outlined the benefits of reducing establishment costs and saving time, improving soil health and some of the challenges in changing to a strip-till system.

Since then the team has been busy talking with growers around the country and implementing some of the innovations on demonstration sites, as well as showcasing the technology at farm walks and conferences, like Hort Connections.

### Lessons from the field

Cover crops, roller crimper and strip tillage have proven a winning combination for a partnership between Mulyan Farms' Ed Fagan and Marc Hinderager from Applied

Horticultural Research.

Cucumber yield and gross income more than doubled, with many soil and weed control benefits adding up to produce impressive yield and quality results.

In the seven-hectare operational trial, the ryecorn cover crop area produced an outstanding cucumber yield, well above farm averages. Direct seeded cucumbers established better and produced more marketable fruit per plant and overall marketable yield per hectare.

For Ed, the standout result was the combination of higher overall yields and higher marketable yields in the ryecorn cover crop areas, where 80 per cent of the crop was marketable, compared to 62 per cent in the fallow area.

You can hear Ed Fagan talk about how his initial reservations about strip-till and cover crops were dispelled in a video on our website, and turn to page 32 for more about Ed's involvement in the Soil Wealth and ICP project.

### Strip-till resources

It's not too late! There's still plenty of 2019 left to investigate what strip-till means for you, your production system and your area.

The project team has developed a package of resources to help you make a start. These include:

- **Lyndon Orpwood discusses the benefits of strip-till to Simplot Australia:** In this video, Lyndon Orpwood from Simplot Australia (Bathurst, NSW) explains how strip-till has improved moisture retention and field productivity. The benefits include stubble retention, greater efficiency and reduced diesel usage.
- **Ed Fagan explains why his initial reservations about strip-till and cover crops were dispelled:** Ed Fagan (Cowra, NSW) explains how strip-till

and cover cropping complement each other for a successful cucumber crop.

- **Strip-till for corn production – Reducing erosion, building robust soils:** Hear Dr Kelvin Montagu demonstrate the erosion control benefits of strip-till in vegetable production in this technical video.
- **Strip-till in the field – Jeff McSpedden, NSW case study:** Jeff McSpedden from Bathurst, NSW, explains how strip-till has improved the productivity of sweet corn on his farm.
- **Strip-till in Tasmania – A reduced till farming system:** Watch this video to find out more about the benefits and challenges of using strip-till in vegetable production systems, as well as testimonials from growers.
- **Strip-till in Tasmanian vegetable crops:** Read this fact sheet to find out more about the benefits and challenges of strip-till, as well practical considerations out in the paddock.
- **Strip-till for vegetables and potatoes with Steve Peterson (USA) and Ben Poglioli (AUS):** Catch up with this webinar recording and hear from industry experts on how strip-till will save you fuel and time; increase soil organic matter; reduce erosion and compaction; and how fertilisers can be banded at multiple depths.

Find out more 

You can access all the resources in this article, as well as news and events from around the country at [soilwealth.com.au](http://soilwealth.com.au). For more information, please contact project leaders Dr Gordon Rogers on 02 8627 1040 or [gordon@ahr.com.au](mailto:gordon@ahr.com.au) and Dr Anne-Maree Boland on 03 9882 2670 or [anne-mareeb@rmcg.com.au](mailto:anne-mareeb@rmcg.com.au).

This project 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: VG16078

**Hort  
Innovation**

# Advancing women's leadership across horticulture

Funding grants are currently available to women who work in the horticulture sector to support their participation in a leadership development program. The courses are provided by Women & Leadership Australia, and the scholarship funding delivered through this project is intended for women across all levels of leadership experience.

A pool of scholarships are currently available for women in the horticulture sector to participate in a range of leadership courses.

The fee support opportunity provides a scholarship of up to \$10,941 for women to take part in one of three part-time practical courses. Participants will network with women peers from a variety of industries, and cover such topics as reinforcing resilience and wellbeing, rewiring your networks, evolving strategic change, team dynamics and supporting leadership performance.

## The initiative

The scholarships are applicable for women who are emerging leaders, mid-level managers or those with senior/ executive level experience. The funding is available both to individuals and groups of employees within all levy-paying horticultural organisations across Australia.

This unique initiative is a collaborative funding partnership between Hort Innovation and Women & Leadership Australia (WLA), and demonstrates the commitment of both parties in bringing about gender progression and equality within Australia's horticulture industry.

All of WLA's courses are part-time, designed for those already employed and are delivered via a 'blended' teaching model – partly online, partly face-to-face. The face-to-face components are held in Sydney, Melbourne, Brisbane and Perth. All three courses commence several times each year in all four capital cities. A payment plan is available for successful course applicants, if preferred.

## How to register

Expressions of interest are open until 15 November. The grants are allocated with the specific intent of providing powerful and effective development opportunities for women who own or work for horticulture levy-paying businesses. Due to a strong amount of interest, it is recommended that those wishing to register do so promptly.

Find out more 

To register your interest, please complete the 'Expression of Interest' form prior to 15 November at [wla.edu.au/horticulture](http://wla.edu.au/horticulture).

*Advancing women's leadership across the Australian horticultural sector* is funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from Women & Leadership Australia and contributions from the Australian Government.

Project Number: LP16000



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## Recognising a successful career in horticultural research

Since graduating from the University of Queensland with a Bachelor of Science (majoring in microbiology) in 1994, Dr Cherie Gambley has conducted research across many Australian horticultural commodities, including vegetables. Cherie's contribution to the industry was celebrated in June this year when she was named 2019 Bayer Researcher of the Year. In this edition, *Vegetables Australia* speaks to Cherie about her career to date.

A plant pathologist is someone who studies plant diseases, including what causes the disease; where the disease came from; how it spreads in the environment or crops; and how to manage the disease. Plant pathologists play a vital role in the vegetable industry and the wider horticulture sector, protecting these billion-dollar industries from pests and diseases and assisting growers in managing what has already reached our shores.

Dr Cherie Gambley is a Principal Plant Pathologist with the Department of Agriculture and Fisheries, Queensland. In June, Cherie was recognised for her contribution to horticultural research when she received the Bayer Researcher of the Year Award at the Hort Connections 2019 National awards for Excellence Gala Dinner.

For over 20 years, Cherie has worked across a variety of crops including sugar cane, banana, pineapple, capsicum and chilli, and has progressed from research assistant to becoming Principal Plant Pathologist as well as group leader within the Horticulture and Forestry Science group of the Department. Cherie has completed several projects for the vegetable industry, and is currently involved in ongoing projects such as *Area Wide Management of Vegetable Diseases: viruses and bacteria* (VG16086) and *Characterisation of a Carlavirus of French Bean* (VG15073). Both projects are strategic levy investments under the Hort Innovation Vegetable Fund.

### Disease focus

As there are many different types of organisms that can cause plant diseases, including bacteria, viruses, fungi, oomycetes and nematodes, plant pathologists tend to specialise into one or two areas because of the wide diversity of these organisms.

"My focus is on diseases caused by bacteria and viruses, and my role is to lead research in plant pathology of horticulture crops for the Department. Primarily, the research is centred on crops of economic importance to Queensland with a second broader national focus, particularly in relation to quarantine and biosecurity," Cherie says.

"My research revolves around developing an understanding on how specific diseases establish and spread. The ultimate aim is always to find solutions to the economic impacts these diseases can cause through cost-effective management strategies for growers. I also have a strong interest in better preparing the industry for diseases we don't currently have in Australia. This is through continued monitoring of situations overseas and evaluating likelihood that these diseases will come into Australia – and developing strategies to respond to them if they do."

Cherie's role involves frequent interaction with vegetable growers and private businesses within the industry such as consultants, private research providers, seed companies and chemical companies. She is currently based within the Granite Belt growing district and has been providing local diagnostics for horticulture moving to the district in 2014.

Cherie says most of her horticulture knowledge comes from working within the industry as a researcher for over 20 years.

"I also grew up within the agriculture industry on a beef cattle farm in northern New South Wales, and have always had an affinity with primary production," she says.

### Research scope

In accordance with her current research, Cherie believes that further work on the feasibility of area wide management of plant diseases would be beneficial for Australia's vegetable industry.

"We can develop the technical management tools; however, getting adoption of these on the scale required is not straightforward. Understanding the socio-economic drivers behind this is very important and some of which are likely to be different in each growing district. This type of research and understanding would help with management of other organisms as well such as insect pests and weeds," she says.

"I also believe we should start investing in research of new DNA-based technologies to solve some of our cryptic disease problems. There are new gene editing techniques in particular which could provide very effective and robust improvements to disease management."

Through her attendance of international research workshops, conferences and study tours, Cherie has established a strong network with key researchers, particularly in the United States and Europe.

"These networks are particularly valuable as their production systems for vegetables are very similar to ours, and so are the disease problems they work with," she says.

"Collaborating with peers from other countries is very beneficial for Australian researchers. It allows us to get better value for our research dollars as we can use the information generated through their large bodies of work to target just the specific gaps here in Australia.

"It also allows us to evaluate a whole range of techniques and disease management solutions using their results without the large investment needed to do the work here."



Left: Bayer CropScience Head of Sales Warren Inwood congratulates Dr Cherie Gambley on winning the 2019 Bayer Researcher of the Year award. Photography by Andrew Beveridge.

Right: Dr Cherie Gambley was the recipient of the 2019 Bayer Researcher of the Year award.



However, Cherie's most rewarding experiences as a member of the horticulture industry are closer to home, helping growers with their on-farm concerns.

"It's when I can provide meaningful advice to explain or solve a disease management concern for a grower. Even something as simple as providing an accurate diagnosis to the problem, which can provide significant economic value for them," she says.

### Supporting women

When the subject of women in horticulture is raised, Cherie says she feels very positive about the gender balance within the horticulture industry and in science research.

"As an example, in my current national project, the project heads for the other agencies involved are all female with the exception of one state," she says.

"That's not so say I haven't encountered discrimination in my career – I most definitely have, although mostly this was in the research arena and was rarely from industry.

"This would be my encouraging message for other women wishing to enter the industry: Don't be afraid of inequality or discrimination. If it does happen, there is a strong network of both women and men out there in industry who will support you if you need it."

### The final word

Cherie describes taking home the 2019 Bayer Researcher of the Year award as a 'very pleasant and completely unexpected surprise'.

"I feel very humbled and appreciative that others think I'm worthy of such an accolade. I also recognise winning this award would not be possible without the people I work with, both in research

institutes and industry. I look forward to continuing this work into the future," she says.

Cherie is also grateful for the wider horticultural industry's support.

"I would like to thank the growers who are generous enough to allow me access to their properties for my research because without this, the research would simply not be done. I'm also appreciative of the seed companies, chemical companies, consultants and private research providers who are happy to provide their knowledge and advice to the work I do.

"It is so important to have industry input into this research and I value their contribution."



A sticky trap erected in a Melbourne community garden plot.

## Educating urban communities about biosecurity

Between July 2018 and July 2019, AUSVEG initiated an urban biosecurity pilot project that aimed to raise awareness of exotic plant pests among urban community stakeholders. AUSVEG Biosecurity Officer Madeleine Quirk reports.

Since 2018, AUSVEG has developed and delivered a pilot project to raise awareness of exotic plant pests among urban community stakeholders and encourage good biosecurity practices. The pilot took place in Melbourne, and more than 210 community members were engaged in 15 workshops held in community gardens.

Australia has a world-class biosecurity system and natural barriers that protect us from exotic pests and diseases and allows our \$4.35 billion vegetable industry to thrive. However, we are experiencing significantly increased trade and travel into the country. In 2018, there were 21.1 million international travellers to Australia, and between 2016-17 there were 158 million mail parcels sent to Australia. During the same timeframe, 340,000 biosecurity items were seized, and this number is expected to double between 2015 and 2030.

### Exotic incursions

In the last two years, Australia's horticulture industry has been impacted by a multitude of post-border detections. These have included tomato-potato psyllid (TPP; *Bactericera cockerelli*), citrus canker (*Xanthomonas axonopodis*), varroa mite (*Varroa jacobsoni*), and brown marmorated stink bug (BMSB; *Halyomorpha halys*). This is on top of facing ongoing regionalised

notifiable threats such as fruit fly.

A majority of these detections have emanated from, or been first detected in, one of Australia's major urban centres. Some of the nation's most important horticultural production zones are concentrated in the peri-urban growing areas immediately bordering the urban sites of initial detection, such as Werribee in Melbourne, Virginia in Adelaide, and the Sydney Basin. The continued security of these growing regions is partially dependent on timely and accurate detections post-border or at major urban centres.

The Melbourne-based urban biosecurity pilot project was initiated as an attempt to combat some of the risks to the major peri-urban growing regions in Victoria. By drawing attention to the connection that growers have with a major urban pathway, and potentially an early detector network in urban communities, we are emphasising the importance of connecting rural and urban communities.

A key focus of the pilot was to raise awareness about four high priority exotic plant pests, including:

1. Brown marmorated stink bug.
2. Colorado potato beetle.
3. Giant African snail.
4. Vegetable leafminer.

The pilot also taught stakeholders how to report suspicious plant pests to the Exotic Plant Pest Hotline and using

My Pest Guide Reporter App. This is an online reporting program created by the Western Australian Department of Primary Industries and Regional Development.

Community gardeners were very receptive to developing skills and engaging in biosecurity. We found that these target groups were concerned about the potential harm to their produce and their willingness to make changes and continue to be biosecurity conscious.

Another message that resonated strongly with community gardens across Melbourne was that biosecurity and urban food security are interdependent, and it was recognised that employing good biosecurity practices had immense value in protecting their produce.

AUSVEG looks forward to working with key partners in the future to undertake more work in this space.

Find out more 

For further information about the pilot project, please contact Madeleine Quirk on 03 9882 0277 or [madeleine.quirk@ausveg.com.au](mailto:madeleine.quirk@ausveg.com.au).



Platinum Ag Virginia agronomist, Paul Pezzaniti, is using IPM techniques in broccoli and other crops.

## IPM techniques changing the horticultural landscape

Integrated Pest Management (IPM) combines the use of biological, cultural and chemical practices to control insect pests in agricultural production. These techniques are gaining popularity across the vegetable industry and over half of the growers located in Virginia, South Australia, have adopted IPM techniques with promising results.

The switch to Integrated Pest Management (IPM) techniques in horticultural crops around Virginia, South Australia, has changed the type and frequency of chemicals used.

Platinum Ag Virginia agronomist Paul Pezzaniti said in the early days of pest control, it was calendar spraying.

"Every seven days there would be something being applied," he said.

Growers went from calendar spraying to rotational spraying, and then progressed to the Integrated Pest Management programs which are being utilised today.

"Now we actually look at the pest closely and we determine if we need to spray. If so, we look at what spray that we need to choose that is going to have the least impact on our beneficials," Paul said.

"We will also order some beneficial insects, predominantly *Diadegma*, which is a predatory wasp for the diamondback larvae. The most important thing is to select a chemical that isn't going to knock out that beneficial, but still help that beneficial get on top of the pest."

### Fighting pest populations

Paul explained that there are a range of insecticides available that were very targeted for the control of pests such as caterpillars, aphids and thrips, that could be used as part of the IPM program.

One of the newer options is Entrust

Organic from Corteva Agriscience, which is scheduled for release in 2020.

"We are looking forward to the release of this product, which is going to have a better fit for the people who want to have a more effective IPM approach," Paul said.

"It is hopefully going to have less impact on the beneficials, and we feel it's also going to be really helpful in other Integrated Pest Management programs. It will also have minimal impact on beneficials in greenhouse crops such as capsicums, cucumber and tomatoes."

Meanwhile, one of the largest brassica growers in South Australia, T Mussolino and Co, is an enterprise that has adopted the IPM approach with great success over the past three years.

"Generally, when the pressure is high we will introduce beneficial insects; otherwise we allow them just to develop as they can by themselves, in the field," Paul explained.

The winter crop of broccoli covered 50 acres and had not required an insecticide application right through until the initial harvest. It was only at this stage that eggs started to appear, and a decision on an insecticide spray was made.

### An integrated transition

According to Paul, approximately 60 to 70 per cent of growers in the Virginia district had adopted IPM techniques – either wholly or in sections.

"There are still a few growers that don't do any Integrated Pest Management and they just have conventional spraying," he said.

"I will visit their crops and generally will find that they'll need a spray for aphids and their need to control of diamondback moth is continual; whereas with Integrated Pest Management, it may be short bursts and then they are back under control again."

"People who are conventionally using broad spectrum insecticides are having to look over their shoulder all the time, whereas a grower using IPM tends to gain control much quicker."

Paul said growers needed to trust the person that is monitoring their crops and that they also needed to be involved in it themselves.

"If the grower is involved with that, they can see how successful it is and if they are happy to continue," he said.

"This is a sustainable approach to growing so we are going to be here for the long-term. We are looking after our chemistry, and these growers are the ones that will succeed."

Find out more

Please visit [corteva.com.au](http://corteva.com.au).

# Diamondback moth:

## A widespread pest

**Name:** Diamondback moth  
(*Plutella xylostella*)

The diamondback moth (DBM) is an extremely destructive pest to the vegetable industry, and the economic impact of its presence among the cruciferous plants grown in the horticulture sector can be enormous.

### Pest description

The adult DBM is a slender grey-brown moth with a pronounced antenna, approximately 10mm long with a distinctive broad cream or light brown band along its back. The adults live for approximately 12 to 18 days, with females having a longer life.

DBM eggs are approximately 0.5mm and oval in appearance, with a yellow to pale green colour. They're deposited in small groupings of two to eight eggs in the depressions on the foliage. Females deposit an average of 150 eggs over approximately 10 days. However, if conditions are suitable, this number can increase to 350. It can take three days to eight days for the eggs to mature, depending on conditions.

DBM can be a difficult pest to manage. It can take as little as 16 days for an egg to grow to an adult and the population can grow exponentially within a short period of time. This, coupled with the adult's ability to migrate long distances, means a multifaceted approach is needed, including Integrated Pest Management (IPM).

### Host range

DBM is a serious pest of vegetable crops that feeds on cruciferous vegetables of the family Brassicaceae, a large family of economically-important vegetables that include broccoli, cauliflower, Brussels sprouts, cabbage and kale.



Diamondback moth larva and feeding injury on cabbage leaf. Image courtesy Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org.



Adult diamondback moth. Image courtesy Alton N. Sparks, Jr., University of Georgia, Bugwood.org.

### Transmission

DBM adults are extremely efficient in travelling large distances to lay eggs in their host plants. Adults using wind currents are capable of moving up to 1,000km per day, and therefore able to reinfest places that are too cold for survival post the winter freeze. This is also a key factor for them to overcome spraying.

### Optimal conditions

DBM life cycles occurs between 8-32 degrees Celsius, while 14 degrees Celsius is the optimal growth conditions.

### Resistance the focus of previous project

**Project:** *Mechanisms and management of insecticide resistance in Australian diamondback moth (VG08062)*

**About:** Diamondback moth (DBM) (*Plutella xylostella*) is the main pest of brassica vegetable crops in Australia and its resistance to older insecticide classes is widespread; as such, the choices for DBM control are increasingly limited to several newer synthetic pesticides and *Bacillus thuringiensis* products. Project VG08062 was undertaken to better equip the Australian brassica industry with knowledge of the current state of resistance levels in DBM strains and of the processes that lead to the development of resistance.

**Outcome:** Key findings revealed that some field populations of DBM had developed significant levels of resistance to two important groups of these new insecticides, IRAC Groups 6 (emamectin benzoate) and 28 (chlorantraniliprole and flubendiamide). The project also demonstrated that high levels of resistance could result in the laboratory from repeated exposure to low concentrations of an insecticide. This occurred with both the synthetic insecticide and the microbial insecticide used in this study.

**Recommendations:** It was predicted that in the near future, the Australian brassica industry is likely to experience declining efficacy with a number of important synthetic insecticides, most notably Group 6 and 28 insecticides. More extensive studies of field strains from all major production areas are required to ascertain the immediacy and magnitude of this threat, and new non-insecticidal technologies for DBM management in Australian Brassica vegetables must be developed to provide sustainable crop production practice.

#### Find out more

The final report for this project is available on InfoVeg. Readers can search 'VG08062' on the InfoVeg database: [ausveg.com.au/infoveg/infoveg-database](http://ausveg.com.au/infoveg/infoveg-database).



## Reducing energy costs in veg growing operations

In this edition of *Vegetables Australia*, Flow Power Senior Account Manager Jacob Mahoney discusses ways that Australian growers can lower their energy costs and still receive cost-effective power for their entire growing operation.

From irrigating to warehousing and cold storage, the horticulture industry leans heavily on power to drive its operations.

The Australian energy market is changing. This opens new opportunities for businesses to take back control of their energy and turn it into a competitive advantage.

Here are a few ways to save costs on even the most energy-intensive operations.

### Tap into better energy

Irrigating systems are the backbone of thriving crops. But they can be energy- and water-intensive. In fact, last year more than 7.2 million megalitres of water was applied to crops in Australia.

While many growers are looking at smarter ways to use water, there is a way to save money on energy costs by looking at how you power the pumps that water crops.

Growers looking to save are perfectly placed to reap the benefits of buying energy wholesale. Growers can uncover an additional layer of savings by simply looking at how and when they pump water.

It can be as simple as scheduling pumps when energy prices are low and keeping pumping at a minimum when they are higher. We call this demand response and, put simply, it means responding to price signals in the market.

### Keep it cool

Cold storage comes into the picture once crops are harvested and need to be kept fresh before they make their way to store shelves across the country. Crops can be kept in cold storage for long periods and keeping them at stable temperatures is crucial, which can push up energy costs.

With some planning, growers can make the most of demand response, even for operations like cold storage that require a steady source of power.

Growers with any flexibility to precool can reduce power usage at certain peak price periods. Backup generators can also switch on as a power source when prices peak, to avoid high prices and take pressure off the grid.

### Summer's a hit

For many growers, heavy seasonal energy use is a fact of life. That also means it is a predictable annual expense that can be planned for.

Instead of paying the same rate year-round – harvest or not – buying energy from the wholesale market connects you to the actual price of power. That means, growers have more opportunities to make the most of the wholesale market's low prices.

While highs are typically short and infrequent, strategies like demand response and Flow Power's Ceiling initiative can help minimise growers' exposure during these peaks.

By taking control of how they use energy, growers can turn energy back into a competitive advantage. Making the simple switch to wholesale can help spark new opportunities to grow savings.

#### Find out more

Please call Flow Power on 1300 080 608, email [go@flowpower.com.au](mailto:go@flowpower.com.au) or visit [flowpower.com.au](http://flowpower.com.au).

## Minor use permits

| Permit Number          | Crop                                                                                                                                   | Pesticide Group | Active                               | Pest/Plant disease/<br>Target weed                                        | Date Issued | Expiry Date | Permit Holder   | States                |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------|---------------------------------------------------------------------------|-------------|-------------|-----------------|-----------------------|
| PER14891<br>Version 3  | Beetroot                                                                                                                               | Fungicide       | Trifloxystrobin                      | Alternaria leaf spot, Cercospora leaf spot                                | 01-Jan-15   | 30-Sep-24   | Hort Innovation | All states except VIC |
| PER14839<br>Version 3  | Eggplant, spinach and silverbeet                                                                                                       | Fungicide       | Zineb                                | Anthrachnose                                                              | 01-Aug-14   | 30-Sep-24   | Hort Innovation | All states except VIC |
| PER14843<br>Version 3  | Celery                                                                                                                                 | Insecticide     | Indoxacarb                           | Helicoverpa, Lucerne leaf roller, Vegetable weevil, Lightbrown apple moth | 17-Jun-14   | 30-Sep-24   | Hort Innovation | All states except VIC |
| PER14842<br>Version 3  | Spring onions, shallots                                                                                                                | Fungicide       | Copper present as copper oxychloride | Downy mildew                                                              | 01-Oct-14   | 30-Sep-24   | Hort Innovation | All states except VIC |
| PER14896<br>Version 3  | Green processing peas                                                                                                                  | Herbicide       | Sodium salt                          | Broadleaf weeds                                                           | 01-Oct-14   | 30-Sep-24   | Hort Innovation | TAS only              |
| PER85103<br>Version 2  | Green beans                                                                                                                            | Insecticide     | Imidacloprid                         | Silverleaf whitefly                                                       | 12-Sep-17   | 30-Sep-22   | Hort Innovation | QLD only              |
| PER14840<br>Version 3  | Cucurbits (including bitter melon, cucumber, gherkin, pumpkin, squash, watermelon, zucchini) and peppers (capsicum, chillies, paprika) | Fungicide       | Bupirimate                           | Powdery mildew                                                            | 01-Oct-14   | 30-Sep-24   | Hort Innovation | All states except VIC |
| PER14596*<br>Version 3 | Brassicas vegetables (broccoli, Brussels sprouts, cabbage, cauliflower)                                                                | Insecticide     | Chlorpyrifos                         | Vegetable beetle (adults)                                                 | 01-Oct-14   | 30-Sep-22   | Hort Innovation | WA only               |
| PER14479<br>Version 4  | Spinach, silverbeet, beetroot, celery, gailum, chicory, endive and radicchio                                                           | Fungicide       | Propiconazole                        | <i>Cercospora</i> spp., <i>Septoria</i> spp., powdery mildew and rust     | 12-May-14   | 30-Nov-24   | Hort Innovation | All states except VIC |
| PER14906<br>Version 3  | Chinese onion, leeks, shallots, spring onions, Welsh onions                                                                            | Fungicide       | Triadimenol                          | White rot                                                                 | 22-Oct-14   | 31-Oct-24   | Hort Innovation | All states except VIC |
| PER80501<br>Version 3  | Alliums (not including bulb onions and garlic)                                                                                         | Fungicide       | Cyprodinil + fludioxonil             | Black mould and grey mould suppression                                    | 22-Oct-14   | 31-Oct-24   | Hort Innovation | All states            |

| Permit Number         | Crop                                    | Pesticide Group | Active      | Pest/Plant disease/ Target weed                               | Date Issued | Expiry Date | Permit Holder   | States                |
|-----------------------|-----------------------------------------|-----------------|-------------|---------------------------------------------------------------|-------------|-------------|-----------------|-----------------------|
| PER88066 <sup>^</sup> | Celery                                  | Insecticide     | Emamectin   | Heliothis, lightbrown apple moth and cluster caterpillar      | 05-Aug-19   | 31-Aug-24   | Hort Innovation | All states except VIC |
| PER14890 Version 3    | Shallots and spring onions              | Insecticide     | Methomyl    | Western flower thrips                                         | 25-Nov-14   | 31-Oct-24   | Hort Innovation | All states except VIC |
| PER87773 <sup>+</sup> | Brassica vegetables (transplanted only) | Herbicide       | Napropamide | Broadleaf and grass weeds. Including suppression of chickweed | 22-Aug-19   | 31-Aug-22   | Hort Innovation | All states except VIC |

**Please note:**

\*Continued issuance of PER14596 (Version 3) is subject to the outcomes of the current APVMA review of chlorpyrifos.

<sup>^</sup>PER88066 replaces the previously issued permit - PER81914.

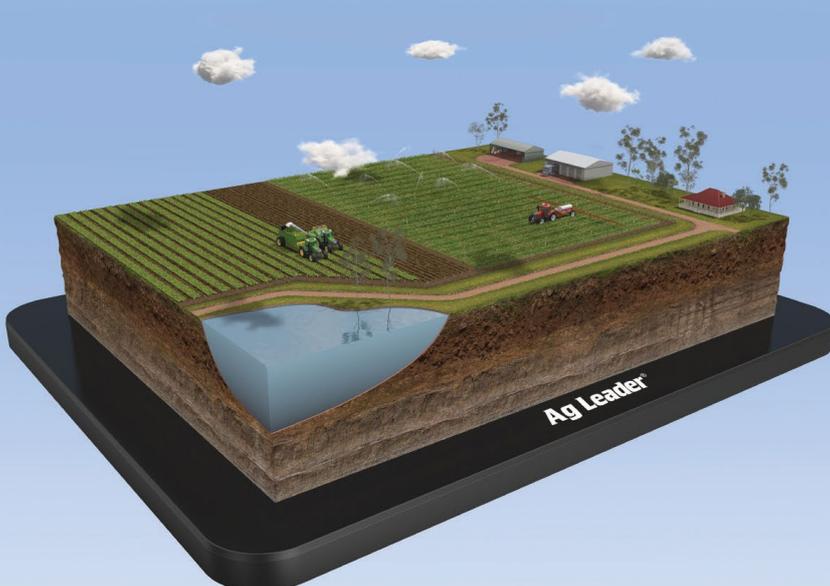
<sup>+</sup>PER87773 – Report any crop damage and efficacy against target weeds (particularly chickweed) to Hort Innovation. Permit was requested via VG16060 and follow up is required with growers who requested the permit.

All efforts have been made to provide the most current, complete and accurate information on these permits, however we recommend that you confirm the details of these permits at: [portal.apvma.gov.au/permits](http://portal.apvma.gov.au/permits).

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



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UNMATCHED ◀▶ COMPATIBILITY



Dr Tim O'Hare with purple corn that is under investigation during the Naturally Nutritious project.



The purple corn variation that is possible. Images courtesy of the Queensland Alliance for Agriculture and Food Innovation (QAAFI).

## Purple sweet corn - naturally nutritious!

Led by the University of Queensland in collaboration with Department Agriculture and Fisheries (DAF) Queensland, a five-year cross-industry project is providing research into innovative and appealing products that are highly nutritious, can be differentiated in the marketplace, and are visually attractive and flavoursome. *Vegetables Australia* spoke to Project Lead Dr Tim O'Hare about the project, which among other things, includes purple sweet corn, strawberries and macadamias.

The Health, Nutrition and Food Safety Fund is one of seven funds developed by Hort Innovation to facilitate collaborative cross-industry research to secure the future of the horticulture industry. A project under this fund is *Naturally Nutritious* (HN15001), which is researching the development of innovative food products and varieties that are nutritious, delicious and visually appealing. One of the products being developed through the *Naturally Nutritious* project is purple sweet corn, with high levels of specific phytonutrients for human health.

Fruit, vegetables and nuts play an important role in human health, and Dr Tim O'Hare, Senior Research Fellow at the Centre for Nutrition and Food Sciences, Queensland Alliance for Agriculture and Food Innovation (QAAFI), said while most

Australians are aware of the 'Go For 2 & 5' program and how many fruits and vegetables they should eat, most are not actually doing it.

"A major thrust of the *Naturally Nutritious* project was to investigate if we could increase the nutrient content of a range of products, so that you could get more bang for your buck, or 'more nutrition per serve'," Dr O'Hare said.

One of the considerations was the 'look' of the product that was being developed. As Dr O'Hare explained, humans are visual beings, so it is important for the product to look attractive and visually differentiated from a 'standard' product of the same type.

"For example, purple sweet corn, developed from Peruvian purple maize, clearly looks different to yellow

sweet corn. Of course, the product has to taste as good – if not better – than the standard product, because after all, this is food and it should taste great. If it doesn't taste great, then the likelihood of you buying it a second time drops dramatically," he said.

In some products, the pigment is actually the active nutrient, in which case Dr O'Hare said that can make it easy to look attractive to consumers.

"For example, the orange colour in orange capsicum is zeaxanthin, which is important for slowing the progress of age-related macular degeneration. Purple and red anthocyanin pigments have been linked to improving cardio-vascular health. So, increasing purple colour also increases the health value of vegetables."

## Purple power

Dr O'Hare began creating purple sweet corn a couple of years before *Naturally Nutritious* was established, however he believes the project can make the development of a supermarket product move forward faster. Though, as he explained, it is not that simple.

"The difficulty is that the natural mutation that makes sweet corn 'supersweet' is positioned extremely close to the mutation that 'blocks' purple pigment production. The challenge was to break this tight genetic linkage, so that the supersweet mutation is now alongside a 'working' part of the anthocyanin purple pigment pathway," he said.

"The good news is that we have done this for two different 'supersweet' mutations now, including 'shrunken-2', which the Australian sweet corn industry and much of the world is based upon."

Dr O'Hare and his team are currently developing molecular markers, or fragments of DNA, to help accelerate their future research.

"This is important if we want to introduce other commercial aspects in the future, such as disease resistance, from yellow sweet corn into the purple sweet corn," he said.

## Increasing health benefits

Dr O'Hare said the products may not necessarily replace artificial nutritional supplements; however, the research team's investigation into nutrient biofortification – or increasing nutrient content in produce – has produced promising results, including in purple sweet corn. It has also identified high-folate strawberries, where a single punnet of strawberries will supply the recommended daily folate intake (four times higher than average).

"We have also identified orange capsicums that have the equivalent zeaxanthin content to 30 macular degeneration supplement tablets.

We are exploring the potential to make macadamia nuts even better for you than they are already. We are looking at purple strawberries, which may have different health benefits to regular strawberries, plus we're planning to extend the narrow season of the high-anthocyanin Queen Garnet plum, by bringing it forward into the Christmas festive season (it currently produces in February)," Dr O'Hare said.

"On top of that, we are undertaking consumer evaluation of the product concepts, as well as two clinical studies about to go underway to back up the science (one on Queen Garnet plum, and one on the high-folate strawberries). We also have a study on the comparative benefit of different fruit and vegetables, specifically which ones make you feel full faster and which make you last longer before wanting to eat again. This is all good for the waistline."

## Next steps

Purple sweet corn will become available to Australia's vegetables growers following the issue of a public tender once the product is closer to a commercial hybrid.

"Through issuing a public tender, we can get the best people out there to carry it forward into the commercial world," Dr O'Hare said.

He added that with two years remaining, the project is progressing as planned.

"Not everything happens at once, but we are getting to the stage where different industries can decide if they want to take things further in separate focused projects; that is, beyond the proof of concept stage. We know that not everything will be a winner – some things would obviously suit 'niche markets' better, while others have wider market appeal.

"We'd definitely like to see a *Naturally Nutritious 2* in the future. Horticulture includes so many crops that a single project simply cannot cover everything. We know there is so much more out there to achieve."



Possible purple corn variations.

### Find out more R&D

Please contact Dr Tim O'Hare, Senior Research Fellow, Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland at [t.ohare@uq.edu.au](mailto:t.ohare@uq.edu.au) or 0408 148 049.

More information about *Naturally Nutritious* can be found at [hortfrontiers.com.au/project/naturally-nutritious](http://hortfrontiers.com.au/project/naturally-nutritious).

*Naturally Nutritious* is funded by the Hort Frontiers Health, Nutrition and Food Safety Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from the University of Queensland and contributions from the Australian Government.

The Queensland Alliance for Agriculture and Food Innovation (QAAFI) is a research collaboration between University of Queensland and the Queensland Government through the Department of Agriculture and Fisheries.

Project Number: HN15001



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Agriculture Victoria Chief Plant Health Officer Rosa Crnov.

## State biosecurity update: Victoria

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. AUSVEG Biosecurity Officer Madeleine Quirk interviews Victoria's Chief Plant Health Officer Rosa Crnov about biosecurity response and preparedness activities undertaken by Agriculture Victoria.

Biosecurity is fundamental to the health, well-being and prosperity of all Victorians. Exotic pests and diseases can threaten the state's agricultural sector, environment, horticulture and animal industries and potentially harm human health.

Victoria has a strong record of identifying and managing biosecurity risks, but our natural environment and primary industries constantly face new and emerging pest and disease threats. These bring new challenges that require new solutions.

Agriculture Victoria is responsible for delivering the state's biosecurity programs, including policy development, emergency response, domestic quarantine activities, and the provision of commodity and area freedom certification.

"A key focus for Agriculture Victoria is preventing a biosecurity emergency, for example a serious plant disease incursion that could affect Victoria and Australia," Victoria's Chief Plant Health Officer (CPHO) Rosa Crnov said.

"Agriculture Victoria works with industry and other states across the country to ensure our agriculture industries continue to operate and trade without any debilitating pest and disease outbreaks."

### Responding to new incursions

The Plant Health Committee, Australia's national committee for plant biosecurity decision-making, has identified the top 40 exotic and unwanted plant pests for the government to focus investment and action. The number one threat is the fast-spreading bacterial disease *Xylella fastidiosa*, which is known to infect more than 350 plant species; there's no easy solution once a plant is infected.

If it did enter the country, a *Xylella fastidiosa* outbreak could cost Australia's wine industries up to \$7.9 billion over 50 years, according to the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), while crops such as cherries, citrus, nuts, olives and summer

fruit could also be at risk.

Other places around the world are already reeling from the effects of this deadly plant disease.

"In Brazil, for instance, *Xylella fastidiosa* has infected about 200 million citrus trees. In California, it causes more than \$100 million in annual losses to the grape industry. And in Italy's Puglia region, around 10 million ancient olive trees are estimated to have been infected, meaning the trees no longer produce olives," Rosa said.

Also in the top 40 exotic plants pests that we want to keep beyond our borders are exotic fruit flies (at risk are over 300 fruit and vegetable crops), Gypsy moth (may affect more than 1,000 plant species), giant African snail (500 plant species at risk), exotic bees and pests of bees (affecting honey and pollination-reliant food crops) and a wheat stem rust fungus called Ug99 (first identified in Uganda in 1999). While Ug99 is not present in Australia, an outbreak here could cause crop failure in wheat, barley, oats and rye and would have a major economic impact on our wheat industry.

Agriculture Victoria is planning for as many of the top 40 as it can. The cooperation of industries, Plant Health Australia and all governments through the National Emergency Plant Pest Response Deed (EPPRD) is crucial to achieving that.

Coming into effect in 2005, this Deed is a legally binding agreement between Plant Health Australia, the Federal Government, all state and territory governments and national peak plant industry bodies.

"Covering eradication, cost sharing and potential grower reimbursement costs following an exotic pest outbreak, has led to faster, more effective responses to emergency plant pest incidents," Rosa said.

### Regulations at the border

Victoria's CPHO has authorising powers provided by the state's Plant Biosecurity

Act 2010 and Plant Biosecurity Regulations 2016. They are responsible for all 'post border' biosecurity threats, while pre-border and at-border threats are managed by the Commonwealth Department of Agriculture.

Victoria's CPHO, in collaboration with affected industry and community groups, has also developed clear policy positions on the management of a range of high-risk plant biosecurity threats.

The purpose of these policies is to manage biosecurity response operations (local, regional and state) in accordance with state and national requirements, ensuring our plant industries and environment are protected from exotic plant pests and invasive plant, animal and marine species.

It is vital to help primary producers understand how developing a farm biosecurity management strategy can not only minimise the risks of a disease or pest incursion, but also facilitate trade by demonstrating their commitment to best-practice biosecurity on their properties.

"For every task that has a biosecurity implication, you can prepare yourself with information on how you can secure your farm to secure your future," Rosa said.

Agriculture Victoria's work manages food security risks in the agriculture sector and helps to position Victoria as a preferred global supplier of clean and safe food, contributing to growth and employment in rural and regional communities.

#### Find out more

Please visit [agriculture.vic.gov.au](http://agriculture.vic.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](mailto:madeleine.quirk@ausveg.com.au). The Farm Biosecurity Program is funded by the Plant Health Levy.

## A shared responsibility

Vigilance is always needed. Biosecurity is a responsibility we all share, and everyone needs to play their part to keep our borders free of exotic pests.

“People can do their bit by not bringing plants or seeds into Australia through the airport or mail and, if you’re a grower, by reporting any suspect plant pests or symptoms on crops,” Victoria’s CPHO Rosa Crnov said.

For growers, the best chance of stopping the spread and establishment of exotic pests is to report anything suspicious to Agriculture Victoria.

The Exotic Plant Pest Hotline is 1800 084 881, and all calls made within Victoria are diverted to the Agriculture Victoria team.



Below and above: Biosecurity staff investigating the presence of phylloxera in the Yarra Valley.



## Preparedness activities

Agriculture Victoria’s efforts to secure domestic and international market access for Victoria’s primary producers, and its ability to respond to plant biosecurity incursions, are facilitated through a targeted risk-based approach that identifies new and emerging threats.

The team then plans work around identified ‘high risks’ focusing on how these risks can be managed if an exotic pest turns up on Victoria’s doorstep. This can involve developing or contributing to pest contingency planning, development of surveillance plans, participation in national training exercises and development of community materials.

Nationally, there is a significant amount of work happening in the preparedness space, and Victoria is part of these national conversations.



The diseases caused by *Xylella fastidiosa* go by a range of names depending on the host species, including: Pierce’s disease, almond leaf scorch, bacterial leaf scorch, citrus variegated chlorosis, olive quick decline and olive leaf scorch. Images courtesy of Agriculture Victoria.

# Hort Innovation vegetable fund investments (levy projects)

| Project code | Delivery partner                                       | Project title                                                     | Project lead contact details                                              | Project description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|--------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VG16078      | Applied Horticultural Research                         | Soil wealth and integrated crop protection - phase 2              | Gordon Rogers: gordon@ahr.com.au, 0418 517 777                            | This project will continue to provide vegetable producers with the latest information in soil and pest-related areas. It brings into one investment the well-respected Soil Wealth and Integrated Crop Protection initiatives, with project resources delivered through soilwealth.com.au.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| VG16042      | Fresh Produce Safety Centre Australia and New Zealand  | Pathogen persistence from paddock to plate                        | Stephen Fujiwara: stephen@fpssc-anz.com, 02 8627 1058                     | This project is looking at pre-harvest water and untreated animal manure withholding periods in relation to minimising or eliminating the risk of microbial contamination of high-risk vegetable crops. It will help growers use untreated manures and pre-harvest water confidently, with proven exclusion periods, without compromising the safety of their products.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| VG16086      | The Queensland Department of Agriculture and Fisheries | Area wide management for vegetable diseases: viruses and bacteria | Cherie Gambley: cherie.gambley@daf.qld.gov.au, 07 4681 6130, 0423 200 211 | This investment is responsible for developing an 'area wide management' (AWM) strategy to address high-priority viral and bacterial diseases affecting vegetable crops. This strategy will include viral diseases transmitted by thrips, aphid and whitefly pests, and phytoplasmas transmitted by leafhoppers, and will involve pest management approaches. The project will also be keeping track of surveillance of tomato-potato psyllid (TPP), through linkages with other industry TPP work. The second major focus of the project is on managing foliar bacterial diseases. Work will also involve developing rapid diagnostic test for key bacterial and viral pathogens. There is a sister component of the same name and code led by the NSW Department of Primary Industries, which is contributing to the development of an area wide management strategy for the New South Wales vegetable industry, complementing the strategies developed under the initial investment. |
| VG17003      | Western Sydney University                              | National Vegetable Protected Cropping Centre                      | Ian Anderson: i.anderson@westernsydney.edu.au, 0404 081 120               | In November 2017, the nation's first state-of-the-art vegetable glasshouse-production research centre was launched. This project continues to facilitate work at the facility, with the aim of manipulating inputs to create the optimum environment to drive maximum harvest windows and overall yield for a variety of vegetables, then share this information with Australia's growers. Through this facility, industry also aims to attract new entrants to horticulture careers by offering students access to some of the most advanced technology currently available.                                                                                                                                                                                                                                                                                                                                                                                                          |
| MT16018      | AUSVEG                                                 | National Tomato Potato Psyllid (TPP) Program Coordinator          | Alan Nankivell: alan.nankivell@ausveg.com.au, 0428 260 430                | This multi-industry project is responsible for coordinating the development and implementation of a national tomato potato psyllid (TPP) management strategy – essentially helping ensure research and development, engagement and other response efforts related to the pest across the various industries and areas it affects are coordinated, prioritised and strategic. In mid-October 2017, Alan Nankivell began in the role of national TPP program coordinator under the project. He acts as a point of contact between the various TPP-affected industries, government and service providers, to help implement TPP management in Western Australia and prepare eastern-state growers.                                                                                                                                                                                                                                                                                        |
| VG16085      | vegetablesWA (lead)                                    | Export facilitators                                               | John Shannon: john.shannon@vegetableswa.com.au, 08 9486 7515              | With sub-projects for different growing regions, this collaborative program aims to increase Australian vegetable exports by supporting growers to capitalise on commercial business opportunities. It is supporting the roles and activities of 'on the ground' export facilitators across Australia's vegetable growing regions, establishing a facilitator network across Australia. The facilitators will help create export plans in conjunction with vegetable growing businesses, promote collaboration within the industry, and provide linkages across the supply chain that will assist in achieving the overarching objective of the <i>Vegetable Industry Export Strategy</i> of growing the value of vegetable exports by 40 per cent by 2020.                                                                                                                                                                                                                            |

| Project code | Delivery partner               | Project title                                                                                             | Project lead contact details                                   | Project description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|--------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VG16061      | AUSVEG                         | Vegetable industry export program                                                                         | Michael Coote:<br>michael.coote@ausveg.com.au,<br>03 9882 0277 | This project is intended to position the industry to achieve the target of growing exports by 40 per cent – to the value of \$315 million – by 2020. This target was announced in 2017, with the release of the <i>Vegetable Industry Export Strategy</i> . Expanding on previous export development work, activities under the project will broadly include market development and market access work, plus export readiness, training and education for growers and other stakeholders, to prepare the industry to take advantage of export opportunities.                                                                                                                                                          |
| VG15068      | University of South Australia  | Improving safety of vegetable produce through on-farm sanitation, using electrolysed oxidising (EO) water | Enzo Lombi:<br>enzo.lombi@unisa.edu.au,<br>08 8302 6267        | This project is investigating whether 'electrolysed oxidising' or 'EO' water can be used to increase the quality of vegetable irrigation water. Specific project activities include comparing the efficiency of EO water with that of other options for treating irrigation water for relevant water-borne pathogens; discerning whether EO water treatment can prevent potential microbial contamination or fresh produce pre-harvest; assessing the ability of EO water to control soil pathogens, and any effect on important soil microorganisms; and ultimately developing protocols for EO water adoption by Australia's vegetable growers.                                                                     |
| VG16005      | UniQuest                       | ProbiSafe - development of biocontrol agents to inhibit pathogen growth                                   | Mark Turner:<br>m.turner2@uq.edu.au,<br>07 3365 7364           | This project has a focus on keeping vegetables healthy and safe. It is developing, verifying and ultimately making available new biological control agents (new strains/blends of beneficial bacteria termed 'ProbiSafe') to inhibit the growth of harmful bacteria on vegetables. The result will be an additional level of safety in both fresh and processed produce.                                                                                                                                                                                                                                                                                                                                              |
| VG15064      | Applied Horticultural Research | Improved management of pumpkin brown etch                                                                 | Gordon Rogers:<br>gordon@ahr.com.au,<br>0418 517 777           | This project seeks to improve the management of brown etch, also known as 'rust mark', in pumpkin crops. The research is set to confirm the cause and environmental conditions conducive to brown etch; investigate varietal resistance/susceptibility in current commercial varieties; develop and evaluate suitable control measures; and extend management strategies to growers.                                                                                                                                                                                                                                                                                                                                  |
| MT17017      | Nielsen                        | Vegetable cluster consumer insights program                                                               | Chanel Day:<br>chanel.day@nielsen.com,<br>02 8873 7669         | 'Harvest to Home' brings growers insights into household shopping behaviour and attitudes for 28 commodities across the vegetable, onion and sweetpotato industries. Launched in December 2017, the online platform ( <a href="http://harvesttohome.net.au">harvesttohome.net.au</a> ) allows growers to quickly identify how well commodities are selling in each state, how often consumers are buying, how much they are spending on each occasion, triggers and barriers to consumption and more.                                                                                                                                                                                                                 |
| VG16064      | CSIRO                          | Tools and interventions for increasing children's vegetable knowledge                                     | David Cox<br>david.cox@csiro.au,<br>08 8303 8811               | This investment aims to address the finding that Australian children are not eating the recommended daily intake of vegetables, while increasing vegetable demand. It will develop best practice guidelines to increase vegetable knowledge, and a national online hub of vegetable educational sites and materials. The current dietary advice for children will also be updated, using evidence-based knowledge of flavour exposure and food preference development, to help vegetable acceptance. On top of that, vegetable education initiatives will be delivered in settings such as at daycare centres and early primary school facilities.                                                                    |
| VG16063      | AUSVEG                         | The EnviroVeg Program 2017-2022                                                                           | Danielle Park:<br>danielle.park@ausveg.com.au,<br>03 9882 0277 | The EnviroVeg Program is the industry's environmental best management practice (BMP) program, and has existed in evolving forms since 2000. It involves a range of resources and services so that Australian vegetable growers can benchmark and improve their BMPs and showcase their environmental credentials through certification. This iteration of the project includes the EnviroVeg Pilot Program, a funded pathway through EnviroVeg to reach Freshcare Environmental certification and attain the best practice benefits of environmentally responsible, sustainable vegetable production. Please contact <a href="mailto:byron.dekock@horticulture.com.au">byron.dekock@horticulture.com.au</a> for more. |



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### AUSVEG SA

AUSVEG SA was excited to recently join the Premier of South Australia, the Hon. Stephen Marshall MP and Australian Deputy Prime Minister, the Hon. Michael McCormack MP to announce the first customers under the \$150 million Northern Adelaide Irrigation Scheme (NAIS) in late August.

A number of protected cropping growers around the Penfield Gardens region have recently signed up to the scheme after years of reliance on mains water at excessive prices. The new scheme will see the water bills of these growers from \$3,600 per megalitre (ML) down to \$500 per ML, meaning savings for many growers upwards of \$10,000 per quarter.

AUSVEG SA was a key driver behind having the NAIS scheme put in place and welcomes the announcement on behalf of these growers who have been doing it hard for a number of years. Despite this result, AUSVEG SA is aware that for other growers on existing agricultural water schemes or river water \$500 per ML is a significant increase

on the \$200 per ML they are currently paying. As such, we are working with the SA government and water authorities to see how pricing can be better structured for field vegetable growers expected to take up the vast majority of the 12 gigalitre water scheme.

AUSVEG SA understand that commercial discussions are underway but remains committed towards assisting our growers to negotiate and take up these resources and provide jobs for South Australians.

In other news, AUSVEG SA has concluded the first round of its LEAN manufacturing audits which allowed South Australian vegetable growers to receive funded audits examining their packhouse efficiency. The project has identified over \$1.5 million in efficiency savings for participating growers as well as productivity savings. AUSVEG SA is keen to see this project continue in future years, so interested growers should register their interest.



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### NT Farmers Association

The Top End of the Northern Territory has had a magnificent Dry season. This is usually measured by the number of minimum temperatures under 20°C in Darwin. The average is 50 nights per year when the mercury drops below 20°C. Any more than that is classed as a "good Dry". Darwin is at 65 days (and counting) with the cool weather showing no signs of going away just yet. In the Greater Darwin Rural Area, the temperatures are usually a couple of degrees cooler at night as distance to the coast increases.

This year it has actually been cold. Middle Point, located 45 kilometres from central Darwin, has had 105 days with a minimum under 20°C and 12 of those were under 10°C. The lowest recorded temperature this year was a chilly 4.6°C at the research station at Middle Point.

This is excellent for mangoes, which need a strong chill to initiate flowering but under 15°C does the job. Under 8°C, our tropical fruit trees such as Durian and Rambutan drop all their leaves – any flowers that may be starting – and go into shock. It will take a full Wet season for them to recover fully. It also slows up our vegetable production, which relies on the heat of the Dry to give the Top End growers our market window for the southern winter. Some cucurbit crops such

as Long Melon and Hairy Melon take much longer to mature, and production is reduced. This is off-set by how long the growing season, and incidentally the tourist season, is this year.

Normally in late August, the prevailing winds switch around to the north-west and blow hot humid air into the Top End. This doesn't look like happening until mid-September. The long Dry means the build-up will be delayed, and early storm rain will be a long way away. The worry here is that last year's Wet, which was less than two-thirds of the average fall in the Darwin rural area, did not recharge the underground aquifers that feed our horticulture industry (as happens most years).

Growers will be hoping this Wet season is as good as this Dry and we get heaps of rain. About two metres would be great to refill all the storages in the Greater Darwin area. Meanwhile, NT Farmers is planning to start a water efficiency project to help growers fine tune their water use. Growers are already using low waste systems like under tree micro sprinklers for tree crops and drip tape and plastic mulch for row crops. The project will try and find that extra small saving in water through improved soil moisture monitoring, scheduling and benchmarking their water use efficiency.



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## Growcom

Farmers in Queensland's Lockyer Valley can be rightly proud of their role in the Queensland Government reversing tack on proposed water allocations that could have curtailed their productivity and threatened the future of horticulture in the region.

The Queensland Department of Natural Resources' original plan was to base groundwater entitlements on old and inaccurate meter monitoring. More than 1,000 farmers objected to the proposal in formal submissions, arguing further reductions could make them unprofitable and destroy their livelihoods.

To his great credit, Queensland Natural Resources Minister Anthony Lynham listened and outlined a new Moreton Water Plan, as suggested by farmers themselves, that will give a blanket six megalitre per hectare allocation to growers in the Valley. This is a great example of trickle-up water policy development, where the government was willing to accept advice and meaningfully engaging with growers to reach a win-win.

Australian and Queensland government ministers responsible for drought policy should be taking a leaf out of Minister Lynham's policy playbook. With an ear to the ground, they should have heard by now the long and loud call for extending water

infrastructure rebates to horticulture, and tree crops in particular.

If we are entering a period of greater climate variability, then programs to encourage our orchardists to improve their water infrastructure and undertake dam de-silting are essential.

This extension of rebates literally can't come a day too soon. Orchardists are making decisions today about whether they can afford to keep trees alive.

It's not just other Ministers that can learn from the Lockyer Valley example, but farmers across Queensland should also be taking notes.

The Queensland Competition Authority is currently reviewing water pricing.

This is an important opportunity for Queensland farmers to lay the groundwork for cheaper water and irrigation prices for years to come. But their voices need to ring as loudly of those in Lockyer, otherwise it'll be an opportunity lost.

More than a trickle, we need a flood of voices. Growcom, with the Queensland Farmers' Federation, will be coordinating this choir, calling for water prices that will give Queensland farmers confidence in their future.



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## AUSVEG VIC

Victorian growers need to be working with their labour hire providers to make sure that they have begun the process to become a registered labour hire contractor, with the new laws coming into effect on Wednesday 30 October.

The Victorian Labour Hire Authority has told AUSVEG VIC that for a labour hire provider to continue to provide a labour hire service, it must apply for a licence prior to 29 October 2019.

From 30 October 2019, a host must not engage a provider that has not applied for, or been granted, a labour hire licence by the Authority.

There are various government grants on offer to Victorian growers to help with energy consumption, making your operations more energy efficient. These opportunities are becoming made available through Agriculture Victoria, providing growers with an on-farm energy grant.

Eligible primary producers can apply for a grant until March 2020.

AUSVEG VIC is here for growers who are looking to apply for grants, and runs the services of assisting growers with their applications. Please contact the AUSVEG VIC State Manager to discuss this more.

Meanwhile, AUSVEG VIC is holding its annual general meeting (AGM) on Friday 25 October at the Junction Oval in St Kilda. All AUSVEG VIC members are encouraged to attend the meeting to hear about the achievements from the past year, and the plans for the next 12 months.

To attend the AGM, remember that you need to be a financial member of AUSVEG VIC, and memberships are still being collected for 2019/20. Please contact the AUSVEG VIC State Manager for more details about becoming a financial member.



VGA trading as AUSVEG VIC



### Alexandra Bunton

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## NSW Farmers Association

The NSW Farmers Horticulture Committee hosted its annual general meeting and forum in Griffith on 19 August, which was attended by growers from around the state.

Water remains the most discussed topic within the Committee, and it was certainly a focus of the annual forum. The New South Wales Department of Primary Industries water section presented a seasonal allocation update to the forum, which demonstrated the ongoing difficulties for our producers – particularly those in the north-west of the state. While allocations in the south are somewhat higher, we are still looking at extremely dry forecasts and far below-average rainfall, which jeopardises the sustainability of permanent plantings.

The National Farmers' Federation attended the forum and updated attendees on its work to increase the value of the broader agricultural industry to \$100 billion by 2030. Members agreed that achieving this goal requires better water management to ensure the viability of high-value irrigation-dependent industries; it also includes removing barriers to trade, increasing the available workforce, increasing farm equity, and reducing farm fatalities.

The forum heard from AUSVEG on the work the organisation undertook at the

Federal Election to highlight the priorities of the vegetable and potato industries, and discussed approaches to labour hire licensing. MADEC updated attendees on harvest labour hire options and changes to seasonal work programs, while Safework NSW discussed high-risk harms in horticulture and the Agriculture Sector plan. The NSW Farmers Industrial Relations team provided an overview of changes to single-touch payroll and ongoing labour issues in the industry.

Members passed a motion to call upon retailers who demand quality assurances requirements of farmers and suppliers to ensure they only source produce from farms with accredited schemes in place. The motion seeks to acknowledge the work that producers undertake to implement best-practice management, which is highly valued by the retail sector, and looks to ensure that sourcing policies that rely on accreditation are upheld during times of product shortages.

Following the forum, the Committee and guests visited the farm of member Sue Brighenti, where it discussed water metering and irrigation licensing and met with Pacific seasonal workers harvesting blood and Navel oranges.



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## vegetablesWA

The vegetablesWA team has recently welcomed two new staff members, Melissa Denning and Amber Atkinson.

Melissa will make our labour facilitator project come to life with the aim of improving grower use of the Seasonal Labour Program and Pacific Labour Scheme. Growers using these visa categories have reported significantly higher productivity than with working holiday makers (backpackers), but only a small number of Western Australian growers have used these workers so far. Melissa has previously worked for the Pacific Labour Scheme, helping growers access the program, and as the Labour Attaché at the Timor Leste Embassy, helping growers to access both schemes. Any grower who has problems with labour, please give Melissa a call on 08 9486 7515.

Amber Atkinson also comes onboard as our new communications officer. She will now direct and coordinate all of our communications activities. We're very lucky to have someone join the team who has the

agri-food experience in communications that Amber has. I look forward to even further improving our communications programme with Amber.

Along with these pieces of news, I am sad to also acknowledge the departure of our outstanding Operations Manager Rebecca Blackman. Over the last eight years, Bec has provided me, the association and all of our grower members with peerless service. When Bec first joined me at vegetablesWA we had two and a half staff members and now we have 10, so she has seen and made way for much change and development. We could not have provided growers with so much assistance without her before, but now we look forward to seeing Bec scale fresh new horizons in her career as we as an organisation do so too.

Despite any staff changes, vegetablesWA will always continue to take up the problems of our members. Please call any of us at any time on any issues.



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## Tasmanian Farmers and Graziers Association

With the planting season rapidly approaching, Tasmanian vegetable growers are busy on-farm preparing for the upcoming season. Direct drilling of peas and strip tillage of beans is underway, with rainfall so far this year slightly below average in parts of the state.

Pea growers have recently finalised a three-year contract agreement with Simplot through the Tasmanian Farmers and Graziers Association (TFGA) pea negotiation committee. The committee, led by Will Green, was successful in negotiating an increase each year for Simplot pea growers in Tasmania. Simplot bean growers are currently two years into a three-year contract deal negotiated by the TFGA bean negotiation committee, led by Nick Eyles.

Negotiations have also recently concluded between Tasmanian potato growers and the two potato processors in Tasmania, Simplot and McCain, facilitated by the TFGA. Both the Simplot potato negotiation committee (led by Trevor Hall) and McCain negotiation committee (led by Beau Gooch) met several times with their respective processors. Discussions were productive, with a range of issues impacting on Tasmanian potato production discussed including a changing climate, shortage of skilled and unskilled labour, land availability and competition with other commodities, such as livestock.

The ability of potato, pea and bean producers and processors to be able to come together to discuss issues, such as labour shortages as well as contracts and price, is important in maintaining industry unity. The TFGA is able to facilitate these discussions through the collective bargaining agreement with the processors and the Australian Competition and Consumer Commission (ACCC). The permission to collectively negotiate is important in ensuring that a fair and equitable deal is offered and adhered to by all in the industry. As negotiations continue, the value of this agreement is evident.

In other news, Tasmania's biggest vegetable export – onions – have had one of their best seasons, with 17,000 tonnes sent to Europe. A new federally-funded program has resulted in new niche markets in Asia and Europe for Tasmanian onions, and onion exports from Tasmania have risen to \$16 million.

TFGA also congratulates Tasmanian grower and packer, Harvest Moon, on receiving the Exporter of the Year Award at the Hort Connections Gala Dinner in June.

## Calendar

11-13 November – TropAg 2019:  
International Tropical Agricultural Conference

**Where:** Brisbane Convention and  
Exhibition Centre

TropAg attracts over 700 delegates from around 50 countries and will feature over 300 presenters and keynote speakers. The program will focus on 'Shaping the science of tomorrow' across five program themes: field crops, horticulture, livestock, nutritious food and an AgFutures stream on technology and investment. The program is set to celebrate scientific research success stories and discuss how the tropics will address challenges in the future.

Further information: [tropagconference.org](http://tropagconference.org)

25-28 November 2019 –  
Australasian Plant Pathology Society Conference

**Where:** Melbourne Convention and Exhibition Centre

The Australian Plant Pathology Society (APPS) is hosting its 22nd Biennial Conference at the Melbourne Convention and Exhibition Centre. This conference will be the climax of the APPS' 50th birthday celebrations with the themes of 'strong foundations, future innovations'. The event will include scientific presentations by local and international speakers, supported by engaging field tours and workshops. There will also be plenty of opportunities for networking at APPS's social functions and 50th birthday conference dinner.

Further information: [apps2019.org](http://apps2019.org)



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**Darren Rathjen**

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