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2025 SPRING
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Hort Connections 2025 wrap-up

Plus One Serve by 2030

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BY 2030

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AUSVEG WOULD LIKE TO THANK ITS LEAD STRATEGIC PARTNER

syngenta

2025 Horticulture Awards: Syngenta Grower of the Year. Jeremy Haw from Hussey & Co. *See page 14.*
Image courtesy Andrew Beveridge.

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MESSAGE FROM THE

AUSVEG Chair

With the dust settled after the 2025 federal election campaign, we've continued our engagement with the new Parliament to make sure all politicians know they need to act on the big issues we're facing as vegetable growers.

In July we hit the ground running with AUSVEG CEO Michael Coote and General Manager – Public Affairs Lucy Gregg attending Parliament House in Canberra for the very first sitting day – ensuring the serious challenges growers across the country are still facing remain on the political agenda.

It may be a new term of Government, but for us as vegetable growers not a lot has changed – increased costs combined with declining returns mean too many are still struggling to be profitable. That means AUSVEG's work fighting for the positive solutions we need to see as growers is more important than ever – and that's the message we're continuing to send to Australian MPs.

Another major message that politicians need to hear is that the ever-increasing burden of compliance is overwhelming too many growers, and bogging down the productivity and profitability of our businesses. As growers we are spending too many hours writing and rewriting multiple documents for multiple authorities, getting tangled in red, green and grey tape. This needs to change.

To chart a path forward AUSVEG has commissioned an independent White Paper, *Horticulture Compliance and Regulation: Reducing the Burden by 2030*. It will propose tangible solutions to reduce the compliance overload and duplication that is swamping us. Growers need to be doing what we do best – growing world-class vegetables for Australian families, not stuck in an office. Politicians would do well to adopt the recommendations.

The White Paper will be published along with the results of our most recent Industry Sentiment Survey in coming weeks. Thank you to all the growers who took part.

Productivity has been another major political focus since the election, and has long been a big issue in our industry. The intensive, high-volume and low-margin nature of growing vegetables means maximising productivity is more important for us than any other sector in agriculture, or even horticulture. Current barriers to productivity – over-regulation, lack of profitability to re-invest in innovation and challenges securing the workforce we need, among others – are seriously threatening our capacity to keep producing the vegetables Australians depend on.

In mid-August our CEO Michael Coote took part in the Federal Agriculture Minister's Agriculture Productivity Roundtable ahead of the Economic Reform Roundtable convened by the Federal Treasurer. This was an opportunity to ensure the biggest barriers to productivity for growers – as well as the solutions we need to see – were brought to the attention of politicians with the power to do something about it. We'll continue pushing for action here, because without a boost to our productivity, our industry, as well as our national food security are at risk.

Another upcoming priority for AUSVEG is making sure we have a seat at the table during the development of *Feeding Australia* - the Government's promised national food security strategy, as well as its National Food Council. We've consistently identified increasing vegetable consumption as critical to the health of all Australians, future food security, and our national economy. Getting Australians eating more veggies would also improve productivity, as Australians with chronic and preventable health conditions take twice as many sick days as healthy employees and require significant resources in the healthcare sector. The new council has potential as another avenue to make sure the views and needs of growers in our industry are reflected in national food policy, and that the Government commits to a coordinated behaviour change campaign to get more Australians eating more vegetables.

Finally, Hort Connections 2025, was held this year in Brisbane, with 3,900 delegates, including close to 1,000 growers, attending from Australia, New Zealand and other parts of the globe.

This year's event was an opportunity to highlight the latest developments in Australian horticulture, and to present a united front to politicians and other key decision makers. During Hort Connections, the AUSVEG Board welcomed the opportunity to meet with the Federal Agriculture Minister, the Hon Julie Collins MP and Assistant Agriculture Minister Senator the Hon Anthony Chisholm, and appreciated their genuine interest in supporting our industry.

We were also pleased to have Queensland's Agriculture Minister the Hon Tony Perrett MP open the trade show, and the Speaker of the Federal House of Representatives the Hon Milton Dick MP, Federal Nationals MP Sam Birrell, and Queensland's Assistant Minister for Regional Development Bryson Head MP, attend the Gala Dinner and Awards for Excellence. Hort Connections 2026 will be held in Adelaide from 1 to 4 June, and I look forward to seeing you all there.

Bill Bulmer
AUSVEG CHAIR

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THE STATE OF THE SECTOR WITH THE

AUSVEG CEO

Heading into the final quarter of 2025 the operating environment is still extremely challenging for Australia's vegetable growers – as has been the case over recent years.

Workforce and skills shortages remain, compliance overload has continued to build, investment in productivity enhancements has stalled, and severe cost pressures have persisted, if not worsened.

In a vicious cycle of diminishing returns, it's little wonder that over one in three growers are continuing to actively consider leaving the industry because of a combination of these factors. In a concerning sign of the times, that figure has been consistent over consecutive AUSVEG Industry Sentiment Survey since 2023. But just as worrying is that, more recently, more still say they would stop growing vegetables if a viable exit pathway was available.

These aren't just statistics, but real people and businesses – significant employers and economic contributors – often lifelong, multi-generational growers – considering getting out of the vegetable industry altogether.

Though sobering, the information provided by growers through our sentiment surveys provides a powerful story and warning that politicians and policy makers need to take seriously – unless they take positive and corrective action now, the outlook for our national vegetable industry, and by extension Australia's future food security, will remain deeply uncertain.

With the results of our most recent sentiment survey due for release imminently, the credible, informative and cumulative insights and data gained since 2023 have continued to prove invaluable in our ongoing political and public advocacy on behalf of the vegetable, potato and onion growers we represent.

We are grateful to all growers who have participated in each of our previous surveys, and emphasise the importance of future engagement to ensure your voice and key issues are heard and reflected in our ongoing work towards a more viable and prosperous Australian vegetable industry.

By presenting the undeniable facts and lived experiences of the growers who Australians rely on for 98 percent of the fresh vegetables bought and consumed in this country, we can ensure politicians hear the message loud and clear – our vegetable industry is of critical national interest, and its future must be secured.

The bigger picture

During the federal election it was clear both major parties' campaigns were focussed on the cost of living and in particular demands to ease the cost of food at the cash register. With growers in the vegetable industry being price takers not price setters, and still struggling for profitability, these dynamics have added to the pressures many are feeling.

While the prolonged high inflationary environment of recent years has eased somewhat, many households and businesses continue to feel the pinch. Though we can expect the Albanese Government will not walk away from addressing cost-of-living concerns altogether, it is still unclear exactly how it will factor in the need to ensure Australia retains a profitable and viable vegetable industry into the future. As we have done over many years now, AUSVEG will continue to advocate on the key issues facing growers, and continue pushing the Government to adopt the necessary solutions.

Productivity is something both Government and producers agree needs addressing quickly, and the recent heightened political focus on this issue must result in meaningful improvements for Australian vegetable growers. AUSVEG is also watching closely what the impact on global trade will be as a result of the current volatile international environment. The continually evolving geopolitical situation continues to dominate media headlines, and the recent decision to allow US beef imports into Australia is a clear example of how quickly things can move.

Our attention is also on Europe, with restarted EU FTA negotiations underway. AUSVEG is hopeful that benefits can be achieved, especially tariff relief for the vegetable crops we export to the EU. While the last attempt at achieving an agreement stalled and then ceased due to disagreements over the naming of certain commodities and products among other barriers, ongoing global uncertainty may see both parties more incentivised to sign a deal this time around.

Vegetable industry challenges

The international and domestic economic challenges of recent years have continued to compound pressure on Australian vegetable, potato and onion growers and their position in both the national economy and food supply chain.

We are a sector heavily reliant on international factors and imported farm inputs. Global volatility has been a significant contributor to our cost-of-production crisis, continuing to push up the price of key farm inputs like fertiliser, fuel, seed and freight.

Domestically, wage costs continue to rise for all Australian businesses. Labour remains among the largest cost confronting growers, who are still under ongoing pressure to accept often unsustainably low prices for their produce – which may not even cover the cost of production, let alone return a profit.

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THE STATE OF THE SECTOR WITH THE

AUSVEG CEO

Compliance

AUSVEG continues to receive ongoing feedback from growers through successive sentiment surveys, and our work across the country, about the growing and unsustainable burden of compliance. As cost pressures have ramped up, growers have continued to be hit with mounting and overwhelming compliance costs, regulations and requirements.

This includes everything from industrial relations, building and works approvals, resource use, machinery transportation, food safety, business administration, environmental schemes and more. These have proliferated, from governments of all levels, customers, suppliers and other third parties. Increasingly these are replicated across jurisdictions – the requirements are often identical, but unavoidable, with many growers now spending more time doing paperwork than growing crops - or spending money which should be directed to farm improvements on meeting compliance obligations.

In our sentiment surveys compliance cost and burden is regularly one of the top reasons growers are considering leaving the industry. The vegetable, potato and onion industry needs relief through practical solutions which are underpinned by evidence and experience. To help achieve this objective AUSVEG has commissioned an independent and comprehensive White Paper - *Horticulture Compliance and Regulation: Reducing the Burden by 2030* - which will be released in the coming weeks.

Here we will outline the facts, alongside recommendations to back up and address the anecdotal stories growers often tell of their frustrations. The White Paper will provide a comprehensive assessment of the current compliance landscape, to ensure that when we advocate and propose solutions to Government on this important issue, we will do so with an evidence base that decision makers will be unable to ignore or dismiss.

Looking ahead

One of the current priorities identified by the Albanese Government and welcomed by AUSVEG is the need to address productivity. In many industries it is at an all-time low, and it is no different in horticulture. As a high volume, low margin industry, this issue is particularly important to vegetable growers, as any drags on productivity have a critical impact on their businesses.

Given the industrial nature of growing and processing vegetables on farms for domestic and international markets, growers rely heavily on being able to source enough workers, across a range of skillsets. Unfortunately, skills and workforce shortages have remained the norm for many growers in recent years, making it extremely challenging to get on with their core business of growing and supplying vegetables. Workforce shortages are far from the only productivity challenge for vegetable growers – compliance burden, lack of profitability to reinvest and low vegetable consumption stand out as others – but it is among the key issues that need urgent attention.

In mid-August I took part in the Agriculture Productivity Roundtable, held by Federal Agriculture Minister the Hon Julie Collins MP, to share the vegetable industry's concerns directly with the minister and a room full of decision and policy makers. This sector specific roundtable was held prior to the Economic Reform Roundtable convened by Federal Treasurer the Hon Jim Chalmers MP, to inform considerations at that forum.

Given the critical need to improve productivity in the Australian vegetable industry, AUSVEG remains actively involved with these discussions, and will continue pressing for critically needed changes to improve vegetable industry productivity.

Plus One Serve and lifting vegetable consumption

A key commitment sought by AUSVEG in our 2025 Federal Election Priorities was seeking Government support for the Plus One Serve campaign.

Increasing vegetable consumption remains a critical AUSVEG priority. With vegetable consumption among Australians tracking at just 1.8 serves per person per day against the recommended five daily nutritional serves, improving this dire metric needs to be a national priority. Addressing it is an opportunity to act decisively and commit to measures which will boost Australia's vegetable industry and improve Australia's health and wellbeing.

As we move towards the launch of a public facing campaign AUSVEG and the Plus One Serve team will be engaging across all sectors of the Australian economy from business, to philanthropic to government to build support for this initiative to benefit the health of all Australians, the national economy, and the long-term viability of Australia's vegetable growers.

Hort Connections

In June, Hort Connections 2025 was held in Brisbane, and again it proved itself as the premier horticulture event in the Southern Hemisphere, attracting 3,900 delegates including nearly 1,000 growers. A special thank you to Hort Innovation for their support of Hort Connections 2025 and their commitment to continue partnering with this important event in the years ahead – and to our event partner IFPA-ANZ.

Thanks also to all of the sponsors, exhibitors, and supporters of Hort Connections, including first time Gala Dinner sponsor Moffatt Fresh Produce. It was pleasing and welcomed by industry to witness Federal Agriculture Minister the Hon Julie Collins MP announce Federal Government support for Hort Connections for the next three years at the Syngenta Networking Event on the first evening of this year's conference.

Next year Hort Connections will be hosted in Adelaide over four days from 1 – 4 June at the Adelaide Convention Centre. Once again it will provide plenty of opportunities to connect with industry colleagues and learn more about the latest innovations, research and trends within our industry at a time when that is more important than ever.

Michael Coote
CEO, AUSVEG

VEGETABLES
ONIONS

Industry study tours
2025–2026

Growers can scan the QR code to express their interest in joining future study tours.

A new program of vegetable and onion study tours has gotten underway, giving growers and industry stakeholders an opportunity to bring global ideas back to their business.

In June AUSVEG invited growers to apply for the first tranche of study tours to be delivered in 2025-26 as part of the new five-year program.

The first tour visited New Zealand in August 2025, followed by tours to Europe in September 2025, and Fruit Logistica in Berlin in February 2026, with more to come.

These industry study tours provide opportunities for Australia's vegetable and onion growers and supply chain businesses to increase their awareness and knowledge of the research and innovations in the global horticulture industry through the delivery of tours to strategic vegetable and onion growing regions, conferences, facilities, and innovation centres around the globe.

AUSVEG welcomed the new Hort Innovation funded, five-year international study tour program. The study tours are aligned to the Vegetable and Onion Industry Strategic Investment Plans, in particular to improve industry capability and foster an innovative culture that maximises investments in productivity and demand and builds resilience across the sector.

"International study tours have a considerable impact of driving innovation and building the capabilities of the Australian vegetable growing community through increased knowledge sharing, networking and collaboration, which will lead to improving the productivity, profitability and competitiveness of the industry," said AUSVEG CEO Michael Coote.

"The learning opportunities go both ways. Australian industry members get to experience what's happening overseas, what is working and what does not, and the farming operations they visit learn about what is happening in Australia."

The sentiment was echoed by Hort Innovation CEO Brett Fifield.

"Capability building is essential for the continued growth of Australia's horticulture industry," he said.

> "International study tours are one of the many ways we invest in this priority, and we're pleased to support the vegetable and onion industries to deliver this valuable initiative.

"Study tours have long been popular among vegetable growers, providing a unique platform for learning and connection – both among Australian growers and with overseas counterparts. We encourage growers in the industry to get involved and look forward to hearing all of the learnings collected from across New Zealand and Europe."

The benefits of study tours should not be underestimated, and AUSVEG encourages growers from across the country to lodge their expression of interest for upcoming tours. The EOI form also includes a survey for growers to provide feedback on what they would like to see included in the 2026-2027 study tour program.

Images. Delegates on the ATMAC European Study Tour in 2023 learning how farming operates in the Netherlands and UK.

The *Vegetable and Onion Industry Study Tours* have been funded by Hort Innovation using the vegetable and onion research and development levies and contributions from the Australian Government.
Project: VG23002

Hort Innovation ONION FUND
Hort Innovation VEGETABLE FUND

Hort Connections 2025 wrap-up

Another highly successful Hort Connections was held in Brisbane this year from 4 to 6 June, attracting 3,900 delegates and nearly 1,000 growers from Australia, New Zealand and across the globe.

AUSVEG and the International Fresh Produce Association – Australia New Zealand, with the support of Hort Innovation, hosted the three-day convention and trade show, which included tours of the Brisbane markets, visits to some of south-east Queensland's leading producers and processors, multiple networking and business-development opportunities and a world-class speaker and plenary session line-up.

During an action-packed program at the Brisbane Convention and Exhibition Centre, delegates were able to see first-hand the latest technology in the horticulture sector, learn about the latest research, product developments, and industry issues. As well, they heard inspiring addresses from speakers like big wave surfer Mark Matthews, former Foreign Minister the Hon Julie Bishop and filmmaker Dr Chadden Hunter.

Annual Vegetable Industry Seminar (AVIS)

Leading into the official opening of Hort Connections, the Annual Vegetable Industry Seminar (AVIS) was held at the convention centre. AVIS brought together leading researchers, agronomists, growers and industry stakeholders to explore the key challenges and emerging opportunities in the industry.

This year the event was split into two distinct sessions — the vegetable-focused seminar before lunch, followed by the Potato R&D Forum in the afternoon, delivered in collaboration with AUSVEG, Applied Horticultural Research and *PotatoLink*.

Open to all Hort Connections delegates, both sessions provided an opportunity for growers to engage directly with research providers, ask questions, and better understand how to implement innovation on their farms.

The *Annual Vegetable Industry Seminar* project (VG24003) is funded by Hort Innovation using the vegetable R&D levy and contributions from the Australian Government, and the *PotatoLink* project is funded by Hort Innovation using the potato R&D levies and contributions from the Australian Government.

Images courtesy Tom Bicknell and Andrew Beveridge.

Federal funding for Hort Connections and continuing Hort Innovation support

On day one of Hort Connections at the Syngenta networking event, the Minister for Agriculture, the Hon Julie Collins MP, announced the Albanese Government, through the Department of Agriculture, Fisheries and Forestry (DAFF) had committed to provide $1.5 million over three years in support of Hort Connections.

AUSVEG CEO Michael Coote welcomed the commitment saying, "The funding means Hort Connections can continue to promote and showcase Australian horticulture, including the broader horticulture ecosystem, and ensure that Australian growers are at the cutting edge of innovation and technology.

"The funding will be used to increase networking and information sharing for horticulture growers and stakeholders during the event and allow us to ensure we can support more growers attending and participating in Hort Connections. The Federal Government's support of Hort Connections is recognition of the vital role the conference and trade show plays in the horticultural sector across Australia."

During the event, Hort Innovation also confirmed its ongoing support for Hort Connections as Principal Convention Partner, which was also welcomed by AUSVEG and IFPA-ANZ.

AUSVEG thanks its Hort Connections' event co-host IFPA-ANZ, and all the sponsors, exhibitors, and supporters, for their contributions to the southern hemisphere's biggest and best horticulture event.

Hort Connections 2026 will be held in Adelaide over four days from 1-4 June at the Adelaide Convention Centre, providing growers and industry members plenty of opportunities to connect with industry colleagues and learn more about the latest innovations, research and trends within our industry.

Industry excellence recognised at **2025 Horticulture Awards**

The best and brightest in Australian horticulture in 2025 were given due recognition at the Horticulture Awards for Excellence, held during the Gala Dinner, sponsored by Moffatt Fresh Produce.

Ten winners were presented with Horticulture Awards for Excellence at the Hort Connections 2025 Gala Dinner, representing the best in production, research, education, marketing and community involvement. The awards also recognised the crucial role of women in all sectors of the industry and gave special recognition to the next generation.

"I congratulate all the winners of this year's Horticulture Awards for Excellence for the contribution they have, and continue to provide, to Australia's horticulture industry," said AUSVEG CEO Michael Coote.

"I would like to recognise all the nominees in all the awards. While there can only be one winner in each category, all the nominees have made a massive industry contribution, and this should be recognised.""

The awards ceremony was held during the Hort Connections Gala Dinner held on Friday 6 June, marking the culmination of Hort Connections 2025 in Brisbane.

As the Southern Hemisphere's largest horticulture industry Conference, Hort Connections is jointly hosted by AUSVEG and the International Fresh Produce Association Australia-New Zealand (IFPA ANZ). This year 3,900 delegates attended from around Australia, New Zealand, and the globe.

For more information about the 2025 Horticulture Awards for Excellence, please visit hortconnections.com.au/awards.

SYNGENTA
GROWER OF THE YEAR AWARD

Jeremy Haw / Hussey & Co

Celebrating 50 years, Hussey & Co—led by Jeremy Haw—is a leading Australian grower, processor, and distributor of premium baby salad leaves. With a vertically integrated national presence, the company supplies major retailers and exports to seven countries. Innovative processing enhances food safety and quality, while precision agriculture reduces waste. A solar farm offsets all peak daytime energy use, underscoring their commitment to sustainability. Jeremy's focus on excellence, employee growth, and industry impact has established Hussey & Co as a leader in its field.

L-R: Jeremy Haw; David Van Ryswyk, Syngenta ANZ Country Manager.

CORTEVA AGRISCIENCE
YOUNG GROWER OF THE YEAR AWARD

Craig Dingle / *Kalfresh Vegetables*

Craig Dingle joined Kalfresh as a graduate in 2017 and swiftly advanced to Head of Agriculture, now overseeing more than 2,000 acres across three farming regions. In this role, he implements world-class agricultural practices, leading improvement projects with data-driven precision, deep agronomic expertise, and strong grower relationships. Craig's attention to detail and collaborative approach have established him as a respected leader in the industry. His innovative contributions include introducing in-field robots under the Queensland Smart Farms Initiative and deploying cushioned bin-loading trailers and in-field graders, which reduced onion handling and touchpoints by up to 80%.

L-R: Nick Koch, Marketing Manager, Corteva Agriscience; Craig Dingle.

BAYER
RESEARCHER OF THE YEAR AWARD

Dr Penny Measham / *QLD DPI (Now Cherry Growers Aust. CEO)*

Dr Penny Measham is an internationally recognised scientist and has a long and solid history of supporting the Australian horticulture sector through science. Her own research efforts have had real world impact in plant and insect physiology, with outcomes for plant productivity, plant protection and pest management, and pre-and post-harvest fruit quality. Her contribution to horticulture extends to advancing trade and exports with a strong legacy in building capacity for market access research through the eight-year Fresh and Secure Trade Alliance.

L-R: Damien Odgers, National Sales Manager – Horticulture, Bayer; Dr Penny Measham.

BUTLER MARKET GARDENS
ENVIRONMENTAL & SUSTAINABILITY AWARD

Angela Candeloro / *Tripod Farmers Group*

Tripod Farmers Group leads in sustainable horticulture, as one of the first in Australia to adopt the Carbon Robotics Laser Weeder to reduce herbicide use and improve soil health. They worked closely with the US team to adapt it to Australian conditions. Their CHEP partnership saved 1,877 tonnes of CO_2e, 10,807kL of water, and diverted 514 tonnes of waste. They've moved to recyclable cartons, use on-site water recycling, and invested in efficient European packhouse equipment—setting a benchmark for practical, scalable sustainability in fresh produce.

L-R: Angela Candeloro; Rick Butler, Butler Market Gardens.

UPL
TECH & INNOVATION AWARD

Troy Qualischefski / *Qualipac*

Qualipac is an Australian owned enterprise growing and packing vegetables. Qualipac are always on the lookout for continuous improvement options, including the introduction of new agtech, and have become a leader in adoption of agtech through partnering with the Department of Primary Industries Queensland Smart Farms initiative to test new technology. Working with DPI, Qualipac have tested an autonomous robotic weeder and seeder. Benefits include labour savings; yield increases and reduced herbicide use.

L-R: Ian Cass, Marketing & Business Development Manager, UPL; Troy Qualischefski.

MUIRS
COMMUNITY STEWARDSHIP AWARD

Sam Licciardello / *Orchard 1 Sixty*

Sam Licciardello is a passionate grower and champion of community engagement, not only on his own orchard, but also celebrating the WA growing region. Host and organiser of the Donnybrook Long Table Lunch and the Easter Apple Festival, Sam showcases local apples and pears through immersive, paddock-to-plate experiences that attract thousands of visitors each year. A long-time community leader, Sam continues to promote WA's apple and pear industry with energy, authenticity and deep industry pride, sharing his commitment and growing expertise.

L-R: Nardia Stacy of Pomewest (on behalf of Sam Licciardello); James Muir, Muirs.

HORT INNOVATION
EXPORTER OF THE YEAR AWARD

Mark Kable / *Harvest Moon*

Harvest Moon is a leading Australian fresh produce exporter with over 35 years' experience supplying markets in Southeast Asia, Japan, Taiwan, the Middle East and Europe. The company works with a national network of more than 80 growers across Tasmania, Victoria, New South Wales and Queensland, enabling strong supply capabilities. In the past 12 months, Harvest Moon shipped more than 6,500 tonnes of vegetables a 50% increase, expanding beyond its established carrot and onion exports to broccoli, cauliflower, pumpkin and watermelon. Internationally recognised for quality and service, its products feature in major Asian supermarkets and industry trade shows.

Mark Kable (3rd from right) and the Harvest Moon team; Brett Fifield, CEO, Hort Innovation (2nd from left).

NAB
WOMEN IN HORTICULTURE AWARD

Melita Jurgens / *Vee Jay's Kalfresh*

Melita Jurgens leads by example by empowering young women to advance their careers in horticulture and supports them to take on leadership positions. Melita is a co-Director of Vee Jay's Kalfresh, a joint venture in Bowen, North Queensland, producing Certified Organic and conventional fresh produce. Melita champions sustainable and regenerative farming practices across 1000ha of cropping and was integral to VJK becoming Australia's largest producer of field-grown baby capsicums, and a leading national supplier of commercial-scale organics.

L-R: Alison Blanshard, State Business Bank Executive, NAB; Tracey Campbell from Kalfresh (on behalf of Melita Jurgens).

VISY
INDUSTRY IMPACT AWARD

Claire McClelland / *AFPA*

For over a decade, Claire has been one of the most dedicated and effective advocates for the Australian horticulture sector, achieving outcomes in the areas of workforce, trade, biosecurity, sustainability and more. Her practical approach to challenges and unwavering commitment to protecting the industry's viability has made a lasting impact on fresh produce businesses nationwide. Claire's ongoing effort continues to shape a stronger, more resilient horticulture sector—delivering results today while laying the foundation for future growth.

L-R: Kym Ziersch, Sales Manager, Visy; Claire McClelland.

SEEKA
MARKETER OF THE YEAR AWARD

Sonia Gabauer / *Driscoll's Australia*

Driscoll's Australia launched an omnichannel summer campaign, the "Sweetest Batch Strawberries Campaign" to showcase the premium flavour and experience of its Sweetest Batch Strawberries. Led by Sonia Gabauer, the campaign combined sampling, lifestyle activations, national media coverage, and retail media partnerships, headlined by high-profile lifestyle moments like the Bondi Beach pop-up and the Moonlight Cinema Romance Week sponsorship where 3,500 premium samples were handed out during each activation. Results were significant with A$17.3 million in campaign sales, and a 22 percent increase in online sales.

L-R: Michael Franks, Seeka CEO; Rachel Sanders, Driscoll's Australia; Jim Smith, Seeka.

Inaugural Australian-Grown Innovation 'Incubate' cohort named at Hort Connections

BY HORT INNOVATION

Hort Innovation's new Australian Grown Innovation project has unveiled the first group of participants who'll develop their problem-solving ideas through the initiative.

The first cohort of Australian-Grown Innovation 'Incubate' participants was announced at a Hort Connections breakfast in Brisbane in early June. This follows the launch of the program in March this year, which saw 72 participants from across the horticulture supply chain involved in engagement sessions held around the country.

The 'Incubate' cohort, which is made up of 14 growers, will participate in a six-week program designed to offer hands-on support via workshops and mentoring that will refine their inventions, and help understand market desirability and competition before bringing their products and services to life in a third 'Build' phase.

The new Hort Innovation initiative has been designed to drive innovation, working alongside levy funded initiatives, to tackle the most pressing challenges in horticulture and offer participants insights into global best practice in their areas of innovation.

In partnership with Startupbootcamp and Cluster Connect, the announcement at Hort Connections revealed the members of the project's inaugural cohort.

Brett Fifield, CEO at Hort Innovation, expressed his congratulations to the group.

"We are thrilled to welcome 14 participants to the first cohort of the Australian-Grown Innovation Incubate program," he said.

"We launched this program as we know growers identify incredibly effective solutions to some of the biggest challenges we face as an industry, but don't often have the support required to bring their solution to life.

> "There are lots of industry-changing theories being explored in this first cohort, and we look forward to supporting the participants in bringing their ideas to life."

Anna Barlow, Food and Agriculture Innovation Partner at Startupbootcamp, said the initial stage of the project will help growers develop their ideas, before the next stage brings them to life.

"We are excited by the combination of horticulture industry challenges and potential solutions the cohort will explore through the Incubate stage of the Australian-Grown Innovation program and seeing how we can support the cohort to validate their ideas," she said.

"Following the Incubate stage, growers will have the opportunity to progress their ideas to a Build phase, which is a 12-week structured mentoring program to develop a test version of their idea and trial it in a real-world market environment."

Cohort participants

- **ATEK Integrated Engineering,** *NSW*
- **Pectin 360,** *NSW*
- **Organic AG,** *NT*
- **Bowen Gumlu Growers Association,** *QLD*
- **SMA Marketing,** *QLD*
- **Fresh Produce Safety Centre ANZ,** *QLD*
- **Swaggie,** *QLD*
- **REKO Australia,** *QLD*
- **Sunnybrae Farm,** *QLD*
- **Bureau of Meteorology,** *QLD*
- **Corporate Roses,** *SA*
- **Macro Group Australia,** *SA*
- **Ace Apples,** *VIC*
- **The Bee Buddy,** *WA*

This program will run over the next five years. Those wishing to participate can learn more or sign up at frontiers.au/agi.

Australian-Grown Innovation is funded through Hort Innovation Frontiers with co-investment from Startupbootcamp and contributions from the Australian Government.

INCUBATE PARTICIPANTS

OF INTEREST TO THE VEGETABLE INDUSTRY

ACE APPLES

Mark Trzaskoma VIC

FRONTIERS THEMES
Healthy Living, Market Growth, Capability Building, Disruptive Technologies

INDUSTRY
Apple, Nut, Vegetables

COMPANY DESCRIPTION
Ace Apples is a B2B digital platform that unites fruit, nut, and vegetable growers to improve marketing, education, and supply chain transparency through QR-coded produce.

THE BEE BUDDY

Jessica Brunner WA

FRONTIERS THEMES
Adaptation & Resilience, Capability Building, Disruptive Technologies

INDUSTRY
All

COMPANY DESCRIPTION
The Bee Buddy is an all-in-one modular hive system making safe, affordable, and biosecure beekeeping accessible to families and future pollinators.

BOWEN GUMLU GROWERS ASSOCIATION

Jenn Honnery QLD

FRONTIERS THEMES
Adaptation & Resilience, Market Growth, Capability Building

INDUSTRY
Capsicum, Mango, Tomato

COMPANY DESCRIPTION
Bowen Gumlu Growers Association transforms waste produce into nutrient-rich freeze-dried ingredients and bioactives, helping food manufacturers and nutraceutical companies source premium, Australian-grown inputs.

BUREAU OF METEOROLOGY

Rachel Davis QLD

FRONTIERS THEMES
Adaptation & Resilience, Disruptive Technologies

INDUSTRY
All

COMPANY DESCRIPTION
The Bureau of Meteorology provides impact-based forecasts that translate weather and climate data into clear biosecurity risk insights, helping farmers and advisors make informed, timely decisions.

FRESH PRODUCE SAFETY CENTRE ANZ

Farzana Adams QLD

FRONTIERS THEMES
Healthy Living, Adaptation & Resilience, Capability Building

INDUSTRY
All

COMPANY DESCRIPTION
Fresh Produce Safety Centre offers a mobile-friendly, visual food safety guide that helps growers easily understand and comply with regulations, boosting confidence and audit readiness.

REKO AUSTRALIA

Jacki Hinchey QLD

FRONTIERS THEMES
Healthy Living, Adaptation & Resilience, Market Growth, Disruptive Technologies

INDUSTRY
All

COMPANY DESCRIPTION
REKO Australia empowers small-scale food producers to sell directly to local communities through low-cost, Facebook-based pre-order pickup rings, boosting regional food culture and reducing market risks.

SWAGGIE

James Wills QLD

FRONTIERS THEMES
Capability Building, Disruptive Technologies

INDUSTRY
All

COMPANY DESCRIPTION
Swaggie is a workforce platform that simplifies hiring for farmers by connecting them with available workers quickly, reducing the time and hassle of finding labour.

MACRO GROUP AUSTRALIA

Corina Javier SA

FRONTIERS THEMES
Adaptation & Resilience, Market Growth

INDUSTRY
Potential for Capsicum, Nursery, Chilli

COMPANY DESCRIPTION
Macro Group Australia is developing a rapid test kit for early and accurate detection of tomato rugose fruit virus and related infections in tomatoes, capsicum, and chili crops, helping growers protect yields and reduce losses.

Safeguarding crop protection

A NATIONAL AGRICHEMICAL PROGRAM GETS UNDERWAY

A major new initiative is now underway to secure the future of crop protection in Australia's vegetable, onion, and potato industries.

A new project was contracted in July to deliver national leadership to ensure that vegetable, onion and potato growers have access to safe, effective, and export-compliant agrichemicals — against a backdrop of regulatory pressures and growing market demands.

Funded by Hort Innovation using industry R&D levies and led by AUSVEG, the *National Agrichemical Management Program* (MT24023) is a five-year program, and represents a direct response to urgent threats — including the potential loss of critical chemistries, permit renewals under pressure, and tightening residue rules in international markets.

At the helm is newly appointed National Agrichemical Manager David Daniels, an experienced industry leader with over 20 years of expertise in biosecurity, export compliance, and regulatory systems.

"This project is about protecting the industry's ability to grow crops, stay productive, and access high-value markets," David said. "We're facing a regulatory environment where older chemistries are disappearing and new ones aren't coming fast enough. We need a coordinated national response — and this project delivers it."

The program will bring together growers, agronomists, researchers, and the crop protection industry through an Agrichemical Reference Group to ensure the sector's real-world needs are heard and actioned.

Central to the project will be a strong focus on the Strategic Agrichemical Review Process (SARP) for each crop — vital resources that identify pest and disease challenges as well as the crop protection gap.

There are currently 29 Strategic Agrichemical Review Process (SARP) reports across the vegetable, onion, and potato industries, and many of these are now due for revision. The timing couldn't be more appropriate, with the recent launch of project MT24023 coinciding with the loss of several key chemistries and a growing number of APVMA chemical reviews.

Under this new project, AUSVEG will support Hort Innovation by coordinating industry input into the SARP updates, ensuring they are informed by current production challenges and driven by real, on-the-ground priorities

"The SARPs have helped set the agenda for years, but every strategy needs to be accompanied by an action plan," David said. "We'll distil key findings, prioritise the most urgent needs, and ensure agvet companies and other solution providers are clearly informed and engaged."

The regulatory landscape is evolving rapidly, with significant implications for growers. Reviews of critical actives are already underway or scheduled, and further restrictions are likely. The program will assess potential impacts and help identify viable alternatives.

It will also review the current suite of minor use permits — many of which are essential for the industry — and work closely with Hort Innovation and the APVMA to support renewals, data generation, and transitions to label where feasible.

"Many of the sector's most important permits are vulnerable due to changing classifications and rising data requirements," David said. "Our job is to make sure those risks are managed and that pathways to long-term solutions are supported."

With Australian vegetable exports now exceeding $250 million annually, trade compliance is a major focus. The project will monitor international Maximum Residue Limits (MRLs) for key crops and markets and issue timely alerts to help growers, packers, and exporters stay ahead of emerging risks.

MRL violations can result in shipment rejections, trade bans, and reputational damage. The program aims to reduce that risk by publishing twice-yearly MRL updates and working closely with exporters and testing labs to improve compliance and reporting standards.

Practical support for a stronger future

In addition to technical advice and strategic coordination, the project will deliver targeted communication through *AUSVEG's Weekly Update*, *Australian Grower* magazine, *PotatoLink*, podcasts, and direct industry engagement. It will also support Hort Innovation by contributing to the review of R&D priorities and identifying investment opportunities aligned with emerging pest and disease risks.

David summed it up simply: "We're here to make sure the industry doesn't lose the tools it needs — and to build the case for the next generation of solutions."

FIND OUT MORE

For more information or to get involved, contact david.daniels@ausveg.com.au.

The *National Agrichemical Management Program* is funded by Hort Innovation using the vegetable, onion and potato research and development levies and contributions from the Australian Government.

Project: MT22004

Hort Innovation VEGETABLE FUND

Hort Innovation ONION FUND

Hort Innovation POTATO – FRESH FUND

Hort Innovation POTATO – PROCESSING FUND

Minor Use Permits

ISSUED JUNE 2025

The below minor use permits were recently issued by the Australian Pesticides and Veterinary Medicines Authority (APVMA). This information is circulated as part of Hort Innovation's Growing Innovation e-newsletter, which members and interested horticulture participants receive monthly.
Sign up at horticulture.com.au/growers/become-a-member

PERMIT ID	DESCRIPTION	DATES	PERMIT HOLDER	JURISDICTION
PER81260 Version 4	Imidacloprid / Beetroot / Aphids & Thrips	1 Dec 2015 to 30 June 2027	Hort Innovation	All states & territories, except VIC
PER12716 Version 4	Imidacloprid / Asian root vegetables / Greenhouse whitefly and Green peach aphid	12 April 2015 to 31 May 2028	Hort Innovation	All states & territories, except VIC
PER89216 Version 3	Ranman 400 SC Fungicide / Parsley / Phytophthora soil fungus	12 Aug 2020 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER14593 Version 4	Mancozeb / Specified fruiting and legume vegetables / Downy Mildew, Anthracnose (Colletotrichum spp) & Alternaria.	10 July 2014 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER81408 Version 4	Phosphorous acid / Eggplant and protected Capsicum / Phytophthora soil fungus	7 Sept 2015 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER82456 Version 3	Mancozeb & Metalaxyl-M / Snow peas, Sugar snap peas, Field grown capsicum, Chillies & Paprika / Downy Mildew	27 June 2017 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER80538 Version 2	Mancozeb / Parsley, Chicory, Brassica leafy vegetables (Brassica spp.), Radish, Swedes and Turnips / various fungal diseases	1 April 2015 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER80910 Version 4	Iprodione / Brussels Sprouts & Eggplant / Grey Mould	1 Aug 2015 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER14722 version 4	Abamectin / Cucumber, zucchini, squash / Tomato red spider mite	17 Feb 2015 to 31 May 2030	Hort Innovation	All states & territories, except VIC
PER82895 Version 3	Chlorothalonil / Parsley / Downy Mildew / Botrytis / Alternaria / Cercospora	4 Aug 2017 to 31 May 2030	Hort Innovation	All crops except Garden Peas All States and Territories, except VIC. Garden peas WA only
PER84261 version 3	Pyriproxyfen / Broccoli, Brussels sprouts, Cabbage and Cauliflower / Silverleaf whitefly	11 Oct 2017 to 31 May 2030	Hort Innovation	NSW, QLD and NT only.
PER89185 version 3	Flonicamid / Bulb vegetable / Thrips	6 Aug 2020 to 31 May 2027	Hort Innovation	All states & territories, except VIC

All efforts have been made to provide the most current, complete and accurate information on these permits, however you should always confirm all details on the APVMA website at: **portal.apvma.gov.au/permits**. Details of the conditions of use associated with these permits can also be found on the APVMA site. You can also access the Non-Performance Reporting Form for Horticultural Pesticides at **horticulture.com.au**. This form should be completed when an adverse experience occurs as a result of using a permit. A 'non-performance' is an unintended or unexpected effect on plants, plant products, animals, human beings or the environment, including injury, sensitivity reactions or lack of efficacy associated with the use of an agricultural chemical product(s) when used according to label (or permit) directions.
Users are advised that while the pesticide can be applied legally under the APVMA minor use permit, there can be a significant delay until the MRL gazetted by the APVMA is adopted in the Australia New Zealand Food Standards Code. Until this occurs the MRL may not be recognised and a zero tolerance may be imposed for residues of the pesticide resulting from its use according to the APVMA permit.
Please be aware that in the absence of an MRL in the Food Standards Code, the use of the pesticide according to the permit may result in the suspension of the produce in the marketplace. Please check the FSANZ website or the **Australian Government ComLaw website: legislation.gov.au/Series/F2015L00468)** to confirm if there are MRL established by the Australia New Zealand Food Standards Code.

Want a Ford Ranger plus more this season?

Horticulture Growers preparing their crop protection programs have an added incentive this season – Nutrien Ag Solutions' Horticulture Win Big competition is offering the chance to win a share in over $100,000 in prizes, including a 2025 Ford Ranger Wildtrak, by purchasing products from three leading crop protection brands.

From July 1 to October 31, horticulture customers of Nutrien Ag Solutions who spend $5,000 or more in a single transaction on one or more participating products from Corteva, Syngenta or BASF can submit an online entry to be in with a chance.

The 12 winners will be identified through a random draw on Monday, November 10, and offered the opportunity to attend a celebratory dinner at a paddock-to-plate concept restaurant in the picturesque surrounds of South East Queensland, including airfares and accommodation for two people.

"Australian growers invest a lot of time and money into their crops each season to put some of the world's best produce on our plates," Mel Taylor, Nutrien Ag Solutions Horticulture Marketing Manager, said.

"The team at Nutrien pride themselves on partnering closely with suppliers and industry stakeholders to ensure growers have access to the latest in crop protection technology and advice so growers can maximise their yield and the quality.

The Win Big competition highlights some of the key technology available to our growers this season with the added chance of taking home a Ford Ranger WildTrak!"

"We're proud to support Australian horticulture, and any one of the prizes would be a welcome addition to the farm, whether it's the Ranger, Metos weather station or one of the iPads."

Nutrien's national footprint, complemented by its global network, means its roots in horticulture run deep and broad, with specialist staff and agronomists working on preventative measures along with strategies to support growers diversify and remain ahead of the game.

James Goegan, Operations Manager at Goegan Fresh Produce in Werribee South, Victoria, has been working with Nutrien Ag Solutions and horticultural agronomist Sig Howard for the past 10 years.

"It's been a great partnership and he continues to help us diversify and overcome challenges that we face on a yearly basis," Mr Goegan said.

"Growing fennel has been challenging at times especially during the warmer months but we've got it down to a tee now mainly thanks to Sig's help with our fertiliser and spraying programs."

"Growers want what's best for their crops and so do we," Ms Taylor said.

"We're excited to offer the opportunity for them to Win Big by purchasing some of the latest in crop protection technology and partnering with their local Nutrien branch.

"Best of luck to our growers with the competition and for the upcoming season!"

Entry forms for the Win Big competition can be completed and submitted online at nutrienagsolutions.com.au/winbig where growers can also find the full details on eligible products from BASF, Corteva, and Syngenta.

Above. Victorian grower James Goegan (right) and Nutrien Ag Solutions agronomist Sig Howard.

FOR MORE INFORMATION
Visit nutrienagsolutions.com.au

About Nutrien Ag Solutions. Going further for Australian farmers is at the heart of what drives Nutrien Ag Solutions every day. As one of Australia's largest agricultural solutions providers, we connect growers with best-in-class thinking, tools and technology to progress Australian agriculture. Our team of 4,000 ag professionals across every corner of Australia specialise in agronomy, farm supplies, livestock, finance, insurance, sustainable ag and more. We're proud to be trusted advisors to farm businesses nationwide, combining our global resources with local expertise to deliver solutions that support both the productivity and profitability of Australian farmers.

YOUR CHANCE TO

WIN*

A FORD RANGER

PLUS MORE THIS SEASON!

SCAN TO LEARN MORE

OVER **100K** WORTH OF PRIZES UP FOR GRABS

Purchase participating Horticulture crop protection products from **Syngenta**, **BASF** and **Corteva** to enter.

Nutrien Ag Solutions | syngenta | BASF We create chemistry | CORTEVA agriscience

NutrienAgSolutions.com.au/ **WinBig**

*T&Cs apply – Offer valid at participating Nutrien Ag Solutions stores from 12.01am AEDT 1.7.2025 to 11.59 AEDT 31.10.2025 (subject to store opening hours), or earlier if stocks run out. Ford Motor Company is in no way affiliated with or connected to Nutrien Ag Solutions other than by reason of the provision of the prize. Minimum $5,000 spend in a single transaction on participating products to qualify. Offer available to Horticulture customers of Nutrien Ag Solutions. SA permit: T25/912 NSW authority: TP/04356. Excludes NT and ACT.

export / trade + update

Bridging borders

AUSVEG Reverse Trade Mission showcases Australia's horticultural strength

The long-running AUSVEG Reverse Trade Mission program has developed strong networks between the Australian vegetable industry and global buyers.

Australia is internationally renowned for high quality, clean and delicious fresh produce supported by a range of stringent quality assurance programs and a first-rate food safety system.

Since 2013, the AUSVEG Reverse Trade Mission has served as a critical platform to showcase this produce to international businesses from key export markets. It also offers Australian vegetable growers, whether they are new to exporting or already engaged in exporting fresh vegetables, a valuable opportunity to connect directly with potential and existing international partners.

The Reverse Trade Mission program typically includes visits to vegetable-growing businesses, irradiation facilities, and research and development centres, showcasing Australia's horticultural production capabilities and R&D innovations that underpin its ability to deliver some of the freshest, highest-quality vegetables to international buyers from key export markets.

Over the past decade, the Reverse Trade Mission has cultivated a vast network of alumni and grower-exporters who regularly exchange ideas, insights, and expertise in trade and innovation. This ongoing exchange has fostered long-lasting business relationships, delivering significant benefits to all participants. To date, the program has hosted more than 450 international businesses, covering more than 15 markets and has visited major vegetable production regions across Australia, including Western Australia, South Australia, Tasmania, Queensland, and Victoria.

2025 program overview

The 2025 Reverse Trade Mission was scheduled for 29 May to 4 June, aiming to amplify the presence and global footprint of Australia's vegetable, onion, and melon industries by showcasing the country's production capacities and capabilities to international businesses from key trading markets.

Each year, AUSVEG collaborates closely with Austrade to bring vegetable buyers to Australia, with participating markets aligned to AUSVEG's export market prioritisation strategy. In 2025, the program welcomed up to 40 international delegates from key export markets across the Middle East and Asia-Pacific region, including Singapore, the United Arab Emirates, Saudi Arabia, Malaysia, Indonesia, Thailand, the Philippines, Hong Kong, Taiwan, Japan, South Korea, and the Pacific Islands.

The 2025 Reverse Trade Mission is funded through the Hort Innovation vegetable, onion and melon funds, and partially supported by the Australia-Japan Showcase Program, which is funded by the Department of Agriculture, Forestry and Fisheries.

Welcome Reception

The week-long program officially commenced with a Welcome Reception at W Brisbane, where international delegates were greeted in a relaxed setting ahead of a busy week of farm visits, business connections and export discussions.

AUSVEG CEO Michael Coote and Hort Innovation Head of Trade Mimi Doan extended a warm welcome to the visiting delegates and thanked them for taking the time to visit Australia. They underscored the value of strong and long-standing collaboration between industry bodies, government agencies like Austrade, state governments and Research and Development Corporations (RDCs) in driving the future of Australian horticulture.

VEGETABLES
ONIONS

They reinforced the importance of working together to drive international demand, develop new markets through a coordinated and united approach, delivering in turn mutual benefits for growers and international buyers.

Tarome and Kalbar

On Friday 30 May, the Reverse Trade Mission kicked off with site visits to Moffatt Fresh Produce in Tarome and Kalfresh in Kalbar. They are the two leading vegetable growing operations in Queensland's Scenic Rim.

Tarome benefits from rich volcanic soils and a favourable subtropical climate, making it ideal for year-around growing. Kalbar, known for its strong agricultural heritage, has evolved into a dynamic growing region that supports both conventional and innovative farming operations.

The delegates toured the packing, processing, and cold chain facilities at both farms. Many were impressed by the size and scale of the operations, particularly those who had previously traded with the farms but had never had the opportunity to visit in person.

St George

Located in Queensland's Balonne Shire, St George is a powerhouse of inland horticulture, known for its expansive landscapes, water supply from the Balonne River and innovative farming practices.

The tour group flew out early on Saturday 31 May to St George. A highlight of the visit was an exclusive tour of Moonrocks, one of two large-scale vegetable growing business in the region, renowned for its onions, garlic, pumpkins, and cotton.

Delegates toured the on-site processing facility where garlic is prepared for market, visited onion fields, and viewed specialised harvesting machinery. The visit also featured a drone spraying demonstration, offering international buyers a firsthand look at the innovative technology being adopted by Australian growers.

This was followed by lunch at Riversands Winery. At the winery, the group was officially welcomed by the Deputy Mayor of the Balonne Shire, along with local councillors and the Council's Economic Development Officer. In their remarks, they emphasised the significance of regional agribusinesses like Moonrocks and their growing role in showcasing the region's capability to export premium Australian produce to the world.

Retail insights – understanding consumer access

On Sunday 1 June, the focus shifted to the consumer end of the supply chain. Delegates visited Coles, Aldi, and Woolworths in Indooroopilly, followed by a tour of Harris Farm Markets in West End. This provided buyers valuable insights into Australian retail standards, product presentation, and pricing structures.

Research and innovation in the Lockyer Valley

Monday 2 June featured a deep dive into horticultural R&D and agri-technology. The day began with a visit to the Gatton Smart Farm, part of the Queensland Department of Primary Industries' (QDPI) Gatton Research Station, showcasing Australia's innovation in crop production and technology.

The delegates received comprehensive presentations on various research carried out by QDPI, including trials in glasshouses focused on fruit fly management. The visit also featured demonstrations of advanced machinery designed to support more efficient harvesting and on-farm operations. After that, delegates toured Windolf Farms, a key grower in the Lockyer Valley, known for leafy greens and root vegetables.

Processing and export readiness

On Tuesday 3 June, the group travelled to Steritech in Narangba to learn about irradiation technology, a vital component of Australia's export protocols. Delegates were guided through the full process of how fresh produce pallets are treated using irradiation, further underscoring Australia's commitment to exporting fresh, safe, and high-quality products.

The itinerary continued with grower visits to Qualipac Produce and Barden Produce, both of which are actively engaged in export. Each farm has also invested in advanced machinery to efficiently pack produce for international markets.

Industry connection & AUSVEG Fresh Produce Showcase

On Wednesday 4 June, the program wrapped up with a Knowledge Exchange Breakfast Forum and the AUSVEG Fresh Produce Showcase, where delegates met with growers from across the country in a dedicated B2B setting.

The Knowledge Exchange Breakfast Forum included three presentations, including *'How Australian fresh produce/ horticulture sector connect with shoppers and activate our commodities in the Australian marketplace'*, presented by Ben Leigh, D2C; *'Australian table grapes: reaching new markets'*, presented by Jesse White, Australian Table Grape Association; and *'Australia's fresh credentials/unique selling proposition for Australian fresh produce'*, presented by Najib Lawand, Export Connect. The forum also concluded with an exporter Q&A panel, where three critical topics for fresh produce was discussed – product, supply chain and promotions.

AUSVEG Fresh Produce Showcase

The final component of the 2025 Reverse Trade Mission concluded with the AUSVEG Fresh Produce Showcase, a standout event for the international delegates who participated in the week-long program. Grower-exporters from across the Australian horticulture sector, including vegetables, onions, potatoes, melons, citrus,

berries, stone fruit, apples, and bananas, showcased their premium produce to international buyers. The event generated strong business interest and connections, reinforcing the value of face-to-face engagement between growers and global markets.

The showcase brought together 30 Australian grower-exporters and buyers from 12 priority markets, providing a unique platform to facilitate trade discussions and build commercial relationships. The event was delivered by AUSVEG, with support from Hort Innovation, and the showcase continued to expand its footprint on previous years, including having a wider range of fruit growers on board and a broader representation of Australia's key production regions. This signifies the importance of united approach within the Australian horticulture industry.

Importantly, the majority of international delegates rated the AUSVEG Fresh Produce Showcase as the most essential and impactful component of the Reverse Trade Mission, highlighting its effectiveness in connecting buyers with high-quality Australian produce and supporting long-term export growth.

Key takeaways and future prospects

The 2025 Reverse Trade Mission highlights Australia's strong commitment to supporting grower-exporters through targeted research and development initiatives that enable export success. Fostering international relationships and showcasing the industry's excellence are essential steps toward securing a sustainable future for Australian vegetable and horticulture growers.

Amid the evolving landscape of international trade and the increasing global emphasis on food security, it is important for both government and industry to intensify their efforts in ensuring Australia's horticulture sector is well-positioned to meet growing demand and achieve its export goals.

The Reverse Trade Mission received positive feedback from delegates, who appreciated the opportunity to meet with growers and visit farms across key horticultural production regions. Many also valued the chance to tour the Steritech irradiation facility and the Gatton Smart Farm, gaining firsthand insight into Australia's advanced export readiness and innovation in agri-technology.

A majority of delegates reported immediate trade outcomes as a direct result of the program, with several anticipating significant commercial activity to follow in the months ahead. Almost all participants expressed strong interest in attending similar trade development initiatives in the future and praised the support provided by Austrade and AUSVEG in ensuring a smooth and productive experience throughout the program.

International trade events 2026

Through the *Multi-industry export program (Vegetables, Onions, Melons)* project, AUSVEG coordinates grower participation in and exhibition at several international trade missions aligned with major trade events in regions.

EVENT	2026	LOCATION
Gulfood	26-30 January	Dubai Expo City
Foodex	10–13 March	Tokyo Big Sight, Japan
South East Asia Trade Mission	April	Thailand, Malaysia & Singapore (TBC)
FHA-Food & Beverage	21–24 April	Singapore Expo
AUSVEG Fresh Produce Showcase	1 June	Adelaide, Australia
Reverse Trade Mission (inbound)	May/June	South Australia
Asia Fruit Logistica	September	Asia World Expo, Hong Kong

FIND OUT MORE

Please contact Andrea Lin, International Trade Specialist, AUSVEG **andrea.lin@ausveg.com.au** or +61 3 9882 0277

The *Multi-industry export program (Vegetables, Onions and Melons)* project is funded by Hort Innovation using the vegetable, onion and melon research and development levies and contributions from the Australian Government.

Project: MT21009

Hort Innovation VEGETABLE FUND
Hort Innovation ONION FUND
Hort Innovation MELON FUND

Grit meets gear

How Kubota supports horticulture in the Tablelands

In Far North Queensland, where the growing conditions are as wild as they are rewarding, Martin Inderbitzin is building a business that's as diverse as the region itself. Together with his brother Paul, he runs Berry North and Kureen Farming, producing a diverse crop mix across the Atherton Tablelands.

"We grow avocados, bananas and custard apples, and then blueberries across two different farms as well. Every crop comes with its own quirks, especially when you're trying to grow something outside its natural environment," says Martin.

"That's probably the biggest challenge for us with blueberries, is making things work in a tropical setting that wasn't necessarily built for it."

To help make it all happen, the family relies on a fleet of Kubota machines, featuring RTV520 and RTV- X1140s, mowers including ZG222 and ZG327 and smaller tractors suitable for orchard work, such as the M8540DCN, L3800HD and M9540DHC-DS sourced through their long-standing relationship with GR8 Northern Ag.

"We've got a few RTVs across the farms. They're just essential for running around, checking irrigation and getting jobs done. Most of the tractors are small hydrostatic Kubota machines because it's all orchard work, and space is tight.

"We stick with Kubota because the gear is well made, reliable and simple. It's not overcomplicated, which suits our team and the type of work we do."

According to Brent Craighead, the Branch manager of GR8 Northern Ag based out of Cairns and Tully, it's the family's progressive mindset that stands out most.

"Martin and Paul are always looking to improve and open to trying new innovations," Brent says.

"They're a great family to partner with because they're forward-thinking, hands-on and genuinely interested in how things can work better."

GR8 Northern Ag has been a Kubota dealer for over 30 years and became a standalone Kubota dealership in 2023. Brent himself has been with the business for more than a decade and says the Tablelands and surrounding region offer a unique mix of farming challenges and opportunities.

"There's a bit of everything up here, which is why Kubota fits so well. The machines are simple, reliable and backed by a parts and service network that matters when you're this far north," Brent says.

Martin values the support of GR8 Northern Ag just as much as the machinery.

"They're always great to deal with. Brent and the team solve problems when they come up. He's got the parts on hand, and his service guys are really onto it. You can't fault them, they do a very good job," Martin says.

And while Martin is known for his work ethic and practical approach, he's also got a knack for numbers. At this year's Hort Connections conference in Brisbane, he managed to correctly estimate the number of mung beans in Kubota's display cube within just 62 beans of the actual count, earning himself a weekend getaway for two.

"I rang a mate of mine who's a bit of a numbers guy. I asked him how many seeds per kilo in mung beans, and he gave me a range. I took the middle value, then looked up the average density, about 700 kilos per cubic metre. I worked out the volume of the cube and did the math. I was very lucky."

Back home on the Tablelands, the focus returns to getting the job done, harvests to manage, equipment to maintain and always keeping an eye on what's next.

"It's a challenge, and I like that. What we do is technical, and it keeps your brain firing. We're always trying to get better every season. We finish a run, look at how it went, and then we do it better next time," Martin says.

With Kubota's durable machines in the shed and a dealership team that knows the land, Martin and his family are well-placed to keep doing what they do best: growing quality produce and building a business with deep regional roots.

TO FIND YOUR LOCAL KUBOTA DEALER
Visit kubota.com.au

vegetable fund update

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

Hort Innovation VEGETABLE FUND

Pupae busting for fall armyworm: a participatory action approach to area-wide management in sweet corn

BY DR JOHN STANLEY, RAMESH PURI AND DR HEIDI PARKES,
DEPARTMENT OF PRIMARY INDUSTRIES, QUEENSLAND

Figure 1: Typical setup of emergence cages positioned over maize plants, one month after initial fall armyworm infestations at DPI Bowen, QLD, October 2024.

A collaborative, regionally-led trial shows that pupae busting through cultivation can significantly reduce fall armyworm emergence in sweet corn crops.

Area-wide management (AWM) of the invasive fall armyworm aims to reduce overall pest pressure by limiting survival from one generation to the next across a whole region. Through a Participatory Action Research (PAR) approach, we worked with growers and agronomists in the Bowen–Burdekin region on the practical question: do standard weed cultivation practices help reduce the survival of fall armyworm in sweet corn?

Fall armyworm goes to the ground to pupate for one to two weeks before emerging as a moth and reinfesting sweet corn, maize and sorghum crops. Our trials explored whether standard interrow weed cultivation targets and disrupts the pest at this vulnerable stage. We also looked at the effect of a shallow soil disturbance that simulated robotic weeding. A major goal was to include grower-led observation and feedback through field visits and collaborative planning, an approach known as participatory action research or PAR *(Figure 1 and 2)*.

Our trials explored whether standard interrow weed cultivation targets and disrupts the pest at this vulnerable stage.

Figure 2: Dr John Stanley discusses a fall armyworm management trial with agronomist John Nancarrow from Vee Jay's Kalfresh.

Figure 3: Fall armyworm pupae found in sweet corn soil in Bowen, North Queensland.

Figure 4: A cage set up in a sweet corn trial to capture emerging fall armyworm moths at DPI Bowen, Queensland, in October 2024.

Weeding out fall armyworm in sweet corn

Our results showed that sweet corn growers can expect that their interrow weed cultivations will seriously disrupt fall armyworm emergence. We found as much as an 80 percent reduction in moth emergence following typical weed cultivations (along the side of each corn row with ~10cm wide scarifying tips down to 10cm).

Cultivation often occurs three to four weeks after crop emergence, at about the same time that early infestations of fall armyworm are going to ground to pupate. Those pupae are typically within 20cm of the plant row and down to about 7cm in our sandy clay loam soils *(Figure 3)*. Most are close to the plant line and within the top 4cm.

Uncultivated rows (control) were compared to cultivated rows by collecting emerging moths in large mesh cages (50cm wide x 80cm long, see photo). Every day, we counted and collected moths and parasites (flies and wasps) that emerged into the cages *(Figure 4)*.

How it works

We believe that cultivation directly damages the pupae and/or simply collapses the tunnels the insects rely on to get back to the surface. Heaping of the soil against the base of the plants during cultivation probably also plays a part in burying emergence holes between plants within the row where the plough tine does not directly cut through. This pupae busting is an aspect of area-wide management that aims to reduce the overall pest pressure of future populations.

Potential robotic pupae busting

For another set of cages, we manually scarified the soil to a depth of 3cm, to see whether the action of a robotic weeder might disrupt fall armyworm emergence tunnels well enough to cause pupae busting. This appeared to cause 40 percent mortality, about half the mortality caused by the typical tractor driven cultivation *(Figure 5)*.

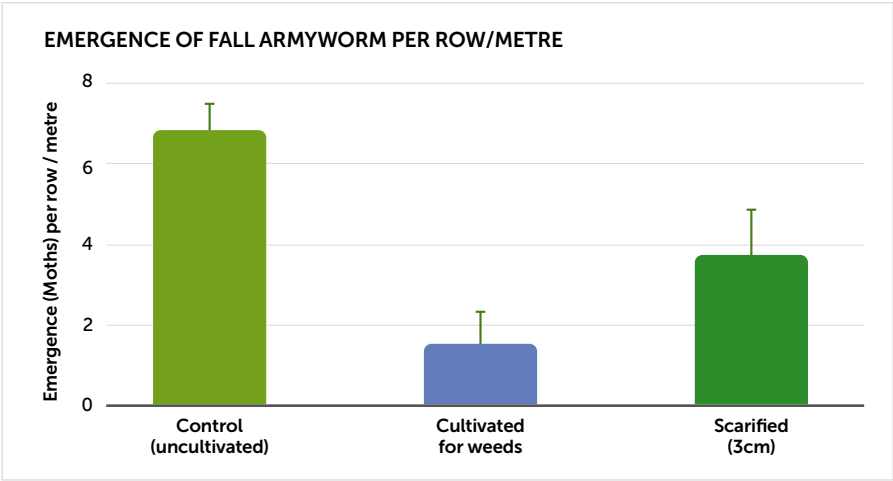


Figure 5: Emergence of fall armyworm per row/metre of maize following cultivation for weed control using spear points to 10cm along, or surface scarification to 3cm across the entire soil surface around plant stems. Error bars are StdErr (n=4)

Very high levels of parasitism in unsprayed maize

In similar trials, an estimated 90 percent parasitism of fall armyworm occurred. This shows that many of the parasites that attack our native pests, like *Helicoverpa* and *Spodoptera litura*, are adopting the fall armyworm (invader) as a host.

Take-home message

Pupae busting occurs while sweet corn growers carry out their usual weed cultivations. Also, later generations of fall armyworm are becoming heavily parasitised as late instar larvae or pupae in unsprayed crops, typical of rain-grown sorghum and maize crops. Weed control cultivations do not usually occur later in the sweet corn cropping cycle because these crops get too tall and weeds are shaded out.

So, the final opportunity for pupae busting would be immediately after harvest. Fall armyworm pupae do not diapause (do not 'hibernate' to overwinter) so cultivation, as early as possible after harvest, has the benefit of pupae busting fall armyworm that might have been selected for insecticide resistance.

MORE INFORMATION

Visit QDPI's FAW Engagement Hub at dpi.engagementhub.com.au/fallarmyworm

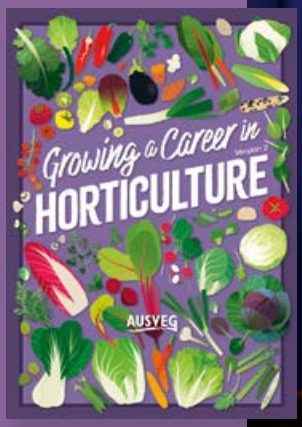
The *National fall armyworm innovation system for the Australian vegetable industry* project is funded by Hort Innovation using the vegetable research and development levy and funds from the Australian Government, with co-funding from the Queensland Department of Primary Industries and the Victorian Department of Energy, Environment and Climate Action.

Project: VG22006

Hort Innovation VEGETABLE FUND

Growing a Career in Horticulture

REDEFINING THE FUTURE OF OUR INDUSTRY



If you ask the average person what a career in horticulture looks like, the image that may come to mind for them might still be "an old bloke on a tractor", or even a line of workers, bent at the hip, pulling out weeds. But ask anyone currently working in the industry and they will tell you a very different story – one of drones, data, digital traceability, logistics, sustainability, and science.

The AUSVEG *Growing a Career in Horticulture* project exists to rewrite that narrative and address one of the most pressing challenges facing our sector – attracting and retaining the next generation of talent.

A changing industry, a new approach

Despite being one of Australia's largest and most innovative agricultural sectors, horticulture has struggled to shake outdated perceptions. The reality on the ground – advanced technology, diverse roles, and real career pathways – often is not what young people, school leavers or even job seekers imagine when they hear the word 'horticulture'.

This project, developed by AUSVEG with funding through Hort Innovation and the Australian Government, aims to close that perception gap. The *Growing a Career in Horticulture* booklet, first launched in 2023 and now expanded in a second version, showcases more than 40 real people working across the horticulture supply chain. It's accompanied by a new website that features videos, a career-matching quiz, and extended Q&As. growingacareerinhort.com.au

The new edition of the booklet was officially launched at Hort Connections 2025 in Brisbane by the Assistant Minister for Agriculture, Senator the Hon Anthony Chisholm. Speaking to a room full of growers, researchers and industry leaders, Senator Chisholm highlighted the importance of attracting new people to the sector and celebrating the diverse career pathways available in horticulture.

Since the first edition of Growing a Career in Horticulture was released in 2023, it has proven to be one of the most popular and well-received resources produced by AUSVEG.

"At conferences, trade shows and field days it has proved a favourite among our visitors," said AUSVEG CEO Michael Coote.

"We have also had interest from many education institutions, career counsellors, and workforce recruiters wanting to provide it to students, as well as parents, to increase awareness on horticulture as an exciting and achievable future career option."

Real people, real roles

At the heart of the *Growing a Career in Horticulture* project are the young individuals shaping the industry from the ground up. Their roles are diverse, their journeys are varied, and their stories challenge the old clichés about what horticulture is and who it is for.

These eight profiles represent just a sample of the roles that make up Australia's vegetable, potato and onion industries today. While they span different states, skill sets and entry pathways, they share one thing in common: a belief that horticulture offers real careers with purpose, growth, and progression.

Top L-R. Assistant Minister for Agriculture Senator the Hon Anthony Chisholm, AUSVEG's Alex Laschuk and Lucy Gregg, and Secretary of Department of Agriculture, Fisheries and Forestry Adam Fennessy PSM launch the *Growing a Career in Horticulture* publication at Hort Connections.

CAREER SNAPSHOTS

Vishnu Gaddy
Harvest Manager

Originally from India, Vishnu first dreamed of becoming a doctor. But after financial constraints and family conversations redirected her path, she pursued a degree in agriculture, later completing a Master's in Applied Science in Tasmania. That decision opened doors in Australia's horticulture sector, first in hydroponic growing and now in open-field vegetable production.

Today, she manages the harvest of crops like cos, iceberg, and coral lettuce, leading a seasonal team of 25 and forecasting crop yields to guide sales planning. Her role requires close attention to weather, labour, and market pressures, often making quick decisions to avoid crop losses and meet customer expectations.

The move from glasshouse to field has tested her resilience, but it's a challenge she has embraced.

"Agriculture is not just a profession for me - it's a way of living. I'm happy with where I am now, and I'm proud to keep growing every day."

Danny Rickard

UAV Drone Operator

Schreurs & Sons

Danny has been involved in farming since leaving school, but aviation shaped his early career. After earning his commercial helicopter licence in 2009, he spent over ten years as an agricultural pilot, working closely with vegetable growers. Two years ago, he helped transition a major grower from helicopters to drones, ushering in a new era of precision horticulture.

Now, he operates UAVs to conduct aerial spraying across intensive vegetable blocks. His day starts with checking weather conditions, preparing chemicals, and mapping each field via GPS to ensure accurate, efficient application.

As drone capabilities improve year on year, Danny is enthusiastic about their growing role in the sector.

"One of the most rewarding experiences was implementing new, unproven drone technology into large-scale intensive spray programs."

Annie Wang
Machine Learning Team Lead

Bitwise Agronomy

Annie leads a team of machine learning engineers and data scientists that builds AI tools to tackle real on-farm challenges. Her team specialises in deep learning models for fruit counting, yield forecasting, and practical computer vision tools designed specifically for growers.

Originally from a data science and engineering background, Annie made the shift into horticulture through tech, driven by the opportunity to solve meaningful, real-world problems using AI.

A standout achievement was developing a video-based fruit counting system that reached 90 percent accuracy without GPS data.

"I would say the most rewarding part is to see that direct impact of how AI could address those real challenges in this industry."

Michael Farrar
Research Fellow

Griffith University

Michael is a Research Fellow at Griffith University, specialising in biochar-based fertilisers and hyperspectral imaging – a technology that can assess soil and crop quality without damaging the produce. His work helps optimise food production while improving sustainability across horticulture.

Michael's career began in medical science but took a turn after eight years working in music and prison education. A chance suggestion from a ginger farmer led him to run an organic farm, which reignited his passion for agricultural science.

Now, he works closely with growers and industry stakeholders, testing new tech on macadamias, avocados, ginger and more.

"Many jobs that will be essential in the future don't even exist yet, so staying adaptable and identifying opportunities early on is vital."

Vanessa Russo
IP & Sustainability Manager

Montague Farms

Vanessa wears two hats at Montague Farms: she manages licenses for exclusive fruit varieties and leads the company's sustainability initiatives. From tracking packaging data under APCO to preparing for upcoming climate reporting requirements, her work supports long-term environmental goals.

Vanessa's journey into horticulture began with a part-time admin job while studying nutrition—ten years later, she's shaping change across the business. She helped launch Montague Farms' first sustainability committee and continues to drive cross-team collaboration.

"I think being in horticulture, we think of it as being quite sustainable because we are growing plants—but then there's a lot of other aspects that need to be considered."

Ruby Daly
Business Development Manager
Daly Farms and Hellfire Bluff Distillery

"I was never coming home to the farm for potatoes," says Ruby Daly, who now helps run one of Tasmania's most recognisable paddock-to-bottle businesses. After starting in the beauty industry, Ruby returned home to help build Hellfire Bluff Distillery from the ground up. "I've been here for nearly 10 years now."

She finds her work deeply fulfilling. ***"When you have a win, you have a really big win... I think it's important that we keep pushing this industry forward for the next generation."***

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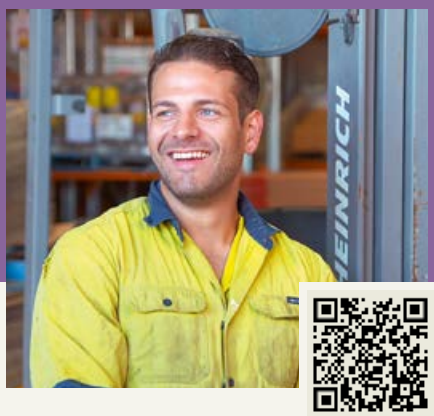


Antonio Fragnito
Maintenance Supervisor
Zerella Fresh

Antonio keeps things running at Zerella Fresh, where he leads a team responsible for maintaining and fabricating the complex packing machinery used to process potatoes, onions and carrots. His work spans everything from break-fix repairs to full production line builds, with a growing focus on automation and technology.

Antonio began his career as an apprentice boilermaker before moving on-site to lead major infrastructure upgrades. He believes trades are a powerful way into the industry and into a rewarding rural lifestyle.

"It's the happiest I've ever been."

Jason Hsu & Ashley Zhang
Forklift Driver & Warehouse Packer
Premium Fresh

Jason and Ashley came to Australia from Taiwan on working holiday visas, with no prior experience in horticulture. They started out on a berry farm before moving to Premium Fresh in Tasmania, where the work was more consistent year-round. Jason now drives a forklift, while Ashley works on the packing line, grading onions and running the pre-pack machines.

They've both grown in skill and confidence, and made lasting friendships along the way.

"You can make a lot of different friends, and you can learn a lot of different things."

Growing a Career in Horticulture: a tool for awareness and action

The *Growing a Career in Horticulture* project showcases the many exciting and essential roles that power our industry – from sustainability and robotics to research, logistics and export. The booklet offers a snapshot of what modern horticulture looks like today: high-tech, innovative and full of opportunity.

But it is just the beginning

To extend its reach, a digital platform has been launched at: growingacareerinhort.com.au. Created with students in mind, the website features extended video interviews, a career quiz, a searchable role library and downloadable resources, making it easier for schools and career professionals to bring horticulture into the conversation.

At the same time, this resource is designed for the entire supply chain. Whether you are a grower, industry organisation, government agency, training provider or school, we want you to have it on hand when you are speaking with young people about their futures. Take it to a classroom, bring it to a careers expo, or keep a few copies ready for that next conversation. The earlier we reach students, the better chance we have of growing our next generation of skilled and passionate professionals.

This project was developed in response to a real and urgent need: to future-proof the horticulture workforce by making the industry visible and viable to new generations. However, awareness alone is not enough. We also need action – stronger school-industry connections, clearer career pathways, and a louder voice to tell the story of who we are.

Workforce attraction is not a one-off task. It is a shared, ongoing responsibility and one this project hopes to support.

Order your copies

If you would like to order physical copies of the *Growing a Career in Horticulture* booklet for your business, local school, TAFE, careers event or office, scan the QR code or visit forms.gle/PCJEraJERXpYArMC6. Booklets are free and can be shipped anywhere in Australia.

"Take a look at it and don't just dismiss it as a farmer's job...there's so many opportunities to grow and to be a part of a business that you may never have thought of." RUBY DALY

Help us rewrite the story

Horticulture does not always get the airtime it deserves, but the story we tell about our industry matters. It shapes who sees themselves in it. It influences who applies, who stays, and who leads us into the future.

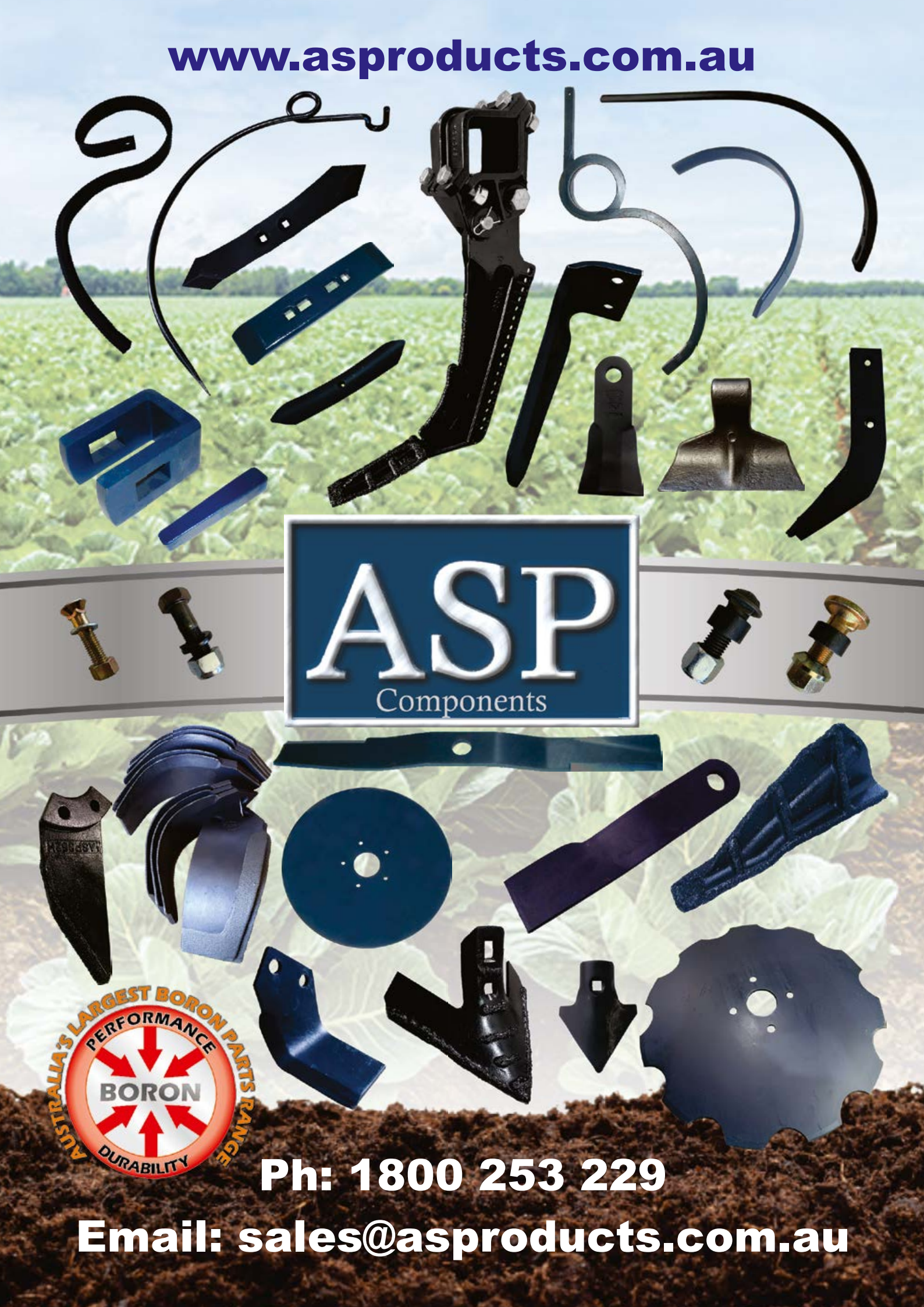
With more than 40 real people sharing their journeys and tools designed to back it up, Growing a Career in Horticulture is one of the strongest steps we have taken in reframing the industry for the next generation.

So let us use it. Share it. Build on it. And keep showing the world that this is not just a job – it is a future.

Growing a Career in Horticulture Version 2 has been produced with support from Hort Innovation.
Project: VG24009

Hort Innovation VEGETABLE FUND

www.asproducts.com.au



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The Skye's the limit for smart nutrient management

DEMO SITE FARM WALK

BY DIMI KYRIAKOU, RMCG

Improving nutrient management, soil nitrogen cycling and organic matter retention has been the focus of a Soil Wealth ICP trial site running at Skye in Victoria over the past few years.

Cover crops, nutrient use efficiency and crop health were the key topics of discussion at the Soil Wealth ICP demonstration site farm walk in Skye, Victoria on Wednesday 7 May.

The event attracted around 20 industry members including local vegetable growers, agronomists and industry to the demonstration site at Butler Market Gardens, which produces spring onions, herbs and a range of Asian vegetables about 50 kilometres south-east of Melbourne.

The site is dominated by sandy loam soils which – as a result of the intensive cropping regime typical for market gardens – are generally lacking in organic matter and overall soil health and structure.

The Soil Wealth ICP team has been working with Butler Market Gardens owner Rick Butler and operations manager Dale Creed to trial ways to effectively manage nutrients at the site and improve soil nitrogen cycling and organic matter retention. This has included the use of nitrogen-fixing cover crops such as legumes, with a view to ultimately reduce the use of synthetic fertilisers on the farm.

The trial is using plant and soil testing as well as in-field monitoring to understand nutrient uptake and balance and reduce nitrogen losses.

Attendees heard insights from Rick and Dale as well as Soil Wealth ICP team members Camilla Humphries and Doris Blaesing, and Bruce Scott from Campbells Fertilisers.

Key takeaways

Dale and Camilla explained the site trialled three cover crops including a mixed legume species (lablab, cowpea, soybean and sun hemp), buckwheat/vetch and sorghum, with the latter producing the highest above ground biomass and nitrogen uptake for recycling to the soil. The level of labile carbon – a food source for microorganisms and a key indicator of soil health – was demonstrated with a quick in-field test which showed a significant improvement in the trial area which housed the sorghum cover crop and is now growing a cash crop.

Doris explained that cover crops have been a key focus for the Soil Wealth ICP project since its inception and has been informed by many lessons learnt along the way, particularly through demonstration sites.

Cover crops can also outcompete weeds and can help improve soil organic matter and soil structure, protecting the cropping beds from erosion.

"If you're looking to start with a cover crop, keep it simple, see what works in your system and learn from your mistakes. The benefits of cover crops are huge, and in an intensive rotation like a market garden, the benefits pay for themselves," Doris said.

As soil-borne diseases such as *Pythium*, *Rhizoctonia* and *Fusarium* are common in market gardens, biofumigant cover crops such as mustards can be planted instead of using chemical fumigation. When the seeds are macerated, they release isothiocyanate compounds which produce a biocidal effect, similar to that of metham sodium which is toxic to fungal and bacterial pathogens.

Cover crops can also outcompete weeds and can help improve soil organic matter and soil structure, protecting the cropping beds from erosion. Cover crops are a good alternative to leaving paddocks in fallow as they help to improve soil biological processes by increasing the amount of labile carbon, providing an energy source for microorganisms to cycle plant available nutrients.

Dale added that Butler Market Gardens invested in a 'spider seeder' to help identify the main causes for poor crop germination in wet weather, and if it is due to the presence of pathogens in the soil or the planting equipment.

Finally, Bruce provided an overview of the role of different nutrients in vegetable production, particularly nitrogen, potassium and calcium. He highlighted the importance of understanding the soils you are working with and the context of open field versus protected cropping, as well as the application and type of fertilisers available.

Bruce reiterated the importance of knowing your base level of nutrients for effective monitoring through soil and plant testing and focusing on increasing organic matter in the plant rootzone to improve nutrient uptake.

Finally, Bruce explained how controlled release fertilisers can help make plant essential nutrients available throughout the crop cycle and that polymer-coated fertilisers can be used to protect nutrients from being lost either through leaching below the rootzone or volatilised as nitrous oxide into the atmosphere. The non-plastic polymer coating technology turns into a gel once wetted, allowing for the slow release of nutrients and is biodegradable.

"We need to be smarter at managing cover crops, nutrients and fertilisers," Bruce said.

What resonated with participants?

Attendees shared the following topics of interest from the farm walk as well as areas they will investigate further:

- Investigating labile carbon testing and soil-borne disease testing
- Increasing organic matter in soils
- Looking at cover crop options and 'having a go'
- Understanding how cover crops assist vegetable production
- Advisors sharing knowledge with grower clients.

FIND OUT MORE

The *Soil Wealth and Integrated Crop Protection (Soil Wealth ICP)* project provides research and development (R&D) extension and communication services on improved soil management and plant health to the Australian vegetable and melon industries.

You can find out more about the trial results at the Skye demonstration site, and the many other aspects of the Soil Wealth ICP project, at soilwealth.com.au.

You can also hear more from Dale Creed and Camilla Humphries about the trial and the field walk in the video and podcast episodes in the QR codes below.

VIDEO: Improving nitrogen cycling & organic matter at Butler Market Gardens

PODCAST: Lessons from the Soil Wealth ICP Skye trial site.

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

Project: MT22004

Hort Innovation VEGETABLE FUND

Hort Innovation MELON FUND

Exploring soil health and tillage practices

RICHMOND, NSW

BY UMBERTO CALVO AND PAULETTE BAUMGARTL
APPLIED HORTICULTURAL RESEARCH

A collaborative demonstration trial underway at the Local Land Services Riverfarm (Richmond, NSW) is investigating the practicalities of improving soil health through reduced tillage, cover cropping, and innovative transitions between vegetable crops.

Led by the Soil Wealth ICP team in partnership with Local Land Services (LLS), the initiative aims to give growers real-world insights into how they can enhance soil structure and fertility, while reducing the intensity of soil disturbance.

The trial, which began in 2024 and will run until 2026, is testing a wide range of cover crop options and residue management techniques across two demonstration bays.

"Our goal is to help growers reduce their reliance on rotary hoeing and other intensive cultivation practices," Soil Wealth ICP team member (AHR) Umberto Calvo said.

"These practices, while familiar, can contribute to long-term soil degradation and poor structure, especially in flood-prone or heavily worked paddocks."

Inset. Soil Wealth ICP team member Umberto Calvo explaining the trials and showcasing an emerging oats and vetch cover crop at a field day on 17 June 2025.

Hands-on trials for real impact

Designed with input from growers, agronomists and researchers, the trial compares conventional and reduced tillage approaches across a sequence of crops.

Initially, multiple cover crop mixtures – including oats, rye, barley, wheat, vetch and pollinator blends – were planted in autumn to build biomass, protect soil and introduce biological diversity.

After cover crop termination (via slashing and herbicide), the team tested two tillage approaches to plant sweet corn: traditional full rotary hoe versus a strip rotary hoe (ST) technique. Crop emergence, weed pressure, soil structure and residue breakdown were then compared.

"The results have been a little surprising," Umberto said.

"While reduced tillage showed promise in saving on time and costs, suppressing weeds and maintaining residue cover, other results were quite variable."

Corn germination and emergence were inconsistent across both systems, particularly in areas where high-biomass grass species were used, possibly due to allelopathy, nitrogen tie-up, or mechanical issues related to residue handling.

Notably, better results and yields were generally observed where legume cover crops had been used, suggesting they may offer a more favourable pathway into corn for this region.

Learning by doing – adapting to challenges

Soil biology and fertility are key focus areas for the trial, with the team using soil testing to assess nutrient levels before and after each cropping phase. Adjustments, such as targeted fertiliser applications and the potential use of lime, are being trialled as needed.

Several challenges emerged early on. In addition to the poor corn emergence, seed quality, hard pans in the soil, and equipment compatibility needed to be addressed.

"It's all about giving growers confidence to try new approaches that build healthier, more resilient soils."

However, these hurdles sparked valuable discussion among the team and the broader grower community, fuelling iterative improvements and helping to refine the approach.

One particularly promising innovation is the use of the strip rotary hoe, a relatively accessible tool that many growers already own or can easily modify. Taking out all but two blades and running it in narrow bands rather than across the whole bed disturbs only a small portion of the soil, retaining surface residues and protecting soil biology. While it doesn't fully eliminate compaction or replace deep ripping in hard pan conditions, it represents a practical step toward more sustainable soil management.

Next crop: brassicas and beyond

As the trial progresses, the next phase involves transitioning from corn to brassicas, with buckwheat sown as a bridging cover crop. When initial attempts to establish buckwheat struggled due to seed viability, extreme weather events and weed competition, the team missed a useful window to plant the warm season cover crop.

The team therefore decided to trial a cold-season grass and legume cover crop (oats and vetch) and terminate it before planting brassicas in winter. In addition to comparing soil and crop performance across tillage treatments, future phases will examine how cover crop residues influence pest pressure, water retention, and soil structure in the following vegetable crop. The addition of beneficial insect-attracting floral strips is also under consideration.

Engaging with growers: field days and knowledge sharing

Central to the project is its focus on grower engagement. Two field days (December 2024 and June 2025) provided key opportunities to showcase findings and gather feedback.

At the most recent event, Soil Wealth ICP team members Isabella Ellmers and Umberto Calvo from AHR were on hand to guide growers through the trials and discuss the soil improvements, answer questions, and share practical tips for implementing similar practices on-farm.

"It's all about giving growers confidence to try new approaches that build healthier, more resilient soils," Isabella said.

Additional information on the Richmond demonstration site can be found at soilwealth.com.au.

A young vetch plant showing nitrogen-fixing nodules on its root system and soil particles sticking to the roots – a good sign of biological activity and soil health

FIND OUT MORE

The *Soil Wealth and Integrated Crop Protection (Soil Wealth ICP)* project provides research and development (R&D) extension and communication services on improved soil management and plant health to the Australian vegetable and melon industries.

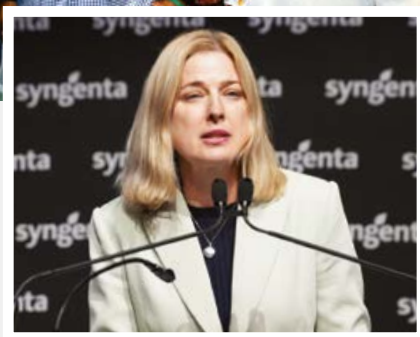
For further information, contact project leaders Dr Gordon Rogers at gordon@ahr.com.au and Carl Larsen at carll@rmcg.com.au.

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

Project: MT22004

Hort Innovation VEGETABLE FUND

Hort Innovation MELON FUND



Syngenta's strong roots in Hort Connections blossoms in 2025

Amid the bright lights and loud signs at Hort Connections 2025, in the Brisbane Convention and Exhibition Centre, stood a tree bearing the symbolism of a big move for Syngenta. The tree was located within the Syngenta Networking Lounge, where guests sipped complimentary barista-made coffee and excitedly discussed the future of horticulture. Much of this excitement stemmed from the global innovation VERTENTO® insecticide, powered by PLINAZOLIN® technology.

"The tree represented our latest innovation in crop protection" advised Portfolio Lead, Scott Mathew. "VERTENTO® insecticide was recently registered for the control of key pests in almonds, avocados, citrus, macadamias, mangoes and papaya. For most of these crops, it is the first new mode of action in over a decade and presents growers with a real break-through in control, residual protection and value."

VERTENTO® was also the focus of the Syngenta concourse display featuring a trailer designed to support application excellence, something that numerous orchardists have huddled around in recent months at various farms from Griffith to the Burdekin and various stops in between.

For Hort Connections, the trailer helped reveal what makes the novel mode of action so effective, the molecular view made tangible through a captivating animation. The VERTENTO® trailer also featured a bug dormitory, containing multiple generations of fruit spotting bugs hiding within the host plants. This formed a mini-challenge for visitors to 'count the bugs' for a chance to win one of two RM Williams gift cards, each valued at $600. A little fun, helping put fruit spotting bug under the microscope, with the confidence of a new control option for advisors.

"Fruit spotting bugs are notoriously hard to find as they like to hide under leaves, but the damage they can cause to marketable produce and yield cannot be overstated," said Mr Mathew. "Demonstrating this through our competition really brought the challenge tree crop growers are facing every day to a reality."

Winners of the competition included Jane Harris and Lachlan Donovan, who each received a $600 RM Williams voucher.

One of the key events is always the Syngenta Networking Event where the finalists of the Grower of the Year award are recognised for their contribution to horticulture.

"Each of the finalists has an extraordinary story of innovation, resilience and hard-work. We are always honoured to be associated with every finalist and enjoy the anticipation of waiting for the Gala Dinner when the Syngenta Grower of the Year is announced" said Mr Mathew.

A special feature for this year's Networking Event was the presence of Federal Minister for Agriculture, The Hon. Julie Collins who used the event to announce several areas of funding support for horticulture. Most importantly these included a commitment to provide $1.5 million over three years in support of Hort Connections.

The highlight of the event is always the Gala Dinner and the Syngenta Grower of the Year award, which this year was presented to Jeremy Haw of Hussey & Co. Celebrating 50 years, Hussey & Co, led by Jeremy Haw, is a top Australian grower, processor, and distributor of premium baby salad leaves. With a nationwide, vertically integrated presence, it supplies major retailers and exports to seven countries. Innovative processing enhances food safety and quality, while precision agriculture cuts waste. A solar farm offsets all energy use, demonstrating their sustainability commitment. Jeremy's focus on excellence, employee growth, and industry impact establishes Hussey & Co as a leader in its field.

As lead strategic sponsor of Hort Connections, Syngenta was proud to see the 3,500 delegates enjoy this year's event. Syngenta will in 2026 mark the 20th anniversary of this sponsorship.

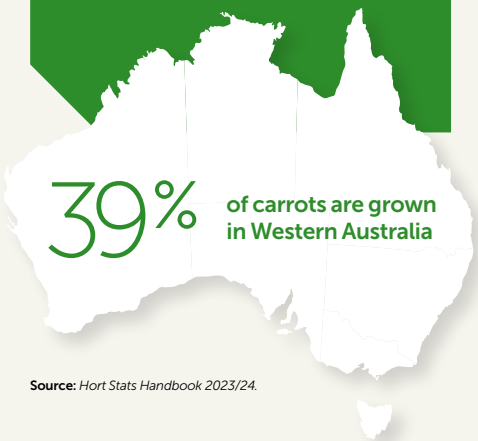
Above L–R. Syngenta ANZ Country Manager, David Van Ryswyk with Thursday competition winners, Jane and Paul Harris of Myrtle Park Produce at the Syngenta Networking Lounge. The Syngenta Networking Event in the Sky Room at BCEC where guests enjoyed canapes and drinks against the Brisbane skyline. **Inset.** Federal Minister The Hon. Julie Collins at the Syngenta Networking Event announcing a range of Federal-funded initiatives for horticulture.

FIND OUT MORE
For more information, please contact your local Syngenta representative or visit **Syngenta.com.au**

COMMODITY PROFILE

Carrots

The latest edition of the Handbook was release in February 2025, unpacking the carrots sector performance during the financial year of 2023/24.



Source: *Hort Stats Handbook 2023/24.*

91% Australian households
Purchased carrots

Source: *Hort Stats Handbook 2023/24.*

7.3kg Annual
per capita consumption

Source: *Hort Stats Handbook 2023/24.*

The *Australian Horticulture Statistics Handbook 2021-22 to 2023-24* project has been funded by Hort Innovation using multi-industry research and development levies and funds from the Australian Government.
Project: MT21006

The *Harvest to home Consumer Behavioural Retail Data* project has been funded by Hort Innovation using multi-industry research and development levies and contributions from the Australian Government.
Project: MT21004

Hort Innovation VEGETABLE FUND

Plus One Serve by 2030

BY MICHELLE LAUSEN
PROGRAM MANAGER, PLUS ONE SERVE BY 2030

A national effort to grow vegetable demand and a healthier Australia

Australia is in the midst of a vegetable consumption crisis – and the vegetable industry is stepping up with a bold, collaborative solution. Backed by new research, cross-sector engagement, and a shared sense of urgency, the Plus One Serve by 2030 program aims to add one more serve of vegetables to every Australian's plate, every day, by the end of the decade.

It's a clear and achievable goal – but one that requires national action and industry alignment to succeed.

Co-funded by Hort Innovation and industry levies, *Plus One Serve by 2030* is the most ambitious vegetable demand creation initiative ever undertaken in Australia. Led by AUSVEG and supported by research, health, retail, and education partners across the country, the program is grounded in the principle that increasing vegetable consumption is good for everyone – from public health to household budgets, to vegetable growers' bottom lines.

This article provides an overview of the program's purpose, the critical evidence base behind it, and what it means for vegetable growers in every region of Australia.

Why we need a national shift

Australians are not eating enough vegetables. In fact, according to updated baseline modelling completed in 2024, we're consuming just 1.8 serves per person per day on average – well short of the recommended five daily serves.

This low intake has major consequences: poor health outcomes, rising chronic disease, and a shrinking domestic market for vegetable producers. At the same time, growers face ongoing pressure from rising input costs, weather extremes, and market volatility. A coordinated demand-side response is not just timely – it's essential.

In 2022, the Fruit & Vegetable Consortium's *Shifting the Dial* report made the case for a national strategy to increase vegetable intake. It called for a cross-sector response similar to other successful public health efforts, such as anti-smoking campaigns or water conservation programs. From this recommendation, *Plus One Serve by 2030* was born.

Building the foundation: strategy, baseline, and evidence

Before any interventions could be designed, robust groundwork was needed. In mid-2024, AUSVEG, together with partners CSIRO, Corporate Value Associates (CVA), AgEcon, and over 40 industry collaborators, delivered the *Plus One Serve National Strategy and Baseline Report* – a foundational body of work that now guides the entire initiative.

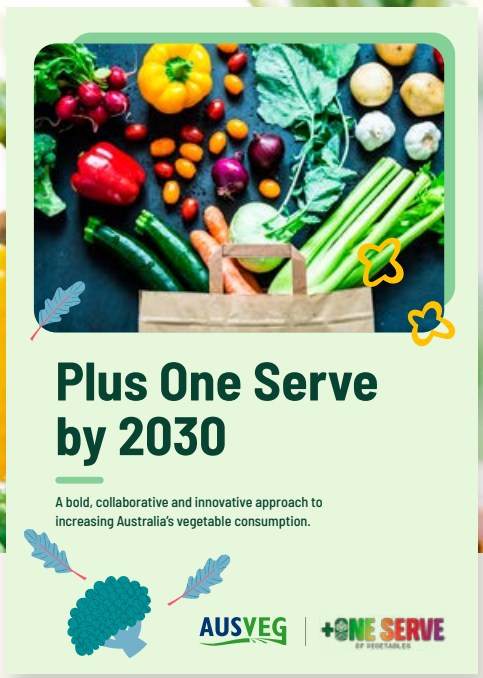
The report delivered several key outcomes:

- **A new national baseline:** by integrating production, sales, and household food waste data, the report confirmed that average vegetable consumption is actually lower than previously estimated – just 1.8 serves per day, not 2.4.
- **Behavioural intervention framework:** drawing on global best practice and behavioural science, the team developed a framework for targeted, evidence-based intervention across five priority settings – home, retail, early learning, primary and secondary education.
- **Economic modelling:** If Australia achieves an extra serve per person per day by 2030, it would result in a $1.38 billion reduction in healthcare costs, a $3.3 billion uplift to the vegetable supply chain, and create over 12,800 new jobs, mostly in production regions. For every $1 invested, there's an estimated $12.30 return.

This rigorous body of work is already guiding program actions – and giving growers and partners confidence in the strategy ahead.

What will the program do?

Plus One Serve by 2030 is a six-year national R&D and demand creation program with a focus on scalable, practical interventions that meet Australians where they are. Rather than launching a single campaign, the program is structured as a platform to test, invest in, and scale what works – using a settings-based approach.



Scan the QR code above to view the *Plus One Serve National Strategy and Baseline Report*.

The Priority Settings

1. **Retail:** with 82 percent of vegetables purchased via supermarkets, greengrocers, and markets, the retail setting is a powerful access point. *A Retail Setting Action Plan* was developed in early 2025 to co-design shopper-led interventions like per-serve pricing, product placement, bundle offers, and digital nudges to make vegetables easier and more appealing to buy.
2. **Home:** consumption happens at home. Interventions here focus on helping Australians build long-term habits – such as cook-at-home meal kits, waste reduction tools, convenience packs, and education through influencers or digital content.
3. **Education:** reaching children early, across all stages of education, is key to building lifelong healthy eating habits. In-school interventions include curriculum-linked programs, kitchen garden initiatives, school canteen improvements, and parent engagement.

Each setting will be underpinned by co-designed projects, industry partnerships, and shared measurement.

A whole-of-system approach

What sets Plus One Serve apart is its collaborative, whole-of-system approach. The program is not driven by the government alone or limited to retail marketing. Instead, it unites a diverse group of partners under one shared goal – each playing their part in shifting behaviour and strengthening the supply chain.

Supporting the Plus One Serve program is a growing network of vegetable ecosystem collaborators, including:

- **National Research Network:** bringing together Australia's top nutrition, behavioural science, and public health experts to guide interventions and evaluate outcomes.
- **Vegetable Consumption Collective (VCC):** a community of practice involving health NGOs, government departments, grower organisations, and community groups sharing tools, knowledge, and coordination.
- **Retail and Industry Partners:** retailers, supply chain operators, and food service businesses are critical implementation partners – working pre-competitively to trial and scale solutions.

Program governance: united leadership, shared accountability

A program of this scale and national importance requires strong governance and aligned leadership across sectors. That's where the National Program Steering Committee (NPSC) plays a vital role.

The NPSC provides high-level strategic oversight and expert guidance to ensure *Plus One Serve by 2030* stays on track, focused, and grounded in evidence.

It provides external oversight of the program's direction, risks, scope, timeline, and methodology – ensuring transparency, accountability, and sector alignment at every step.

Chaired by AUSVEG CEO Michael Coote, the NPSC brings together senior leaders from across the agricultural, health, retail, education, and research communities, including:

- Hort Innovation
- Premier Fresh Australia/IFPA (International Fresh Produce Association)
- Woolworths
- Coles
- Simplot
- Rugby Farm
- Kalfresh
- CSIRO
- Flinders University
- Australian Catholic University (ACU).

This multi-sector committee meets quarterly to review progress, manage risks, and steer the direction of the national program. Their collective knowledge ensures the program's workplan reflects real-world conditions and delivers shared value across health, industry, and society.

> "Historically low vegetable consumption is not just a health concern, it threatens the long-term viability of Australia's vegetable industry," says Mr Coote.

Key responsibilities of the NPSC include:

- Providing strategic advice and cross-sector expertise to align and strengthen the program
- Endorsing annual workplans, including stop-go decisions and co-designed R&D priorities
- Championing and amplifying the program's goals across their respective industries
- Advising on risk management, operational delivery, and potential program scope changes
- Recommending new evidence-based R&D projects to Hort Innovation for funding consideration.

"We're not just selling a product – we're shaping a national habit," says Mr Coote. "Plus One Serve is about building lifelong demand for vegetables, and every grower has a stake in that future."

By bringing together the right minds around one table, the NPSC ensures that *Plus One Serve by 2030* is guided by expert input, collaborative decision-making, and a commitment to outcomes that benefit all Australians – and the vegetable industry that feeds them.

This model of governance is designed to evolve with the program – allowing new voices, sectors, and innovations to join as momentum builds and interventions are scaled.

What this means for growers

For vegetable growers across Australia, *Plus One Serve by 2030* represents a long-term commitment to building domestic demand.

Historically, industry efforts have focused on generic health messaging. This program moves beyond that – focusing instead on interventions that *change real behaviour* and improve the shopper and consumer experience.

Here's how growers stand to benefit:

- **Demand uplift across categories:** the program aims to lift volume across fresh, frozen, and canned formats – not just single hero vegetables
- **Improved category positioning:** with strategies like value-based pricing and better product placement, vegetables will compete more effectively against less nutritious convenience foods
- **More resilient consumption patterns:** by embedding habits in schools, homes, and services, the program fosters long-term behavioural change – not one-off spikes
- **Research and data access:** growers and grower groups will have access to new data, evaluation results, and co-design opportunities to ensure the strategies reflect on-ground realities
- **A platform for policy advocacy:** a national, evidence-backed program provides a strong basis for government investment and health sector alignment.

Most importantly, this is an industry-led solution – designed with and for the people who grow vegetables in every corner of the country.

What's next?

The next 12 months of Plus One Serve will focus on moving from strategy to action. Key priorities include:

- Finalising and launching the Retail Setting Action Plan, with pilot projects in partnership with retailers
- Advancing the Home Setting Action Plan
- Expanding the National Research Network to cover all five settings and priority cohorts
- Strengthening state and community engagement through the Vegetable Consumption Collective
- Establishing baseline and ongoing measurement tools, including consumer tracking and M&E dashboards
- Securing co-investment partners and enabling test-and-learn pilots that can scale.

Get involved

The success of Plus One Serve depends on partnership. Whether you're a grower, a processor, a wholesaler, or a manufacturer – your insights and involvement matter.

There are many ways to get involved:

- Participate in co-design workshops or R&D projects
- Advocate for the program through your networks and industry bodies
- Share your voice and feedback to help shape future actions
- Support retailers, educators, and health partners in delivering real change.

Together, we can grow not just vegetables, but a stronger, healthier, and more sustainable Australia.

MORE INFORMATION

For more information or to connect with the program team, visit plusoneserve.com.au or contact info@plusoneserve.com.au.

This project has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.
Project: VG23016

Hort Innovation VEGETABLE FUND

Meet the Plus One Serve Program Team

Justine Coates
Managing Director

Justine is dedicated to building sustainable futures for human and planetary health. With expertise in agriculture, food, health, and funding models, she drives investment and consumer demand strategies to deliver a triple-bottom-line of benefits.

Michelle Lausen
Program Manager

Michelle drives collaborative action across the diverse vegetable ecosystem including vegetable growers and supply chain, researchers, government, and the health sector to develop impactful strategies to increase national consumption.

Keira Doyle
Brand Manager

Keira is an experienced Brand Manager with a health background, driving brand and digital strategy for the Plus One Serve program. She combines creative insight, consumer understanding, and a passion for health to deliver campaigns that drive awareness and engagement.

Quality is the key for WA family farm

Producing quality fruit and vegetables to supply high end Western Australian markets is the major focus of the Canzirri family enterprise, located at Carabooda, north of Perth.

Leo Canzirri said they work 120 acres of irrigated land growing iceberg and cos lettuce and celery all year round, watermelon through the summer and cauliflower, cabbage and broccoli through the winter.

"For us quality is everything," he said. "We don't supply processors and try to stay out of the bottom end of the market -we try to produce the best quality of everything. We're supplying the top shops and stores who want the best produce and that's where we think we fit."

The focus on quality can be quite demanding with crops experiencing a range of challenging weather events.

Perth started 2025 with temperatures reaching 40°C and Mr Canzarri said they needed to have the irrigation and fertigation correct to maintain quality.

Growing in an outdoor environment brings other issues also, including dealing with disease in the melon and lettuce crops.

"We're only about five kilometres from the coast. Powdery mildew in melons seems to pop up every year. Sclerotinia in the leaf lines is always around and hard to control. We do try to keep good rotations, but it still pops up."

He said disease was always a challenge, particularly after a harsh weather event – and they implemented a preventative fungicide program to try to keep on top of it.

Powdery mildew is one disease that has been of great concern, with the existing range of chemistry utilised in the program coming under resistance pressure, which required them to look at new options.

"We were having trouble with Powdery mildew in melons," Mr Canzirri said. "We were speaking to the resellers asking if there was any new chemistry coming through that we could get on early and use it in rotation with our other ones."

"I heard about Verpixo® through Brad Giles at Muirs and was keen to give it a go."

Verpixo® Adavelt® active is a new Group 21 fungicide from Corteva Agriscience designed to protect melons and other cucurbit crops from damaging diseases such as Powdery Mildew and Gummy stem blight. "We got onto the Verpixo and it did a great job. I noticed a difference within the first couple of weeks," Mr Canzirri said. "It was added to our program because we were struggling to control the Powdery so I just brought it into the rotation with the other ones and it went well.

"We were seeing Powdery on the leaves or foliage, and even on the fruit. After spraying Verpixo, the Powdery dried up which was really good. To see something work like that is rare."

He said melons were a relatively short season crop, so Verpixo was applied early to give the crop the best possible start. Other chemistries were then rotated through the season.

Verpixo is designed as a protectant fungicide and should be applied prior to disease infection or when conditions favour disease development.

It was able to stop disease development in the melons on the Canzirri farm and has now become an integral part of the program.

Mr Canzirri said they would also look to use Verpixo to control sclerotinia in their iceberg and cos lettuce crops.

"Sclerotinia in lettuce is very hard to control," he said. "It's a short cycle crop and you only have a few weeks. I haven't done a lot with Verpixo in the leaf lines, but I'll be looking forward to doing that in the winter.

Above. Quality produce is the major goal for Angelo, Will and Leo Canzirri, of Carabooda, WA. Verpixo Adavelt active fungicide is helping achieve that goal.

FOR MORE INFORMATION
Visit corteva.com.au

Cover crops to reduce root-knot nematode populations

BY WAYNE O'NEILL, QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

Damage and yield losses from root-knot nematodes can be minimised by reducing populations to the lowest levels possible prior to planting vegetable crops. This can be achieved in several ways, such as pre-plant nematicides/fumigants, bare fallows and resistant cover crops.

Root-knot nematodes are obligate parasites, which means that they require a susceptible plant host to survive and reproduce. By growing a cover crop that is not a host to root-knot nematodes they will starve, and populations will be greatly reduced. A clean bare fallow (no weeds or volunteer plants) will have the same effect but may be detrimental to soil health and has a higher risk of topsoil loss from erosion.

There are several types of cover cropping:

- **Alternative cash crop** – a commercially grown cover crop different to the main vegetable crops grown by the business, usually off season.
- **Rotation crop** – grown for pest/disease suppression and other benefits, but not as a cash crop.
- **Mixed cropping/companion planting** – not commonly practiced in Australia, but common in intensive smallholder cropping in other parts of the world.
- Cover crops have many benefits, as well as some costs, which will be described below.

Benefits of cover crops

- **Improved microbial diversity.** Bare fallows provide harsh conditions for beneficial microbes (as well as pathogens), which leads to a decrease in the abundance and diversity of the good guys in your soil. Growing a cover crop allows beneficial microbes to persist from crop to crop, and different root exudates produced by differing plants encourages a diversity of soil microorganisms. A diversity of soil microbes makes for a resilient soil.

Above L-R. A vigorous sunn hemp cover crop in a sweetpotato field. A glasshouse screening experiment of cover crops.

- **Increased soil organic matter/carbon.** Cover crop residues boost organic carbon levels, which influences many soil properties. Soil carbon also helps fuel beneficial microbes, including nematode competitors, predators and parasites, which occur naturally in most soils. Increasing the populations of these beneficial microbes in the soil further helps to suppress plant-parasitic nematodes.
- **Nutrition benefits.** Cover crops also assist with nutrient recycling and help to reduce leaching/loss of nutrients. As well as carbon, residues from cover crops contain nitrogen, phosphorus and other valuable nutrients. Legume cover crops can also contribute significant amounts of N through nitrogen fixation.
- **Physical soil benefits.** Growing cover crops can improve soil physical characteristics due to the presence of the plants themselves, the increase in soil organic matter, and the associated boost in soil organisms. Improved soil structure/aggregate stability, increased water infiltration, and improved drainage are some of the potential gains in soil physical properties.
- **Weed suppression.** Having a wide host range is part of the root-knot nematode survival strategy. A vigorous, nematode resistant cover crop (like certain forage sorghum varieties) will help suppress weeds that may allow nematodes to carry over between seasons. Cover crops not only suppress and compete with one generation of weeds, but often a second and third weed germination dies out when seedlings emerge and receive no sunlight for photosynthesis.
- **Erosion control.** This is particularly important in regions where more frequent, intense rainfall events are being experienced. A field protected by a cover crop is far less likely to suffer soil losses from rainfall events compared with a bare paddock.

Disadvantages of cover crops

- **Planting and maintenance costs.** These can be quite expensive for cover crops, especially due to the high cost of seed. For large scale use of cover crops a precision no-till planter (to allow planting into moisture and accurate use of seed) is beneficial.
- **Potential water usage/cost.** If you are going to grow a cover crop it needs to be done well to reap all of the benefits outlined above. A poorly established, struggling cover crop can become a weed hosting area, and may cause more harm than good.
- **Managing crop residues.** Spraying-out or tilling-in crops, dealing with residues, potentially extra work for bed preparation.

Growers may aim to minimise costs/work associated with cover crops as much as possible, but should try to keep in mind long term benefits and savings.

Hort Innovation-funded projects in sweetpotato and vegetables have been screening cover crops to test for root-knot nematode resistance. Since 2018, The Queensland Department of Primary Industries (QDPI) has tested over 120 different cover crops against two or more RKN species.

TABLE 1. COVER CROPS WITH GOOD LEVELS OF RESISTANCE AGAINST TWO OR MORE RKN SPECIES

Common name	Crop species	Cultivar	Species of *Meloidogyne*		
			M. Enterolobii	*M. Incognita*	*M. Javanica*
oats (forage)	*Avena sativa*	Austin	Highly Resistant	Highly Resistant	Slightly Susceptible
oats (forage)	*Avena sativa*	Bond	Highly Resistant	Slightly Susceptible	Highly Resistant
oats (forage)	*Avena sativa*	Brunswick	Highly Resistant	Slightly Susceptible	Highly Resistant
oats (forage/grain)	*Avena sativa*	Swan	Highly Resistant	Highly Resistant	Highly Resistant
oats (grain)	*Avena sativa*	Williams	Highly Resistant	Resistant	Highly Resistant
peanut*	*Arachis hypogaea*	Alloway	Not Tested	Highly Resistant	Highly Resistant
peanut*	*Arachis hypogaea*	Holt	Highly Resistant	Highly Resistant	Highly Resistant
peanut*	*Arachis hypogaea*	Kairi	Not Tested	Highly Resistant	Highly Resistant
peanut*	*Arachis hypogaea*	Wheeler	Not Tested	Resistant	Highly Resistant
Rhodes grass	*Chloris gayana*	Callide	Highly Resistant	Resistant	Slightly Susceptible
sabi grass	*Urochloa mosambicensis*		Not Tested	Resistant	Highly Resistant
signal grass	*Urochloa decumbens*		Highly Resistant	Highly Resistant	Slightly Susceptible
sorghum (forage)	*Sorghum x Sudan*	Dyna Powa	Not Tested	Highly Resistant	Highly Resistant
sorghum (forage)	*Sudan x Sudan*	Flexigraze	Highly Resistant	Highly Resistant	Resistant
sorghum (forage)	*Sorghum x Sudan*	Jumbo	Highly Resistant	Highly Resistant	Highly Resistant
sunn hemp	*Crotolaria juncea*		Resistant	Resistant	Resistant
sweet smother grass	*Dactyloctenium australe*		Not Tested	Highly Resistant	Highly Resistant

*Note, while peanuts have excellent resistance to several RKN species, they are susceptible to *M. arenaria and M. hapla.*

Cover crops were screened as part of the following Hort Innovation projects:
Integrated pest management of nematodes in sweetpotato (completed). PW17001
Pest management for the Australian sweetpotato industry (current). PW22000
Guava root-knot nematode identification and management (current). VG23007

These projects have been funded by Hort Innovation using the vegetable and sweetpotato research and development levies and contributions from the Australian Government.

Hort Innovation VEGETABLE FUND
Hort Innovation SWEETPOTATO FUND

Guava root-knot nematode (*Meloidogyne enterolobii*, GRKN) was detected in Australia in 2022 and can be particularly damaging to many horticultural crops. This species has been added to the DPI screening program to ensure that cover crops resistant to GRKN are identified and available. Until the detection of GRKN, screening focussed on *M. incognita* and *M. javanica*, which are two of the most significant and widespread RKN pests in Australia. Growers can submit samples to their state nematology laboratory for testing to determine their root-knot species. Testing of cover crops to identify more resistant options for growers is ongoing in the research projects.

Resistance to plant-parasitic nematodes is determined by the capacity of the nematode to multiply on a plant, with high multiplication rates indicating susceptibility and low multiplication rates indicating resistance. QDPI screens cover crops in a glasshouse by inoculating pots with a known number of RKN eggs, growing the plants for a known number of accumulated heat units (to allow nematode reproduction), and then recovering the nematode eggs from the roots to assess reproduction. Egg numbers are counted under a microscope and the reproduction factor is then calculated. Resistance/susceptibility categories are the assigned according to the level of reproduction.

Because cover crop screening is conducted in a glasshouse with only a selection of RKN populations used for screening, there are some limitations. Where possible, cover crops have also been included in project field trials, with results matching expectations based on the glasshouse results.

Growers should assess cover crops locally for agronomic performance and RKN suppression. Availability of cover crop varieties also changes over time, so continued screening is required to assess new varieties, as shown in *Table 1.*

Some other crops may serve as potentially useful rotations but are not as resistant as the ones listed above, and therefore, will be less effective in reducing RKN numbers. For example, soybeans can be a useful legume rotation with cash crop potential, but most varieties are susceptible to RKN. The varieties A6785, Fernside and Kuranda HB1 are some of the better options, with resistance to *M. incognita* but still somewhat susceptible to *M. javanica.*

Caution for mixtures & biofumigants

Commercial cover crop mixtures may contain some RKN resistant crops and some susceptible. It is important to understand exactly what is in a mixture and whether all components are resistant. Unless all varieties in the mix are resistant it will not successfully reduce RKN populations. Custom mixtures of RKN resistant crops to suit your nematode pests and region may be an option.

Biofumigation can successfully reduce soilborne diseases, but many biofumigant crops are susceptible to RKN, so should be used very cautiously for management. In our testing, *Raphanus sativus* cultivars like Terranova radish and Black Jack radish were the best performers, with some resistance to *M. incognita*, but they were moderately susceptible to *M. javanica.*

Root-knot nematodes are one of the most significant pests in the Australian sweetpotato industry and can cost up to 20 percent of the farm gate value in losses. Through Hort Innovation-funded research projects, the industry has supported nematode screening of cover crops as they are considered an integral part of integrated management by many growers.

"My main advice is to keep it simple," said Eric Coleman, of Queensland grower Australian Sweet Potato, who's been involved with QDPI's research projects.

> "Plant a cover crop you know is highly resistant and easy to grow. Mixed species cover crops are a feel-good and can create risks by introducing other diseases and potentially hosting some pathogenic nematodes.

"A single species robust cover crop like forage sorghum is hard to beat, it will endure dry, is vigorous and will outcompete weeds."

In summary, resistant cover crops can be a key strategy in an integrated management program for reducing RKN populations between crops to avoid severe damage and/or yield losses. Cover crops can have numerous other advantages which enhance long-term sustainability and profitability.

Management tactics like cover cropping should be used in conjunction with nematode monitoring, which allows you to understand what nematode pests you have and to keep track of how your management program is going.

Quick wins, long gains

HOW BENCHMARKING CAN BOOST YOUR BUSINESS TODAY

BY STEPHANIE CARSTAIRS, PLANFARM

In a tough and unpredictable market, vegetable and onion growers don't have to wait years to get results—benchmarking can reveal immediate, actionable changes that will improve profitability in the short-term, while laying the foundation for long-term success.

Level Up Hort, a business improvement and benchmarking program funded by Hort Innovation, released its 2024 season benchmarks in June, offers growers a powerful tool to understand their business performance, identify cost pressures, and make informed decisions.

Whether you're a small-scale operator or managing a large enterprise, this article shows how data-driven insights can help you tweak your management practices today, and build a more resilient, profitable business for tomorrow.

Why benchmarking matters

Benchmarking is more than just comparing numbers— it's a business improvement tool. It's about understanding the financial health of your business and identifying the levers that influence productivity and profit. The *Level Up Hort* program provides growers with:

- A clear picture of their business performance relative to peers.
- Annual one-on-one consulting with confidential and personalised financial reports.
- Industry-wide benchmarks to track trends and an industry snapshot.
- Confidential, de-identified data analysis to protect intellectual property.

The process has proved to be valuable for growers, and builds on a previous project in Western Australia.

"The analysis and one-to-one consultation pinpointed the financial strengths and weaknesses of our business and supported us to successfully negotiate better prices. It's now central to ensuring our business remains profitable," said Maureen Dobra of Loose Leaf Lettuce Company, who took part in the previous project.

Key insights from the 2024 benchmarks

The table below outlines the key financial metrics from the 2024 season benchmarks for vegetable and onion producers across Australia.

2024 SEASON KEY VEGETABLE AND ONION PERFORMANCE MEASURES

MEASURE	MOST PROFITABLE	AVERAGE	LEAST PROFITABLE
Vegetable income ($/ha)	$107,412	$61,374	$52,823
Vegetable costs ($/ha)	$90,059	$57,141	$61,345
Vegetable EBIT ($/ha)	$17,353	$4,233	-$8,522
Vegetable EBIT margin (%)	20%	7%	-23%
Labour costs as % vegetable income (%)	35%	36%	51%
Return on assets managed (%)*	8%	2%	-5%

*Return on assets managed, net of liquid assets.

The 2024 season vegetable and onion benchmarks revealed several compelling trends:

- **Profitability isn't necessarily about spending less –** the most profitable businesses often spent more per hectare but achieved significantly higher returns. Their cost allocation was more targeted, especially in areas that directly contributed to income.
- **Crop type doesn't determine profitability –** the better performing businesses were not all one crop type or one location; performance varied within different crop types. This indicated that success was more about management strategy than what was grown.
- **Profitability spans all types of businesses –** high-performing businesses were found across all states, including both low-value and high-value crops, and varied widely in size, scale and intensity. Some were highly mechanised, while others relied more heavily on labour-intensive practices.
- **Labour productivity impacts the bottom line –** businesses that utilised labour more effectively had greater returns. The most profitable businesses spent more per hectare on labour (as a $/ha figure) but their use of labour was more efficient which resulted in more profit per labour unit.
- **Seasonal comparison showed a decline –** a comparison of benchmarks for the group of vegetable and onion businesses who participated in both the 2023 and 2024 season indicated a decline in performance. Margins, on average, fell year-on-year. Although the dataset was relatively small and should be interpreted with caution, the results align with anecdotal feedback from growers, in which a number of businesses reported difficulty turning a profit and expressed concerns about their long-term viability in the industry.

These findings underscore the importance of data-driven decision-making and using year-on-year analysis to guide internal cost management and strategic investment. They also highlight that profitability is achievable across a wide range of business models – what matters most is how well each grower understands and manages their unique cost structure.

What can underperforming businesses do to improve their position?

While it can be difficult to generalise on why some businesses performed better or worse than others, and there will always be exceptions and each business should be assessed on a case-by-case basis, there are some themes that emerge from the benchmarks around the importance of data in vegetable businesses and understanding your individual cost structure, which parts of your business erode profit, and what parts contribute to profit.

A good first step is to know your numbers, start some level of business analysis and identify where to focus your efforts, and what to investigate further. Elements to consider include:

- Knowing and understanding your numbers.
- Focusing on what you ***can*** control within your business.
- Focus on where you can make productivity gains to increase profitability – be that production or labour use.

The more profitable growers:

- Maximise efficiencies within high-cost items – they optimise targeted inputs, maximise saleable yield and packout/quality, and optimise land utilisation.
- Assess, monitor and increase labour use efficiency – labour is by far the largest cost for horticultural producers so effective utilisation of every labour unit in the business counts, including management units. Knowing and understanding your labour cost structure and improving output per labour unit will contribute to profitability.

These findings underscore the importance of data-driven decision-making and using year-on-year analysis to guide internal cost management and strategic investment.

Common themes across growers

From across Australia, growers shared several recurring benefits of being involved in Level Up Hort through published case studies printed in recent editions of *Australian Grower* magazine. They described how the program helped them to better understand their business and guide strategic decision-making.

Strategic clarity: benchmarking helped identify profit drivers and areas that needed attention.

"It sharpened us. We could see where we were making money, where we were breaking even, and patterns emerged. It gave us a 3D view of our business," said West Australian grower David Ellement, who has taken part in the project.

Operational efficiency: comparing practices with top performers lead to smarter resource use.

"Benchmarking gave me a clearer understanding of where my business stood. I could identify areas for improvement and make better decisions," said South Australia grower Kingsley Songer.

Financial performance: better input management and improved productivity per hectare.

"There are some elements that we are doing well in and others that maybe we need to take a sharper look at... There's always places to improve, so it was very valuable," said Victorian grower Chris Schreurs.

Goal setting: annual reviews helped set realistic, measurable objectives.

David Ellement noted that the program helped them analyse every crop in detail, prioritise investments, and set clear goals.

Confidentiality: data is securely handled, ensuring trust and transparency.

Growers consistently valued the confidential, de-identified nature of the data, which allowed them to engage openly and honestly.

Commitment pays off: active engagement yielded deeper insights and better outcomes.

"If you do get involved, you need to be involved. Don't sit on the sideline. The more you put in, the more you get out," David said.

Long-term success: the year-on-year analysis helped create long-term goal setting and targets.

Growers consistently noted that the benefits of participating in Level Up Hort extended well beyond a single season. By tracking performance over time, they were able to make more informed decisions, adapt to changing market conditions, and build businesses that were not only more profitable, but also more resilient and future-ready.

"It's not just about surviving the season—it's about building a business that can thrive year after year," said Queensland grower and project participant Jessica Volker.

"You've got to be prepared for bad news as well as good news, and be open to change." CHRIS SCHREURS.

Final thoughts: turning data into profit

Benchmarking isn't just for large corporations—it's a powerful tool for any grower who wants to understand their business better and make evidence based decisions. Through the *Level Up Hort* program, vegetable and onion businesses have a unique opportunity to access expert guidance, industry data, and business insights – aimed at helping businesses become more profitable, resilient, and future-ready.

Benchmarking might seem daunting at first, especially for growers who've never tried it before, but it doesn't have to be. With the right mindset, it can be a game-changer for your business. Industry benchmarking with an additional consulting service, such as this program, is an opportunity to gain clarity, improve decision-making, and take control of your business performance. Level Up Hort makes it easy to get started, all it takes is making that first call to shift your business trajectory toward greater profitability and long-term success.

Left. Three Ryans use benchmarking to Level Up their business.

Case Study

Click the QR code to hear how WA grower Jake Ryan uses benchmarking to understand and manage costs in his vegetable business and take the guess work out of production costs of and price setting.

HOW TO GET INVOLVED

Participation in Level Up Hort is open to vegetable and onion growers across Australia. The program is fully funded through Hort Innovation until 2028.

To join, growers can complete an expression of interest form at **leveluphort.com.au** or call project manager Steff Carstairs 0428 712 852.

Level Up Hort is funded by Hort Innovation using the vegetable and onion research and development levies together and contributions from the Australian Government

Project: MT22009

Hort Innovation ONION FUND

Hort Innovation VEGETABLE FUND

VEGETABLES

Current projects

HORT INNOVATION VEGETABLE FUND

Hort Innovation conducts a number of R&D projects funded by grower levies. Here is a list of some of the projects currently underway.

Exploring AI Applications for the Vegetable Industry

VG24008

DELIVERY PARTNER: **RMCG**

The objectives of this project are to:

- Identify key opportunities for AI in the vegetable industry by engaging growers and industry representatives in structured workshops. The objective is to brainstorm, evaluate, and prioritise 3–5 high-impact areas where AI solutions can deliver commercial benefits for growers, ensuring alignment with real industry challenges and needs.
- Define the scope for a potential second phase of development and implementation, including possible solution providers, by leveraging consolidated stakeholder insights and prioritisation.

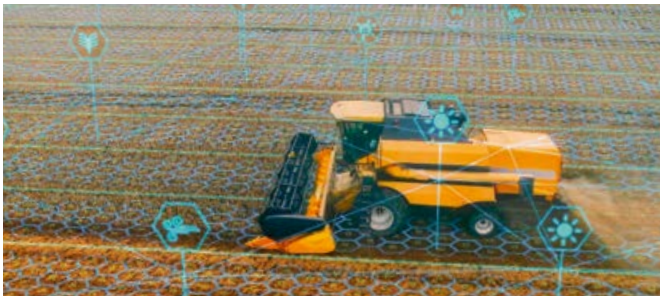
Evaluating mechanical harvest solutions in Australia

VG24006

DELIVERY PARTNER: **DEPARTMENT OF PRIMARY INDUSTRIES QLD**

This project aims to support the Australian vegetable industry in addressing rising labour shortages and costs by accelerating the adoption of mechanical harvesting technologies. It will connect international harvesting equipment manufacturers with Australian growers and agribusinesses to ensure machinery is tailored to local production needs. Through regional field tours, workshops, and direct engagement, the project will showcase the scale and diversity of Australia's vegetable industry, encouraging global investment and collaboration in harvesting innovation.

Key outcomes include the development of a harvesting technology roadmap outlining advancements in machinery, farming system adaptations, and economic scenarios. The project will also produce communication materials such as podcasts, videos, and articles to support informed decision-making and technology adoption. Collaboration with the Western Growers Association will provide Australian growers with a voice in global innovation discussions through participation in an International Automated Harvesting Advisory Committee, fostering long-term partnerships and future R&D opportunities.



Current projects

HORT INNOVATION VEGETABLE FUND

...the in-person seminar will be run concurrently with Hort Connections while also providing access for those unable to attend in-person through digital platforms.

V Plant-based protein for sustainability and healthy aging

VG24004

DELIVERY PARTNER: **DEAKIN UNIVERSITY**

This project is providing robust evidence to support the role of vegetable/plant-based protein diets on muscoskeletal outcomes in older adults and a clear understanding of sensory drivers, barriers and motivators for adoption of vegetable/plant-based protein diets among key stakeholders.

In older Australians, increasing vegetable intake and transitioning towards more vegetable/plant-based protein diets (i.e. protein transition), as aligned with their preferences for sustainable diets, holds significant potential for improving human and environmental health.

Barriers to this transition include the perceived negative impact of vegetable/plant-based protein diets on muscle health and changes in sensory perception of older consumers in the community as well as aged care. Foundational evidence addressing these barriers will increase knowledge, awareness and attitudes towards a sustainable vegetable/plant-based protein transition and drive vegetable demand.

To succeed, the project team will assess:

1. Associations of vegetable/plant-based protein diets on muscoskeletal outcomes in older Australians
2. Sensory, biological, and physiological factors driving satisfaction and consumption of vegetable/plant-based protein diets
3. The efficiency of vegetable/plant-based protein diets on muscle health
4. Barriers and motivators for adoption of vegetable/plant-based protein diets among key stakeholders.

V Annual Vegetable Industry Seminars 2025-2027

VG24003

DELIVERY PARTNER: **AUSVEG**

This project is delivering the Annual Vegetable Industry Seminars from 2025 to 2028 through a combination of in-person events, online webinars and video resources. All activities will be used to highlight outcomes from vegetable grower's levy investments.

As with previous investments, the in-person seminar will be run concurrently with Hort Connections while also providing access for those unable to attend in-person through digital platforms. This ensures the outputs from the project will cater to growers from around the country and from all backgrounds. The seminars and webinars will ultimately assist growers in increasing their profitability and efficiency by highlighting the latest global technology and innovations.

V Optimising capsicum and chilli quality

VG24002

DELIVERY PARTNER: **CENTRAL QUEENSLAND UNIVERSITY (CQU)**

This project aims to improve the quality and marketability of capsicums and chillis by reducing post-harvest losses and consignment rejections due to defects such as internal rot, silvering, and pitting. By working with leading producers across major growing regions, the project will map and monitor supply chain performance, assess fruit quality using digital and traditional methods, and develop best practice recommendations for both production and post-harvest handling. The goal is to increase the volume of blemish-free, high-quality fruit that meets retailer specifications, ultimately improving grower profitability.

Key challenges addressed include managing harvest maturity, fruit structure and composition, and post-harvest cool chain processes. The project will also explore how production and handling techniques affect fruit quality and develop predictive tools for retail outcomes. With support from regional grower groups, the project will take a grower-led approach to research and extension, enabling broader adoption of improved practices that enhance product uniformity, ripening control, and reduce the risk of rejection in commercial supply chains.

CODE

O Onion P Potato V Vegetable M Melon

VEGETABLES

Current projects

FRONTIERS PROGRAM

Hort Innovation Frontiers

V Optimisation of Fungal Bio-control Agent for Varroa Mite

PH24001

DELIVERY PARTNER: **MACQUARIE UNIVERSITY**

This project aims to develop and optimise fungal biological control agents to combat Varroa destructor, a parasitic mite responsible for significant honeybee colony losses worldwide. By creating a sustainable, eco-friendly alternative to chemical treatments, this research supports an Integrated Pest Management (IPM) approach to enhance honeybee health and safeguard global pollination-dependent agriculture.

VOPM Building Capability in Australian Horticulture through Hort Connections

LP24004

DELIVERY PARTNER: **AUSVEG / IFPA**

Building on the proven success of previous years, Hort Connections continues to be a key event in advancing the horticulture industry. The *Building Capability in Australian Horticulture through Hort Connections* initiative will further strengthen the sector, with Hort Innovation committed to deepening its contributions.

Funded through the Hort Frontiers Capability Building Fund, this six-year partnership aims to bring long-term benefits through leadership development, stakeholder collaboration, and fostering innovation - while unlocking new investment opportunities for the industry.

The strategic goal is to position Hort Connections as a central platform for Australian horticulture - where key industry discussions take place, impactful relationships are forged, and sector-wide collaboration is encouraged. The event creates valuable opportunities for growers and stakeholders to exchange insights, share innovations, and shape the future of the industry.

By showcasing grower levy-funded investments in research, development, and marketing, the partnership showcases initiatives that directly enhance industry capability and drive growth.

The event creates valuable opportunities for growers and stakeholders to exchange insights, share innovations, and shape the future of the industry.

VOPM The nutritional advantage of fresh produce: a focus on bioactive nutrients and their role in consumer demand

HN22003

DELIVERY PARTNER: **MACQUARIE UNIVERSITY**

This program is increasing the knowledge and awareness of bioactive compounds derived from plant-based foods across Australia with a major focus on promoting their health and well-being benefits.

The overarching objective is to ensure improved health, productivity, and market access to plant-based products (particularly from fruits, vegetables, nuts, and mushrooms) by Australians and international consumers, catalysed by a better understanding of evidence-based benefits of bioactives, especially among younger adults and children.

The program will develop and implement a comprehensive communication strategy supported by an analytical understanding of the availability and nutritional benefits of different bioactives.

The research team will develop 'Bioactive Master Files' that will include key information about which bioactives are present in which plant-based foods and include a Relative Dietary Intake where appropriate or Nutrient Reference Values for each bioactive.

While essential nutrients in plant-based products have clear definitions with well-established recommended intake levels, complex bioactives present in lower concentrations often lack such definitions and may decrease in effectiveness if consumed after cooking. Generally, society has a poor understanding of the health benefits of plant-based bioactives or their role in the prevention of chronic disease.

CODE

O Onion P Potato V Vegetable M Melon

THIOPRON® Fungicide
Powdery mildew control on tap

Growers looking for an easy-to-use sulphur to protect tomato crops from mites and powdery mildew will have access to an advanced liquid formulation from UPL Australia this season.

Growers looking for an easy-to-use sulphur to protect tomato crops from mites and powdery mildew will have access to an advanced liquid formulation from UPL Australia this season.

New Thiopron® fungicide (825g/L Sulphur) is a SC formulation powered by Xanthane®, a built-in food-grade natural adjuvant. The result? An organically certified product offering excellent rainfastness, greater coverage, and better dispersion for optimum efficacy.

Ian Cass, Head of UPL Marketing and Business Development, said they are excited to announce the registration of Thiopron in Australia for growers.

"This is sulphur like it's never been seen here before," said Mr Cass. "No more handling bags and prolonged mixing. Thiopron is an advanced liquid sulphur formulation that has excellent water dispersion and suspensibility, making it easy to use, store and handle."

Like other leading sulphur products in the UPL stable, Thiopron has small and uniform 1.2 micron sulphur particles, compared to the larger, inconsistent size particles averaging 3 micron in WG sulphurs.

Mr Cass said that the smaller particles provide greater coverage of the crop surface, with less space between particles, which in turn creates a greater defence against powdery mildew. Other benefits include improved contact point on leaves and smooth sublimation.

"The premise of sulphur as a fungicide is based on sublimation - or conversion - of solid sulphur particles on the plant's leaf to a vapour that includes hydrogen sulphide gas," he said. "The vapour is toxic to pathogens and acts as an antisporulant, preventing early infection and disease spread – where disease is already present."

He added that Thiopron has a built-in food-grade surfactant – Xanthane® – which has several benefits.

"The inclusion of Xanthane improves the suspension of sulphur in the liquid, as well as stabilising and maintaining the same concentration of sulphur throughout the liquid.

Thiopron therefore gives both better distribution of sulphur on the surface of the crop and better adhesiveness, compared to a WG sulphur."

"It also means that the sublimation process is slower with Thiopron compared to WG sulphur, ensuring this process occurs gradually and closer to the leaf surface, rather than one 'big explosion'. A smooth sublimation gives greater persistency of the fungicide."

In comparison, WG sulphurs undergo a much faster sublimation, with greater losses to the atmosphere and reduced persistence as a result.

One other key benefit for growers using Thiopron is the improved rainfastness of the Thiopron formulation.

"In lab results Thiopron has been shown to have just over 4.5 times the amount of sulphur deposit remaining on the leaf after 30mm of simulated rain compared to WG formulations," said Mr Cass.

In a zucchini trial in Italy after 30mm of simulated rain, powdery mildew incidence was 1.56% for plants treated with Thiopron, compared to 30.3% for WG sulphur treated plants, and 100% incidence for control plants.

Thiopron is currently registered in Australia for use on tomatoes and grapevines.

"UPL have trialled Thiopron in tomato crops and vineyards across Australia, with great results," added Mr Cass. Thiopron has been used in crops and vineyards in Europe for over 10 years with great success.

UPL is also very happy to have obtained approval for Thiopron as an organic input in Australia.

"We are really excited to introduce this new technology to Australian growers," said Mr Cass. "Thiopron is a superior liquid formulation delivering both performance and ease of use. For some growers the choice may be as simple as 'No more bags!'"

FOR MORE INFORMATION
Visit uplcorp.com/au

onion fund update

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

Hort Innovation ONION FUND

Exploring innovation in the Lockyer Valley

INSIGHTS FROM THE ONION FARM TOUR

...ARA can apply selective or non-selective herbicides, fungicides, insecticides, and biostimulants with pinpoint accuracy.

On June 4, 13 onion growers from across Australia joined the Onion Farm Tour in Queensland's Lockyer Valley.

The tour brought growers face-to-face with new technologies, research, and farming innovations aimed at tackling some of the biggest challenges facing onion production in Australia, including extreme weather conditions, disease pressures, and rising input costs. The tour also provided an opportunity for growers to engage in cross-regional discussions, exchanging insights and approaches to improve production and address shared industry challenges.

The first stop was the Gatton Smart Farm, where growers witnessed the ARA smart sprayer from Ecorobotix in action. ARA is designed to reduce chemical use by up to 95 percent through ultra-precise, plant-by-plant spraying.

By recognising individual onion plants and weeds via an AI-driven camera, ARA can apply selective or non-selective herbicides, fungicides, insecticides, and biostimulants with pinpoint accuracy. ARA has been found to reduce spray drift by 95 percent due to nozzle action being close to the ground and through the presence of protective covers.

For onions, this means:

- **Less crop stress -** where foliage is particularly sensitive to chemical burn, ARAs precision helps reduce phototoxicity, avoid leaf burn and supports healthier tops, critical for bulb sizing and quality.
- **Lower input costs -** savings on chemical usage of up to 96 percent have been recorded, depending on weed pressure and crop growth stage, due to spray algorithms, contributing to more sustainable farming practices.
- **Versatility -** ARA is able to operate day or night and can cover up to 96 hectares every 24 hours ensuring growers can hit key spray windows.

The second stop brought the group into the laboratory at Metagen AU, where the focus turned underground. Metagen's work helps growers assess and boost soil microbial activity, which plays a crucial role in reducing the severity of diseases and improves overall crop health. By testing for beneficial microbes and soil function, growers can tailor nutrition programs, use biological inputs, and make more informed decisions about crop rotations and soil amendments.

The discussions at Metagen highlighted how biologically active soils support stronger root systems and healthier foliage, creating a more resilient farming system.

The Lockyer Valley has faced an increasingly volatile climate in recent seasons. Extended wet periods have delayed on-ground operations, increased canopy humidity, and made it harder for grower to maintain preventative spray schedules. These conditions, followed by rapid drying and high heat has created the perfect storm for a rise in fungal plant pathogens such as Verticillium wilt in potatoes and Stemphylium leaf blight in onions.

At our final stop, Wickham Farms, fourth-generation grower and mechatronic engineer Bryce Lamb discussed with the group how the business is responding to these challenges to stay adaptive and competitive.

After experiencing significant issues with Verticillium wilt in their potato crops, Wickham Farms partnered with the Queensland Department of Primary Industries (QDDPI) to trial biofumigant cover crops, funded by the Department of Environment and Science. Two biofumigant varieties BQ Mulch and Caliente, were planted to assess their ability to suppress *Verticillium dahliae* in the soil.

Soil DNA testing showed that *Verticillium dahliae* inoculum levels dropped to concentrations unlikely to impact future potato crops after the first season of biofumigant cover cropping. The recommended safe threshold for this pathogen is around 10 pgDNA per gram of soil. Before biofumigation, all trial sites exceeded this threshold by eight to 140 times. After just one season of biofumigant cover cropping, most sites re-tested below the threshold, with soil DNA levels reduced by 92 percent with BQ Mulch and 97 percent with Caliente compared to pre-trial levels.

These results demonstrate how biofumigant cover cropping can be a powerful tool for reducing soilborne disease pressures and protecting crop health.

Wickham Farms focuses on efficiency, sustainability and value-adding through innovation. Their *HandcutHarvest* line, a retail-ready range of peeled, sliced, and diced onions, potatoes, sweet potatoes and pumpkins highlights this. Using advanced thermoforming technology, they deliver fresher produce with longer shelf life, turning paddock to plate into a convenient reality for consumers, living up to their motto of "let us do the preparation for you".

The Onion Farm tour, delivered under the Onion Extension Project in partnership with VegNET 3.0, provided a valuable opportunity for growers across Australia to connect, share insights with their peers, and explore opportunities that can help them thrive in a changing environment.

The Onion Farm Tour was made possible through the generosity of Wickham Farms, Metagen AU, and the VegMech team at the Gatton Smart Farm. A big thank you to all of those who shared their expertise and insights.

Growers can view the presentation, including full trial findings and management recommendations, by scanning the QR code.

Accelerating the adoption of best management practices for the Australian onion industry is funded by Hort Innovation using the onion industry research and development levy and contributions from the Australian Government.

Project: VN21000

Hort Innovation ONION FUND

MARKETING RESULTS IN

Australian Onions back in the spotlight and first in the pan

BY HANNAH PARRY, HORT INNOVATION

Launched in October 2024, the Australian Onions marketing campaign, funded by the onion marketing levy and delivered by Hort Innovation, set out with a clear goal: to reposition onions as the essential first ingredient in flavourful, healthy meals and encourage more frequent purchase among Australian households.

With 53 percent of households purchasing onions every four weeks, the campaign focused on reaching 'light buyers' – those who buy onions less frequently – by shifting perceptions and reinforcing onions' role in everyday cooking.

Strategic approach: cultural moments and behaviour change

The campaign strategy was grounded in a key insight: from Aussie barbecue favourites to multicultural cuisine, most dishes start with onions. This inspired the central campaign message – 'onions are the first ingredient' – aimed at driving long-term behaviour change by encouraging consumers to grab an onion every time they cook.

To maximise impact, the campaign focused on cultural relevance, aligning earned and social media activity to key calendar moments to spark conversations. Each moment highlighted a unique 'layer' of onions, covering messaging around taste, versatility and health benefits to ensure a well-rounded campaign narrative. Mary Kalifatidis, media personality and passionate home cook, bought the message to life as campaign ambassador, helping to drive engagement and connection.

Campaign highlights and results

From October 2024 to June 2025, the campaign featured three major PR spikes complemented by always-on social media content. Collectively, these activities exceeded KPIs for earned reach and delivered strong social engagement.

Spike 1

Ambassador announcement & Aussie smashburger

The campaign launched with Mary Kalifatidis' ambassador announcement, generating immediate buzz through news features and lifestyle interviews. A highlight was an exclusive feature in 9Honey, reaching 1.1 million readers with messaging around onions' taste, versatility and flavour.

Mary also announced the partnership on her Instagram, generating 139,051 views. She also introduced her take on the trending Oklahoma-style smashburger – the 'Aussie Onion Smashburger' – reinforcing Australian Onions as the essential 'first ingredient'. This content performed strongly, reaching over 486k on Instagram and 393k on TikTok, with 8,155 total engagements. Nine earned stories about the recipe appeared in outlets including *Farm Weekly, Daily Motion*, and *Good Fruit & Vegetables*, reaching a total 1.26 million.

Spike 2

The Aussie onion dip

For summer, onions became the star of picnic season with Mary's fresh twist on French onion dip – the Aussie Onion Dip - positioning Australian Onions as a key ingredient for seasonal entertaining.

Exclusive interviews, supported by new summer food trend research, a custom recipe and visual assets were offered to media, landing eight pieces of coverage and a reach of 32 million. Highlights included Mary's appearance on The *Morning Show*, where she showcased both recipes and emphasised Australian Onions as a versatile, hero ingredient. She was also featured in *Sydney Morning Herald*'s 'My Day On a Plate' column – syndicated across *The Age, Brisbane Times*, and *WA Today*, reaching 13.6 million readers.

On socials, Mary's dip recipe video performed strongly, reaching over 428k on Instagram and 331k on TikTok, with 6,955 total engagements. Paid social further boosted content visibility and achieved over 4.1 million impressions, helping to promote the flavour profile of onions and their versatility.

Spike 3

The great onion debate – *under or over?*

Coinciding with the May federal election, the third PR spike ignited a national conversation around the iconic democracy sausage: should onions go under or over?

To spark conversation, Alex Dawson, founder of the Democracy Sausage website, championed the 'onions under' stance in an exclusive *TODAY* interview, while *TODAY Extra* featured kitchen expert Jane De Graaf demonstrating the perfect caramelised onions for a democracy sausage. During the segment, Jane also discussed the differences between Australia's three onion varietals, reinforced the 'first ingredient' message, and encouraged viewers to visit the Australian Onions website.

A live sausage sizzle activation in Melbourne added to the buzz, serving 458 democracy sausages and inviting passers-by to choose a side, with local advocates from both Team Over and Team Under displaying posters and banners.

Results from this campaign were exceptional, with 79 pieces of earned coverage generating a total reach of over 75 million.

Mary also extended the debate into camping season, sharing content that encouraged families to debate onions rightful place as the first ingredient on the sausage sizzle. This reached 338k people on Instagram and TikTok and generated over 1,000 additional engagements.

Sustained social impact

Between spikes, always-on social content kept the brand visible, with a focus on seasonal relevance, recipe inspiration and health messaging.

In cooler months, content emphasised onions' winter health benefits and featured Mary Kalifatidis' favourite family meals. This included a 'day on a plate' approach, positioning onions as the essential first ingredient across breakfast, lunch and dinner occasions. These posts performed strongly, achieving over 28k in reach and 3,000 engagements across platforms.

Four evergreen recipe ads further built mental availability, each showcasing onions in different meal occasions. The 'One Pan Chicken Parmi' was the top performer, achieving over 1 million reach and 2,047 recipe clicks, followed by the 'Sunday Roast' and 'Tangy Citrus Salad'.

Organic social activity supported brand salience, using existing recipe imagery on Facebook and Instagram to maintain presence and brand salience. The Father's Day post was the top organic performer, driving 1.7k reach and 28 engagements.

Final thoughts

By tapping into cultural moments, food trends and seasonal relevance, the campaign successfully repositioned onions as the essential first ingredient. Mary Kalifatidis' authentic voice brought credibility and warmth to the message, while targeted PR spikes and sustained social activity kept onions front of mind year-round. With strong media results and signs of shifting consumer behaviour, the campaign has laid the groundwork for long-term impact – reminding Australians that great meals start with an onion.

The *Onion domestic marketing plan FY25* is funded using industry marketing levies through Hort Innovation.
Project: VN24601

Hort Innovation ONION FUND

Regenerative thinking on a global scale

LESSONS FROM G'S FRESH WITH JULIUS JOEL

Julius Joel from G's Fresh shared lessons from the major UK grower's transition to regenerative agriculture at workshops in Victoria and Tasmania.

In June 2025, Julius Joel, Product Director at G's Fresh, travelled from the UK to Australia to share insights on regenerative agriculture with growers and industry stakeholders in Brisbane at Hort Connections. Following this, hosted by AUSVEG and VegNET, Julius visited key vegetable production regions across north-west Tasmania and Victoria, culminating in two grower workshops where he shared the lessons, and challenges, of transitioning one of the UK's largest fresh produce operations towards more regenerative systems.

The workshops, held in Ulverstone, Tasmania, and in Chadstone, Victoria, gave Australian growers an opportunity to hear firsthand how G's Fresh is rethinking its farming systems to remain profitable, sustainable, and resilient in an era marked by climate volatility, regulatory pressures, and shifting consumer expectations.

G's Fresh is a vertically integrated farming and fresh produce business operating across the UK, Spain, Senegal, and the Czech Republic. Their philosophy is to be recognised as outstanding, market-led growers and suppliers of sustainable, healthy fresh produce, and to be at the forefront of the industry in everything they do.

Julius has over a decade's worth of experience in the business and expertise in intensive horticulture, encompassing all aspects of the supply chain through to category management and market analysis. In recent years, he has spearheaded G's regenerative agriculture agenda, working to reconfigure farming systems to reduce environmental impact, improve soil health, and maintain yields in light of mounting pressures on the industry.

During the workshops, Julius described the evolving pressures confronting farming operations worldwide, including more extreme weather events, increasing cost-price squeeze, and limited availability to agrichemicals.

Julius shared with the group one of the worst weather events he's seen at G's operations in Spain

"We had eight inches [203 millimetres] of rain in an hour and 24 inches [609 millimetres] of rain in 24 hours," he told workshop attendees.

Julius highlighted that this is the new standard for what farms have to be able to function in, and growers have to change their farming practices to create soils that are able to absorb eight inches of rain in an hour.

Meanwhile, regulatory changes and product withdrawals are making crop protection and weed management more difficult.

"As a celery grower in Spain, we now have no herbicides available to use after planting, and we're about to have no insecticides available from November," Julius noted.

On top of all of that, profit margins continue to be squeezed by flatlining prices and escalating costs.

"Our experience is, every time you reduce your carbon footprint, you save money," said Julius.

"We've all been fighting against that dynamic perpetually," Julius stated, highlighting the importance of change within a business to stay competitive.

"We were in the territory of the farm becoming unsuitable for the business it had supported for 50-60 years," Julius stated.

The realisation of that hard truth led G's Fresh to embrace regenerative agriculture, for both the environmental benefits and the need to build resilience into the business and stay competitive in the industry.

In its simplest form, regenerative agriculture is an approach to farming based on feeding organisms in the soil which, in turn, feed plants. The heighted biological activity allows farmers to produce the greatest yield for the lowest cost. The principles of regenerative agriculture includes minimising soil disturbance, maintaining living roots, maximising diversity, keeping soil covered with cover crops, integrating soil microorganisms, and recognising context.

Julius spoke on how these principles are not hard rules growers have to immediately follow. Whilst your system will benefit from the implementation of all principles working together, "there was no way we were going to go cold turkey," Julius stated.

Julius recognised that showing up to work on a random Monday and deciding to give up all chemical inputs and cultivations isn't going to benefit your farm or your business. The best approach is to plan change over often large amounts of time as timing and conditions allow. It's important to recognise that regenerative agriculture isn't going to cure all problems and only result in higher returns; sometimes it may feel like one step forward and two steps back.

G's sustainability agenda is broken down into three overlapping and highly interdependent pillars; drive down GHG emissions, improve soil health, and increase biodiversity. The key intended outcomes of these pillars include building well-aggregated soils with better water infiltration and holding capacity, reducing the need for heavy cultivation, and creating a rich and diverse soil biology supported by a balanced soil food web that not only cycles carbon but begins to sequester it.

The result is a farming system that is more resilient to climate extremes, with long-term environmental benefits, safeguarding supply for both growers and retailers and in turn protecting profits long-term.

Over the years as machinery gets bigger and businesses grow, it is the nature of the industry to increase the number of tractors in the fleet and at the same time increase the horsepower of those tractors, Julius explained.

"That's partly self-indulgence because you've got to have a bigger tractor than your neighbour," joked Julius, but also highlighted that the soils are becoming harder and harder to work because of the compaction caused by heavy equipment.

In response to this, G's Fresh have actually reduced the number of tractors they use in their operation, and look towards smaller, lighter machinery that will cause less disturbance and compaction to the soil.

Another example of G's transition is the 'iceberg rig' system used in its salads business. This field-harvest and field-packing rig allows produce to be packed, labelled, and palletised immediately after harvest, minimising handling and storage, improving freshness, and cutting fuel use and greenhouse gas emissions.

By investing in the soil through regenerative agriculture, capital costs spent on tractors and the amount of fuel used on farm will be reduced.

"If we can grow the same yield with less diesel, less tractors, less purchased inputs, we're going to have more profit."

G's Fresh are using two accelerators to aid in their journey into regenerative agriculture.

Sap and tissue testing

A sap analysis examines available nutrients from the xylem – the system in a plant that transports water and dissolved minerals from the roots to the rest of the plant – and the phloem – the system in a plant that transports organic nutrients, particularly sugars produced during photosynthesis, from the leaves to the other parts of the plant. A tissue analysis assesses available and unavailable (total) nutrients accumulated over time from the entire leaf.

Together, a sap and tissue test help identify if a crop is lacking key nutrients, or alternatively if inputs are being 'wasted' on the crop. Plants can often show no visible signs of deficiency, but growth and yield are still limited. Sap and tissue tests help reveal these shortages before they become a problem and can be used at key growth stages to verify if the crop is meeting nutrient standards.

The most important step in sap and tissue testing is the interpretation of results. G's Fresh uses John Kempf's plant health pyramid to support their analysis and on-farm response plan to sap and tissue testing results.

The most important step in sap and tissue testing is the interpretation of results.

Johnson-Su compost

Designed by David Johnson and Hui-Chun Su, Johnson-Su is a static composting process that allows organic materials to be undisturbed for the complete duration of the composting process, around 400 days. The lack of disturbance allows the fungal communities to better process the organic materials and produce higher quality compost that is fungi dominant.

G's Fresh has implemented this composting system into their large-scale horticultural business and use Johnson-Su as a biological inoculant, through foliar applications, in-furrow treatments and as a seed coating.

After initially trialling Johnson-Su on-farm, Julius shared the positive findings.

"We were seeing yields increase by 20 percent and disease go down," he stated. Johnson-Su used without fertiliser was showing the same yields in onions as a full fertiliser program. Upon visual assessment Julius was seeing "rapid fast root growth and then rapid colonisation of those roots by the soil biology".

Julius and the G's Fresh team are also seeing springtails, millipedes, centipedes, earthworms, and other visible signs of life in the soil at levels that they haven't seen for years.

Julius and the G's Fresh team are also optimistic about Johnson-Su as a possible disease suppressor based off of the observations witnessed at G's. "We've planted onions in fields we haven't used for 30 years because of white rot," Julius said.

In sections of fields treated with Johnson-Su, G's is now seeing minimal white rot, with white rot still present in untreated sections of the field.

Applying workshop lessons on farm

Attendee of the Ulverstone workshop, Tim Groom, who oversees production at Charlton Farm and exports onions on behalf of Wynyon Pty Ltd, built a Johnson-Su bioreactor the weekend following the workshop.

Tim hand built the Johnson-Su frame with materials including wire mesh sheets, shade cloths and PVC pipes.

Johnson-Su mixes are made using local materials within 2km of your property, the idea being that you incorporate biology and organic matter that thrives in your local area, therefore ensuring the biology will also thrive in the soil. Tim Groom sourced the following materials from his property; grass clippings, mulched up prunings from fruit and olive trees, barley straw, autumn leaves and chopped up weeds, adding water to ensure moisture is around 70 percent.

It's important to note that there are many different approaches to make Johnson-Su, but there are a few good practices to follow. A couple of days after establishing your Johnson-Su, the PVC pipes can be removed. Beware of steam and potential fire risk during this time, as this is a thermophilic process that produces heat.

It is important to ensure the Johnson-Su is adequately irrigated and moisture levels remain high throughout the entire process. The Johnson-Su is ready for extraction at 9-12 months, although it is worth noting that at 22 weeks the top 80 percent of the mix already has 57 species of biology present, increasing to 99 species at 60 weeks. In the case of Johnson-Su, patience is a virtue.

One to 10kg of Johnson-Su can be used per hectare, with 1kg of compost translating to approximately 100 litres of Johnson-Su extract.

Key takeaways for Tim Groom from the workshop held at Ulverstone was the theory that cultivation and the use of nitrogen and phosphorus fertilisers have made bacteria dominant in the soil, and Johnson-Su offers a way to reintroduce beneficial fungi back into the system.

Although Tim also noted that Johnson-Su isn't a miracle worker.

"You need to have enough food in the soil for the microorganisms in the Johnson-Su to flourish," he said, highlighting the importance of using Johnson-Su as an accelerator to an established regenerative agriculture farming system.

If you missed the workshops with Julius Joel you can catch a recording of his presentation on RMCG's YouTube account.

Accelerating the adoption of best management practices for the Australian onion industry is funded by Hort Innovation using the onion industry research and development levy and contributions from the Australian Government.

Project: VN21000

VegNET 3.0 is funded by Hort Innovation using the vegetable and onion research and development levies and contributions from the Australian Government.

Project: VG21000

Hort Innovation VEGETABLE FUND

Hort Innovation ONION FUND

Current projects

HORT INNOVATION ONION FUND

Hort Innovation conducts a number of R&D projects funded by grower levies. Here is a list of some of the projects currently underway.

O Future proofing onion health: management of rot diseases of onions VN24002

DELIVERY PARTNER: **UNIVERSITY OF ADELAIDE**

This project aims to support Australian onion growers in reducing losses caused by *Fusarium* basal rot (FBR), a major soilborne disease that can result in crop losses exceeding 30%. Delivered by the South Australian Research and Development Institute (SARDI), the initiative will focus on developing cost-effective, integrated disease management (IDM) strategies. These will include field trials on crop rotation, soil and moisture management, plant nutrition, and the use of biological, biostimulant, and chemical controls, building on proven practices from previous research.

The project will primarily conduct on-farm trials to ensure the strategies are practical and adoptable by growers. At its conclusion, an updated IDM strategy will be delivered as a best practice guide, equipping growers with tools to improve disease control, increase marketable yields, and enhance the economic and environmental sustainability of onion production in Australia.

O Understanding and managing the impacts of climate change on Australian onion production VN23001

DELIVERY PARTNER: **THINKSTEP-ANZ**

This project will improve onion growers' understanding of the potential environmental impacts of the industry on a total and per kilogram basis and produce critical external communications based on the findings.

The project team is:

- Working with Australian onion growers to benchmark the environmental performance of onion production. With these benchmarks, including carbon emissions and water usage, growers can compare performance to the industry average and track improvements over time.
- Identifying the areas of greatest return/feasibility for practice change and the value of progressing alternative approaches.
- Providing insights to improve input management while maintaining yield and quality in a changing climate.
- Developing case studies to provide adaptation and risk mitigation options.
- Providing recommendations for industry to address gaps in knowledge and future R&D requirements (actions, mitigations or future R&D investments) to reduce future climate change risks.

CODE

O Onion P Potato V Vegetable M Melon

O Australian Onion Industry Communications VN21000

DELIVERY PARTNER: **AUSVEG**

This investment ensures the onion industry is equipped with the information and resources they need to adopt best management practices. Onion growers will be brought into the existing *VegNET 3.0* program for the vegetable industry to support increased awareness and adoption of R&D.

VegNET is a nationally-coordinated, regionally-delivered extension program that increases the industry's awareness of and engagement with best practices in high-priority areas. The program has regional development officers (RDOs) in ten key vegetable-growing regions around Australia.

A vital component of the program is the establishment of five regionally-based onion grower groups in Tasmania, Queensland, New South Wales, Western Australia and South Australia. The relevant RDO will work with each group to identify regionally-specific issues facing onion growers and work with them to host seasonal activities, including demonstration sites, field days, and grower walks.

A wide range of communications outputs will also be delivered to onion growers, including:

- The quarterly *Australian Grower* magazine, with 36 pages of dedicated onion content
- The *AUSVEG Weekly Update* e-newsletter, with onion content
- A range of onion-focused content such as videos, podcast, case studies, fact sheets, media releases and social media.

O Optimising chemical and cultural management of onion white rot VN20007

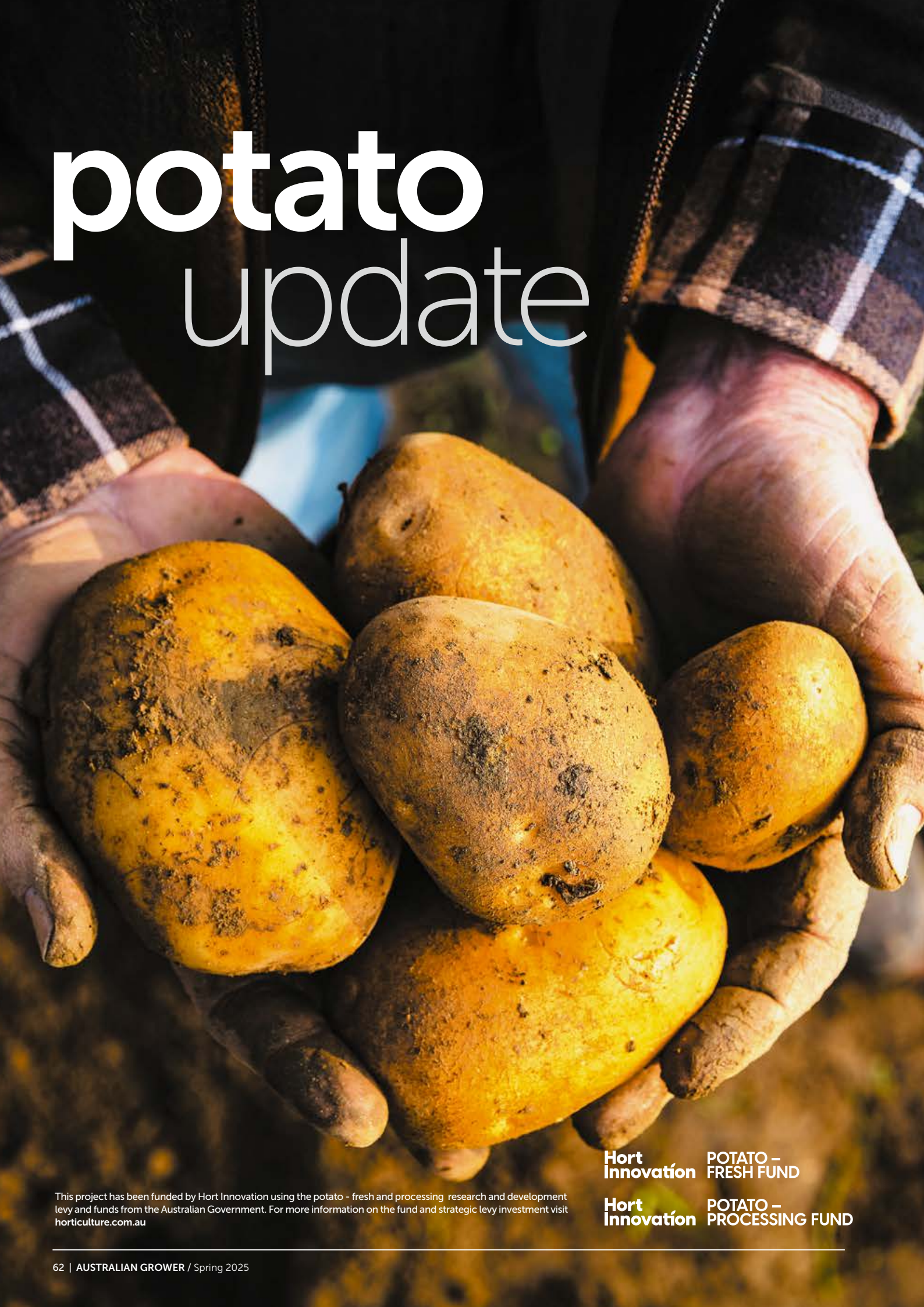
DELIVERY PARTNER: **ARVENSIS**

This investment is developing a more effective integrated disease management strategy for control of onion white rot. Onion white rot is a highly destructive fungal disease of commercial onion crops. This project seeks to improve current control methods for the disease, as well as identify new methods that can be used to combat onion white rot.

The research will incorporate:

- Development of a pre-plant soil DNA test to identify disease risk prior to planting
- Identification and development of natural germination stimulants to reduce disease inoculum levels prior to planting
- Optimisation of spray timing and dose rates of current fungicides
- Identification of new fungicides and biological controls for onion white rot.
- The project team will work closely with the onion industry to extend any new findings to onion growers. Regular updates will be provided to industry, as well as trial sites visits later on in the project to demonstrate the integrated onion white rot management program developed.

potato update



Hort Innovation POTATO – FRESH FUND

Hort Innovation POTATO – PROCESSING FUND

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

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Spotlighting spuds for International Day of the Potato

BY HORT INNOVATION

The Australian potato industry is vital for the nation's economy, but soilborne diseases are a critical issue that can cause major problems.

To mark International Day of the Potato, on 30 May 2025, the Tasmanian Institute of Agriculture (TIA) and Hort Innovation have announced details of a new research project to establish a disease management program for the Australian potato industry.

The $4.2 million Hort Innovation funded project is in collaboration with the Tasmanian Institute of Agriculture, the South Australian Research and Development Institute and Simplot.

"Soilborne diseases are a major production constraint to the Australian potato industry as they increase the costs associated with crop management, reduce yield and ultimately impact profitability for the grower," said Professor Calum Wilson, who will lead the five-year project.

"Tackling diseases that are impacting the Australian potato industry has been identified as a critical issue and a key research priority by the industry."

A team of researchers will focus on combating soilborne disease such as powdery scab disease, pink rot, blackleg, common scab, black dot, verticillium and Rhizoctonia.

"We will develop a program to address these diseases focussing on diagnostics, including new and improved diagnostic testing to detect diseases. This will include development of new tools for detection and identification of disease," Professor Wilson said.

"We'll focus on new disease management solutions, strategies to prevent infection, and build new knowledge on a range of topics including soil health.

International Day of the Potato is an initiative of the Food and Agriculture Organisation of the United Nations and this year's theme is 'shaping history, feeding the future' which recognises the important role of the potato as a vital food source around the world.

Professor Wilson said that globally potatoes are the third most important food staple after rice and wheat in terms of human consumption, with annual production exceeding 320 million tonnes.

In Australia nearly 1.5 million tonnes of potatoes are produced each year. In Tasmania potatoes have a farm gate value of $370 million.

"Plant disease costs millions of dollars each year as they can reduce crop productivity, increase the costs of production, and or impact on the ability to trade both locally and internationally," Professor Wilson said.

An integrated disease management program for the Australian potato industry has been funded by Hort Innovation, using the potato industry research and development levies and contributions from the Australian Government.

Project: PT23002

Hort Innovation POTATO – FRESH FUND

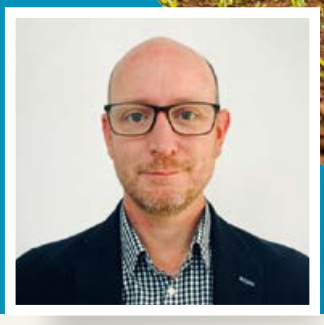
Hort Innovation POTATO – PROCESSING FUND

VEGETABLES
POTATOES
ONIONS

New project aims to reduce admin for vegetable, onion and potato growers

BY HORT INNOVATION

A new Hort Innovation project is set to streamline the way grower feedback is collected across the vegetable industry. The goal of the project is to reduce survey fatigue, boost efficiency, and ultimately enhance the quality of insights used to guide future research and development (R&D) investments that deliver impact for growers.



The project will explore the feasibility of consolidating grower surveys for levy-funded research, development and extension (RD&E) projects into a single, annual survey. This will complement and support strengthened monitoring and evaluation (M&E) processes.

Should feasibility be determined, this will provide a more coordinated, consistent, and grower-friendly approach to capturing M&E data on projects. It will also help ensure clearer, more accurate tracking of project impact, alignment with strategic goals, and support better-informed decision making for future levy-funded projects.

Brett Fifield, CEO at Hort Innovation, elaborated on how this project hopes to support growers.

"We know growers are time poor. This project is about streamlining how we work – making it easier for growers to share project M&E feedback in a way that saves them time, while still collecting the insights needed to ensure levy investments remain targeted and effective."

"It reflects our commitment to delivering smarter, more efficient systems that support grower productivity and profitability. It has been created off the back of grower feedback about the current state of survey fatigue in the industry and is part of our goal to reduce this burden, while still ensuring the information we collect adds genuine value for both industry and growers," concluded Fifield.

The project is being led by research agency Focus Insights, who are expected to make a decision around the feasibility by late 2025, with implementation of the preferred solution to follow if deemed feasible.

Neil Moody, General Manager from Focus Insights, shared his enthusiasm about the possibilities of the project.

"High quality data is the cornerstone of strong decision-making. With improved quality, consistency, and reach of the data collected, this survey has the potential to support stronger project evaluations, more comprehensive M&E outcomes, and ultimately better-informed decision making across the vegetable industry."

Michael Coote, the CEO of AUSVEG, the peak industry body for vegetable, potato and onion growers, agreed getting high-quality grower feedback in an efficient manner was crucial.

"Getting feedback from growers on levy-funded RD&E projects is vital to ensure that the industry is getting impactful, outcome-based, relevant research," he said.

"However, we know growers are constantly asked for input across multiple channels, so one unified survey on these projects is a great step forward."

Inset. Neil Moody from Focus Insights,

MORE INFORMATION

If growers from vegetable, onion, fresh potato and processed potato industries would like to get involved in the consultation stage of the project, they are encouraged to email an expression of interest to Sean Nonnenmacher, Innovation Evaluation Manager at Hort Innovation at Sean.Nonnenmacher@horticulture.com.au

One survey for vegetable, onion and potato levy funded projects is funded by Hort Innovation using the vegetable, onion, fresh potato and processing potato research and development levies and contributions from the Australian Government.

Project: MT22004

Hort Innovation VEGETABLE FUND
Hort Innovation ONION FUND
Hort Innovation POTATO – FRESH FUND
Hort Innovation POTATO – PROCESSING FUND

Current projects

HORT INNOVATION POTATO FUND

Hort Innovation conducts a number of R&D projects funded by grower levies. Here is a list of some of the projects currently underway.

P Potato sustainability – undertaking a life cycle assessment

PT24001

DELIVERY PARTNER: **LIFE CYCLE STRATEGIES**

The objectives of this project are to:

- Inform potato growers nationally of the environmental performance of the sector, providing industry-based data that decision-makers can use in support of sustainability initiatives.
- Help Industry identify the area of greatest return/feasibility for practice change and the value of progressing alternative practices.
- Identify global best practice and how the Australian industry compares, aiming to identify opportunities to improve on individual grower carbon footprint.
- Provide growers with an understanding of the potential to improve the sustainability of their businesses based on national and global best practice.
- Inform future strategic industry investments and provide the fresh and process potato industry with clear messaging on the environmental sustainability of the industry.

P An integrated disease management program for the Australian Potato Industry

PT23002

DELIVERY PARTNER: **UNIVERSITY OF TASMANIA, WESTERN SYDNEY UNIVERSITY**

This investment focuses on a range of economically important diseases including powdery scab, common scab, pink rot, blackleg, Rhizoctonia, verticillium wilt and black dot. The aims are to develop new approaches to reduce disease impacts by reducing inoculum build-up, inhibiting infection and disease development, and preserving the effectiveness of the available chemistries.

The investment will be underpinned by three related research pillars:

- Disease diagnostics
- Soil health
- Disease management.

Combined, these research pillars will inform the development of innovative resources and tools which will be delivered and assisted through a fourth pillar dedicated towards coordination and communication.

CODE

O Onion P Potato V Vegetable M Melon

Current projects

HORT INNOVATION POTATO FUND

P Potato Industry Communication and extension program

PT20000

DELIVERY PARTNER: **APPLIED HORTICULTURAL RESEARCH**

Beginning in 2021, this investment is tasked with supporting Australian potato growers in adopting improved practices on-farm and keeping up to date with the latest industry news, information, resources and technologies.

The project delivers a nationally coordinated but locally implemented program which employs regional delivery partners who provide specialist skills and knowledge to the industry. The role of the regional delivery partners is a broad one, with all activities geared towards improving the circulation and uptake of information within the industry.

As well as extension activities, the project produces key communication channels for the potato industry, including a hard copy quarterly R&D magazine, online webinars and podcasts, social media, and a dedicated website to host industry resources.

VOP Accelerating adoption of Area Wide-Integrated Crop Management in vegetable, onion and potato growing regions

MT24012

DELIVERY PARTNER: **CSIRO**

Historically, Australian agrifood research and development has been focused on productivity gains. The development and adoption of pest management solutions have been hampered by the segregation of researchers and their research processes from the farmers and land managers who are the intended recipients of research findings and solutions.

This project will explore the pest and disease priorities of four horticultural industries within two regions of Australia (TAS and SA) to jointly develop relevant and effective control and management options. Experienced researchers and practitioners will apply an adapted Rapid Appraisal of Agricultural Innovation Systems (RAAIS) methodology to engage farmers, land managers and industry stakeholders across each of the two regions to identify core constraints and use this to direct the development of solutions.

Findings from interview analysis will be used to co-develop regional cross-industry workshops to categorise constraints and brainstorm potential entry points for solutions. This will ensure that cross-industry stakeholders' understanding of their interdependencies in crop protection and management systems is taken into account. A final national workshop will be used to test the co-developed findings across the industries and regions to prioritise both individual industry and cross-industry research and development priorities, providing inputs into the next stage of co-designed research and development investment.

The project team will engage diverse industry stakeholders through interactive and inclusive processes, ensuring buy-in and ownership of shared knowledge. This includes identifying barriers to collaboration, enhancing knowledge exchange, and setting strategic research and development priorities to accelerate the adoption of area-wide integrated crop management.

P Potato industry minor use program

PT16005

DELIVERY PARTNER: **HORT INNOVATION**

Through this project, levy funds and Australian Government contributions are used to submit renewals and applications for new minor use permits for the potato industry, as required. These submissions are prepared and submitted to the Australian Pesticides and Veterinary Medicines Authority (APVMA).

P Mechanisms and manipulation of resistance to powdery scab in potato roots

PT17003

DELIVERY PARTNER: **UNIVERSITY OF TASMANIA**

While the potato tuber blemishes that are caused by powdery scab are a concern for the potato industry, the pathogen's effect on plant roots can't be underestimated, either. Root infection with powdery scab disrupts root function – meaning more irrigation, fertiliser and fungicides are needed to compensate for poor root development – and leads to diminishing yields. In this project, researchers are investigating root resistance to powdery scab infection. This involves looking at how the pathogen infects roots and causes disease, what allows for resistance in some potato varieties, and whether resistance mechanisms may be boosted or transferred.

GROWER PROFILE

Program equips potato agronomists with new skills

BY SONJA MITCHELL, SYNGENTA

A new generation of agricultural professionals is bringing fresh energy to potato production across Australia through a hunger to learn, embracing innovative thinking.

One of the new generation joining the potato industry is Kate Smith, who took part in the inaugural Syngenta Potato Partners Young Potato Agronomist Program launched in Adelaide in June 2024.

Despite growing up "smack bang in the middle of Sydney", Kate developed a passion for agriculture at a young age through the Farm Day program that connected city and farming families from 2006 to 2012.

Above. Yenda Producers agronomist, Kate Smith, enjoys the Riverina area with its diverse range of horticulture crops, from potatoes and other vegetables to citrus, stonefruit, tree nuts, grapes and a wide range of grain crops.

"My parents signed us up for three or four years, and we were placed with a farming family or couple at a busy time of year so you can see what's happening," she said.

"You just help out on the farm for as long as they want you."

These early experiences left a lasting impression. Despite agriculture not being offered as a subject at her high school, Kate chose to study a Bachelor of Agriculture, majoring in plant science, at the University of New England, in Armidale.

She gained valuable hands-on experience through summer jobs, which introduced her to agronomy and pointed her in that direction.

Internship pays off

In November 2022, Kate began an internship jointly funded by CSIRO and Yenda Producers Co-op, a leading agricultural retailer in the Riverina region of NSW.

What was initially meant to be a two-month placement at Yenda Producers quickly turned into a full-time position as a horticultural agronomist.

"I was only going to be here, really for two months, but I fell in love with the place and the job and the team here," she said.

"It's a really nice supportive team. And the first couple of days I was here, I was out in the spuds with the agronomist at the time that was doing it, and I just loved it straight away."

The Riverina is a large potato production region in Australia, accounting for most of the potatoes grown in NSW.

It is also home to a diverse range of horticulture crops, from potatoes and other vegetables to citrus, stonefruit, tree nuts, grapes and a wide range of grain crops.

"Spuds is probably the one [crop] that is the most intensive," Kate said.

"You've got to be out there twice a week. We have such high insect and pest pressure, and disease pressure, so we're in the spud crop a lot more than we are in some other crops here."

Riverina potatoes are grown for the fresh market, usually sold as brushed, and often achieve a price premium for their attractive appearance thanks to the red sandy loam soils they grow in.

While corporate clients mostly leave fields bare fallow between potato crops, Kate said others opted for a mixture of crops – which might include pumpkins, hemp, vetch, garlic, wheat or barley – depending on the season and what the markets are doing.

Learning and growing networks

Kate nominated the field trips to Tasmania as her highlights of the Syngenta Potato Partners Potato Young Agronomist Program.

"Those are probably the best parts of the whole program," she said.

Apart from walking around paddocks and quizzing Syngenta specialists, researchers, growers and their agronomists, the trips opened her eyes to other parts of the industry, such as processing and seed potato production.

"We met one or two consultants down there who work closely with growers but also with processing houses, where they cut seed and then process seed for growers to keep it clean and disease free," she said.

> "That's a whole side of agronomy that I don't have a lot to do with, so that was really good for me to see."

New perspective guides vision

Kate's five-year vision reflects her commitment to the industry, and new insights from the program.

She plans to continue working in the Riverina with potato growers, but now aspires to become more involved in the post-harvest aspects of potato production – being able to pinpoint the impact of water or disease issues on tubers and use that information to 'up our game' in following crops.

Kate said she especially enjoyed the collaborative nature of her work.

"I work with some really amazing clients, really passionate farmers who are brilliant at what they do," she said.

"I quite like that – the ability to work with each individual client and figuring out what exactly works for them in their farming systems. Everyone's a little bit different."

The inaugural Potato Young Agronomist Program operated during the 2024-2025 growing season, with events timed to align with the crop cycle.

> Places on the program were offered to 13 potato agronomists with up to three years' experience who were working at a platinum level Syngenta Potato Partner store in Australia.

The program included admission to the 2024 World Potato Congress, along with a mix of online webinars and in-person workshops.

ISSUE 17

POTATO LINK

supplement

R&D FORUM 2025: NEW PEST AND DISEASE PROJECT FOR THE INDUSTRY

DRONES IN POTATO FARMING

FEATURE ARTICLE

COVER CROPS WITH GROWER MARK FRITZ

ahr applied horticultural research
Hort Innovation POTATO – FRESH FUND
Hort Innovation POTATO – PROCESSING FUND
POTATO LINK AUSTRALIAN POTATO INDUSTRY EXTENSION PROJECT

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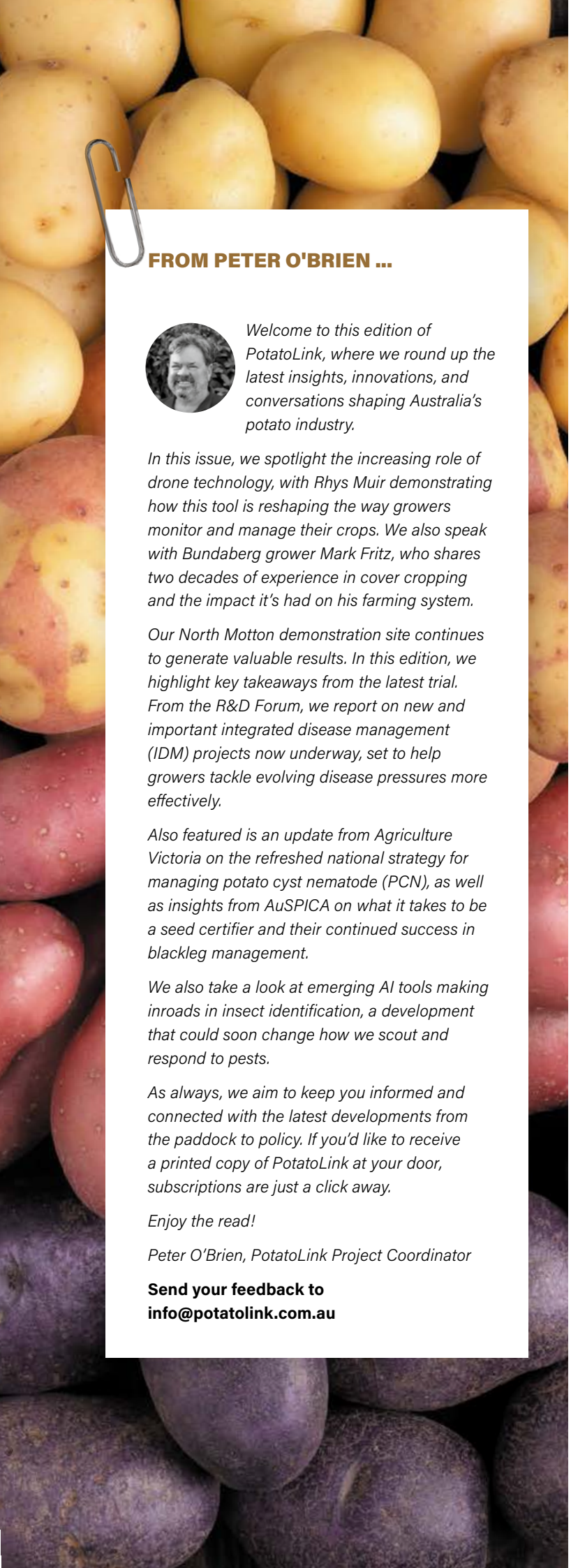

FROM PETER O'BRIEN ...

Welcome to this edition of PotatoLink, where we round up the latest insights, innovations, and conversations shaping Australia's potato industry.

In this issue, we spotlight the increasing role of drone technology, with Rhys Muir demonstrating how this tool is reshaping the way growers monitor and manage their crops. We also speak with Bundaberg grower Mark Fritz, who shares two decades of experience in cover cropping and the impact it's had on his farming system.

Our North Motton demonstration site continues to generate valuable results. In this edition, we highlight key takeaways from the latest trial. From the R&D Forum, we report on new and important integrated disease management (IDM) projects now underway, set to help growers tackle evolving disease pressures more effectively.

Also featured is an update from Agriculture Victoria on the refreshed national strategy for managing potato cyst nematode (PCN), as well as insights from AuSPICA on what it takes to be a seed certifier and their continued success in blackleg management.

We also take a look at emerging AI tools making inroads in insect identification, a development that could soon change how we scout and respond to pests.

As always, we aim to keep you informed and connected with the latest developments from the paddock to policy. If you'd like to receive a printed copy of PotatoLink at your door, subscriptions are just a click away.

Enjoy the read!

Peter O'Brien, PotatoLink Project Coordinator

Send your feedback to info@potatolink.com.au

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DRONES IN POTATO FARMING – A BIRD'S-EYE VIEW OF THE FUTURE

Once considered a novelty or hobbyist gadget, drone technology is now emerging as a serious agricultural tool – and in potato farming, it can make a measurable difference. For some growers, it is already an essential part of their operation. Whether it is for precise spraying, scouting, or reducing soil compaction, drones offer practical benefits that help growers cut costs, save time, and improve crop outcomes.

At a recent demonstration day run by the Potato Growers' Association of Western Australia and PotatoLink with Hort Innovation, VegNet, QDPI and DPIRD, attendees heard from agronomists and drone contractors using this technology in the field.

Among them was Rhys Muir, a contract aerial sprayer and drone operator, who demonstrated the potential of drones firsthand.

PotatoLink recently caught up with Rhys to hear his insights on how drone technology is helping potato growers improve efficiency and crop management.

WHAT CAN DRONES DO FOR POTATO GROWERS?

The short answer? A lot.

While drones are widely associated with mapping or scouting, the real game-changer in potato production is chemical application – especially fungicides.

According to Rhys, readily-available spray drones, for example the DJI Agras T25 or T50, the XAG P150, or the Eavision J100, can deliver low-volume, high-precision applications with a significant degree of canopy penetration.

Unlike traditional aerial spraying from planes or helicopters, which often applies product from higher altitudes and risks drift or uneven coverage, drones fly low and slow – allowing for targeted, efficient application.

This precision helps ensure that both the upper and lower surfaces of the leaves are treated, and fungicide reaches into the plant canopy and down to the soil where it's needed most.

"The prop wash from the drone pushes fungicides under and over the leaf, right down to the soil," explained Rhys. "You get really good coverage."

Other benefits include:

- Reduced soil compaction – no tractor tyres rolling through wet paddocks.
- Fewer disease issues – no physical contact means less damage to plants and fewer opportunities for pathogens to enter.
- Input savings – spray volumes can be reduced to as little as 20–25 L/ha for some chemicals, compared to 200–600 L/ha for traditional boom sprays.
- Less infrastructure disturbance – no need to remove irrigation pipes or cut headlands to access crops.
- Reduced diesel use – switching from tractor-based applications to electric drones can save hundreds of dollars a day in fuel costs. If drones are charged through renewable energy sources, this also equals a reduction in GHG emissions.

These advantages make drones a compelling option, particularly during periods of wet weather. As drones do not rely on ground access, they can fly in and apply treatments even when fields are too soft or waterlogged for tractors or spray rigs.

"This can be a game-changer during critical disease windows, helping growers protect their crops without waiting for conditions to improve – and without causing rutting or compaction in saturated soils," Rhys said.

KEY POINTS

- Drones offer precise, low-volume chemical application, especially for fungicides, with excellent canopy penetration.
- They reduce soil compaction, crop damage, and fuel use - ideal for wet paddocks where ground access is limited.
- Spray volumes can drop to 20–25 L/ha, saving inputs and improving efficiency.
- Operators report excellent coverage due to the drone's low, slow flight and prop wash pushing spray under and over leaves.
- Labour demands remain high, but tasks like battery swapping and batching are offset by avoiding cab time and field damage.
- Sustainability wins include lower emissions, healthier soils, and fewer disruptions to infrastructure or crop rows.
- Getting started is easy!
  Hire a contractor to trial the tech. There is also licensing and training support available for those keen to invest.

IS IT LABOUR-SAVING?

Not exactly – at least not yet. Rhys explained that running a spray drone is physically different from sitting in a cab, but it is far from passive.

"To be honest, most operators are more knackered after a day with the drone than after a day in the tractor," laughed Rhys.

"You're constantly changing batteries, pumping water, mixing chems, and batching up."

With each flight typically lasting just 5–7 minutes, there's a rhythm to the work – especially when covering larger paddocks. Still, Rhys said some growers find it a refreshing change.

"You're not bouncing around in the tractor, and you're not wrecking your back!"

"We're four years in and the tech's jumped ten levels.

It's here to stay – and it's only going to get better."

Rhys Muir

WHAT ABOUT SUSTAINABILITY?

Drones offer multiple sustainability wins, even if they're not always obvious at first glance:

- Lower emissions – a ground rig might burn $500/day in diesel, while some drones cost just $40 in electricity. If this is drawn from green sources, then this is a significant win for the GHG accounts.
- Soil health – less compaction equals healthier soils, leading to fewer inputs, and less erosion, run off, healthier soil biology and so on.
- Fewer crop disturbances – no need to reopen tramlines or remove infrastructure, so the crop stays intact from planting to harvest.

GETTING STARTED: EASIER THAN YOU MIGHT THINK

For growers unfamiliar with drones, Rhys encourages growers to take a look over the fence, see how it works, ask other growers, and attend any local events demonstrating the technology. If that looks interesting, then hiring a contractor is often a good first step.

"People can see what's possible without having to buy their own drone or get certified. They just bring in a contractor and see how it goes," Rhys said.

"When we contract, we bring everything – the drone, the batching unit, all the setup," he explained.

"The grower doesn't have to worry about anything technical. They just focus on the paddock."

This ease of entry is often the ideal way for curious growers to get started – observing a drone in action on a neighbour's property or watching a contractor at work.

"You can learn a lot just by seeing one run," said Rhys.

"You see how the controller works, how the coverage looks. That demystifies it."

Once growers feel confident, many go on to invest in their own drones – often with the support of informal training or one-on-one guidance.

"By the time they get their own drone, they've already got a bit of background knowledge," Rhys added.

LICENSING AND TRAINING: WHAT'S REQUIRED?

In Australia, all drone operators applying chemicals commercially must meet Civil Aviation Safety Authority (CASA) and APVMA requirements.

Key steps include:

- Remote Pilot Licence (RePL) – required for drones over 2 kg used for commercial work.
- Type ratings – for drones over 25 kg (common for spray drones), operators need specific certification for each aircraft model.
- Remote Operator Certificate (ReOC) – required for businesses offering drone services.
- Chemical certification – operators must also comply with chemical use regulations, including appropriate accreditation (e.g. ChemCert).

Formal drone pilot training is available through private providers, and there are industry-led efforts to make training more accessible.

Several companies also offer tailored 'factory training' to help growers set up their fields, plan spray jobs, and use digital mapping systems to import boundaries and generate flight paths.

WHAT'S NEXT? AUTOMATION AND SCALING UP

Over the next decade, drone capabilities are expected to increase significantly. Manufacturers are already testing self-docking stations that can recharge and refill drones autonomously in the field, eliminating the need for constant battery swaps or manual batching.

Battery performance and quick-charging capacity will continue to improve – and CASA regulations may eventually shift to allow larger payloads and longer flight times. Currently, drones over 150 kg face stricter rules, more in line with piloted aircraft.

There's also potential for greater integration with AI-driven agronomy tools. Imaging drones can already provide NDVI and multispectral maps for crop health monitoring, and pairing those with prescription maps for application drones may soon become the norm.

While drone adoption is still in its early stages for many potato growers, the momentum is undeniable – and as prices drop and training improves, the barriers to entry are falling.

"It's not just a gimmick," said Rhys.

"We're four years in and the tech's jumped ten levels.

It's here to stay – and it's only going to get better."

COVER CROPPING IN PRACTICE WITH GROWER MARK FRITZ

Mark Fritz from M&J Fritz, a potato-growing operation based in Calavos (Bundaberg, Queensland), has been building a cover cropping program for 20 years. Here, Mark shares his personal experience in growing and experimenting with cover crops over that time.

Mark works alongside his son Curtis Fritz, Brian Poulsen, and share farmer Tony Grassick, to grow processing potatoes for Pepsico.

They typically work on a two-year cycle with planting in April, growing through winter, then harvesting in September.

Outside of potato production, cover cropping has long been a major focus. Carefully planned rotations use winter cereals like triticale, barley, and ryecorn, summer legumes such as cowpea and sunn hemp, along with summer cereals sorghum and millet.

Through years of trial, learning, and fine-tuning, cover crops have become central to Mark's farming system.

The system is designed to build soil health, improve soil biology, reduce chemical use, and increase soil carbon – all driven by Mark's belief that even if it's not perfect, it's better than not trying at all.

PotatoLink's Steph Tabone spoke with Mark to understand how cover cropping fits into his operation, the challenges he's worked through, and his advice for other growers.

WHAT MOTIVATED YOU TO INVEST IN COVER CROPPING?

For Mark, cover cropping is an essential to "spelling the ground" between potato crops and giving the soil a break from intensive production.

"It's about disease management, soil protection, improving water holding capacity, nutrient holding capacity – the list is endless," Mark explains.

Heavy rains and strong winds in the Bundaberg region can quickly erode sandy soils.

"Without cover crops, the soil can just blow away."

What started as a way to manage erosion and reduce soil-borne disease pressure has grown into a whole-of-

From left: Mark Fritz, Curtis Fritz, Brian Poulsen, Tony Grassick

system approach to improving soil condition and productivity.

Mark has seen clear benefits from cover cropping, including:

- Steady improvements in yields from 32t/ha to 40t/ha (seasonal averages), gained over the last 20 years
- Improved soil health
- Lessened soil-borne disease pressure, particularly verticillium and powdery scab

HOW DOES COVER CROPPING FIT INTO THE SYSTEM?

Timing and establishment

Mark believes timing is everything when it comes to successfully growing cover crops. His strategy is to sow cover crops immediately after harvesting potatoes to take advantage of clean paddocks and any residual soil moisture.

If conditions are dry at harvest, cover crops may establish slowly or not at all. However, if rain follows, it's essential to act quickly and get the cover crop in the ground.

"As we don't irrigate our cover crops, it's critical to make the most of natural rainfall and leftover moisture from the potato season if we want to get a good start and stay ahead of the weeds," he says.

Why legume cover crops?

Legumes are a cornerstone of Mark's cover cropping program as they offer multiple benefits, including:

- **Nitrogen fixation**, thus reducing the need for synthetic fertilisers.
- **Weed control**, as Mark can selectively spray grass weeds without harming the crop.
  - He avoids using pre-emergent herbicides on cover crops because of the extra cost and the desire to reduce chemical use.
- **Pest management**, with sunn hemp, in particular, helping to manage fall armyworm (FAW)
  - FAW tends to favour sorghum but does not significantly impact sunn hemp.

However, there are always trade-offs. Sunn hemp is not as competitive against weeds as sorghum, and weeds, including volunteer potatoes, can still break through cover crops. Weed management is therefore a constant balancing act.

Machinery and planting practices

Mark uses a practical, low-till approach to planting and managing his cover crops, including:

- Direct drilling into the stubble left from the previous crop
- Speed tiller with a seeder box that covers four metres at a time; an Einböck metering system and fan distribute the seed through tubes
- Great Plains disc drill for precision sowing into stubble

"Our aim is to minimise soil disturbance, only working the ground before and after potatoes."

"If a cover crop fails and doesn't produce enough mulch to protect the soil, we spray out the weeds, till the soil, and replant."

Mark emphasises that you don't need the flashiest machinery to get started.

"We began with basic equipment, simply distributing seed with a fertiliser spreader. As the system evolved we moved to more specialised tools."

His advice – start simple and upgrade once you know what works for your farm.

Cost considerations

Costs can vary widely depending on the species and whether seed is purchased or grown on-farm.

Sunn hemp is an expensive option, particularly when buying seed coated with rhizobia inoculant, which can cost up to $600ha. Despite the high cost, Mark says it's the best cover crop he's ever grown, and he's interested in seeing how it impacts soil nematode levels.

Mark is now exploring cheaper ways to ensure legume seed is inoculated with suitable rhizobia. This could mean buying uncoated seed and applying a soil surface inoculant at planting.

Mulching the cover crop

Triticale and sorghum is much cheaper, typically $150–$250/ha.

Where possible, Mark harvests his own cover crop seed, reducing costs to as little as 50c/kg. Having your own seed enables denser planting rates, which in turn helps to choke out weeds.

Termination strategies

Mark has developed tailored termination methods for each type of cover crop:

- **Cowpea** is roller crimped and left for a couple of weeks. Any regrowth is side-mowed, then sprayed with herbicide. Lime or cow manure is applied, followed by minimal soil working to prepare for potatoes.
- **Sunn hemp** is mulched into fine pieces, left on the surface to decompose, side-mowed to tidy remaining stalks, then lightly incorporated before potato planting. Mark prefers to keep the mulch on the surface to protect the soil and support soil biology.
- **Sorghum** is managed by mowing up to three times during growth to control height, with mulching only if it grows too tall.
- **Ryecorn** may be baled for hay or allowed to go to seed and then crimped to terminate.

Mark's aim is not to create a fine soil bed but to retain decaying organic matter on the surface, which prevents erosion, and improves soil structure, moisture retention, and microbial activity.

SOIL CARBON AND EMISSIONS MONITORING

Soil health is a major focus on Mark Fritz's farm. Although emissions monitoring isn't yet on his radar, Mark does keep track of soil organic matter and carbon levels through basic nutrient testing.

"We're not aiming for specific carbon percentages – it's more about building up organic matter steadily, over time," he said.

"It's a slow process, especially when you're essentially sieving the soil every time you harvest potatoes."

When it comes to fertiliser management, Mark takes a practical, whole-farm approach. His nutrient program is generally tailored to each season rather than each individual paddock.

"Customising every paddock would be too hard to manage, and you'd end up wasting too much product," he said.

Each year, he works out his NPK requirements and typically applies rock phosphate and trace elements pre-planting. He uses soil testing selectively-testing around three paddocks out of every ten and rotating which ones are tested to monitor trends across the farm.

In-season adjustments are rare but may be made if there's been a leaching event, provided the potato crop is still viable and worth saving. Mark has also started using more flexible fertiliser blends and has incorporated carbon-coated urea into his program to support gradual nitrogen release.

While the base fertiliser remains consistent, Mark adapts side-dressing and pre-planting rates each season depending on conditions.

Organic carbon is an important part of his system, but he doesn't target a particular mulch percentage – he simply focuses on building organic matter wherever possible.

ADVICE FOR OTHER GROWERS

For Mark, one of the most important lessons is that cover cropping must suit your own farming system.

"Do what works for you," he said.

"Don't get too hung up on doing what others are doing. It has to fit your farm and your conditions."

He's quick to point out that just

Sun hemp at emergence

Sun hemp at termination

Open sun hemp nodule - the red colour is a good indicator that the legume is fixing nitrogen.

LESSONS AND ADJUSTMENTS

Over time, Mark has steadily refined his cover cropping approach, making practical adjustments along the way.

- **Fertilising sorghum** He initially trialled growing sorghum without fertiliser but found it needed some nutrient support to perform well.
- **Managing Fall Armyworm (FAW)** FAW is a persistent challenge in the region. While it reduces sorghum biomass, it hasn't caused a financial loss—just less organic matter to return to the soil. To manage FAW pressure, Mark now leans more towards growing sunn hemp, which the pest tends to avoid.
- **Nitrogen adjustments** Incorporating legumes into the system has allowed Mark to reduce nitrogen rates in his potato crops by 40 kg/ha. He now uses carbon-coated urea to better control nitrogen release.
- **Weed management** Getting cover crops established quickly is key to suppressing weeds, especially after rain events. Volunteer potatoes can also emerge as weeds in the cover crop phase.
- **Machinery and investment** Mark recommends starting with basic equipment before moving to more specialised machinery once the system is proven. He's found that simple setups can be highly effective.
- **Seed costs**
  Saving seed from his own cover crops helps keep costs down and allows him to plant at higher rates to improve weed suppression.

Mark's approach is built on flexibility and having a plan for all weather scenarios.

"Even a cheap cover crop is better than bare soil," he said.

"If it's too wet, wait and plant when you can. If it's dry, wait until conditions improve get something in the ground to protect it."

"Cover cropping is a long-term learning process."

"You have to figure out what works for your soil and your system - it might look different to everyone else's."

because sunn hemp works well in his operation, it doesn't mean it will be the right fit for everyone.

"I tried plenty of other things that didn't work before I settled on what suits my system," he said. "Don't chase what someone else is doing."

Mark's advice is to start small and simple. "Just get started. If it doesn't work, tweak it and try again. Over time, you'll find the system that you're comfortable with and that you can sustain."

He believes it's essential for the industry to keep moving forward.

"We won't survive if we keep doing the same thing. We need to keep trying new ideas and improving how we farm," he said.

"When you first start, it won't be perfect. It might not even be the best option, but it's important to give it a go and learn as you go."

Mark also gives credit to the cover crop seed industry, which he says has come a long way.

"There's some really good seed on the market now, lots of different blends and varieties, including great forage options."

His advice is clear: start with something manageable, build your confidence, and add complexity once you know what works.

PotatoLink Regional Rep for Queensland, Dr Naomi Diplock (AHR) in the cover crop at flower

WHAT'S NEXT FOR MARK?

Mark is keen to try mixed species cover crops, pairing legumes with grasses to scavenge existing soil nitrogen and further stimulate nitrogen fixation in the legumes.

"Weeds might be harder to control in a mixed crop, but I'll work through that," he said.

He also plans to trial cheaper legume inoculant methods and continue experimenting with termination timing and machinery to refine the system.

> *"Cover cropping is a long-term learning process.*
>
> *You have to figure out what works for your soil and your system – it might look different from everyone else's."*
>
> *Mark Fritz*

KEY POINTS TO GET STARTED

- Cover cropping is central to Mark Fritz's potato farming system. Used between seasons, cover crops help build soil health, manage erosion, and reduce disease pressure.
- The program includes both winter cereals (like triticale and ryecorn) and summer legumes (such as sunn hemp and cowpea), with legumes providing nitrogen fixation, weed control, and pest suppression benefits.
- Yields have improved significantly over 20 years, rising from 32 t/ha to 40 t/ha, alongside better soil health and reduced soil-borne diseases like verticillium wilt and powdery scab.
- Timing is critical – as cover crops are not irrigated, they are sown immediately after potato harvest to take advantage of residual soil moisture.
- Low-till methods and basic machinery are used to establish cover crops, with seed distribution ranging from spreaders to precision disc drills.
- Cover crop costs vary, with rhizobium-inoculated sunn hemp being the most expensive (up to $600/ha), but Mark reduces costs by saving seed and is now trialling cheaper inoculation techniques.
- Tailored termination strategies are used for each species, aiming to retain organic matter on the surface rather than creating a fine seedbed.
- Mark monitors soil carbon and organic matter through basic nutrient testing, aiming for gradual long-term improvement without fixating on exact targets.
- His fertiliser approach is whole-farm and seasonally adjusted, with selective soil testing and a focus on flexibility and practicality.
- His advice to other growers is to start small, learn by doing, and adapt cover cropping to suit individual conditions, rather than copying others' systems.

ACKNOWLEDGEMENTS

The PotatoLink team would like to thank grower Mark Fritz for his openness and willingness to share his cover cropping approaches, and for hosting the PotatoLink field walk on his farm earlier in the year.

EXPLORE THE TOPIC FURTHER

- **CASE STUDY:** Improving Soil Health with Andrew Tempra
- **FEATURE ARTICLE:** Management of potatoes under wet conditions
- **ONLINE TRAINING:** Cover crops for potato growers

DON'T PLANT A PEST: MASTERING BIOSECURITY AT YOUR FARM GATE

By Shakira Johnson, AUSVEG

A successful season starts long before the first potato plant breaks through the soil. It begins with the choices you make about what comes through your farm gate. Every delivery—from seed and soil amendments to contractor machinery—is a possible entry for pests, weeds, and diseases. Managing the biosecurity of your farm inputs isn't just red tape; it's one of the most powerful forms of crop insurance you can have.

Anything moved onto your property can carry a hidden threat. By implementing a few robust checks and procedures, you can create a frontline defence that protects your crop, your business, and your neighbours.

SEED POTATOES: YOUR HIGHEST RISK, YOUR BIGGEST PRIORITY

Without a doubt, the single greatest biosecurity risk for any potato grower is infected seed potatoes. They are the primary vector for a host of damaging diseases, including viruses, bacterial wilt, and potentially catastrophic fungal pests like late blight.

In most cases, you simply cannot assess seed quality by eye. That's why relying on accredited, certified seed is the cornerstone of responsible potato production.

Your Seed Potato Checklist:

- **Source from the best:** Always purchase seed potatoes from accredited suppliers participating in a recognised certification scheme. These programs ensure seed is produced under stringent conditions, minimising disease risk.
- In Australia, certification schemes include:
  - The Australia Certified Seed Potato Authority (AuSPICA)
  - The Tasmanian Certified Seed Potato Scheme (TasSeed)
  - The Western Australian Certified Seed Potato Scheme.
- **Demand the paperwork:** Never accept a delivery without documentation. Request and file the paperwork that shows the source and testing history of the seed. This traceability is your best friend if a problem emerges later.
- **Keep detailed records:** For every batch of seed, record the variety, crop class, purchase date, supplier, the area planted, and the specific block where it was planted. This information is invaluable for tracking down the source of any potential incursion.
- **Monitor and report:** Once the crop is in the ground, be vigilant. Regularly monitor for any signs of pests or disease. If you suspect an issue related to the seed, report it.
  - Contact the certifying authority regarding established pests and diseases.
  - Call the **Exotic Plant Pest Hotline (1800 084 881)** immediately if you see anything unusual that could be an exotic pest.

Remember the golden rules: Never be tempted to use poor-quality or diseased seed – it has the potential to infect your entire crop (and soil) for years to come).

Furthermore, cutting seed is a high-risk practice. A single contaminated knife or cutter can spread diseases like bacterial wilt or PSTVd through an entire seed lot before you've even planted it.

THINKING BEYOND THE PADDOCK: WHOLE-OF-FARM BIOSECURITY

Your potato crop doesn't exist in isolation. Pests, weeds, and diseases don't care about your enterprise structure, and a risk introduced for one part of your business can easily become a problem for another.

Consider all inputs for every crop or livestock operation on your property. Are you bringing in hay or feed for livestock? This is a well-known pathway for persistent weeds. Planting a rotational crop? The seed for that crop could introduce soil-borne diseases that will impact your future potato plantings.

A true biosecurity mindset involves looking at every single input — from fertiliser and compost to irrigation water and contractor equipment — and asking a simple question: "What risk could this be bringing onto my property, and what have I done to manage it?"

CHECK WATER SOURCES REGULARLY

Water sources like dams, rivers, and channels have the potential to be reservoirs and conduits for weeds and pests, including bacterial wilt. It's crucial to **monitor the quality of water used for irrigation** and the vegetation along the edges of watercourses and dams. This can provide early warning of new weeds, pests, and diseases brought onto the farm or reveal increased pest pressure due to a build-up of insects or diseases in or near a water course.

If an outbreak of a water-borne disease has been recorded on nearby properties, other measures can be considered. For example, testing by a state department plant health diagnostic laboratory is advised. More care is needed where water that drains from a paddock into a dam is recycled back onto the crop.

Additional measures may be needed to treat the water in the event of a disease outbreak on your farm or a neighbouring farm.

On-farm biosecurity is not necessarily expensive or difficult. Often, reducing risk is a simple matter of adjusting the way that production activities are done. Protect water sources from contamination as much as possible by making yourself aware of where inflows to your irrigation sources come from. Consider treating water which has flowed off a potentially contaminated potato crop, or aerating stagnant bodies of water such as dams to prevent outbreaks of blue-green algae.

USE CERTIFIED FERTILISER

Fertilisers are another input that can potentially introduce diseases, pests, and weeds to your farm when applied to a crop as part of your rotations. In particular, **organic fertilisers such as manure and compost can be a source of pests** like root knot nematode as well as weed seeds.

Reduce risk by ensuring that the supplier is following the Fertilizer Industry Federation of Australia (FIFA) Purchasing Code of Practice or has equivalent quality controls in place. See fertilizer.org.au for more information. Look for compliance with the Australian Standard AS4454-2012 that applies to compost, soil conditioners, and mulches. Ask compost suppliers for a testing history or other assurance of quality.

When batches are used on-farm, keep a record of the source and where it was applied. Check the area for signs of new pests, diseases, or weeds. If you make your own compost, don't include source material that comes from diseased plants. Monitor temperatures during composting and ensure that thresholds for pest destruction are achieved throughout the pile of composting material.

By focusing on what you can control at the farm gate, you give your crop the best possible start and play a crucial role in safeguarding the entire Australian potato industry.

Now that you have a solid understanding of these critical pathways, it's time to take the next step. Refer to your Potato Growers' Biosecurity Manual and use the checklist to evaluate your current practices. Develop a customised action plan to mitigate these risks, ensuring the health and productivity of your potato crops. Proactive biosecurity is your best defence.

To get started on your plan, assess your own farm biosecurity practices against the biosecurity checklist in the Potato Growers' Biosecurity Manual.

For more information or advice on preparing your own Farm Biosecurity Plan, speak to a trusted consultant or agronomist or contact AUSVEG Farm Biosecurity Coordinator, Shakira Johnson at Shakira.johnson@ausveg.com.au

POTATO GROWERS' BIOSECURITY MANUAL

Access the guide and protect your farm by scanning the QR code or visit bit.ly/ausveg-biosecurity

DEMO SITE: OPTIMISING FERTILISER USE IN NORTH MOTTON, TASMANIA

As fertiliser prices fluctuate and environmental scrutiny tightens, the need for informed, adaptive nutrient strategies in potato farming has never been greater.

At our demonstration site in North Motton, Tasmania, the PotatoLink team partnered with local grower Coby Badcock and agronomist and regional representative for PotatoLink Tim Walker to explore the question at the heart of every fertiliser program: How much is enough without compromising quality and yield?

This case study – running from October 2024 to April 2025 – compared conventional, high-input methods against crop sampling-guided approaches in Innovator potatoes.

The objectives of the trial were to:

- Evaluate the impact of varying fertiliser rates and timings (pre-spread, at planting, and top-dress) on potato crop yield, quality (size distribution and specific gravity), and gross margins.
- Compare a crop sampling-based (sap test) fertiliser program with a conventional fertiliser program to evaluate their effectiveness in optimising fertiliser use, yield, nutrition uptake, and input cost efficiency over a single growing season.

THE TRIAL

Four 1 ha treatment blocks were allocated within a commercial potato crop. Single Superphosphate (SSP) with Muriate of Potash (MOP) was applied across all four blocks as a pre-spread. The four blocks were then treated as follows:

T1 – Minimum + pre-spread: Low-rate fertiliser program with an additional pre-spread application of SSP + MOP. Top-dressed based on sap test results.

T2 – Conventional – high: High-input program with an additional pre-spread application, full-rate DAP/MAP at planting, and top-dressed by a conventional program (no sap testing).

T3 – Conventional – moderate: A more moderate program using standard planting fertiliser (no additional pre-spread). Top-dressed based on sap test results.

T4 – Minimum: The lowest-input program (no additional pre-spread) and compound fertiliser at planting. Top-dressed based on sap test results.

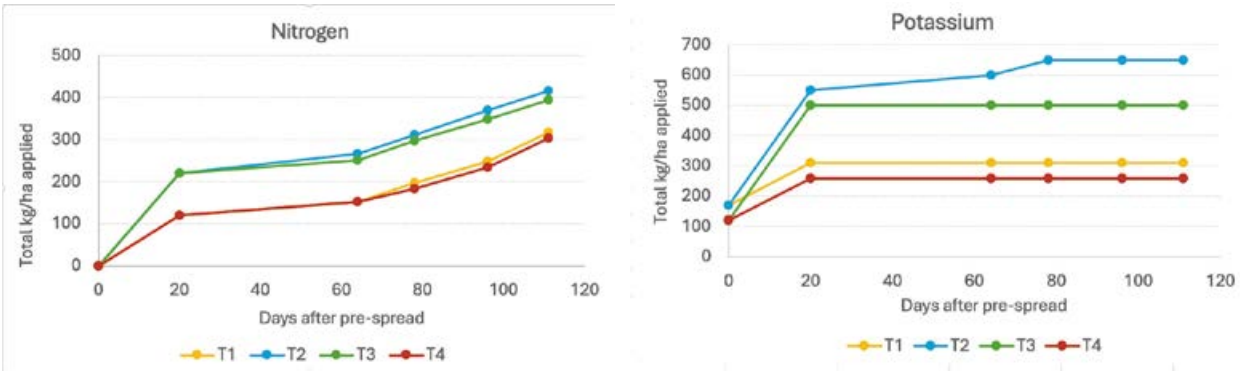

Figure 1. Cumulative total applications of nitrogen and potassium to treatment blocks T1 to T4. Initial application was a pre-spread. Fertiliser was then applied in furrow at planting, then as four side dressings. For T1, T3 and T4, top dressing applications were based on sap test results.

		T1	T2	T3	T4
Pre-spread		700 kg × (67% SSP + 33% MOP)			
		500 kg × (80% SSP + 20% MOP)			
In furrow at planting		1,000 kg × Compound	2,000 kg × DAP + MAP		1,000 kg × Compound
		Sap test x 4		Sap test x 4	Sap test x 4
Top dressing	12.12.24	150 kg × SOA	200 kg × Urea + Potash	150 kg × SOA	150 kg × SOA
	26.12.24	100 kg × Urea	200 kg × Urea + Potash	100 kg × Urea	150 kg × SOA
	13.01.25	150 kg × Urea + SOA	125 kg × Urea	150 kg × Urea + SOA	150 kg × Urea + SOA
	28.01.25	150 kg × Urea	100 kg × Urea	100 kg × Urea	150 kg × Urea
TOTAL kg/ha		N:P:K:S 316:127:309:208	N:P:K:S 416:337:649:114	N:P:K:S 393:302:499:123	N:P:K:S 302:92:259:199

Figure 2. Summary of fertiliser applications by treatment. NPKS ratios as follows; Compound – 12:5:14:6; DAP + MAP – 11:13:19:1; SOA – 21:0:0:24; Urea – 46:0:0:0; Urea + Potash – 23:0:25:0; Urea + SOA – 33:0:0:12

PLANT SAP TEST RESULTS

Plant sap testing offers a real-time snapshot of nutrient levels within plants. It can help fine-tune fertiliser programs by identifying where nutrients are deficient or excessive.

However, sap testing should not be used in isolation; it is most effective when combined with soil test results, crop growth stage knowledge, and visual assessments.

Sap test results indicated that most macro and micronutrients remained within the target range for the majority of the cropping cycle (Table 1).

Sap levels of **nitrate** (NO_3) were relatively constant over the cropping cycle, occasionally exceeding recommended levels. However, sap concentrations of **ammonium** (NH_4) decreased over time. While they remained within range, levels fell close to minimum recommendations during tuber bulking, especially for T1 and T4.

While high nitrate levels can potentially reduce uptake of **calcium**, in this trial, sap concentrations of calcium remained within the desirable range or even higher.

Although **phosphorus** started low across the treatments, all were within range during tuber bulking.

Potassium levels generally exceeded the ideal range, even with reduced inputs, suggesting possible over-application. Side dressing with **sulphur** at early bulking was also reflected in overly high levels in sap.

Of the micronutrients, zinc, copper, sodium, iron and magnesium were all within range. Manganese was marginally low early, with levels increasing as the crop developed. Boron also increased, with overly high levels recorded in sap during tuber bulking across all treatments.

SITE AND ASSESSMENTS AT A GLANCE

- Location: North Motton, Tasmania
- Trial site: 4-hectare paddock
- Variety: Innovator (for processing)
- Irrigation: Pivot
- SAP tests collected four times during growth: tuber initiation, tuber development, early tuber bulking and mid tuber bulking
- The following were harvested and assessed to determine the effects of each treatment:
  - Sampled 5 x 3m plots of each treatment, recording:
    - Stems and tubers / plant
    - Weight of tubers by size: <50mm; 50-100mm; 100-150mm; 150-200mm
    - Yield / plot
- Total yield data was collected by excluding edge rows and spray runs, then using GPS-tracked harvesting distances to calculate the harvested area per truckload, with final yield determined from load weights and area harvested.
- Specific gravity was provided by the processor

Table 1. Summary of key results from sap tests. Colour indicates whether result was below (red), within (green) or above (purple) recommended levels.

	Nitrate (NO_3)				Phosphorus				Potassium				Calcium				Sulphur			
	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
Tuber initiation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tuber development	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Early bulking	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mid bulking	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

KEY

- Below normal range
- Within normal range
- Above normal range

DID ADDITIONAL PRE-SPREADING BOOST YIELD AND PROFIT?

T1 and T2 received an additional pre-spread application of SSP and MOP before planting, while T3 and T4 did not.

- The extra pre-spread fertiliser did not translate into yield gains.
- T2 had a similar fertiliser program to T3, with the exception of the additional pre-spread application. Yields from the two treatment blocks were not significantly different at 69 and 68 t/ha.
- Similarly, T1 had a similar fertiliser program to T4, with the exception of the additional pre-spread application. Both blocks yielded 62 t/ha, so there was no benefit from the pre-spread.
- While a trend was noted to an increased percentage of large (150 to 200mm) tubers in T1 and T2, this difference was not statistically significant.

As yield was not increased, T1 and T2 had higher fertiliser costs as a percentage of total revenue, ranging from 10.4% to 12.4%, compared with 9.4% to 11.0% for T3 and T4.

Most importantly, profitability was higher in the no-pre-spread treatments. T3 achieved the highest net return, while T4, despite receiving fewer inputs, outperformed T1 in both margin and efficiency.

In summary

Under the trial conditions, additional pre-spread fertiliser was not economically justified.

More efficient nutrient use and better margins were achieved without this treatment.

Figure 3. Example of one of the digs used to assess tubers/plant, tuber size, defects, and yield variability

HOW DID THE RATE AND TYPE OF FERTILISER APPLIED AT PLANTING IMPACT YIELD AND PROFIT?

- The higher input treatments T2 and T3 produced higher yields (69 t/ha and 68 t/ha), compared with 62 t/ha for T1 and T4.
- This suggests that, under the conditions in this trial, increasing fertiliser at planting improved productivity.
- However, this finding is complicated by the fact that both fertiliser type and application rates varied between treatments. For example, the compound fertiliser used in T1 and T4 was only tested at the lower rate, while DAP/MAP was used exclusively at the higher rate. As a result, it is not possible to isolate the effect of fertiliser type from that of fertiliser quantity.

In terms of $/ha:

- T2 and T3 achieved net returns approximately $2,200 to $2,500 per hectare higher than T1 and T4.
- However, these gains came at a cost. Fertiliser spending was $500 to $1,200 per hectare greater in the high-rate treatments.
- When fertiliser cost was factored in, the increase in net return was around 8–10% higher.

IMPACT OF FERTILISER REGIME ON YIELD AND INPUT COST EFFICIENCY

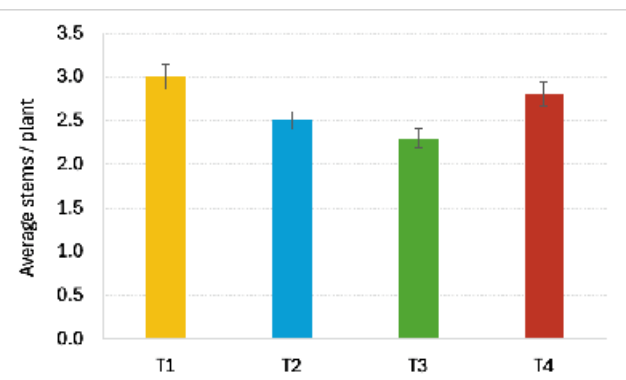

Figure 4a. Average stems per plant, calculated from 5 x 3m digs per treatment. Bars indicate the standard error of each mean value.

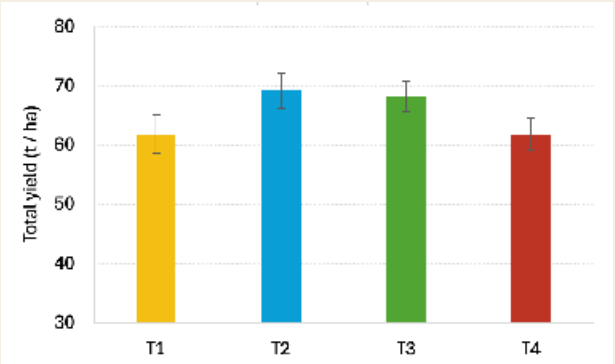

Figure 4b. Total yield at harvest from each treatment block. Bars indicate an estimated variability for each block based on harvested yield.

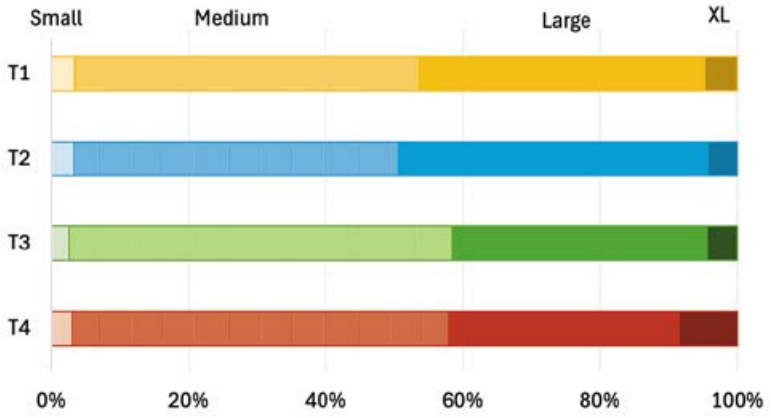

Figure 4c. Proportion of tubers that were small (<50mm), medium (50 to 100mm), large (100 to 150mm) or extra large (>150mm) within each treatment block. Data calculated from 5 x 3m digs per treatment. Note that although more large tubers were recovered from T1 and T2, this difference was not statistically significant.

In summary

In this cropping situation, the use of higher fertiliser rates appears justified. In other situations benefits may not outweigh the extra input costs. Even in this case the return on investment was limited, and it seems likely that not all of the additional fertiliser was utilised by the crop.

Future studies would benefit from comparing different fertiliser types at similar rates to better identify the most cost-effective option.

Table 2: Fertiliser cost as percentage of revenue. While T2 and T3 achieved the highest yield, T4 provided the best returns on fertiliser investment.

Treatment	Fertiliser cost as a percentage of revenue
T1: Minimum + Pre-spread	10.4
T2: Conventional - High	12.4
T3: Conventional - Moderate	11.0
T4: Minimum	9.4

HOW WELL DO POTATOES PERFORM WITH MINIMAL FERTILISER INPUT?

T4 represented the low-input approach, receiving the smallest amount of fertiliser across all treatments.

In terms of t/ha:

- T4 had the lowest yield of the trial at 62 t/ha, 10.6% lower than T2, the conventional high-input program.
- Fertiliser costs for T4 were reduced by 32% relative to T2, with the result this treatment achieved the best fertiliser cost efficiency in terms of input compared to revenue.

In terms of $/ha:

- T4 delivered $2,160 per hectare less than T2, but still offered

strong economic performance for a low-input system.

- For growers operating under cash flow constraints, or in environments where heavy fertiliser application is not warranted, such an approach may provide a more sustainable and financially viable alternative.

In summary

While higher fertiliser rates can boost yields and returns, they come with greater financial risk and environmental impact. Lower input systems may not maximise yield, but they can minimise input costs and reduce over-fertilisation.

SOIL AND NUTRIENT STATUS AFTER HARVEST

Soil testing across the trial site following harvest provided important insights into the growing environment. These factors potentially affected how the fertiliser regimes trialled impacted crop performance.

- **Soil pH ($CaCl_2$)** was 5.9 at the start of the cropping season, well within the optimal range. After harvest, pH had fallen to 4.9. Soil pH ($CaCl_2$) below 5.5 reduces availability of nutrients including phosphorus, magnesium, calcium and molybdenum (Figure 5).
- **Low pH** could explain why phosphorous levels in sap remained at the bottom of the normal range across all treatments, despite high rates of P application in T2 and T3.
- **Cation Exchange Capacity (CEC)** is the measure of a soil's overall nutrient storage and exchange capacity. In this case, it was below desirable levels. This means the soil cannot hold more nutrients, especially when combined with low pH.
- **Organic matter** was very high (>5% carbon) at the trial site. While good for soil structure and microbial health, high levels of soil carbon can potentially bind nitrogen, delaying availability to the crop. High carbon soils require careful nitrogen management, particularly around timing and formulation, to ensure nutrient release coincides with crop demand.
- **Salinity levels and problem cations** remained within safe limits throughout the trial period.
- **Macronutrient** levels showed a mix of favourable and excessive values.
  - Total nitrogen and phosphorus were within satisfactory ranges across treatments.
  - Potassium was high to very high in all treatments, exceeding the optimal range for potatoes. Excess potassium can lead to nutrient imbalances, particularly in magnesium and calcium uptake.
  - Sulphur levels were satisfactory in T1 to T3, but unusually high in T4.
- The **calcium-to-magnesium ratio** exceeded target levels in all treatments. A high calcium dominance in the soil can interfere with magnesium availability. Magnesium is critical to photosynthesis and some enzymes. Fortunately, in this trial, sap magnesium levels remained within the target range.
- **Micronutrient** analysis showed that most elements were within acceptable ranges, with the exceptions of boron and copper, which were low to very low across all treatments. Despite low levels in soil, concentrations of boron were high across all sap tests.

SO, WHAT HAVE WE LEARNED?

The trial highlighted the importance of nutrient uptake dynamics and the limitations of relying solely on fertiliser application rates to predict crop nutrient status.

How crops take up nutrients is influenced by multiple interacting factors beyond just fertiliser inputs. Timing, fertiliser form, pH, and crop demand all play a role.

For example, even though significantly more N was applied to T2 and T3 than T1 and T4, sap tests indicated nitrate levels were generally similar across all treatments. Similarly, although more than twice as much potassium was added to T2 compared to T4, potassium levels in sap were higher in the latter.

These inconsistencies demonstrate the complexity of nutrient uptake. Simply adding more fertiliser to the soil does not mean it will be taken up and used by the plant.

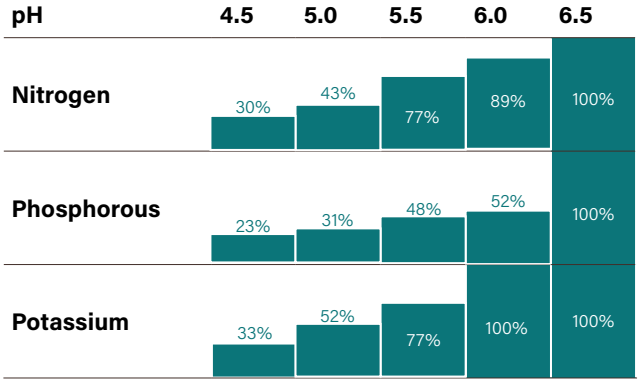

Figure 5. Effect of pH on NPK assimilation. (adapted from https://omya-agriculture.com/au/omyaproducts/calciprill)

Nutrient interactions affect uptake efficiency

Balancing nutrients is very important as there are many interplays going on.

Some examples are:

- Excess potassium can inhibit magnesium uptake due to competitive absorption.
- Too much nitrate can reduce calcium and boron levels – key nutrients for tuber quality and plant integrity.
- Sulphur and nitrogen must also be balanced, as low sulphur can restrict nitrogen efficiency, while excessive sulphur may suppress other nutrients.

Addressing one nutrient in isolation can create deficiencies in others. An integrated approach to nutrition is therefore always best.

Soil pH affects nutrient availability

Soil tests conducted after harvest indicated that soil pH ($CaCl_2$) fell to 4.9 during the cropping cycle. It is likely that these somewhat acidic conditions impacted nutrient uptake.

It is possible that the same fertiliser treatments could produce a very different result at a more neutral soil pH, especially if combined with a higher CEC. In particular, the lower fertiliser regimes tested in this trial may not have incurred the same yield penalty observed here had the soil conditions been optimised for efficient uptake of nutrients by the plants.

LOOKING AHEAD AT FUTURE TRIALS

The grower is keen to further refine nutrient management to improve efficiency and crop health. The immediate priorities are addressing low soil pH and improving CEC.

A soil test will be conducted to guide lime applications ahead of the next potato crop. The focus is on using finely ground lime products to ensure quicker effectiveness.

Strong interest remains in reducing fertiliser inputs. Future trials will explore applying less fertiliser at planting and again tailoring nutrition based on real-time sap and soil test results throughout the season.

Other refinements include:

- Revisiting topdressing strategies, as the additional pre-spread in this trial did not improve yield.
- Increasing planting-time compound fertiliser rates to create more consistent comparisons across treatments.
- Trialling wider seed spacing; this may support lower input growing strategies by reducing competition and improving fertiliser use efficiency.

The grower's long-term goal is to demonstrate that high-quality crops can be produced with fewer inputs by adjusting product types and timing and focusing on crop demand rather than calendar-based application.

KEY POINTS

In this trial

- Extra pre-spread fertiliser didn't improve yield.
- Although higher fertiliser rates at and after planting increased yield and, in this study, profitability, increased production costs were significant.
- Sap test results did not always align with fertiliser rates applied.

In general

- Applying more fertiliser does not mean it will be used by the plant; nutrient uptake is affected by many factors.
- Imbalances between nutrients can limit plant uptake and reduce efficiency.
- Soil pH is a key driver of nutrient uptake efficiency and fertiliser effectiveness.

FURTHER READING

- **FACT SHEET:** The changing nutrition needs of a growing crop
- **MAGAZINE ARTICLE:** Petiole testing for nutrient analysis
- **FACTSHEET:** Interpreting soil test reports

ACKNOWLEDGEMENTS

The PotatoLink team would like to thank grower Coby Badcock for access to his farm and ongoing assistance in the trial, and congratulate him for being nominated for Syngenta Grower of the Year and Corteva Agriscience Young Grower of the Year at Hort Connections 2025. Additionally, thank you to PotatoLink regional representative Tim Walker who has worked with us to carry out the trial and interpret the results.

LATEST FROM AuSPICA

BLACKLEG MANAGEMENT STRENGTHENED THROUGH AUSPICA'S CERTIFICATION SCHEME

Barry Stahan and Dr Nigel Crump

Blackleg is no longer a single-pathogen problem – it's a complex, evolving disease demanding proactive, science-based management. AuSPICA's certified seed scheme continues to play a pivotal role in reducing the risk of blackleg in Australia's potato crops, ensuring clean planting material and reinforcing grower confidence.

While the pathogen complex is evolving, the management remains firmly focused on prevention. Through targeted inspections, strict hygiene protocols, and a zero-tolerance approach to *Dickeya dianthicola*, AuSPICA is safeguarding both seed and commercial growers from costly blackleg outbreaks.

"Growers who invest in certified seed and follow sound hygiene practices are giving themselves the best chance of avoiding costly setbacks," Dr Nigel Crump, General Manager of AuSPICA, said.

"It's not just about passing inspection – it's about protecting future crops, market access, and the reputation of our seed system. The zero-tolerance approach to Dickeya has worked, and we need to keep that same focus across the broader disease complex."

WHAT CAUSES BLACKLEG?

Once largely attributed to *Pectobacterium atrosepticum*, blackleg in potatoes is now known to result from multiple soft rot bacterial species – many of which thrive in hot conditions and can be easily spread by contaminated equipment, seed, or soil.

Key pathogens involved in the blackleg complex include:

- *Pectobacterium brasiliense*
- *Pectobacterium parmentieri*
- *Pectobacterium carotovorum*
- *Dickeya dianthicola*

These bacteria can cause similar, but sometimes more aggressive or atypical symptoms compared to traditional blackleg.

HOW DO SYMPTOMS DIFFER?

While traditional blackleg caused by *Pectobacterium atrosepticum* typically included blackened stems at the base, soft rot, and a distinct rotten or fishy smell, the symptoms associated with newer strains are often different and harder to identify early.

Notable differences with newer pathogens include:

- Sudden and widespread stem collapse without typical stem blackening
- Symptoms developing at higher temperatures than traditionally expected
- More aggressive rotting of daughter tubers in the field and in storage
- Internal browning and hollowing of stems, even when external symptoms are limited

In particular, *Pectobacterium parmentieri* has been associated with substantial storage losses due to soft rot developing during post-harvest handling and long-term storage. These losses can occur even when field symptoms are minimal, making early detection and the use of "clean" seed crucial.

It is critical that seed lots are known in relation to their crop health – especially for blackleg. Seed lots that contain high levels of blackleg-causing pathogens pose a significant risk, not only to the immediate crop but to long-term paddock hygiene, storage outcomes, and surrounding production systems.

Understanding the plant health history and disease testing status of a seed lot helps manage the risk of latent infection and avoids introducing damaging pathogens into clean fields or storage systems.

These variations in symptoms and behaviour highlight the need for laboratory confirmation and evidence-based seed sourcing.

ENHANCED RISK MITIGATION THROUGH STRICTER STANDARDS

A few years ago, AuSPICA reduced the permitted tolerance for blackleg symptoms across all certification classes. This proactive step was taken to enhance risk mitigation and reduce the likelihood of disease carryover, recognising the growing complexity and aggressiveness of blackleg-causing pathogens. The stricter tolerance threshold reinforces AuSPICA's commitment to supplying high-health seed that performs reliably under commercial conditions.

ADVANCING DIAGNOSTICS FOR INDUSTRY CONFIDENCE

To support accurate detection and strengthen industry surveillance, AuSPICA has worked closely with leading diagnostic providers including Crop Health Services, AgriBio, and Intertek. These partnerships have helped develop and validate reliable diagnostic tools capable of identifying multiple blackleg-causing bacterial species. The result is a more informed and responsive approach to managing the disease across certified seed systems and commercial production.

GOOD NEWS: DICKEYA SOLANI IS NOT IN AUSTRALIA

While blackleg is a complex challenge globally, there is some good news for Australian growers: *Dickeya solani*, a highly aggressive blackleg pathogen causing widespread damage in Europe, has not been reported in Australia. This remains the case thanks to ongoing national surveillance programs and strict import controls that support early detection and prevention.

IMPROVED SAMPLING EFFICIENCY

In a further boost for disease detection and affordability, recent changes to AuSPICA's sampling processes have reduced the cost associated with testing 400-tuber lots. This makes comprehensive health assessments more accessible to growers while maintaining robust surveillance for blackleg and other pathogens.

HOW SEED CERTIFICATION PROTECTS THE INDUSTRY

Through rigorous field inspections, DNA-based diagnostics, and strong technical oversight, AuSPICA plays a leading role in disease suppression. Certification ensures that seed meets strict plant health standards before entering the commercial supply chain.

Key certification actions include:

- *Dickeya dianthicola* is managed under a zero-tolerance policy (AuSPICA)
- Routine surveillance and laboratory diagnostics reduce the risk of undetected spread
- Seed crops are inspected at critical stages to detect early signs of disease
- Any blackleg symptoms found during routine inspection must be laboratory tested to determine the specific bacterial species involved

"With the diversity of blackleg-causing bacteria increasing, it's more important than ever to maintain clean seed, clean sheds, and proactive crop management," said Barry Strathan, Senior Certification Officer at AuSPICA.

"Small details like cleaning bins, managing self-sown volunteer plants in the rotation, and checking grading equipment can have a big impact. The strength of the certification scheme is that it gives growers confidence that the seed they're using has been through a rigorous process."

ZERO DICKEYA – A CERTIFICATION SUCCESS

In recent seasons, AuSPICA has reported no detections of *Dickeya dianthicola* in certified seed potatoes. This success reflects the strength of early intervention, effective hygiene protocols, and robust DNA testing systems.

This track record shows how certification contributes to disease prevention, supports market readiness, and protects the reputation of Australian seed potatoes.

THE BOTTOM LINE

Blackleg may be complex, but the solution begins with awareness, hygiene, and certified seed.

By using certified seed and maintaining strict hygiene across paddocks, sheds, and equipment, growers are protecting yields, quality, and long-term industry sustainability.

Awareness, biosecurity, and certification – these are the pillars of blackleg control in today's potato industry.

SAFEGUARDING THE AUSTRALIAN POTATO INDUSTRY:

THE ROLE OF SEED POTATO CERTIFICATION OFFICERS

by Michelle Wilson and Dr Nigel Crump

Seed potato certification officers are tasked with ensuring the health and safety of potato crops, safeguarding against diseases.

PROTECTING CROP INTEGRITY

Certification Officers work closely with seed growers to ensure that crops meet commercial quality standards and are free from diseases and contaminants. However, their role goes well beyond simply ticking boxes – they act as a crucial interface between scientific standards and on-farm practice.

These officers conduct meticulous field inspections at key crop stages. This includes activities such as:

- Soil sampling for potato cyst nematode (PCN), a notifiable pest that can severely impact market access and seed movement
- Visual assessments for varietal purity, using morphological characteristics such as stem colour, leaf shape, and flowering traits
- Identification of disease symptoms and physiological defects, supporting early intervention and management decisions
- Leaf picking for virus testing, which enables early detection and management of viral diseases like PVY. Certification Officers maintain a deep understanding of crop health, certification standards, and industry expectations ensures that any potential threats are detected early and accurately. This hands-on support not only safeguards the integrity of certified seed but also helps growers maintain access to domestic and export markets.

NAVIGATING CHALLENGES

One of the significant challenges faced by Certification Officers is navigating vast regional areas to locate specific crops and inspection points.

Timing is critical – inspections must align with key crop growth stages to ensure accurate assessments.

For example, early-season inspections are required when plants are actively growing to coincide with flowering and to verify trueness-to-type and disease freedom. Later inspections allow for leaf collection for virus testing and final disease assessments.

Missing these windows can compromise the certification process and delay market readiness, meaning Certification Officers must be highly organised, adaptable, and responsive, often planning visits days in advance

Moreover, the working environment is not without its hazards. Snakes, stinging nettles, and uneven terrain present challenges of there own.

In addition to natures hazards, they must also navigate machinery and human activity in the paddock while ensuring their own safety.

FOSTERING RELATIONSHIPS

A strong relationship with growers is critical. This relationship is formed through a shared purpose, regular engagement, and mutual respect built over time. Here's how that bond typically develops:

1. Regular on-farm interaction

Certification Officers visit farms frequently during the growing season for inspections. These aren't just formal checks – they often involve walking the crop rows together, discussing issues like plant health, pest management, or seasonal challenges. These regular visits create familiarity and provide opportunities for informal conversations.

2. Shared commitment to quality

Both parties are invested in producing high-quality seed. Certification Officers are there to uphold standards, but they also become allies in achieving the grower's success. When growers see that officers genuinely care about the health of the crop, not just ticking boxes, it deepens trust.

3. Respect for experience and expertise

Growers bring generations of knowledge about their land and crops; Certification Officers bring formal expertise in plant health, diagnostics, and regulation. When both acknowledge each other's knowledge and work collaboratively, a strong professional respect forms.

4. Support during challenges

Whether it's managing a virus outbreak, interpreting regulation, or making decisions after adverse weather, Certification Officers often assist growers during tough times. This support builds a strong foundation of trust and loyalty.

5. Consistency and continuity

In many regions, the same officer will visit the same growers year after year. Over time, they become familiar faces, sometimes even friends – sharing family news, discussing weather patterns, or just chatting in the shed.

6. Mutual pride in success

There's a shared satisfaction in seeing clean, healthy crops pass certification. For growers, it's their livelihood. For Certification Officers, it reflects their guidance and vigilance. That mutual pride reinforces the partnership.

INSPECTING CROP AND SEED LOTS

In addition to their role in crop health, Seed Potato Certification Officers uphold regulatory seed certification standards and ensure that operations run within the bounds of the seed certification Scheme. Seed Potato Certification Officers are tasked with inspecting crop and seed lots. This involves thorough assessments of commercial quality standards, including factors such as mechanical damage, insect feeding damage, rots, and disease resistance.

They also pay close attention to import biosecurity issues, ensuring that seed lots are not affected by important diseases and pests such as Bacterial wilt, Potato Cyst Nematode and Potato Spindle Tuber Viroid (PSTVd) to name a few.

By diligently enforcing regulations and conducting thorough inspections, Seed Potato Certification Officers help prevent the spread of diseases and maintain the overall health of potato crops. Their work is essential for preserving the quality and safety of seed potatoes and sustaining the potato supply chain.

EMBRACING NATURE'S OFFICE

Despite the challenges they face, Certification Officers revel in the beauty of their workplace. Surrounded by vast expanses of natural beauty, theirs is truly an office without walls. The open spaces and fresh air provide a serene backdrop to their vital work, offering a stark contrast to the confines of traditional office environments.

KEEPING PACE WITH TECHNOLOGY AND EMERGING CHALLENGES

Change is constant, and each season brings its own specific challenges. Identification of pests and diseases is always a priority, and modern technology, such as PCR testing for viruses, has provided Certification Officers with new tools to address these challenges effectively.

By embracing continuous learning and adopting innovative technologies, Certification Officers stay ahead of emerging issues, ensuring the continued success of the potato industry.

"I've had the chance to learn from experienced professionals like Professor Steven Johnson (University Maine), Willem Schrage (North Dakota), and Dr Nigel Crump, whose practical insights continue to shape how I approach my work."

Michelle Wilson

ABOUT AUSPICA

AuSPICA, an independent provider of Seed Potato Certification and other services to the Australian Potato Industry

AuSPICA is the authority responsible for the seed potato certification schemes in Victoria, South Australia and Northern New South Wales (Guyra).

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EYES ON THE WORLD – RECENT ADVANCES IN POTATO RESEARCH AND INNOVATION

Improving the performance of machine learning algorithms for detection of individual pests and beneficial insects using feature selection techniques

Aminu R, Cook SM, Ljungberg D, Hensel O, Nasirahmadi A. 2025. Artificial intelligence in Agriculture 15:377-394

WHAT WAS IT ABOUT?

When it comes to insect invasions, early warning is everything. Insects are easier and cheaper to manage when populations are small and spread is contained to a limited area. For example, detecting that first wave of summer aphids can prevent virus infection spreading through the field.

Of course, detailed oversight relies on detailed scouting. However, scouting is labour intensive and expensive, even assuming skilled labour is available. Outsourcing makes sense.

Advances in computer vision and machine learning have allowed development of systems that can detect and recognise small objects with increasing accuracy. Systems that can recognise (and control) weeds, classify disease and identify insects are becoming more common.

While identification of an insect photographed on a flat surface is relatively easy, it is far more challenging within the complex lighting, colour, and architecture of a potato crop. Moreover, to be commercially viable, systems sent to scout a potato crop need to;

1. use relatively simple hardware
2. learn quickly, and
3. react in real time

European researchers have been tackling this issue using machine learning and artificial intelligence.

WHAT WAS DONE?

The researchers focused on two insect pests – the Colorado potato beetle (CPB) and green peach aphid – and one beneficial insect – the seven-spot ladybird (note: seven spot ladybirds are considered a biosecurity risk in Australia). All life stages – egg, larva and adult – were included.

The insects were photographed on potato plants at the laboratory and in the field. Additional images captured from actual field infestations were included for diversity, as were images of leaves without insects.

Relatively low-resolution images were used to minimise computational power and time requirements. Images were processed by manually adding bounding boxes around insects. Differences in colours, shapes and texture were used to train the machine learning algorithm to recognise each species.

While Colorado potato beetles and ladybirds were relatively easy to identify, aphids proved more challenging due to their small size and colour similar to the plant leaves. However, identifying individual aphids is not necessary as long as a percentage can be recognised. The team also determined that using only a few key features for each insect improved accuracy compared to more complex models.

WHAT WAS FOUND?

The system was able to accurately identify CPB and ladybirds as well as a percentage of aphids on potato leaves. Overall accuracy was 90 to 93%, which was significantly better than previous systems, despite using a simpler computing method and faster training time.

The authors suggest that their method could be integrated with agricultural equipment, such as tractors and drones, or deployed in devices strategically placed around the crop edge.

Figure 1. Examples of images that were used to train the model; a ladybird, a Colorado potato beetle, green peach aphids and clean leaves.

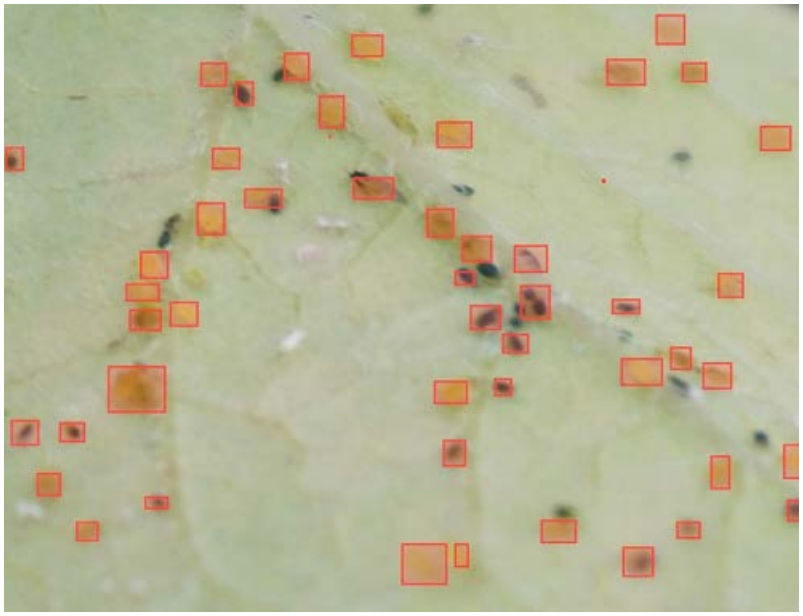


Figure 2. Bounding boxes used to identify green peach aphids on a potato leaf; winged adults and nymphs are both present.

While aphid detection remains challenging, they suggest results could be improved through artificial lighting or other technique. However, if 80% of insects can be detected, this is likely enough to determine when pest thresholds have been crossed, triggering targeted application of pesticide.

In conclusion, this research offers a new approach to the reliable detection and discrimination of pest and beneficial insects. This in turn can facilitate more targeted pest control, resulting in cost savings, crop improvement, and environmental sustainability.

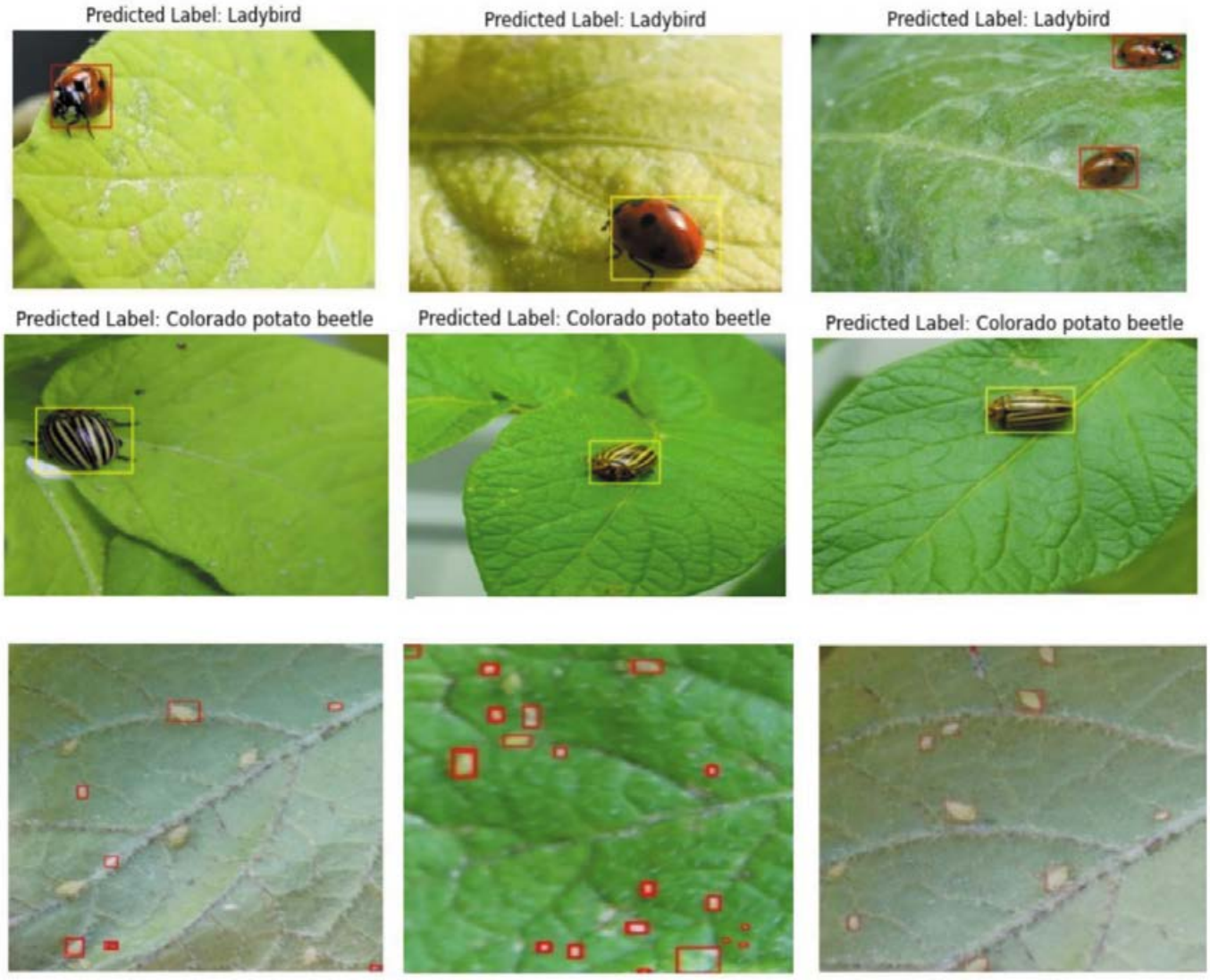


Figure 3. Successful identification of ladybirds (top) and Colorado potato beetle (middle) with partial identification of aphids (bottom).

PCN MANAGEMENT

NATIONAL REVIEW TARGETS SMARTER PCN MANAGEMENT FOR AUSTRALIAN POTATO GROWERS

A national effort is underway, led by Agriculture Victoria, to modernise Australia's approach to managing Potato Cyst Nematode (PCN), a serious soil-borne pest that has long challenged potato growers. The national review, led by Agriculture Victoria, aims to strike a balance between effective biosecurity and more practical, nationally consistent trade regulations. A recent workshop at Hort Connections 2025 in Brisbane, run by Lavinia Zirnsak and Pippa Kay, covered progress to date.

PCN has long challenged potato growers market access, this review aims to present nationally aligned conditions that will enhance market access while managing the risk of PCN spread.

WHY PCN MANAGEMENT IS BEING REVIEWED

Victoria is leading the national review of PCN management, supported by a reference group that includes scientific, biosecurity and trade experts from each State and Territory and representation from the Plant Industry Biosecurity Committee (PIBC), Nursery and Garden Industry Victoria (NGIV), and AUSVEG. Endorsed by the Plant Health Committee (PHC) and managed by its Subcommittee for Market Access Risk and Trade (SMART), the review seeks to develop updated, scientifically justified movement and trade conditions that facilitate interstate trade without compromising pest control.

A key component of the review is developing a protocol for 'reregulation' – a process for reclassifying land once PCN risk is significantly reduced. The first step, now in progress, is a comprehensive national PCN Pest Risk Analysis (PRA), which will underpin future movement rules and land-use protocols.

PCN IN AUSTRALIA: A QUICK HISTORY

Potato Cyst Nematode (PCN) has been part of Australia's biosecurity landscape since its first detection in Western Australia in 1986. WA responded swiftly with strict quarantine and an eradication program, and by 2010, the state was officially declared PCN-free.

In Victoria, PCN was first detected in 1991, with additional detections in 2003 and 2008, all southeast of Melbourne. Victoria initially managed PCN via a containment program with the long-term goal of eradication. Regulation implemented to support the control program has successfully contained the pest through long-standing regulation and control measures., much of Australia's current PCN regulation is not contemporary. The last major update was in 2013, and inconsistent requirements across states and territories continue to create unnecessary trade barriers. Some movement restrictions are not aligned with the actual level of risk and may be more restrictive than necessary.

Over time, Victorian PCN populations have likely declined in some areas due to strict management, changing land use, and improved farming practices. Other countries, including the United States and Canada, have already developed science-based pathways to reduce regulation on land as pest risks decline. Victoria is now seeking akin processes to WA and overseas where reregulation of land has been endorsed. Provision for this is in the Australia's National Potato Cyst Nematode Management Plan (2012), which provides a process to progressively reclassify land from infested to non-linked status.

The national review of PCN management presents a critical chance to modernise regulations, improve consistency across jurisdictions, and ensure that movement rules are practical, science-based, and supportive of trade without compromising biosecurity.

UNDERSTANDING PCN RISKS

The Pest Risk Analysis uses internationally recognised methods to assess PCN threats across 29 potential pathways, ranging from natural soil movement to shared farm machinery, transport vehicles, and human activity. It evaluates both the likelihood of PCN spreading and the potential impact if it does, calculating what's called the Unrestricted Risk Estimate (URE) for each pathway.

Importantly, Australia's biosecurity system operates on an Acceptable Level of Protection (ALOP) that aims to keep biosecurity risk very low, but not zero. The analysis has revealed that most of the identified pathways exceed this acceptable risk level without proper controls, highlighting the need for new, targeted measures.

THE KEY SPREAD PATHWAYS

Some of the highest-risk pathways include:

- Untested seed potatoes: Without certification, these can easily spread cysts in soil clinging to tubers.
- Shared farm machinery: Equipment moved between farms can carry infested soil.
- Used bags and bins: Containers reused across farms may transport contaminated soil.

Pathways including ware and processing potatoes, some seed potatoes, other farm machinery and vehicles, people and natural soil movement by wind and water runoff are other pathways which may spread PCN by movement of soil and are considered to have moderate or low risk.

High, moderate, and low risk pathways are all above ALOP and where practically feasible, will require some measures to manage the risk of spreading PCN.

Other pathways, such as certified seed potatoes (initial stock and mini-tubers), present negligible risk thanks to strict testing and sterile production systems.

The next phase of the PRA focuses on pest risk management and identifying the best points in the supply chain to apply controls.

GLOBAL PERSPECTIVES AND LAND DEREGULATION

PCN is a global concern, with both *Globodera rostochiensis* and *Globodera pallida* now present in 80 countries. Other nations, such as the United States and Canada, have established stepwise processes to remove regulatory controls from land as PCN risks decline.

WA declared freedom from PCN in 2010, based on thorough testing and widespread adoption of resistant potato varieties. Similarly, Victoria's long history of PCN management, evolving production practices, and changes in land use suggest that some areas may now have significantly reduced PCN risk.

Australia's National Potato Cyst Nematode Management Plan (2012) already provides a framework for changing land status from infested to linked and, eventually, non-linked land. The national review aims to provide an endorsed process for previously gazetted properties to reregulate land status

INDUSTRY PARTICIPATION

The success of the review depends heavily on input from industry stakeholders. Practical insights from growers, agronomists, and supply chain participants will help ensure that any new regulations are effective, achievable, and consistent across states. Keep your eye out for further opportunities to participate in PCN reform as the risk management phase of the PRA continues.

The national reference group also recognises that many growers already use best-practice measures that successfully limit the spread of PCN. These established practices will form a vital part of the future PCN management framework.

Globodera rostochiensis cysts on potato roots. Image K. Walker

ahr applied horticultural research

Hort Innovation POTATO – FRESH FUND

Hort Innovation POTATO – PROCESSING FUND

POTATO LINK97 AUSTRALIAN POTATO INDUSTRY EXTENSION PROJECT

Controlling thrips the key to quality vegetable crops

Pests such as western flower thrips and aphids can be highly damaging to vegetable crops in spring. Western Australian grower Jason Neave shares his experiences with these destructive pests, and how his operation is overcoming the challenges that they pose.

The ability to control thrips as winter turns into spring has a major bearing on the yield and quality of tomatoes and capsicums grown on the JE and MC Neave and Sons enterprise. Jason Neave said the operation, which is located at Carabooda, north of Perth in Western Australia, was hit by a wide range of insects in the spring which included western flower thrips and aphids.

Western flower thrips is a vector for tomato spotted wilt virus, which can cause major crop loss in tomatoes, capsicums and other vegetables. “Spring is the hardest time for tomatoes and capsicum. This is because of the amount of tomato spotted wilt virus that is around the place,” he said.

Western flower thrips is a pest that develops resistance to pesticides easily and there is a limited number of options available. Mr Neave said the bugs arrive in spring when the crops are young and the weather improves. “We tend to get a lot of thrips that blow in from the east. You get bombarded daily – thrips fly in and you have no control over it,” Mr Neave said.

“Some of those thrips might not transmit the virus at all. You have high numbers of thrips that blow in as well as aphids, but you just don't know which ones have got the virus and which haven't. So, you're trying to eliminate as many as you can and not let the virus start in the crops. It's hard to manage. Having a virus spread in one plant snowballs and then you've got it throughout your whole crop, so we really try and make sure we get no virus in at all."

Offering a solution

To ensure yield and quality are maintained, the enterprise relies on a multi-product insecticide program through the season. “Our past experience has shown us that we have got to target the adult and nymph stages,” Mr Neave said.

One of the key products used in recent years has been Benevia® insecticide, which has activity on the adult, larvae and nymph stages of western flower thrips. Mr Neave said it was important to understand any chemistry’s mode of action, what stage of life they kill, and the insects that they control. “We've been using this insecticide for a couple of years now, and we use it in those early stages when the pressure's high.”

Benevia® is also used as a double-knock option with two sequential applications providing excellent control. Mr Neave said his operation would normally apply the product twice and then change chemistry groups. “You’ve got about six weeks there that you need to go hard and change the groups that you’re using on thrips and aphids,” he said. “We swap to another group just to make sure that if there are any resistant ones out there, it is three or four weeks before you apply the same chemical again."

While thrips and aphids are the main target of the Benevia® application, other pests such as silverleaf whitefly, heliothis and tomato leaf miner, are also controlled by the insecticide. Mr Neave said the main aim of the insecticide program was to produce high volumes of top-quality produce. “When you are producing a high volume and quality, and you see the trucks driving out full of this good quality produce, it gives you a feeling of achievement,” he said.

“Last season, we were quite happy. With tomatoes, we netted ten kilos per plant which is a fantastic result.”

Above. Controlling thrips in tomatoes and capsicums is key to producing high quality yields for Jason Neave from Carabooda in Western Australia.

FIND OUT MORE
Visit ag.fmc.com/au/en/products/insecticides-miticides/benevia-insecticide

R&D + biosecurity update

SEASONAL UPDATE

FRONT LINE EXOTIC PLANT PEST PROFILE

Brown marmorated stink bug

Figure 1

The brown marmorated stink bug is a significant plant pest that affects multiple vegetable commodities, causing crop damage, affecting marketability and reducing yield.

As we approach the seasonal risk period for the nuisance hitchhiker, the brown marmorated stink bug, the Front Line discusses why this pest threatens Australia's vegetable industry, what to look out for, and how to report the pest.

What is it?

The brown marmorated stink bug (BMSB) (*Halyomorpha halys*) is a shield bug insect that is native to China, Japan, Korea and Taiwan. It was accidentally introduced to the US, rapidly establishing itself during the 1990s, and throughout parts of Europe.

The pest is a seasonal hitchhiker associated with imported cargo from the Northern Hemisphere and is sometimes found within the luggage of returning travellers. The southern regions of Australia are particularly at risk of potential establishment.

Why should I be worried?

BMSB feeds on more than 300 plant species, including key vegetable crops like sweetcorn, capsicum, tomatoes, asparagus, green beans and eggplant. Outbreaks can be challenging and expensive to manage, with few effective pesticides available.

Consequently, BMSB is currently ranked eighth on Australia's National Priority Plant Pest list. Its impact on crops varies; it causes physical injury to capsicum fruit and leaves, increasing the risk of secondary diseases, and it pierces sweetcorn husks to feed on kernels, leaving them unsaleable. In urban areas, BMSB becomes a major nuisance during the colder months by sheltering in buildings, vehicles, and packaging. Although it doesn't cause structural damage, its high numbers and the pungent odour it releases when disturbed (often compared to ammonia or sulphur) create substantial problems.

What does it look like?

The brown marmorated stink bug has a brown, shield-like shape. Adult bugs are about the size of a five-cent coin (12-17mm in length and 7-10mm in width) ¬ they are brownish, marbled or mottled in colour with a faint reddish tinge. One of the most distinctive features of BMSB is the white banding present on the antennae, sides of its abdomen and legs.

Eggs are barrel-shaped, about 1.6mm long and light green to white. They are laid in clusters of 25 to 30 on the underside of the leaves (*Figure 1*).

Young, newly hatched nymphs have dark red eyes and a yellowish abdomen mottled with black and red. There are five nymphal instars, and the nymph becomes darker with each moult (*Figure 2*). It then develops the characteristic black and white bands on legs and antennae. (*Figure 3*).

Insect life cycle

The brown marmorated stink bug (BMSB) undergoes incomplete metamorphosis, with young nymphs resembling adults. There is no pupal stage. Adult females lay eggs, from which the first instar nymphs hatch. These nymphs undergo five stages of growth, moulting each time until they reach the adult stage. (*Figure 4*).

In warmer climates, females may lay multiple egg clusters, allowing for several BMSB generations per year. In cooler areas, there are typically one to two generations annually. Adult BMSBs enter winter diapause as days shorten, and dormancy is broken in spring with increasing day length and temperatures.

What can it be confused with?

Many native Australian stink bug species have evolved alongside Australian flora and are not considered pests. Their natural enemies control these species. However, some stink bug species are not currently present in Australia

Identifying the brown marmorated stink bug (BMSB) can be tough. Look for white and black banding around the abdomen and distinctive white banding around the legs and antennae. Note that these features are common in other stink bug species, too! (*Figure 5*).


Figure 2


Figure 3


Figure 4

Figure 1. BMSB egg cluster and first instar nymphs. **Figure 2.** BMSB eggs, 1 and 2 instar. **Figure 3.** BMSB late-stage nymph. *Images ©Gary Bernon, USDA APHIS, Bugwood.org.* **Figure 4.** Adult stage.

How could it get here?

This pest is a frequent hitchhiker, travelling internationally on or inside cargo like machinery, vehicles, and sea containers. Although it doesn't naturally occur in Australia, it can spread rapidly and has a wide range of hosts. It can fly up to 2km per flight.

Seasonal surveillance – biosecurity measures

Australia faces the highest risk of BMSB incursions from goods shipped between 1 September and 30 April, when insects hibernate in the Northern Hemisphere. They will often hibernate in cargo that may potentially arrive in Australia and emerge later. During this period, goods from high-risk countries will be subjected to mandatory biosecurity inspections upon arrival.

The 2024-25 BMSB risk season officially ended on 1 May, 2025. Goods that are classified as 'Target High Risk', manufactured or shipped on or after this date, will no longer be subjected to BMSB seasonal measures. However, Target High Risk goods manufactured and shipped during the highest risk period will still undergo BMSB seasonal requirements. Importers are reminded that goods must remain free of biosecurity risks throughout the year.

The requirement for roll-on/roll-off (ro-ro) vessels to complete the Seasonal Pest Questionnaire ended on 30 June, 2025. However, ro-ro vessels visiting target risk countries or reporting exotic pest detections must still undergo Seasonal Pest Inspections (SPI) upon arrival in Australia. Vessel masters and agents are required to report exotic insects in their pre-arrival documentation. From 1 May, containers shipped during the surveillance window can be declared as 'NIL RISK'.

Figure 5. L-R. *Halyomorpha halys, Alcaeus varicornis.* *©Department of Agriculture, Fisheries and Forestry.*

IMPORTANT UPDATE FOR GROWERS

Brown marmorated stink bug

Australia has recently seen a sharp increase in BMSB detections, with over 26 active responses across Sydney, Melbourne, Brisbane, Perth, and Adelaide. This isn't necessarily a sign the pest is establishing here, but rather a result of new, intensive surveillance programs targeting high-risk imports like vehicles and timber. Detections have more than doubled this season compared to last year.

The response to the threat

Australia's biosecurity teams are working hard to protect our farms. This includes:

- **More staff and traps:** more staff have been brought onboard, and new traps have been deployed, which are checked regularly over 12-week periods. These traps use special scents (pheromones) to attract and monitor the bugs.
- **Targeted actions:** when a detection occurs, like one recently in Wetherill Park, NSW (November 2024), state and federal agriculture departments quickly step in. They conduct thorough searches, visual inspections, and even apply treatments in high-risk areas to understand if the pest has spread.
- **National preparedness:** if we see more widespread detections, authorities are ready to activate a national plan, where costs and efforts are shared across states and the Commonwealth to manage the threat.

While detections are up, the good news is that we haven't found any evidence of BMSB establishing itself in Australia from these detections. Over the past two seasons (2023–24 and 2022–23), all detected bugs were managed, and no established populations were found after intensive surveillance. This shows our border and post-border surveillance is working.

EXOTIC PLANT PEST HOTLINE
1800 084 881

What can I do?

Your vigilance is crucial! BMSB can hitchhike on anything, so:

- **Be aware:** familiarise yourself with what BMSB looks like.
- **Report suspect pests:** if you see anything unusual or suspect BMSB on your farm, report it immediately to your state biosecurity authority or the **Exotic Plant Pest Hotline on 1800 084 881.** Early detection is our best defence.

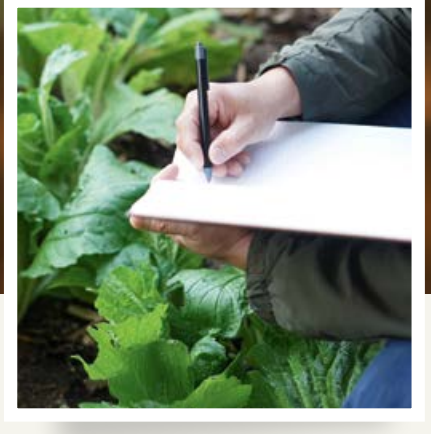
FOR MORE INFORMATION

Please contact the AUSVEG Biosecurity & Extension Team on 03 9882 0277 or email science@ausveg.com.au.

The Farm Biosecurity Program is funded by the Plant Health Levy.

PROACTIVE MEASURES FOR BUSINESSES

Preparing for and recovering from a plant pest incursion



Robust on-farm biosecurity is the most effective defence against the introduction and spread of plant pests.

For Australian businesses in the agricultural and horticultural sectors, a high-priority plant pest detection can trigger a cascade of operational and financial challenges. However, proactive preparation and a clear understanding of the response process can significantly mitigate these impacts and expedite a return to normal trading.

Here's what individual businesses can do to be ready, what they might be asked to provide during an incursion, and how they can speed up the process of regaining market access.

Be prepared: your first line of defence

Good on-farm biosecurity is the most effective defence against plant pests. A well-documented and implemented biosecurity plan is no longer just a recommendation; for many industry assurance programs and market access schemes, it is a requirement.

Key preparedness actions for businesses include:

- **Develop and implement a farm biosecurity plan:** this written plan should be a practical guide for all staff and visitors. Numerous templates and resources are available from industry bodies and state agriculture departments.

  Your plan should cover:
  - **Managing farm inputs:** scrutinise all incoming plant material (seeds, seedlings, nursery stock), soil, and growing media. Source inputs from reputable suppliers with a known biosecurity status. Keep detailed records of all incoming materials.
  - **Controlling people, vehicles, and equipment:** designate a single farm entry and exit point. Maintain a visitor log and require all visitors and their vehicles to be clean on arrival. Have dedicated "clean" and "dirty" zones, and provide facilities for cleaning and disinfecting footwear and equipment.
  - **Production practices:** regularly monitor crops for any unusual signs of pests or diseases. Train staff on what to look for and how to report it. Keep accurate records of crop health, pest surveillance activities, and any treatments applied.
  - **Managing farm outputs:** ensure produce and equipment leaving the property are free from pests and contamination.
  - **Staff training:** regularly train all staff on the farm's biosecurity procedures and their responsibilities.
- **Maintain meticulous records:** good record-keeping is crucial. These records will be invaluable during a pest investigation and for demonstrating pest-free status to regain market access.

Above. Spotted Cucumber Beetle *Diabrotica undecimpunctata.*

What you may be asked to hand over when a pest is detected

If a pest is detected on your property or in your region, biosecurity officers, acting under state and national biosecurity legislation, have the authority to enter the property and request a range of information and documents to aid their investigation.

Businesses should be prepared to provide:

- **Movement records:** detailed logs of all plant material, produce, equipment, and vehicle movements both onto and off the property. This is critical for tracing the potential source and spread of the pest.
- **Visitor and staff logs:** records of everyone who has been on the property, which can help in contact tracing.
- **Pest surveillance and monitoring records**: documentation of regular crop inspections, including dates, locations, and any findings.
- **Treatment and chemical application records:** a complete history of all pesticides and other treatments used on the property.
- **Supplier and customer information:** details of where you source your inputs and who you supply your products to.
- **Farm maps:** detailed maps of your property showing production areas, entry/exit points, and key infrastructure.
- **Training records:** proof that staff have been trained in biosecurity procedures.

Biosecurity officers may also need to take samples of plants, soil, or insects for diagnostic purposes. Cooperation and transparency during this phase are essential for a swift and effective response.

Regaining market access faster: the path to recovery

The speed at which a business can regain market access following a pest outbreak is directly linked to its ability to demonstrate that its produce is pest-free and that it has effective biosecurity measures in place.

Key strategies to expedite market access recovery include:

- **Embrace certification schemes:** participate in industry-led quality assurance and certification schemes. The Interstate Certification Assurance (ICA) scheme is a national program that allows accredited businesses to self-certify that their produce meets the quarantine requirements of other states and territories. This can be a faster alternative to traditional inspections by government officials.
  - **Obtain necessary certificates**: familiarise yourself with the types of biosecurity certificates that may be required to move your produce:
  - **Plant Health Certificate (PHC):** issued by a government inspector to certify that a consignment meets specific quarantine conditions.
  - **Plant Health Assurance Certificate (PHAC):** issued by a business accredited under a scheme like ICA.
- **Demonstrate area freedom:** cooperate fully with surveillance activities to help establish that your property or region is free from the pest. This data is crucial for lifting quarantine restrictions.
- **Maintain open communication:** stay in close contact with your state or territory's department of agriculture and your peak industry body. They will provide the latest information on quarantine boundaries, market access conditions, and any available support programs.
- **Implement a corrective action plan:** if biosecurity weaknesses are identified on your property, promptly develop and implement a corrective action plan to address these issues. This demonstrates a commitment to biosecurity and can build confidence with regulators and trading partners.

By taking a proactive and diligent approach to biosecurity, businesses can not only reduce the risk of a devastating pest incursion but also position themselves to recover more quickly and effectively should one occur.

FOR MORE INFORMATION
Please contact the AUSVEG Biosecurity & Extension Team on 03 9882 0277 or email science@ausveg.com.au.

The Farm Biosecurity Program is funded by the Plant Health Levy.

AUSVEG state update

The Mataranka Regional Roadshow brought a condensed version of the Northern Australian Food Futures event to the regions.

NORTHERN TERRITORY

Big ideas, plenty of conversations, bush tea brews and a few muddy boots: it was all happening in Mataranka in May when NT Farmers hosted the Regional Roadshow!

The Northern Australian Food Futures (NAFF) conference is held in Darwin every two years by the Northern Territory Farmers Association (NT Farmers), with the latest conference held in April this year. People travel from across Australia to attend the conference which is leading the way for agricultural development in Northern Australia.

Alongside these conferences, NT Farmers also organises Northern Australia Food Futures Regional Roadshows (Regional Roadshows) to bring a smaller version of NAFF to regional NT. The Regional Roadshows bring more regionally specific information closer to grower's doorsteps, and it certainly delivered that in Mataranka this May which is approximately 400km south-east of Darwin.

It was a big two days, bringing together over 100 growers, producers, researchers, and industry and government representatives for a forum, networking dinner, and farm visit. The forum covered a broad range of topics starting off with a wellbeing session from Two Two One Charity, followed by cultural insights and a bush tea tasting with Frank Shadforth of Seven Emu Station.

Attendees heard the latest in cropping, cotton, and melon updates, along with insights into water in the Mataranka region. Climate experts shared tools to help manage seasonal variability, and not even record-breaking rain could stop the visit to Coodardie Station, where Moira Lanzarin spoke on regenerative farming and their cattle breeding operations.

NT Farmers would like to acknowledge and thank the Foundation for Rural and Regional Renewal and the Australian Government's Future Drought Fund for making it all possible.

NT Farmers' push for change to the 'use it or lose it' water policy

NT Farmers has submitted a proposal to the NT Department of Lands, Planning and Environment calling for a review of the current water licensing policy that requires users to extract 90 percent of their allocation to retain it, commonly known as the 'use it or lose it' rule.

The proposal highlights how the policy is out of step with the realities of agricultural production in the Territory, particularly for mango growers in the Top End.

NT Farmers recommends lowering the minimum extraction limit to a more practical range of 50–70 percent, introducing greater flexibility through longer assessment periods, and formalising exemptions for new agricultural developments.

Mariah Maughan | NT Farmers Association
ido@ntfarmers.org.au | Phone. 0417 618 468

Development of ecofriendly selective pesticides to safeguard honeybees

BY SHAHNAZ SULTANA, EMILY REMNANT, RON HILL AND JOEL MACKAY, SCHOOL OF LIFE AND ENVIRONMENTAL SCIENCES, THE UNIVERSITY OF SYDNEY

Progress is being made on a pesticide that selectively targets Varroa mite without harming bees.

Of the 100 crop varieties that provide 90 percent of the world's food, 71 are pollinated by bees[1]. However, the recent invasion of *Varroa destructor*, a mite that parasitises honeybees, has led to thousands of hives to being burned, seriously impacting the livelihood of beekeepers and threatening the productivity of horticultural industries[2].

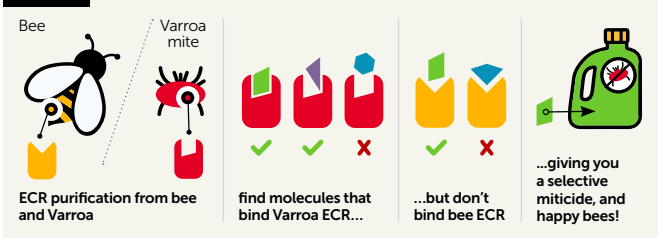
As part of an effective strategy to deal with this incursion, more specific and effective pesticides would be a valuable weapon. However, most pesticides currently used in agricultural applications work non-selectively against both pests and beneficial arthropods. A selective pesticide that is harmful to *Varroa* but safe for honeybees would therefore provide a valuable weapon in our arsenal and might also be a starting point for the development of pesticides that target other harmful mites.

In order to design pesticides that display significant selectivity, a target-based approach can be employed. This strategy leverages protein biochemistry, genomics, structural biology, toxicology and chemistry to identify molecules that interact with specific biological targets. In this context, a hormone binding protein in the *Varroa* mite known as the ecdysone receptor protein is a promising target for pesticide development.

This protein interacts with the pest hormone ecdysone to regulate mite development, reproduction and behaviour[3]. Disruption of this interaction by designed chemicals would significantly impair mite development and reproduction,[4] meaning that such chemicals could be potent pesticide candidates. Also, because this receptor is absent from vertebrates and is also subtly different between insects, chemicals targeting this receptor would be safe for farm workers, consumers and also beneficial insects such as honeybees. Such chemicals can also be applied in conjunction with current insecticides to improve potency and reduce the development of resistance.

Above L-R. The project team: Jen Suh, Shahnaz Sultana, Professor Joel Mackay, Dr Milad Ghafoori, Zahra Falahati and Dr Ingrid Macindoe.

Figure 1



Our research at The University of Sydney, led by Prof Joel Mackay, Prof Ron Hill and Dr Emily Remnant and funded by Hort Innovation and a generous philanthropic donation, aims to develop such a selective insecticide. Already, we have made considerable progress on this quest.

We have identified and purified significant quantities of the *Varroa* ecdysone receptor protein and also the corresponding protein from the honeybee through a laboratory-based protein production process. We have used an array of experimental methods to demonstrate that these lab-generated receptor proteins can interact with the ecdysone hormone and can therefore be used as targets for pesticide development.

With our target in hand, we have recently commenced the search for chemicals that can hit that target. Our strategy is to search collections of thousands of commercially available chemicals to find that needle in the haystack – a chemical that potently interferes with the *Varroa* ecdysone receptor but does not interfere with the equivalent target in the honeybee (and so is safe for our beloved pollinators *(Figure 1)*. Excitingly, we have already discovered several 'hits' – chemicals that are starting points on that journey. Time will tell whether these starting points can be honed to yield our holy grail: a pesticide that can be deployed against *Varroa* without harming honeybees.

Concurrently, we are using this strategy to target another pollinator pest – the small hive beetle. To date, we have already purified and characterised the hormone receptor protein from the beetle and are on track to follow in the footsteps of our *Varroa* work. We hope that this new approach to pesticide design offers a competitive route to the identification of safer, more selective and environmentally friendly agents for the control of insect and arachnid pests, thereby helping to protect global agricultural systems.

1 Nabhan, G. P., & Buchmann, S. L. (1997) Services provided by pollinators. *Nature's Services: Societal dependence on natural ecosystems*, 133–150.

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Development of Ecofriendly Selective Pesticides to Safeguard Honeybees is funded by the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from the University of Sydney and contributions from the Australian Government.

Project: PH20003

Hort Innovation Frontiers

vegnet update

National Vegetable Extension Network
VegNET

AUSVEG

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NATIONAL

VegNET overview

VegNET is the vegetable and onion industry extension program that is run by growers, for growers and delivered by AUSVEG.

The program aims to keep Australian vegetable and onion growers informed about current R&D activities, results and resources – supporting the adoption of industry best practice and bolstering vegetable and onion productivity and profitability in key growing areas across the country.

Coordinated nationally by AUSVEG, VegNET is delivered 'on-the ground' by regional development officers (RDOs) in key growing regions who are responsible for developing and executing regional extension plans.

A critical step in ensuring growers receive assistance is the identification of each region's key priority issues, resources and connections requirements.

The most common challenges identified in consultation with industry are:

- Water (availability, quality and cost)
- Labour (availability, awards, HR and skills)
- Input costs
- Biosecurity
- Pest management
- Market development (including export)
- Post-harvest and marketing
- Urban encroachment
- Social license (environmental impact and chemical (mis)usage)
- Business management

Now in **Phase Three,** the VegNET program is running with RDOs based in organisations with strong grower networks in vegetable and onion production regions.

The program is overseen by a National Coordinator, who works with each regional group to ensure growers have consistent access to an industry-focused extension program that will put their needs first in their efforts to be productive, profitable and more competitive in an ever-increasingly global marketplace.

In 2016 Hort Innovation invested in 10 regional capacity building projects to effectively transfer R&D information to vegetable growers through regionally-based extension projects and associated coordination and training projects. These projects were contracted to delivery partners based in the ten major vegetable growing regions and were unified under a national brand – VegNET.

Phase One The first phase of VegNET finished in early 2020, with the regional development officers (RDOs) delivering R&D awareness and extension activities in their geographical regions.

Phase Two The second phase of VegNET finished in September 2021, and resulted in each region developing regional priority areas for extension. These regional priorities were collated into national priority areas to inform a national extension program that is nationally-consistent and regionally-specific.

VegNET is funded by Hort Innovation, using the vegetable and onion research and development levies and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

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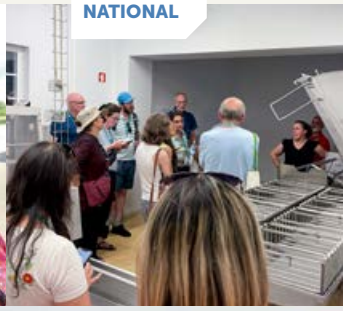

VEGNET
National
UPDATE

European Seminar on Extension and Education

In early July 2025 I was fortunate to attend the European Seminar on Extension & Education (ESEE), a biennial conference about agricultural advice and education. It has gathered scholars, advisors and educators together since 1973.

The ESEE serves as a vibrant platform for dialogue, bridging the gap between scientific inquiry and practical application. Welcoming a wide array of contributions from academic research to hands-on experiences. It cultivates an inclusive environment that values both theory and practice.

The conference was held in Vila Real in Portugal at the local university. The program was a packed four days of plenary, parallel sessions and field trips. Learning to navigate how to get to the university from the accommodation on a bus or Bolt (similar to Uber) was somewhat challenging, but I was fortunate to connect with Halil Ibrahim from the Mulga province in Türkiye. Two people getting lost is better than one!

The conference program was centred around several themes, which were as relevant to Australia as they were to their European audience.

Resilience, relationships, and reform: key learnings for a sustainable agricultural future

As agriculture navigates a changing global landscape driven by climate variability, economic pressures, and shifting social expectations, it has become increasingly clear that a successful future relies not only on innovation and productivity but also on resilience, wellbeing, and meaningful connection.

Adapting to challenges and building mental health capacity

The ability to adapt, to pivot in response to shifting circumstances is a key factor of resilient farming. Whether facing climate extremes, market volatility, or evolving consumer demands, growers must be supported with tools that enable rapid, thoughtful response. Central to this is mental health. Farming under high stress has become the norm for many, and the need to build mental health capacity within rural communities is urgent. Resilience is not just about systems and practices; it is deeply rooted in people.

Understanding cognitive mapping and transitionary support

Cognitive mapping and the way we process and connect information plays a key role in how farmers adapt and make decisions. Learning environments that acknowledge and support different ways of thinking are essential. Transitionary support that understands the how, who, and why behind behaviour change can increase trust and capability. Interconnected support networks, rather than isolated services, are critical in helping farmers navigate change confidently.

From incentives to impact: climate adaptation and sustainable farming

Sustainable farming practices need more than good intentions; they require real incentives. The importance of financial and policy-based motivators was underscored as a key driver of climate adaptation. Farmers need to see clear, tangible benefits for adopting practices that support long-term food security and environmental health. Programs need to align with practical realities and local conditions to be effective.

Safe residues and the role of organics

Organic farming continues to demonstrate the benefits of reduced chemical use, offering safe residues that align with consumer expectations and environmental stewardship. However, it's not just about compliance or certification—it's about trust, transparency, and a genuine commitment to better outcomes for people and the planet.

Gender realisation and inclusive practice

Gender realisation was acknowledged as a critical component of an inclusive agricultural future. Recognising and addressing gendered experiences and barriers whether in leadership, access to land and resources, or recognition of contributions will strengthen industry diversity, innovation, and sustainability.

Networks that work: rules of engagement matter

True support doesn't come from a static database of names. Effective networks are built on trust, clarity, and shared purpose. Establishing rules of engagement, the principles by which we interact, collaborate, and support one another is fundamental to creating networks that genuinely serve their members and drive collective progress.

These themes are not just theoretical; they reflect real-world experiences and emerging needs. By embedding these insights into policy, extension services, research agendas, and grassroots initiatives, we can build a farming sector that is not only more productive but more human, more connected, and better prepared for whatever the future holds.

FIND OUT MORE

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VegNET 3.0 is funded by Hort Innovation using the vegetable and onion research and development levies and contributions from the Australian Government.

Project: VG21000

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VEGNET
Northern Territory
REGIONAL UPDATE

From policy to practice
VegNET NT bridging the gap on water licensing for NT Growers

The VegNET project has had a strong focus on water management this quarter in the Northern Territory, with particular focus on water extraction licensing. It is a requirement in the NT in most regions to have a water license if using land for agricultural use (not including livestock).

Adelaide River and Marrakai are regions south and east of Darwin, and have now had a water allocation plan developed by the state government that will manage and regulate surface and ground water use through the catchment area.

Growers from these regions are now required to apply for a water license like most other regions of the NT. To help growers understand the water license requirements, VegNET NT held a grower meeting on farm in the Marrakai region with a great turnout of 27 growers and 4 industry personnel in attendance.

VegNET NT invited the Northern Territory Government to have a discussion with growers about what the new requirements looked like, how to apply for a water license and what growers' requirements are once successfully obtaining a water license. As majority of the growers in this region are Vietnamese, VegNET NT provided a Vietnamese interpreter to ensure everyone had access to the correct information and could ask questions easily.

To apply for a water license, the grower needs to submit an application which provides the estimated amount of water they intend to use annually over the 10-year lifespan of the license. The grower will also need to submit copies of maps of the property, proof of ownership and bore reports.

A week after the grower meeting, VegNET NT held an Open-Door Day at the NT Farmers office where growers could come in and get assistance with their water license application. During the Open-Door Day we completed six applications. On the day we also had growers come in requesting a session with a Vietnamese interpreter, of which we ran two further sessions with an interpreter present. To date, VegNET NT has assisted in the completion and submission of 23 water license applications.

Once a grower is successful in obtaining a water license, they are required to purchase and install a water meter on their bore(s) for reporting purposes. Many growers will prefer to install the water meter themselves however there are some key installation requirements that need to be adhered to, to ensure the water meter installation is approved by the Northern Territory Government.

To assist growers with this stage, VegNET NT organised an on-farm water meter installation demonstration where they teamed up with a local bore service provider and the Northern Territory Government to install a water meter on farm. Both the Northern Territory Government staff and the bore technician explained how to install the water meter correctly in order to adhere to the installation requirements. With a Vietnamese interpreter present, growers were able to make note of the more specific requirements and ask many questions.

Sonny is a Marrakai mango and vegetable grower who attended all three events.

"I found the meetings helpful," he said. "Before I wouldn't have been able to install the water meter correctly, but now I can. I also think the Vietnamese interpreter is important as some of the growers don't know much English at all."

Sonny was also one of the 23 water license applications that VegNET assisted in completing and submitting.

When new policies or legislation comes into place, grower resistance to adoption is not necessarily the reason for low compliance and adoption. By providing growers with opportunities to gain the information they need, seek the assistance they require or see how the requirements need to be carried out, in a language they are fluent in, we can see quite successful adoption across the board.

Above. There was a great turnout at the Marrakai grower meeting to discuss the new water requirements.

FIND OUT MORE
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QUEENSLAND
WIDE BAY
BURNETT

VEGNET
Wide Bay Burnett
REGIONAL UPDATE

Staying ahead of the mite:
managing varroa in Australian horticulture

Australia's pollination industries are entering a new era of challenge and change with the spread of *Varroa destructor*, a parasitic mite that undermines honeybee health and threatens the reliability of crop pollination. Since its initial detection in 2022, varroa mite has continued to spread in parts of New South Wales and Queensland, shifting focus from eradication to management. For growers of cucurbits and other pollination-reliant crops, staying ahead of the threat means embracing innovation, strengthening preparedness, and exploring new frontiers in pollination.

The varroa challenge

Varroa mites feed on honeybees, weakening colonies and transmitting deadly viruses. While the most serious of these viruses, such as deformed wing virus, have not yet been detected in Australia, their potential arrival remains a significant threat. The long-term impact of varroa could dramatically reduce the availability of healthy hives and increase the cost of pollination services. Crops like cucumbers, melons, and pumpkins are particularly vulnerable, with even short-term disruptions in pollination significantly affecting yields and fruit set.

Plan ahead for pollination – talk to a beekeeper now

With the looming threat of varroa mite, Australia's reliance on feral honey bees for pollination is at risk. Once varroa is detected, managed hives will be in high demand, and pollination service costs are expected to spike almost overnight. Growers who haven't secured hive access may face lower yields and reduced quality. Beekeepers will likely prioritise existing clients, so it's essential to start building those relationships now. Reach out to a local beekeeper or beekeeping association and consider how your business could handle a sudden, significant increase in pollination costs. Acting early could protect your crops and your bottom line.

Monitoring solutions: tech in the hive

Hive health monitoring is fast becoming a critical tool in varroa management. Technologies like BeeRight, which track temperature, humidity, movement, and sound within hives, allow for early detection of colony stress and potential pest outbreaks. These tools give both beekeepers and growers the ability to monitor hive performance remotely and respond quickly to emerging issues.

In the Bundaberg region, four BeeRight monitoring devices have been trialled across two vegetable grower sites, supported by the local VegNET Regional Development Officer and funded by the Queensland Department of Agriculture and Fisheries (DPI). This initiative is providing real-time data on hive health during active pollination periods, improving communication between growers and apiarists, and setting a foundation for better-informed pollination planning in the face of varroa risk.

Beyond BeeRight, other advanced hive monitoring systems are also gaining traction across the industry. See the following page for a snapshot of technology available to Australian beekeepers.

Above. VegNET RDO Jessy checking for varroa mites in hive, nil found!
Below. BeeRight installation with Varroa Mite Development Officer Gavin Jowett, VegNET RDO Jessy Logan and grower Kevin.

COMMERCIAL BEEKEEPING TECHNOLOGIES

SYSTEM	COUNTRY	BEST USE CASE	NOTABLE FEATURES	WEBSITE
BeeSTAR	Australia	Large commercial operations	GPS, alerts, weather-integrated	beestar.com.au
BeeRight	Australia	Hive health, Varroa monitoring	Real-time alerts, Varroa insights	beeright.org
BeePlus	Australia	Pollination services	Hive environment, acoustic sensors	beeinnovative.com.au
Arnia	UK	Large apiary networks	Full sensor suite, online dashboard	arnia.co.uk
BroodMinder	USA	Modular hive monitoring	Cost-effective, cloud-based	broodminder.com
BeeHero	Israel/USA	Enterprise pollination management	Pollination outcome metrics, AI insights	beehero.io

These hive monitoring technologies, amongst others, are helping the pollination sector move from reactive to proactive management. With early alerts and continuous data insights, beekeepers can respond faster to hive issues, reduce losses, and optimise pollination during key crop flowering periods.

This is an evolving space with more innovation underway, so keep an eye out for new providers and technologies emerging soon!

Pollination beyond bees: exploring alternatives

With growing pressure on traditional honeybee pollination due to pests, climate change, and hive shortages, the horticulture industry is investing in long-term alternatives.

The Hort Innovation project *Novel technologies and practices for the optimisation of pollination within protected cropping environments* (ST19000) is reducing reliance on honeybees by trialling new, integrated pollination methods tailored to high-tech farming systems.

Meanwhile, *Development of blue-banded bees as managed buzz pollinators* (PH19001) is advancing the use of native blue-banded bees in greenhouse environments. This project is developing crop-specific guidelines and operational procedures to support their adoption as viable, commercial pollinators.

Complementing these efforts, other research programs across Australia, including work led by Dr Lena Schmidt and various university partners, are exploring the role of native bees, flies, and other insect species as pollinators in open field environments. These studies aim to identify alternative species that can perform under commercial conditions and help buffer the industry against pollination disruptions.

Together, these projects are driving innovation in pollination, supporting more diversified, resilient, and sustainable production systems across both protected cropping and field-grown horticulture.

Preparedness is everyone's job

Preparedness isn't just a beekeeper issue, it's a shared responsibility across the supply chain. The Bee 123 map is a tool used in Queensland, Australia, to report and track varroa mite surveillance data, helping to manage biosecurity risks associated with this pest. For growers, staying connected to industry research and incorporating new technologies into pollination planning will help safeguard against future disruptions.

Looking forward

As varroa becomes an enduring part of Australia's agricultural landscape, growers must adapt to a new reality, one that values planning, technology, and innovation. Whether it's through monitoring tools, alternative pollinators, or stronger grower-beekeeper collaboration, the future of pollination in horticulture depends on the proactiveness of industry as a whole.

Additional information and resources

Varroa Mite Management
varroa.org.au

Bee Aware
beeaware.org.au/pollination/preparing-for-varroa-mite/effect-of-varroa-on-plant-industries

Bee123
business.qld.gov.au/industries/farms-fishing-forestry/agriculture/animal/industries/bees/varroa-mite/surveillance-map

PH19001
horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/ph19001

ST19000
horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/st19000-pollination

Above. BeeRight devices being installed in hive on a vegetable farm

FIND OUT MORE
Please contact Jessy Logan, on 0407 366 797 or email **vegnet@bfvg.com.au**

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Project: VG21000

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NEW SOUTH WALES

VEGNET
New South Wales
REGIONAL UPDATE

From lab to land: researcher connections with VegNET NSW

VegNET NSW held two very successful field days at Local Land Services (LLS) Demonstration Farm at Richmond Lowlands, NSW. The first, the Asian Vegetable Innovation Field Day, was held on 17 June specifically for Australian Chinese growers. The second field day was held on 18 June, called Weeds, Bugs and Brassica Field Day. Over 100 participants attended over the two days that saw topics and trials in herbicides, soil health, food safety and new Primary Production & Processing Standards, Level Up Hort, biosecurity, integrated pest management, and foliar diseases in brassicas.

NSW VegNET RDO Sylvia Jelinek worked closely with presenting researchers Dr Sukhvinder Pal (SP) Singh and Dr Toni Chapman from the NSW Department of Primary Industries and Regional Development (DPIRD) to ensure up to date and relevant information is communicated to growers and stakeholders. Fostering relationships with industry is important in linking growers and researchers so the important work is done for the greatest industry benefit. Sylvia sat down with Toni Chapman, plant bacteriologist from NSW DPIRD, to talk more about researcher-VegNET collaboration and relationship advantages.

Above. Dr Toni Chapman in Europe for the Xylella Professional Workshop. ©*T. Chapman NSW DPIRD.*

FIND OUT MORE
Please contact Sylvia Jelinek on 0427 086 724 or **sylvia.jelinek@lls.nsw.gov.au**.

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Project: VG21000

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Researcher highlight – Dr Toni Chapman

Dr Toni Chapman is a researcher and bacteriologist for NSW DPIRD at the Elizabeth Macarthur Agricultural Institute, positioned within the Plant Biosecurity Research and Diagnostic Unit, and working closely with the Plant Health Diagnostic Service (PHDS), with undergraduate studies completed at Western Sydney University and continuing to Wollongong University for her PhD. Her day-to-day work involves research projects, development of diagnostics for endemic and exotic plant bacteria; as well as plant bacterial diagnostics for the PHDS. Toni has a strong understanding of plant bacterial diseases and crop management and is trained in field and laboratory pathology.

Some recent and current Hort Innovation projects

The current Hort Innovation Australia funded research project *Management of foliar bacterial diseases in vegetables* (VG22001) has a trial site at the LLS Demonstration Farm with the assistance of the NSW VegNET RDO and NSW DPIRD Somersby site. This trial is investigating the persistence of two bacterial pathogens, in plant debris both above and below ground.

The target pathogens are *Xanthomonas campestris*, which causes black rot in brassicas, and *Pseudomonas syringae*, which causes numerous diseases in vegetable crops. A previous trial testing the longevity of *X. campestris* causing black rot in cauliflowers went for 12 months, where viable *X. campestris* was still detected at the 12-month sampling point. These current trials go for 18 months, with silverbeet infected with *P. syringae* and cauliflowers infected with *X. campestris.* Sampling occurs every month for the isolation of the bacteria to determine its viability.

Prior to this current project, from 2018 to 2023, the *Area wide management of vegetable diseases: viruses and bacteria* (VG16086) project was undertaken. This project aimed at developing area wide management (AWM) strategies to address high-priority viral and bacterial diseases affecting vegetable crops. These diseases impact producers nationally, collectively costing millions of dollars each year. A wide range of activities occurred over the duration of the program. The activities were led by the Queensland Department of Primary Industries as well as NSW DPIRD, who delivered separate parts of the program. Sylvia assisted this project by involving growers and organising trips to the Central Tablelands of NSW and sampling over periods of time in different regions and seasons.

One of Toni's greatest scientific achievements is being a part of the Hort Innovation project Improving preparedness of the *Australian horticultural sector to the threat*

Top L-R. Dr Toni Chapman and Sylvia Jelinek at a Billimari farm. Dr Toni Chapman with Callum Fletcher (previous AUSVEG Biosecurity Coordinator) and grower Matt Grech. Dr Toni Chapman sampling at a Cowra farm.

Participants in the field at the 'Weeds, Bugs and Brassica Field Day' in June 2025

potentially posed by Xylella fastidiosa - a severe biosecurity risk (MT17006). From 2017 to 2023, this multi-industry investment updated the National Diagnostic Protocol for *Xylella fastidiosa*, Australia's number one biosecurity pest, to ensure that Australia is adopting world's best practice methods. This work sets Australia up for quick and effective detection of the serious threat to Australia and New Zealand and to facilitate a swift and sure response.

Toni's highlight was working with international experts in Spain, Italy and France, involving both field surveillance activities for the identification of plants infected with *Xylella spp.* across both native and production crops. There was also a laboratory component in each of the different countries to learn how to isolate and identify *Xylella spp*. from different plant hosts. This allowed Toni to develop unique skills that were previously unobtainable in Australia, making her an expert in *Xylella spp.* in Australia. This knowledge has been shared through the delivery of professional workshops. Knowledge from this trip and new diagnostics have been used to develop a new National Diagnostic Protocol for *Xylella spp.* which is in final approval stages with the Subcommittee for Plant Health Diagnostics.

DR TONI CHAPMAN

Quick questions, big answers

How did you become involved in the vegetable industry?

"When I joined the research team at NSW DPIRD 15 years ago, I already had a background in bacteria and assisted in research and diagnostics. Through a great mentoring relationship with Dr Len Tesoriero, I have learned both field and laboratory pathology."

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

"I love working with growers and identifying problems and giving growers management options. I truly love being able to help them."

What is your proudest achievement as a researcher?

"All the little things, the two-way workshops with growers and agronomists, helping the individuals, brainstorming together to problem solve and find successful workarounds."

Where do you see yourself and future research initiatives going forward?

"The same as now but looking at biological controls and faster turn-a-round times for diagnostics and potential in-field diagnostics."

VEGNET
Tasmania
REGIONAL UPDATE

Sprouting success:
the Wolferts' journey to farming Brussels sprouts in Tasmania

In 2000, Johan and Nathalie Wolfert made a big decision to sell their farm in the Netherlands and move to Tasmania. After initially looking at Canada as an option and realising the short growing season would be too challenging, Tasmania was recommended for its fertile red soils.

Within two days of selling their property in the Netherlands, the Wolferts had secured their first block of land in Kindred, North West Tasmania - a 90ha farm, Kindred Downs, with a secure water supply.

Johan explains that Tasmania was chosen because of climate and opportunities to grow vegetables and other crops like poppies, pyrethrum and cereals. The rules in the Netherlands were increasingly pushing strongly towards organic farming, and finding labour was extremely hard.

Laying roots in Tasmania

Not long after settling in Kindred, they found that making a profit through vegetable production on the land they had was becoming an increasing challenge and an opportunity arose to expand, purchasing the neighbouring property which had significant water access. Since 2001, they have been growing Brussels sprouts, holding contracts with Simplot Australia and McCain Foods.

Brussels sprouts are known to be a challenging crop due to their long growing season (6-9 months depending on the variety) and high desirability to bugs including aphids, grubs, slugs and snails – which in turn makes the plant susceptible to fungal disease. Given their background as orchardists in the Netherlands, the Wolfert's were up for the challenge.

In their first couple of seasons of growing sprouts, Johan admits that "returns were not good enough to be viable, so things had to change." Twenty-five years on, the Wolferts have become true specialists in Brussels sprouts, which is their main crop by value. They are one of three commercial growers left in Tasmania, producing over 400 tonnes (give or take) across 14 hectares and continue to sell to processor, Simplot Australia, for the frozen vegetable processing market.

Their sprout specialisation is an ongoing learning journey and with the right crop management and varieties, the crop provides the Wolfert's business with sufficient balance of risk and return.

Key crop management practices:

- Careful and consistent crop monitoring throughout the growing season, working closely with their agronomist, Emily Nellis of Merry Ag
- Timely spraying to keep on top of pest and fungal pressure
- Consistent watering and nutrition to maintain healthy plants
- Avoiding early planting to avoid excessive insect pressures
- Managing crop rotations to ensure sprouts are never planted following a potato crop to help manage volunteer potatoes and soil health, avoiding two heavy crops in a row

Choosing the right varieties

A key milestone for the Wolferts has been gaining the ability to choose their own varieties — a decision usually made by the processor. This reflects the trust they've earned and their ongoing commitment to improving quality and yield. Much of their learning has come from grower and factory tours in the Netherlands, Belgium, Canada and Australia, which they've then adapted for Tasmania's soils, landscape, and climate.

This personal investment in R&D has paid off. In 2005, their yield jumped from 17 to 28 tonnes per hectare, and consistently thereafter, mainly due to new varieties.

TASMANIA

Twenty-five years on, we've become true specialists in Brussels sprouts — proof that with persistence and the right mindset, even the toughest crops can turn into success.

The Wolferts have trialled a range of Brussels sprouts varieties to find what performs best in their growing conditions and suits the frozen vegetable processing market. They start small, planting a tray of around 250 plants to see how the new variety handles their soils, climate, and harvest timing. If it looks promising, they'll ramp up to around 1,000 plants the following season, building from there based on further results.

For the 2024/25 season just harvested, they grew varieties from seed companies Bejo, Syngenta and Claus. The mix of varieties, grown by transplants from Hills Transplants, allows for staggered planting and harvesting — enabling their small team to harvest each variety at its optimum.

Investment and diversification for the future

Johan and Nathalie's son, Yuri, has long been an integral part of the family business and has now taken on the management of Kindred Downs. While his parents remain actively involved, they are gradually stepping back from daily operations. Yuri brings valuable experience from years farming in the North West, time spent in the Netherlands working with leading harvester manufacturer Tumoba, and participation in several study tours and trips abroad.

This season, the Wolferts invested in a reconditioned Tumoba three-row harvester from the Netherlands, now affectionately known as 'Sprout'. It's the largest Brussels sprout harvester in the Southern Hemisphere, with a 10-tonne (26-boxes at 400kg) bunker capacity. This is a big leap from their older machines, which held just 4.5 and 4 tonnes respectively, and one of which is co-owned between Yuri and another grower also growing for Simplot Australia.

Despite Kindred's hilly terrain compared to the flat fields of the Netherlands, 'Sprout' has been handling the slopes well with only minor adjustments needed. They consider this an important long-term investment for their business, with significant gains to labour and harvesting efficiencies. However, one challenge anticipated is the expected drop in volume for the coming season due to a major Australian retailer importing sprouts from overseas.

In addition to sprouts and other vegetables, Yuri and his partner Sarah have recently diversified the business by establishing a seed cleaning operation. This move came after the closure of a local contractor in Ulverstone, which forced the Wolferts to haul seed over an hour from the farm to Carrick — but transport costs soon made this impractical. When the Ulverstone contractor's equipment came up for sale, they took the opportunity and began cleaning their own seed, including lupins, wheat, and cover crop seeds — all grown on the farm, much of which they sell locally.

Word soon got around, and neighbouring farmers started bringing their seed for cleaning. With many Tasmanian growers currently shipping seed to the mainland due to limited local options, Yuri sees potential to expand their service, particularly in the North West.

"It's not just about cleaning seed," he says. "It's about solving problems." They now operate two machines and are planning to scale up for the coming season.

The Wolferts have been actively involved in levy-funded projects, including VegNET Tasmania, PotatoLink, and Soil Wealth and Integrated Crop Protection, and have also taken part in the Resilient Farming Tas program—led by RMCG and Optimum Standard—which helps farmers build resilience in their businesses.

Images: VegNET Tasmania.

FIND OUT MORE

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Tayla Field, Regional Development Officer, RMCG, 0429 391 538 taylaf@rmcg.com.au

VegNET 3.0 is funded by Hort Innovation using the vegetable and onion research and development levies and contributions from the Australian Government.

Project: VG21000

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VEGNET NORTH, WEST & SOUTH-EAST

Victoria

REGIONAL UPDATE

Vegetable farmers invest in the next generation with Lean Leaders

Victorian vegetable farmers have taken advantage of a Hort Innovations scholarship to help level up their business.

In May, AUSVEG Victoria organised two information sessions to introduce LEAN and Continuous Improvement to growers promoting the value of these methodologies through the VegNET 3.0 project, *Lean Principles to Improve Profitability* (MT22011), funded under the Innovation Fund.

Victorian vegetable farmers face a range of similar issues across the industry regardless of their location. Red tape, compliance, narrowing margins, labour supply and skill levels. This is compounded by weather that dictates so much of crop performance. As a result, farmers are looking to fine tune their business to eliminate inefficiencies and boost profitability within their business.

Chris Schreurs and Marie-Astrid Ottenhof from Schreurs & Sons attended the session held on the Mornington Peninsula. Bruce Yelland and Josh Kyne from Moshie shared insights from over 20 years of experience in Lean principals and continuous improvement.

Schreurs & Sons decided to put Astrid Ottenhof and Lachie Schreurs through the extended 10 x 4-hour workshops in Lean. Astrid applied for and won a scholarship from Hort Innovation to continue learning and applying Lean Principles in the Schreurs & Sons business. Hort Innovation has fully funded six applicants from vegetable farms for several years to complete the training with Moshie and upskill their business. The scholarships are valued at $4,000 + GST.

Only one scholarship is available per business, though additional participants can be enrolled at their own expense. It is uncertain if these scholarships will be offered next year.

Lachie Schreurs has now completed the first of the 10 sessions and is loving it. As he put it, "I walked out the first session, called my dad, and said 'This will change our whole business'."

Giovanni Todaro is the farm manager at Mason Bros farm and attended the Werribee information session. He found the presentation by Bruce from Moshie to be very compelling and said that he would recommend it to anybody. Mason Bros has enrolled Vincent Mason and was also a successful applicant for a scholarship. Vincent will be attending the program online while Lachie and Astrid will be attending in person.

The 20-week program includes each participant completing a business project or case study where they have applied Lean Principles to bring a real change to their business. The participant's project is based on an area of need within the business. This guarantees that the learnings gained from the program are applied within the business and not left as a meaningless information session.

At the recent graduation ceremony for the previous cohort, it was clear just how much each participant had benefited. Graduates came from a diverse range of horticulture businesses - from tiny tree farms all the way up to large scale nurseries. Each participant was eager to show how they had applied their learnings to their businesses from significant financial upsides to completely restructuring company processes to streamline productivity amidst transitionary periods in their company.

"Josh and I feel incredibly privileged to work with groups of leaders within horticulture and support them to achieve incredible change in their businesses," said Bruce Yelland. "At today's Lean Leaders graduation, we have a group of 10 people who have identified and started to realise well over $1m+ combined in potential savings for their businesses by applying concepts and strategies of the Lean Leaders program.

"Plus, they have more engaged teams, plus they're building strong workplace cultures, plus they have a better life work balance, plus they're creating sustainable businesses that people want to work for."

Moshie boasts of an ROI per participant of a minimum $40k across the program cohort.

Above. Bruce Yelland presents Lean Leaders on the Mornington Peninsula. ©*Zaine Watson.*

An overview of the 10 sessions presented in Lean Leaders from Moshie website.

PROGRAM STRUCTURE

10 x 4-hour workshops, delivered fortnightly

Module 1
Leadership
Introduction to Lean Principles and Continuous Improvement. Learn the difference between leadership and management, explore learning styles, and use action plans to drive accountability.

Module 2
Personal Productivity
Boost productivity with role clarity and time analysis. Identify high-value tasks, learn to delegate effectively, and maximise daily efficiency.

Module 3
Team Productivity 1
Learn to reduce waste and improve team productivity. Map processes, set SMARTER goals, and create momentum for a stronger team environment.

Module 4
Team Productivity 2
Build a great team culture by addressing dysfunctions and promoting collaboration. Explore coaching techniques and create effective coaching plans.

Module 5
Problem Solving
Present your progress and dive into effective problem-solving tools. Learn to tackle root causes, not just symptoms, for lasting solutions.

Module 6
Projects
Turn solutions into actionable projects. Learn to present ideas with measurable ROI to gain approval and drive meaningful change.

Module 7
Costings
Understand business inputs and costs. Learn to collect and use data to uncover waste and make smarter, data-driven decisions.

Module 8
Workflow & 5S
Streamline workflows and optimise processes. Use 5S principles to organise workspaces, reduce waste, and improve quality and training.

Module 9
Bringing It Together
Consolidate your learnings and focus on driving continuous improvement. Build momentum and foster a culture of change in your workplace.

Module 10
Final Presentations
Present your achievements and key learnings. Evaluate your business, identify new opportunities, and set actionable goals for the future.

"We are incredibly grateful to Hort Innovation for providing scholarships to vegetable levy paying businesses to access the Moshie Lean Leaders Program, and we look forward to supporting the current round of vegetable growers through the current programs and the outcomes that they can achieve," said Bruce.

Graduation for the new cohort will be 13 November this year.

FIND OUT MORE
Please contact Daniel Bosveld from AUSVEG Victoria on 0459 519 433 or email **rdo@ausvegvic.com.au**

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Project: VG21000

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SOUTH AUSTRALIA

VEGNET
South Australia
REGIONAL UPDATE

Strengthening industry engagement and knowledge sharing

VegNET SA has had a strong focus on both regional engagement and the next generation of industry leaders through two standout initiatives this season.

Regional Round Up for Murraylands and Mallee growers

A standout event of the VegNET SA calendar was the Regional Round Up Murraylands and Mallee, which was held Wednesday 30 April at the Bridgeport Hotel in Murray Bridge. VegNET SA, AUSVEG and Hort Innovation collaborated on the event, bringing together content and speakers to provide value to the growers. The event was delivered with funding support from the National Farmers Federation National Horticulture Roadshow.

The event proved to be a high value gathering for growers looking to stay informed and connected in an evolving horticultural landscape. There was strong attendance from vegetable and onion growers in the region, along with members of the National Onion Strategic Investment Advisory Panel (SIAP) who were meeting in South Australia.

To open the evening, AUSVEG SA CEO Jordan Brooke-Barnett and AUSVEG National Manager of Extension and Engagement Zarmeen Hassan shared timely updates on national projects, grower support initiatives, and current challenges affecting South Australian producers. This session set the tone for a practical, forward-focused discussion on industry priorities, innovation, and support systems available to the grower community.

A highlight of the evening was the curated lineup of expert speakers, each offering insights highly relevant to the commercial and operational realities of vegetable and onion growers.

Tom McCue, R&D Manager – Production at Hort Innovation, leads national research investments focused on improving crop production systems and accelerating the adoption of emerging technologies in Australian horticulture.

Tom shared developments in the agtech space, from laser weeders and robotic harvesters to AI-guided smart sprayers—now being trialled in Australia through the VG23003 program. He also introduced opportunities for leadership development, including the recently announced opening of Nuffield Scholarships for 2026—offering a pathway for ambitious growers to undertake international study tours and bring global insights back to their operations. These leadership initiatives are invaluable in equipping growers with a competitive edge in a fast-changing global market.

Stuart Peevor and Nick Sayer of Waterfind Pty Ltd provided an essential update on South Australia's water markets, with a particular focus on the Murray River, emphasising a range of strategies to help growers navigate South Australia's evolving water landscape.

Topics included the importance of water portfolio diversification and the strategic use of carryover to manage seasonal variability. Growers were introduced to options such as forward trades and long-term leasing arrangements, which can offer greater security and flexibility in water access. Intervalley trading was also explored as a mechanism to maximise resource efficiency across regions. The presenters highlighted the value of proactive water planning and budgeting, encouraging growers to adopt structured approaches to managing water assets. Additionally, the session showcased emerging technologies designed to support precision irrigation and data-driven decision making, helping producers optimise water use and improve overall farm sustainability.

Joanna Andrew and John Love, partners at Mellor Olsson Lawyers, tackled two significant issues for farming families and agribusinesses: succession planning and employment law. Joanna and John addressed common challenges such as transitioning control, managing on- and off-farm family members fairly, and navigating recent changes in industrial relations and workplace law.

Above L-R. Murray River©Keith Clarkson. University of Adelaide students with Anthony De Ieso of Thorndon Park Produce

John's session addressed recent SafeWork and industrial relations developments, giving growers clear, practical advice to ensure compliance and long-term business viability. Joanna's presentation highlighted that succession planning is not just a legal or financial process—it is a critical business strategy that ensures the long-term stability and success of family farming enterprises. By openly discussing goals, roles, and responsibilities, families can avoid misunderstandings and conflicts, while giving future leaders the opportunity to develop the skills and confidence needed to take the reins. Their advice underscored the need to begin planning early, communicate clearly, and seek professional guidance to safeguard both the business and family relationships.

Emi Schutz, Assistant Director of Permits Registration Management at the APVMA, demystified the regulatory process governing agricultural chemicals. Her talk provided growers with a better understanding of how to engage with the APVMA and why regulatory compliance matters to industry sustainability and community trust. In an environment where market access is closely tied to chemical use practices, this transparency builds grower confidence.

Beyond the knowledge exchange, the evening was a celebration of community. Over a hearty roast dinner, growers had the chance to catch up, share ideas, and form connections across growing regions. Feedback following the event highlighted the quality of the conversations and presentations, with one grower commenting that "different speakers will appeal to different people – everyone would have found something of interest".

The strong turnout and energy in the room was a clear reflection of the value placed on events that not only inform, but also bring people together. The success of the evening was a testament to the collaboration between the VegNET SA team, AUSVEG and Hort Innovation showing what's possible when local knowledge and national coordination combine.

As industry continues to evolve, events like the Regional Round-Up play a crucial role in ensuring growers are supported, informed, and connected—ready to tackle challenges and seize new opportunities in horticulture.

Supporting the future of horticulture

Students at the University of Adelaide studying an intensive winter school subject, Horticultural Production and Quality, had a whirlwind couple of weeks visiting different farms in SA. This course takes them touring the Adelaide Hills, the Fleurieu Peninsula and the Northern Adelaide Plains, giving the students an overview of horticultural industries across the domains of annual field vegetable crops, perennial tree and vine crops, protected cropping, peri-urban and amenity horticulture.

VegNET SA Regional Support Officer Kirsty Kittel attended the students' visit to Thorndon Park Produce. Grower Anthony De Ieso led the students on a field tour, discussing the value of different crops, how they are picked, washed and distributed. The students asked lots of questions and gained knowledge of the production cycles, environmental management and quality control of horticultural crops. Furthermore, the tour helped students develop knowledge and skills in identification of horticultural pests and diseases, irrigation technology, plant health, post-harvest and supply chains.

Kirsty represented VegNET SA on the day, explaining the VegNET project to the students and how it is delivered in South Australia. The visit was also an opportunity to highlight the exciting and diverse career pathways in the industry.

VegNET SA then had the opportunity to attend the assessment for this horticulture subject, a 'Shark Tank' style presentation at the Waite Campus. This involved the students presenting a unique problem in horticulture and then pitching their innovative and sustainable solution to that problem. This assessment was designed to give them a scientific understanding of a crop and develop the capacity to provide recommendations for the establishment and management of a new commercially viable horticultural enterprise. There were some creative ideas such as using the discarded part of a carrot crop to create a powder used for baking and smoothies.

Anthony Kachenko, General Manager Sustainability and Production R&D at Hort Innovation, who was also in attendance gave his feedback to the students. The day was a positive step in strengthening the ties between the university and industry. Overall, these collaborations between VegNET SA and The University of Adelaide have been an exciting investment in the future of horticulture.

Top L-R. Regional Round Up speakers Joanna Andrew, Tom McCue and John Love.
Inset. Regional Round Up participants.

FIND OUT MORE

Please contact Peta Coughlin, AUSVEG SA on 0409 029 745 or email **peta.coughlin@ausveg.com.au**

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QUEENSLAND
LOCKYER VALLEY

VEGNET SOUTH EAST QUEENSLAND
Lockyer Valley
REGIONAL UPDATE

Looking forward

The first half of 2025 has certainly flown by with growers now in full winter production. The landscape is full of beauty in the array of vegetables planted, from tiny seedlings to ready-to-harvest products. Looking forward, VegNET Southern Queensland has some exciting events, with planning well underway.

Full winter vegetable, onion and potato production in Southern Queensland is certainly a sight to see. The flurry of activity in the fields is the effect of careful and skilled planning. The produce being harvested from the area, and the vast array of product, is quite amazing. The planting and growing activities in the area shows it is busy times for our growers and industry.

A highlight for our growers and industry was to have Hort Connections 2025 at our back door in Brisbane. The networking opportunities Hort Connection provides is invaluable, each year being able to meet and get to know more and more of industry and growers. To even find just that 'one little gem of knowledge' is of value. Darren Brown, VegNET Officer, attended Hort Connections and the VegNET National Coordinated seminars and events in the days leading up to Hort Connections. For VegNET officers to be able to sit in on speaker sessions, spend time in the trade show and attend events, gives knowledge and connections they can pass on to local grower networks.

VegNET Southern Queensland is excited to announce that, through the VegNET Innovation Fund, funding has been secured for a local grower tour. This tour is also supported by the delivery partner, Lockyer Valley Growers Inc, and its dedicated volunteers and sponsors. In 2017 a Young Growers Study Tour operated with great success, with many of these young growers now actively attending VegNET events, and more importantly still working in the industry. It is fantastic to be able to get this event off the ground again.

The planning is in the final stages and the details of the tour will be coming out soon. The tour will commence in Gatton with a networking dinner to bring everyone together ready for gem tour. An early start will see the group head off to Brisbane to visit the Brisbane Product Markets. This will be the start of two days of visits across the Brisbane area, with an overnight stay in Brisbane City.

The tour will facilitate attendees to be able to see various areas of the supply chain, packaging facilities, retail stores, customer DCs and more. This year's tour will be open to those who work within vegetable, potato and onion growing businesses, not just young growers. Those that work 'behind the scenes' of growing operations are as important as the growers in the field. It is fitting then, as the tour will be looking at the whole supply chain, to encourage those who work in all aspects of growing businesses to consider attending.

The second half of the year will also see several grower BBQs, our signature events, where growers can hear from three or four speakers then follow up with a BBQ dinner. The success of our grower BBQs is that they are not seminars, they are opportunities for speakers to have 10-15 minutes to share their expertise, then have the opportunity to meet and chat more deeply about topics one-on-one with growers over dinner and beyond.

Working lunches will also be occurring in the coming months, with attendees able to hear about topical issues over lunch. These are great opportunities for all who work in the growing businesses to network and learn.

Full winter vegetable, onion and potato production in Southern Queensland is a sight to see — the flurry of activity in the fields is the effect of careful and skilled planning.

FIND OUT MORE
Please contact Lockyer Valley Growers on 0456 956 340 or email **ido@lockyervalleygrowers.com.au**

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VEGNET VICTORIA
Gippsland
REGIONAL UPDATE

VICTORIA
GIPPSLAND

Promoting safe & smart spray use

INSIGHTS FROM THE GIPPSLAND AGRICHEMICAL MASTERCLASS

Gippsland growers and industry professionals gathered in July for a highly informative and engaging Agrichemical Masterclass hosted by Food & Fibre Gippsland through the VegNET Gippsland program.

The session was led by consultant Peter Dal Santo from AgAware Consulting, who brought his decades of experience in pesticide regulation, compliance, and agricultural extension to the room. Peter's down-to-earth delivery and practical examples made complex regulatory and chemical management topics accessible and relevant to growers and industry service providers alike. Also joining the day was David Daniels, National Agrichemical Manager at AUSVEG, who gave a concise presentation on current initiatives being led nationally to support vegetable growers with access to safe and effective crop protection tools.

A deep dive into crop protection

Key pests of vegetables Peter opened the session by walking the group through the common and emerging pests impacting vegetable production in Australia. From chewing and sucking insects to diseases like downy mildew and powdery mildew, understanding the pest pressure on crops is vital for making informed chemical decisions.

Pesticide requirements & product registration Participants gained valuable insight into how crop protection products are registered and regulated by the Australian Pesticides and Veterinary Medicines Authority (APVMA). Peter demystified the registration process and explained why some products are available for certain crops but not others.

MRLs (maximum residue limits) The importance of observing MRLs, particularly for fresh produce destined for domestic and export markets—was a strong theme. Attendees learned how MRLs are determined, the role they play in food safety, and the implications of residue breaches on market access.

Permits for off-label use Peter outlined how growers can access legal use of products on crops not specified on a label via APVMA-issued minor use and emergency use permits. Knowing when and how to apply for a permit—and how to find existing ones—was a key takeaway for many in the room.

Victorian legislation The session explored relevant state-based legislation, including recordkeeping requirements, buffer zones, and the obligations of licensed chemical users under the *Agricultural and Veterinary Chemicals (Control of Use) Act 1992.* There was discussion around the role of Agriculture Victoria in compliance and enforcement.

Vegetable crop permits A special focus was given to the vegetable industry's unique reliance on minor use permits due to the diversity and relatively small scale of many vegetable crops. David Daniels shared updates on national permit priorities and encouraged growers to report any emerging needs through VegNET or AUSVEG channels.

Major vs. minor crops The distinction between major and minor crops under regulatory definitions has major implications for agrichemical access. Many vegetable crops are considered 'minor' due to their limited growing area, even if they're economically significant to certain regions like Gippsland.

Pesticide reviews – Australia & overseas Peter provided a timely update on the current and upcoming chemical reviews being undertaken in Australia and internationally. Participants were briefed on what happens when a product is under review and how decisions made overseas can influence local use patterns.

Compliance & best practice A critical part of the workshop was understanding the importance of on-farm compliance—from storage and mixing to application and disposal. Peter reinforced the value of accurate recordkeeping, staff training, PPE use, and following label directions to avoid breaches and ensure safety.

Secondary standards & stewardship The group was introduced to the role of secondary standards—such as industry-developed guidelines, QA schemes, and retailer protocols—which often go beyond legal minimums. These frameworks help growers maintain access to markets while promoting best practice in agrichemical use.

Real-world relevance & local context A hallmark of the masterclass was Peter's ability to tailor technical content to the local Gippsland context. Participants appreciated the focus on regionally relevant crops such as leafy greens, brassicas and root vegetables, and the discussion often circled back to practical applications such as how to interpret a label or when to seek technical advice. David Daniels' contribution further strengthened the session's value by connecting local concerns to national efforts. His update on the current SARP (Strategic Agrichemical Review Process) priorities and advocacy for increased label access highlighted the importance of collaboration across the industry.

Feedback & future sessions Attendees rated the masterclass highly, and came away with a clearer picture of how to navigate the complex agrichemical landscape. As regulation continues to evolve and market expectations tighten, events like this provide an invaluable platform for knowledge sharing, upskilling, and building confidence in safe spray use practices.

FIND OUT MORE
Please contact Amanda Gould on 0474 500 380 or email **amanda.gould@foodandfibregippsland.com.au**

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VEGNET FAR NORTH
Queensland
REGIONAL UPDATE

RapidAIM's RapidMEGA sensor in the field.

One year of the Fall Armyworm National Surveillance Program

One year into the Fall Armyworm National Surveillance Program, and at the halfway point of the project, there is very valuable data being generated around moth movement and habits.

In June 2024, the proposal for a large-scale project for on-farm technology to monitor the destructive pest was accepted by AUSVEG and, in partnership with RapidAIM, Bowen Gumlu Growers Association began to implement the project to trial the RapidMEGA Fall Armyworm sensor units.

A year later and with close to 300 of these units deployed around Australia, a robust data set is being generated every day so growers have a better chance of tracking movement throughout the country and of understanding potential impending risk to their crops.

This data will also help stakeholders work towards understanding fall armyworm (FAW) habits to better manage the pest through chemical application and integrated pest management, and potentially develop a new management strategy in the future. Data generated from these sensors is available online to every grower and researcher in Australia to track population movement, and growers who are hosting sensors on their farms can see their own sensor data on the go on their mobile devices to make better informed decisions in real time.

With the issue of fall armyworm affecting so many growing regions and a selection of vegetable varieties, researchers, agronomists and industry representatives are working together to find a way to manage the pest, as eradication is not possible. The availability of data generated from the on-farm RapidAIM sensors is vital for a nationwide snapshot of the FAW population and hotspots. This data can be broken down further by time of day, weather, crop type, and locality, which could in turn lead to a better prediction of heavy pressures and better offensive moves by the growers.

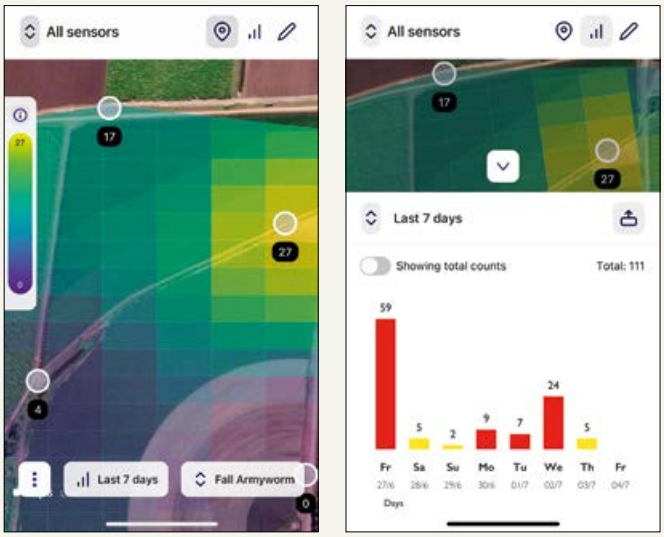
This has been a huge exercise in cross-region collaboration for the VegNET Regional Development Officers who manage the sensors in their own growing district. The RDOs work with their growers to maintain the sensors, change the lures at six-weekly intervals, and report what is working and what needs improvement.

The Bowen Research Facility of the Queensland Department of Primary Industries (QDPI) received a sensor and deployed mid-April so that FAW entomologists have data to compare to their own monitoring methods and counts. This is considered a valuable collaboration and will provide an excellent source for data and data interpretation on the habits of FAW.

QDPI has a project running called *National fall armyworm innovation system for the Australian vegetable industry* (VG22006), which is also funded by Hort Innovation, and the collaboration between this project and the VegNET Fall Armyworm National Surveillance Program is providing a robust dataset delivered through a far-reaching network of websites, newsletters, webinars, events and workshops.

The Fall Armyworm National Surveillance Program utilises the detection technology of RapidMEGA, and it is important to note that the technology is developing and being continually improved throughout the trial to meet the needs and challenges encountered along the way.

Feedback from VegNET Regional Development Officers and Regional Support Officers, as well as QDPI entomologists, has provided valuable guidance for the RapidAIM team about where improvements can be made in an effort for the most accurate reporting. One such instance is battery life; given that these are quite remote units that may not be easily or frequently accessed, the batteries have undergone an upgrade to ensure minimal time offline and a continuation of data generation, and growers will likely be able to 'set and forget' until the six-week lure changes.



L-R. Screenshot of the RapidAIM app showing the counts for three sensors. Screenshot showing the total counts for the same three sensors seven days prior.

Another issue that has been flagged is unwanted guests in the units. Some regions encounter higher numbers of pests taking up residence in the units, with ants, spiders, geckos, frogs and wasps purportedly interfering with readings by reducing the ability of the FAW moths to be registered in the unit (or potentially triggering false readings), and RapidAIM is working to reduce this interference.

While some may query the accuracy of the numbers being reported, QDPI entomologist John Stanley says that it is also about a bigger picture – that the relative size of the fall armyworm populations are being monitored (sampled) from region to region.

"It's very early days, so largely anecdotal, but we are seeing a reasonable correlation between daily, manually checked pheromone trap catches and the real time fall armyworm data, despite occasional disrupted counts," he said, noting that disrupted counts are a problem for all pheromone trapping.

"The strength of the data from these networks is expected to come from the high resolution [daily recording] of many sensors at a regional scale, quickly identifying changes in fall armyworm populations."

Feedback from RDOs indicate that there is quite a number of growers and their agronomists who are watching their apps closely and factoring the RapidAIM counts into their integrated pest management plan. A quick look at the app will tell them if there is increased activity and this will have the growers checking their paddocks to help plan their next moves.

For RapidAIM, it's been a massive undertaking with unforeseeable issues being worked out on the run that, by the end of the trial next year, will likely see a capable and hardy end product that generates a steady flow of data, whatever the season.

"This has been a very successful collaboration with Bowen Gumlu Growers Association and all the wonderful VegNet RDOs who've helped us roll out the national RapidMEGA grid," said RapidAIM COO Rebecca Feddema.

"We're already receiving positive responses from growers about how this is helping provide early visibility of pest pressure and we really value the candid feedback about the challenges we need to solve for, too. As we collect more real-time data over the coming season to continue to train our models, this will only serve to make our information even more accurate."

NATIONAL ROLLOUT – FALL ARMYWORM SURVEILLANCE

2024

JUNE ◀ **AUSVEG Innovation Fund** accepts Bowen Gumlu Growers Assoc proposal for the Fall Army Worm National Surveillance project.

AUG ◀ **Bowen & Burdekin Regions** North Queensland — 62

◀ **Wide Bay Burnett** Queensland — 68

SEPT ◀ **Lockyer Valley** Queensland — 48

◀ **Geraldton** Western Australia — 4

NOV ◀ **Richmond, North Coast, Central West & Central Tablelands** New South Wales — 30

DEC ◀ **Gippsland** Victoria — 30

2025

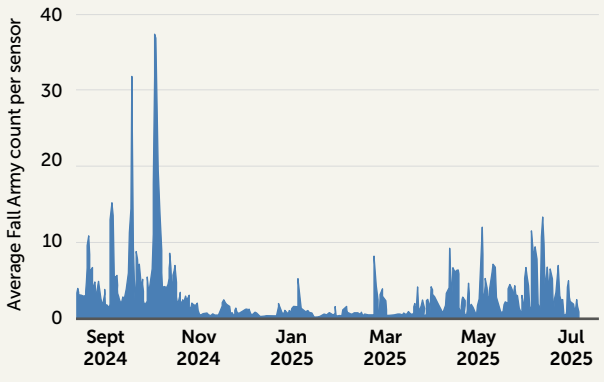
FEB ◀ **Northern Region** Tasmania — 10

MAR ◀ **Carnarvon** Western Australia — 4

APR ◀ **Kununurra** Northern Territory — 15

◀ **Bowen & Burdekin Regions** North Queensland — 8

DAILY FAW PEST PRESSURE IN THE BOWEN REGION



An example of the daily updates on FAW detections, in this case for Bowen, available to growers through the project. ©*RapidAIM*.

FIND OUT MORE

Please contact Richelle Kelly, Bowen Gumlu Growers on 0419 429 808 or email rdo@bowengumlugrowers.com.au

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Project: VG21000

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VEGNET
Western Australia
REGIONAL UPDATE

OWL project update: advancing AI precision weed control

The OWL (Open Weed Locator) Project is an innovative, grower-led initiative driven by the Warren Cauliflower Improvement Group in Manjimup, Western Australia, with supportive seed funding through the VegNET innovation program and regional and global partnerships; The OWL Project – Manjimup is advancing affordable, open-source ag-tech solutions for precision weed management.

At the centre of the project is the OWL camera system, developed to detect and manage weeds in vegetable crops using AI-powered "green-on-green" and "green-on-brown" spot spraying algorithms. By addressing both environmental sustainability and cost-accessibility, the project is designed to help growers reduce herbicide use, cut input costs, and make precision agriculture more accessible, affordable and achievable on-farm without the barriers of patents and high costs associated with commercialised products.

One of the key features of the OWL Project is its practical, hands-on approach to grower engagement and technology adoption. With leadership from inventor Guy Coleman, Manjimup growers Warren Cauliflower Improvement Group recently participated in an international industry tour, visiting the open-source technology hub at Copenhagen University in Denmark. This was followed by a series of local open-source focused workshops, farm and field demonstrations in the use of AI weed detection and spraying technology, including guided regional farm visits that utilise the technology in mixed production, onions and spinach.

As part of the OWL Project's international collaboration and knowledge-sharing efforts, a dedicated field day was hosted at the University of Copenhagen's research facilities in Taastrup. The event brought together researchers, growers from Denmark and Australia, ag-tech innovators, and industry experts to explore the potential of open-source technologies in advancing precision agriculture globally and showcasing some of the technology available.

The Field Day began with a series of presentations highlighting the growing role of open-source tools in farming. Guy Coleman from the University of Copenhagen introduced the open-source movement in agriculture, followed by Patrick Coleman from Pemberton.digital, who explored the practical applications of open hardware in ag-tech. Contributions from Frederik Larsen of Agrovi and Australian grower Jake Ryan provided valuable agronomic and farmer perspectives on the adoption of tools like the OWL system in real-world vegetable production.

The program also featured insights into various autonomous cutting-edge precision technologies with speakers presenting on collaborative projects such as OneCropHealth (OCH), satellite-based predictive systems from Geco Engineering, drone solutions by CropUp, tractor-based innovations from PerPlant, and precision implements from EcoRobotix. A mapping demonstration by RoboWeedMaps further showcased the integration of data for weed management collecting data sets via drones.

In the afternoon, attendees participated in hands-on field demonstrations. Technologies including the OWL system, and a DIY spot-spraying setup with a 12m boom. Commercial sprayers were displayed alongside open-source and other higher cost solutions from PerPlant, EcoRobotix, CropUp, and RoboWeedMaps. The demonstrations provided a tangible look at how open-source and precision technologies can be applied directly on-farm, reinforcing the day's theme of accessible, farmer-led innovation in weed control and crop management.

Above L-R. The OWL Project camera unit assembly workshop at Copenhagen University. The open source ag tech-and AI precision weed management field day in Denmark.

A full day OWL workshop was delivered by Guy Coleman, which guided growers to assemble their own OWL camera units using Raspberry Pi-based hardware and learn to train AI models on weed image datasets. These sessions provided foundational skills in building, coding, and deploying the technology for real-world weed detection and control, with growers commenting how easy it is to assemble with the guidance by the OWL Project and accessible information via GitHub and YouTube tutorials.

The OWL Project group in Manjimup, led by Jake Ryan, are pioneering a 16-channel platform initially targeting brassica crops, and planning farm field demonstrations and a podcast to come once the unit is fine-tuned and can be shared with other growers. OWL is laying the groundwork for broader application across regions and crop types.

The OWL Project's next phase focuses on establishing an open-source, publicly accessible weed image library. With three core pillars—industry study tours, hands-on hardware workshops, and the weed image dataset—the OWL project has evolved into a scalable platform for grassroots innovation.

A full report on the industry tour will be featured in the next Australian Grower, with insights from the farms and growers who participated in the eight-day open-source project tour.

FIND OUT MORE
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CASE STUDY

Pest resilient landscapes in horticulture: A Lockyer Valley perspective

Introduction

South-east Queensland, like other horticultural areas in Australia, hosts a range of farming systems including conventional, organic, protected cropping and hydroponics.

On a global scale, across these systems, pests destroy more than 40 per cent of the potential global food production despite the annual use of approximately three million tonnes of pesticides[1].

The Australian Horticulture Sustainability Framework (2021) and the Australian Agriculture Sustainability Framework (2022) highlight the importance of best practice land management for soil health, reducing erosion, increasing biodiversity, preserving natural waterways and incorporating functional natural landscapes, while acknowledging that land under agricultural management delivers ecosystem services.

Following discussions with Hort Innovation's Olive Hood on pest resilient landscapes, VegNET VegNET South-East Queensland Regional Development Officer Darren Brown investigated if it was possible, in a horticultural context, to meet the goals of the sustainability frameworks while reducing pesticide use and maintaining productive horticultural farms in the Lockyer Valley.

In particular, Darren examined if the findings from a recent vegetable levy-funded project, *Field and landscape management to support beneficial arthropods for IPM on vegetable farms* (VG16062), were relevant to Lockyer Valley growers. This project, which ran from 2017 to 2020, helped vegetable growers to develop practical approaches for pest control, building on previous research from Australia and around the world that shows pest populations can be influenced by field and landscape vegetation on farms.

Key messages

- Maintaining acceptable control of pests through sustainable pest management practices is a key focus area for VegNET South-East Queensland.
- Following industry discussions on pest resilient landscapes and the publication of industry sustainability frameworks, Regional Development Officer Darren Brown investigated how the Lockyer Valley is balancing the competing demands of productive farms and environmental sustainability.
- The recent findings of a vegetable levy funded research project, *Field and landscape management to support beneficial arthropods for IPM on vegetable farms* (VG16062) was also discussed.
- VegNET VegNET South-East Queensland will continue to raise awareness of the VG16062 findings and the implications for regional farming systems, and keep growers informed of insights around sustainable pest management practices. The project will also follow-up with growers looking to increase the resilience of their landscapes and connect them with natural resource management or Landcare groups to increase native habitats on their farms.

1 Jeanneret, P. B. (2016). Landscape Features to improve pest control in Agriculture. Solutions, 48-57

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Insights from grower discussions

Darren visited Rob Bauer (Bauers Organic Farm) and Reck Farms in the Lockyer Valley, and held discussions with agronomists Antony McConville and Andrew Richards.

Bauers Organic Farm consists of 282 hectares (113 hectares are cropped). There are many smaller paddocks across the property which are mostly surrounded by riparian fringes or other natural/non-crop habitats (see image 1 below).

Rob considers all organisms in the landscape including bats and birds such as magpies, ducks and scrub turkeys.

The farm ecosystem has a variety of plants which includes many natives (Acacias, Eucalypts, Casuarina and Melaleucas), which will self-regenerate in the area if left alone. There are several weed species as well, including Chinese Elms, Leucaena, Castor oil plant, cats claw creeper and a range of grass species including green panic and couch grass.

Nesting sites and over-wintering areas are important for birds, bats and insects. Leaving as much natural landscape mixed with the cropping enterprise reduces the impact of pest insect species on the horticultural crops. Unfortunately, weeds are possibly worse in this system of wide-ranging plant species in the agricultural landscape.

Reck Farms operates 16 diverse properties over four regions (Mulgowie, Upper Tenthill, Lower Lockyer and Brisbane Valley), farming approximately 1000 acres. There is generally less pressure on the farms which have higher amounts of native vegetation around the cropping areas. However, this is not always observable.

Insights from industry discussions

Lockyer Valley agronomist Anthony McConville, who was involved in VG16062, said that generally there is less insect pest pressure in fields with large amounts of surrounding vegetation. However, it appears that other factors play a large part in the success of remnant vegetation and its effectiveness in suppressing pest insects.

Image 1: Aerial view of Bauers Organic Farm showing cropping and non-cropping areas

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"Flowering strips are a good idea and appear to have an impact on pests, but it is difficult for growers to see this as a positive and not a loss of productive cropping space," Anthony said.

"Crops growing nearby can have an impact in overcoming the best principles of integrated pest management (IPM) and vegetation as a management tool. The degree to which surrounding landscapes and IPM can be used to control pests is determined by the crops grown and the amount of damage which can be tolerated."

It takes time for beneficials to build up to levels where they can control the pest species. It is difficult to find reasons for unknown hot spots of insect activity (possibly linked to non-vegetable crops nearby).

"Insects will move from a non-vegetable crop into vegetables particularly if the non-vegetable crop gets harvested. Organic or conventional farmers all face the same issues," Anthony added.

Andrew Richards, another agronomist based in the Lockyer Valley, said that remnant vegetation can sometimes assists with pest control, however, other factors reduce the effect of vegetation.

"Pest hot spots do not seem to be reduced by remnant vegetation. IPM is a great principle, but it does not always work, and chemicals are often required to suppress pests to acceptable levels. This is very much dependent on the crop species and the acceptable levels of damage."

AgBiTech Australia's Zara Janke added that there are wider implications on managing pests.

"Do not look for specific beneficials, look at the system. It is not necessary to know which beneficial species are in the crop, just that they are there and are parasitising pest species eggs. Any vegetation or flowering plants which support beneficials will improve their impact on pest species."

Improving grower productivity, profitability, preparedness and competitiveness

While this activity initially aimed to determine if increasing vegetation had a positive effect on insect pests in vegetable crops, it quickly became apparent that this was only part of the issue and solution.

There are benefits to increasing useful vegetation in and around vegetable crops, and this is backed by existing research. How vegetation is incorporated on a farm is determined by the individual grower and the limits of their production system.

Endeavouring to meet the goals of the Horticulture Sustainability Framework and the Australian Agriculture Sustainability Framework will be a major challenge. Further research is required to develop approaches to incorporate habitat conservation with agricultural production. Part of such integration will pivot around better farm planning.

Investments such as those through carbon markets that result in long-term biodiverse carbon storage on farms could be critical in this respect, including stewardship schemes where farmers are paid for demonstrably improved conservation outcomes on their land[2].

VegNET South-East Queensland connected growers with VG16062 findings and outputs, as well as key researchers such as Dr Loren Fardell who is currently researching the impact of microbats on insects. There is significant opportunity to continue sharing the learnings from the project further.

Next steps

Going forward, VegNET South-East Queensland will continue working with growers, agronomists and researchers to boost their knowledge of pest resilient landscapes and how they can be used to reduce the reliance on synthetic pesticides. This links in well with existing research on managing fall armyworm and using an IPM and area wide management approach to manage diamondback moth.

Image 2: Bauers Organic Farm riparian area. **Credit:** Darren Brown.

2 Lindenmayer, D. (2022). Birds on Farms: a review of factors influencing bird occurrence in the temperate woodlands of South-Eastern Australia. EMU - Austral Ornithology, 238-254.

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Key findings from existing research on pest resilient landscapes

Field and landscape management of crop pests, by biological control or direct effects of vegetation on pests, offer great opportunities to vegetable growers.

Biological vs. synthetic insecticides

Research has found that pests were no more numerous in fields where only biological insecticide types – such as Bacillus thuringiensis (Bt) or Nuclear Polyhedrosis Virus (NPV) – were used when compared with fields using synthetic insecticides. The number of beneficial insects was significantly higher in fields sprayed only with biological insecticides compared to those where a mixture of insecticides was used[1].

Flora and fauna

Wild fauna occurs in every agroecosystem and their interactions with crops can influence yields positively or negatively. Research on the impact of fauna activity on agricultural production mostly focuses on the costs (e.g. crop damage) or benefits (e.g. pollination), with few studies addressing cost-benefit trade-offs in the same context. This has resulted in an incomplete understanding of the implications of fauna activity in agroecosystems[2].

Pest resilience is not as simple as increasing the non-crop habitat. Other biotic and abiotic mechanisms play a role, including:

- Selecting pest-resistant crop varieties
- Intercropping
- Using cover crops
- Climate adapted push-pull techniques
- Mulching
- Minimum tillage and other soil management practices[3].

One explanation for this difference may be that the greater diversity of organisms involved in pest control (such as birds, bats, spiders, beetles, flies, etc.) may underlie their more diverse landscape responses[4].

Organic vs. conventional

There is no difference in biological control between organic and conventional fields when the farming system was the sole predictor (Figure 1). However, the number of distinct habitat patches in the landscape had a positive effect on biological control only in more complex landscapes[5].

Birds are important ecosystem service providers across a range of ecosystem types. They can travel long distances, have high metabolic demands and can utilise a range of habitats.

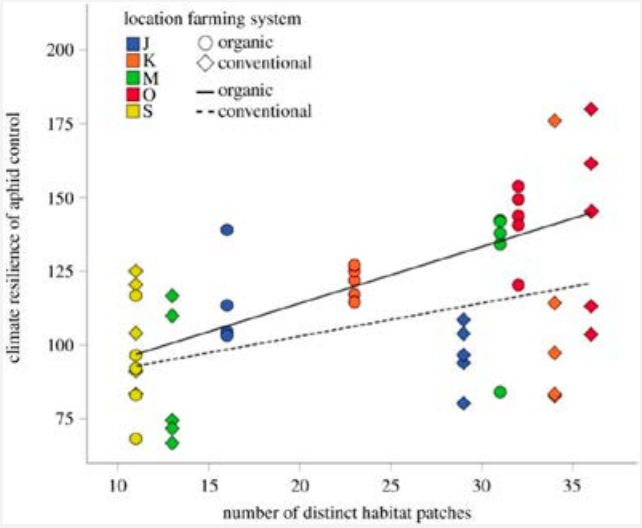

Figure 1: Biological control, farming system, habitat patches effect on aphid control, where JKMOS are randomly assigned fields. **Source:** B.B Feit[6]

1 Gurr, G. (2021). Field and landscape management to support beneficial arthropods for IPM on vegetable farms. Sydney: Horticulture Innovation Australia.

2 Peisley R.K., S. M. (2015). A systematic review of the benefits and costs of bird and insect activity in Agroecosystems. Springer Science reviews, 113-125.

3 Heeb, L. J. (2019). Climate smart pest management: Building resilience of farms and landscapes to changing pest threats. Journal of pest science, 952-969.

4 Karp, D. e. (2018). Crop pests and predators exhibit inconsistent responses to surrounding landscape composition. Proceedings of the National Academy of Sciences (pp. 7863-7870). PNAS.

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Birds are commonly found in agroecosystems and their foraging activities provide significant benefit to primary producers from biological control of pests, however, birds are most active within 20m from natural vegetation[7].

In Australia, 66 percent of insectivorous bats roost in tree hollows, and bat colonies do not travel great distances to exploit crop insects. Thus, bats foraging over crops in Australian agroecosystems are predominately tree-dependent species roosting in nearby non-crop woody habitat and may provide a pest control service. Around 53-63 tonnes of insect pests are removed from Australian cotton crops each year by the average non-reproductive bat[8].

It is apparent that there are many factors contributing to pest control in the horticultural landscape (Figure 2).

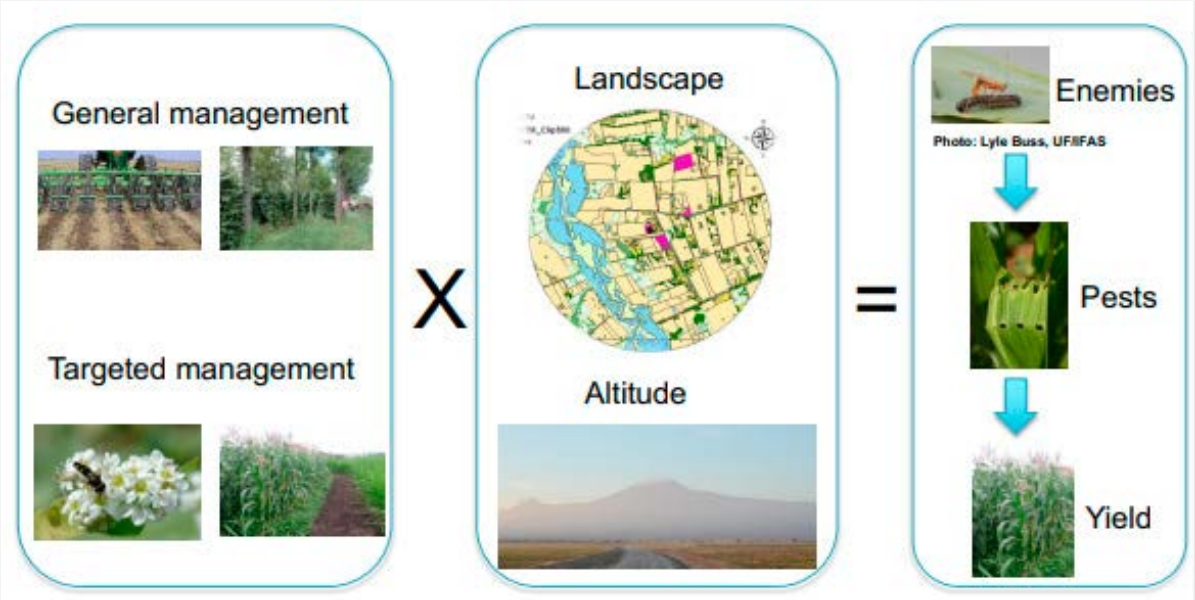

Figure 2: Pest management depends on both local management and surrounding landscape context. Source: M. Johnson[9] .

7 Peisley R.K., S. M. (2015). A systematic review of the benefits and costs of bird and insect activity in Agroecosystems. Springer Science reviews, 113-125

8 Heidi Kolkert, R. S. (2021). Insectivorous bats provide significant economic value to the Australian cotton industry. Ecosystem Services

9 Johnson, M. (2020). Diversified agricultural Landscapes for pest control. Resilience Landscapes, SLU global Seminar. Uppsala: Centre for Biological Control.

Image: Bauers Organic Farm and nearby riparian native vegetation. **Credit:** Darren Brown.

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

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Other research

In addition to the research from Hort Innovation project VG16062: *Field and landscape management to support beneficial arthropods for IPM on vegetable farms*, other studies include:

- 206 insect-only studies, where 18 percent related to vegetables and 70 bird studies, where 2.9 percent related to vegetables[10]
- 1 micro-bat study in cotton (University of Queensland is currently undertaking a study in the Lockyer Valley on how well bats can control insect pests)[11].

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Further information

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Field and landscape management to support beneficial arthropods for IPM on vegetable farms (VG16062) was funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

More information and resources from the project can be found here: www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/

Image: Typical creek line in the Lockyer Valley. **Credit:** Darren Brown.

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