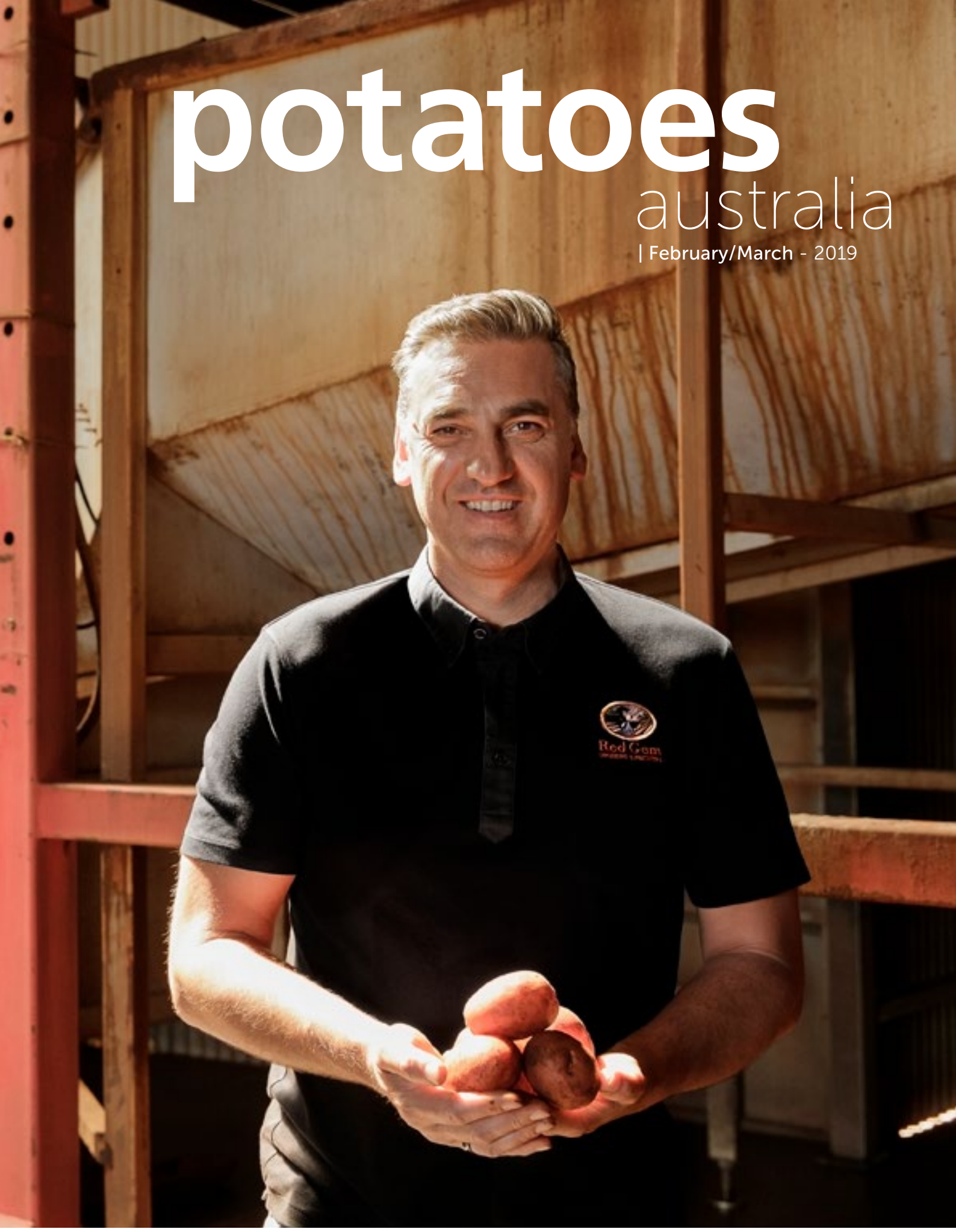
# potatoes australia

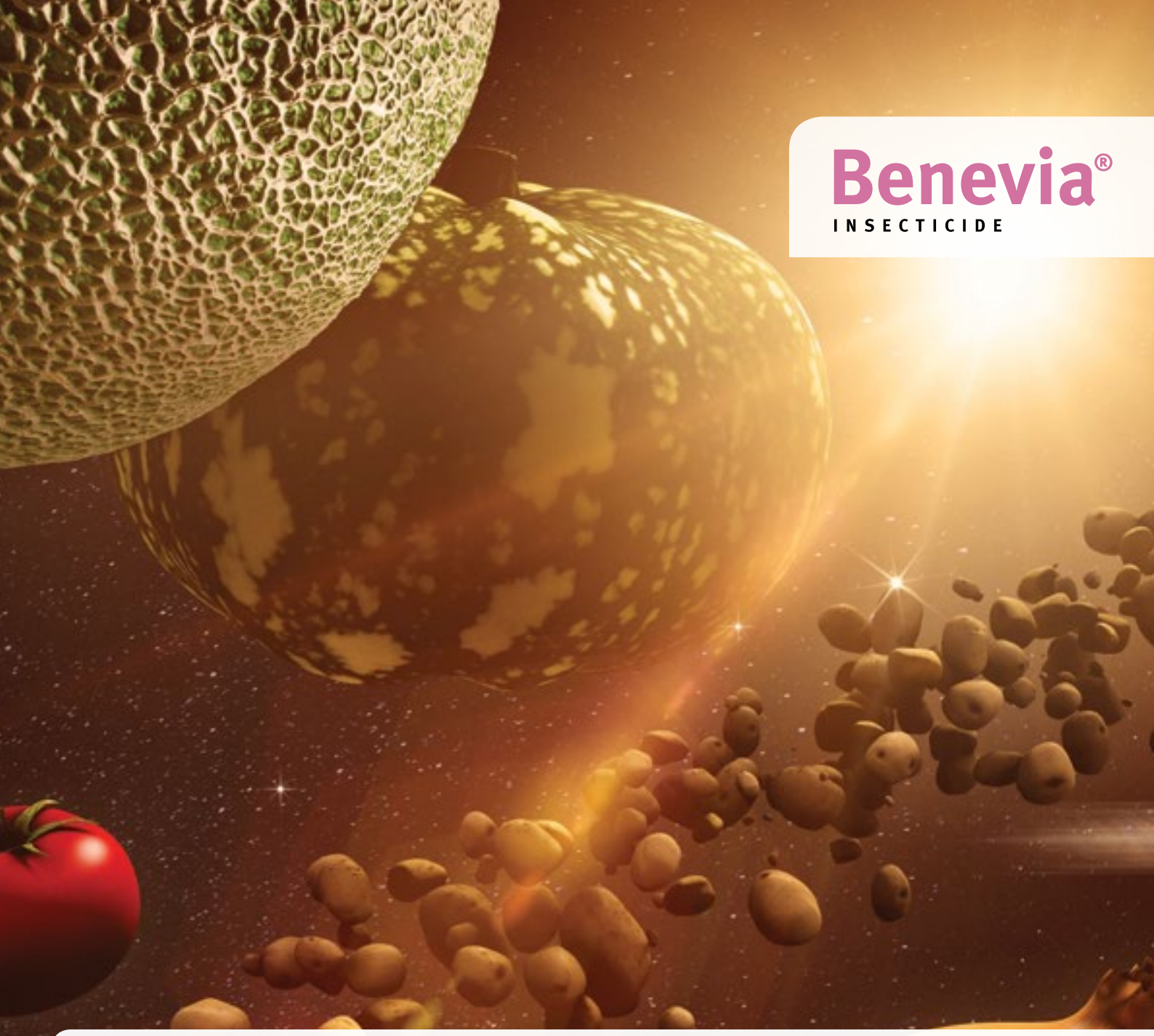
| February/March - 2019




**ROBERT CERCHIARO** - X-RAY VISION DELIVERS QUALITY SPUDS

**CHURCHILL FELLOWSHIPS** - APPLICATIONS NOW OPEN

**RESEARCH UPDATE** - TIPS TO IMPROVE POTATO SEED QUALITY AND MANAGEMENT



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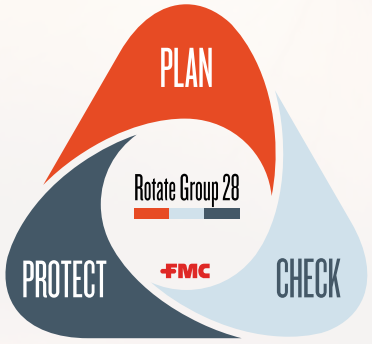




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AUSVEG

Hort Innovation

# Editorial

Those who work the land are some of the most humble and unassuming individuals that we meet. We come across them in the search for growers to profile each edition – while some are keen for the opportunity to be featured, others are hesitant to embrace a moment in the spotlight and mistakenly assume that their story is not newsworthy.

Most growers are happy to be left to do what they do best – grow high quality, fresh produce for their customers – without praise or recognition. It isn't, however, reflective of what our readers, the wider industry and consumers are looking for. Time and time again, we see that personal stories and experiences resonate the most with others, providing inspiration and a sense of pride in our industry.

With so many news articles tainted with hardship or negativity, there is a clear opportunity for the horticulture industry – and potato and vegetable growers in particular – to start proactively sharing their good news stories and achievements. As we enter another new year, there is no better time on the calendar to start.

This edition of *Potatoes Australia* features many examples of those who are proud to share their story for the benefit of the wider industry. Our grower profile of Red Gem Growers and Packers on page 10 explains how Guido and Robert Cerchiaro have implemented a trial of x-ray technology into their packing facility to improve the quality of their potatoes, while our young grower profile of Frankie Galati on page 26 highlights his vision of the industry in the future.

In the R&D space, Wayne Tymensen shares his journey of being one of the first potato growers in Australia to adopt Integrated Pest Management on his farm (page 18), while Terry Buckley, Andrew Langmaid and John Doyle have all provided a glimpse of the ways they farm, handle and store potato seed to strengthen the quality of the potato production process (page 12).

The horticulture industry has not always taken the opportunity to promote its positive impact to others, often to its own detriment. It's time for growers and all industry members to step into the spotlight and share their good news stories with the world, and encourage others to take the lead as well. It will not only be a positive move for you and your business, but also the wider industry.

AUSVEG is always keen to promote these stories and grower profiles across our communications channels, so if you have a good news story, please get in touch with the team on 03 9882 0277 or communications@ausveg.com.au.

# Message from the CEO

Often, it pays to venture outside your backyard to be exposed to the latest in global technological innovations and industry research. A successful example can be found in this edition's profile of Victorian potato grower Robert Cerchiaro, who travelled abroad to Europe and the United States where he discovered how x-ray technology could be used as a tool to assist in the everyday running of his potato packaging operation. Robert returned to Nar Nar Goon armed with fresh ideas and a greater insight, which was instrumental in his successful application for a $350,000 loan through the Coles Nurture Fund.

Robert is now reaping the rewards from his overseas travels – although currently in the trial stage of the x-ray technology on his farm, it has already proved to be a worthy investment for his business, Red Gem Growers and Packers, reducing workloads and ensuring that the potatoes produced meet customer specification. Ultimately, this innovation is not only important for the growth of Robert's business, but it also has the ability to positively impact the wider Australian potato industry in years to come.

On the subject of travelling abroad, I, along with AUSVEG Chair Bill Bulmer and Deputy Chair Belinda Adams, recently had the pleasure of embarking on a fact-finding mission to New Zealand. While there, we spoke with growers and industry representatives to see what we could learn from our Trans-Tasman neighbours. We also gained an international perspective on what we, as an industry, can do to generate positive results for our growers and improve our systems here in Australia. AUSVEG would like to thank our New Zealand counterparts for being so generous with their time and assistance.

James Whiteside

James Whiteside
*CEO*
*AUSVEG*

# LYNX 2 ROW HARVESTER

The **AVR LYNX TWO ROW HARVESTER** can do both in-line and off-set harvesting and is entirely hydraulically driven. There is a choice of three different types of cleaning module: pintle belt, pintle belt/cross roller set or pintle belt/Varioweb. The Varioweb application - well known from the Puma 3 self-propelled harvester - is especially unique!

The machine operates completely hydraulically, and a number of intelligent technologies enable the harvesting to be done even more flexibly. The Lynx rides on wide tyres, which guarantees low soil pressure and makes the machine easy to pull. The machine is aimed at the seedling market on heavy soil, the industry, but can also be used for the combination industry – starch – firm flesh, where a top-quality harvest is imperative.

### Smooth harvesting

Most components can be controlled hydraulically from the tractor: steering wheels, machine level, digging unit up / down, hydraulic digging unit depth (option), (automatic) drawbar steering, Varioweb in / out, pintlebelt inclination, elevator cylinders, emptying the supply belt and elevator, inclination of the axial rollers (option).

### Advantageous offset harvesting

When needed, the drawbar can easily be shifted hydraulically, creating a off set harvester. In that case, the tractor can be equipped with wide tires. Thanks to the automatic drawbar steering (default), the steering is completely taken over. This assures a perfectly ergonomic way of controlling and steering the machine.

### Clear harvesting process

The AVR digging unit is characterized by its wide intake, large haulm intake rollers and plastic diabolos. The central depth setting can be adjusted using a simple spindle (optional hydraulic depth setting via display). The oscillating digging unit and the automatic row following system ensure that the ridges are followed meticulously, especially in case of off set harvesting.
The unique asymmetrical frame provides for a perfect view on the harvester from the tractor. You can follow the entire harvesting trajectory, from uptake to deposit in the car. All hydraulic and electrical components have thereby been eliminated on the side of the machine. Thanks to the digging unit's open construction, the crops are transported smoothly. In addition to practical comfort during maintenance and repairs, this also promotes the design of the machine. This is a nice machine to work with in every respect.

### Three different cleaning modules

The Lynx is constructed modularly, which means that for one frame, three types of cleaning modules can be opted for. Because of this, the machine can easily be adjusted to the applicable growing and harvesting circumstances. For heavy soils, axial rollers (in Varioweb) can be opted for. The advantage of this configuration is that for vulnerable potatoes or easily sievable soil, the axial rollers can be taken out of the product flow. If no axial rollers are needed, the cleaning module can be replaced with a rubberized rod belt.

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# Developing a taste for potatoes in the name of science

It can be difficult for retailers and food producers to know what consumers want when making everyday food choices. *Potatoes Australia* investigates how a team of food technologists and sensory scientists in South Australia are closing this gap with consumer testing of potato varieties.

Potatoes are known for their taste and versatility.

However, some varieties of potatoes have proven to taste better when cooked using a number of different methods. This has been determined over the past few years at the South Australian Research and Development Institute (SARDI), the research division of Primary Industries and Regions South Australia (PIRSA).

SARDI conducts sensory and consumer testing for South Australian food producers, including the potato sector, as part of a broader food technology program funded by PIRSA. The program's services vary in size, depending on the customer, and include identifying any perceivable differences between products if there is a change in supplier, ingredient, process and packaging; flavour profiling; testing consumer acceptance and preference towards a product; benchmarking a product against its major competitors; and the development of online surveys, workshops and training.

"We service industry associations, larger retailers such as Coles or Woolworths as well as growers or individual companies," SARDI Food Technology Program Leader Andrew Maronich said.

Potatoes were recently on the menu at SARDI when sensory scientists conducted consumer acceptance testing of 58 potato varieties involving 2,100 consumers.

"That project was undertaken to determine or identify the most acceptable potato varieties by Australian consumers, and to produce results to a major retailer to narrow down what should be the predominant potato varieties available on-shelf," Mr Maronich explained.

Located in Urrbrae, South Australia, SARDI's state-of-the-art sensory facility has 10 independent tasting booths with controlled temperature and lighting. During the project, SARDI sourced the main commercial potato varieties available in Australia and evaluated them using six cooking methods: mashing, frying, boiling, roasting, baking and microwaving.

During the blind tasting, panel members were given six different potato samples (for each cooking method) to eat in a single sitting. The consumers then rated the levels of like or dislike (in a 9-point hedonic scale) on the different sensory attributes of these potatoes including appearance, colour, flavour, texture and overall liking. The results were subsequently provided to the retailer that commissioned the project.

## Project methodology

Mr Maronich and SARDI sensory scientist Dr Yaelle Saltman outlined how projects, such as potato sensory testing, are organised.

"The customer usually provides the potatoes and we store them at SARDI according to the customer's request. We've got the facilities to store them at designated temperatures and humidity," Mr Maronich said.

Dr Saltman organises the consumer panels depending on the number of varieties and cooking methods, while a chef is employed to prepare and cook the food.

"Most of the preparation is done by fully qualified chefs – we have to follow a method in terms of time and temperature to ensure consistency. The sensory scientist conducts the evaluation and oversees the whole concept," Mr Maronich said.

"Once we finish the experiment, we cross-examine all of the data with a computer program using statistical analysis called ANOVA (Analysis of Variance) to see which potato was more liked by the consumer on the different sensory attributes for each cooking method," Dr Saltman said.

## Further research

As mentioned, the wider food technology program at SARDI is not limited to sensory activities, and product development consultancy is becoming increasingly important. Companies may want to improve their products by introducing new ingredients or pre-packaging their lines, and therefore require consumer testing to determine if it will affect the product's popularity.

Mr Maronich said growers or any food producers in South Australia are welcome to contact the food technology and sensory testing teams for assistance.

**Find out more** R&D

For more information, please contact Andrew Maronich on 0412 971 375 or andrew.maronich@sa.gov.au or Dr Yaelle Saltman on 0432 577 851 or yaelle.saltman@sa.gov.au.

Further details can be found at pir.sa.gov.au/research/services/sensory_and_consumer_testing.

Jono Craven (left) was awarded a Churchill Fellowship in 2015 to investigate effective recycling of urban and agricultural wastes.

# Cultivating innovation in Australian horticulture

Hort Innovation has once again partnered with the Churchill Trust to offer three Fellowships in 2019. The purpose of these Fellowships is to help cultivate new, innovative ideas that will grow the Australian horticulture industry. Applications for Churchill Fellowships are now open.

Sir Winston Churchill famously referred to gardening as the "natural occupation of man", with Fellowships to be offered in his name to encourage innovation within Australia's horticulture industry.

Under an ongoing partnership with Hort Innovation, three Churchill Fellowships will be offered again this year that will provide recipients with the opportunity to travel the world to access knowledge not readily available in Australia, harnessing it and growing the nation's collective knowledge by sharing it.

Some of Australia's foremost horticulturalists are Churchill Fellows, including long-time Gardening Australia host Peter Cundall, citrus grower and expert Ian Tolley, rose petal industry pioneer Sarah Simmon and vegetable grower Jono Craven, to name a few.

"As an industry, horticulture represents an important contributor to our nation's economy, and the Trust is excited to see how these Fellowships can have a positive impact in Australia," Churchill Trust CEO Adam Davey said.

"There are only two prerequisites for a Churchill Fellowship – the first is creating a research project that will provide benefit to the Australian community.

"The second is disseminating all of the skills, insights and knowledge gathered from world experts on the Fellowship when returning home."

## Industry advancement

Belinda Hazell from Tasmania was the proud recipient of the Hort Innovation Churchill Fellowship in 2018 and will travel to New Zealand, the United Kingdom, Ireland and the Netherlands this year to investigate the use of horticultural quality assurance standards to stay ahead of social license demands.

Mr Davey said that the Churchill Trust is looking for Australians just like Belinda, with even just a seed of an idea, to apply for these Fellowships that are designed to drive innovation and transformation in the horticulture industry.

Hort Innovation is one of the nation's 15 Rural Research and Development Corporations, focused on supporting primary producers and growing the future productivity and profitability of Australia's fruit, vegetable, nut, plant and tree industries.

A recent study commissioned by Hort Innovation and conducted by the University of Queensland suggested the Australian horticulture industry outperforms the average Australian business in the innovation field – with almost 80 per cent of horticultural producers reporting some form of innovation, whether it was new to the farm or new to the industry.

**Find out more** R&D

Applications for a Churchill Fellowship are open until 30 April 2019. For more information, please visit churchillfellowships.com.au.

*Churchill Fellowships* are funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation with co-investment from the Churchill Trust and contributions from the Australian Government.

Project Number: LP16002

hort frontiers Strategic partnership initiative | LEADERSHIP FUND


Photography by Danae Commercial

# Victorian growers' x-ray vision pays dividends

Father and son duo Guido and Robert Cerchiaro are aiming to significantly increase their business' efficiencies by becoming the first potato growers in Australia to trial x-ray technology in their packing facility, courtesy of the Coles Nurture Fund. Robert, the General Manager of Red Gem Growers and Packers, speaks to Michelle De'Lisle about this latest innovation and the potential long-term benefits for the Australian potato industry.

The Victorian township of Gembrook has a rich potato growing history – located just 50 kilometres south-east of Melbourne, potatoes have been grown in the red volcanic soil surrounded by the rolling hills of the picturesque Dandenong Ranges since the late 1800s.

However, due to market access limitations that have developed since the early 1990s, many potato growers have moved to the Gippsland region, including Mirboo North and Thorpdale.

Among the potato growers who relocated from Gembrook is Guido Cerchiaro and his son Robert from Red Gem Growers and Packers. The pair now operate their business from Nar Nar Goon, known as 'the Gateway to Gippsland'.

Red Gem grows and supplies brushed and washed varieties of potatoes to major retailers around Australia. While the business is based in Nar Nar Goon, it also has farms operating in Hillston in the Riverina region of New South Wales and Mount Gambier in South Australia. Trials of sweetpotato and onions are also underway through joint venture crops in Gippsland.

However, it is in the packing shed where the business' latest and most exciting innovation is currently taking place. A 32-year strong partnership between Red Gem and supermarket chain Coles has culminated in an investment that may change the shape of the Australian potato industry.

In 2018, Robert and Guido received a $350,000 Coles Nurture Fund loan to implement x-ray vision technology into their potato packing facility, which is expected to deliver improvements in the quality of Crème Royale potatoes supplied to Coles. It will also be environmentally-friendly, with the equipment powered entirely by solar panels. The trial is the first of its kind in Australia and started in January 2019.

## Innovation in practice

Robert Cerchiaro's search for technology to improve potato growing standards and enhance potato quality for consumers led him overseas to the United States and Europe. In the US, Robert found this x-ray vision system, which is used by most food manufacturers for metal detection.

"It takes an image of the potato based on density, so it sizes fantastically, but it also sees through the potato, looking for holes, voids and density changes. As soon as I saw the x-ray vision system, I thought that this is what we need for our brushed potatoes – the help we're looking for is this system," he says.

While there have been some teething problems, implementing this

ground-breaking technology into the packing shed has already made an impact on the business.

"A lot of the workload was on graders and workers who were inspecting the potatoes. They were taking out undersized and oversized potatoes because of mechanical error; they were doing a lot of that work and were still having to grade for quality," Robert says.

"Now, they don't have to worry about size because our size is very accurate. They just focus on visual defects – things that the x-ray can't detect at this stage. It makes their job so much easier and it gives us peace of mind that we're delivering to our customers the specifications required."

This technology will also benefit consumers of Coles' Crème Royale potatoes in the long-term, with customer satisfaction expected to increase.

"Customers aren't going to get any surprises of rotten potatoes and internal defects when they cut it or prepare it," Robert says.

"If we're going to impact today's Australian consumer and try to stop the decline of fresh potato consumption, we need to give them greater confidence that when they're buying our product, they're going to get value for money and they're not going to get these surprises of defective potatoes."

## Heading abroad

Robert highly recommends travelling overseas in search of innovative ideas and to gain an insight into the technology that is currently available to industry.

"There's no doubt that abroad is where the R&D is in terms of technology for weighing, grading, packing and handling of potatoes. If that is the way your business would like to go, you need to get out and see what's available," he says.

"I think that if you can combine that with a trip to one of the international trade shows such as Berlin Fruit Logistica or the Produce Marketing Association (PMA) conference in America, I think that we could all learn a lot more about what others are doing and try to apply it to our own industry where we can."

Robert reiterated that without the support of the Coles Nurture Fund, it may not have been possible for Red Gem to dream big and implement this x-ray technology into the business.

"The rising cost of doing business in Australia is an issue, and I don't think we're alone in terms of that – every year it is becoming costlier to produce. While we look for new varieties and we own our breeding program, that's still challenging. We're looking to get more for less inputs and that's easier said than done," Robert says.

"But we've certainly made a lot of progress there – the reality is that the reason that our business has been able to invest in an x-ray vision project is because of Coles' ability to commit to an exclusive supply of one of our varieties. That was a challenge in itself: there were lots of hurdles to jump over.

"I'm so thankful we've got such a good working relationship with Coles. It's the best relationship we've ever experienced, and I think the Nurture Fund is certainly very supporting of that."

## Focus on sustainability

The innovations at Red Gem are not only limited to the packing shed; soil health is seen as critical to maintain the ongoing sustainability of the business.

"We're putting back into the soils with our green manure program, trying to improve the soil health that is ultimately going to improve the quality of our potatoes and help with the groundwork," Robert says.

"We're certainly adding beneficial organic matter back into the soil and we're always on the look-out for other options. Ultimately if soil health improves, we should have less fertiliser inputs and less chemical requirements – it all should flow on."

Robert is also looking to continue managing Red Gem's varieties of potatoes that underpin the business and introduce new ones as needed, particularly in terms of increased pest and disease resistance. There is also a future vision of zero-waste on-farm.

"We're trying to find ways to add as much value to our fresh potato offerings as we can, and value-add some of our waste streams so we can make our growing operations more viable. It could be in the form of processing, or it could be in the form of dehydration," Robert says.

"But you can't rest on your laurels; you can't stop there. It's a never-ending story – you've just got to keep working at it."


# Research uncovers opportunities to improve potato seed quality and management

**The fresh and processing potato industries recently invested in a research project to identify the current status, and potential opportunities, to improve Australian potato seed quality and handling practices. Dimi Kyriakou reports on the findings of the project, which will pave the way for industry to adopt best practice for high-quality seed.**

The quality of potato seed plays an integral role in the yield of the resulting crop, and arguably the overall success of the potato industry. However, there are many and varying factors that contribute to this quality – from physiological age of the seed, to seed cutting, planting, storage, transport and much more.

Given the complexities involved in achieving the highest possible standard of potato seed quality, a research project was undertaken to investigate best practice in this area. The project also identified any gaps and opportunities for improvement, and recommended action to drive improved industry profitability, sustainability and reliability in the supply of quality potatoes.

*Extension activities for the Australian potato industry – Literature review and Survey* (PT16000), a strategic levy investment under the Hort Innovation Fresh Potato and Potato Processing Funds, was conducted by Peter Philp of Philp Hort and Peter O'Brien of AgAims. It involved a two-step process, being a literature review and grower survey.

"The objective of the project's first step was to research world literature on potato seed, its management and impact on potato crop yield and quality," Project Lead Peter Philp explained.

"After understanding and identifying key elements from the literature search, the second step was to understand the Australian potato industry's situation on these key productivity elements. This was done through an industry survey, which

engaged the Australian potato industry including seed, fresh and processing sectors. We also engaged the supply chain – the potato growers' customer – so as to focus the survey and analysis of results."

The respondents represented over 95 per cent of the potato volume produced in Australia. Face-to-face surveys were carried out in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia, while a simplified survey was also posted and emailed to some recipients.

"Thanks goes to all the respondents who participated in the project survey. All respondents were generous of their time, particularly at a busy time of their season, in welcoming Philp Hort and supporting Hort Innovation to drive our potato industry improvement in sustainability, best practice and achieving global excellence. Their response was open and without fear or favour," Peter said.

## Key findings and opportunities

The survey results were then analysed, and the project team identified the areas of opportunity for the Australian potato industry to improve its understanding of potato seed quality and management. Some key findings are outlined below.

**Physiological age of seed:** Most growers understood this principle, which is defined as the process of change of the potato bud from dormant status to active vegetative growth. Cool storage is used to manage the physiological age of seed and synchronise seed development with the timing of production.

"However, physiological seed age is impacted by cumulative stress," Peter said. "Stress influences the rate of change in dormancy, particularly the temperature and rate of respiration.

"There is currently no easy method of measuring dormancy of potatoes, but managing dormancy drives apical dominance (the formation of a dominant stem in the plant) of seed and stems per tuber.

"The seed potato has a genetic potential of dormancy, which is controlled by a complex of naturally-occurring growth regulators and reducing sugar levels. Abscisic acid (ABA) is the primary dormancy regulator, while auxins and cytokinin activity is critical in the seed apical dominance."

**Cutting seed:** Seed is cut to best manage seed piece sizes and achieve accuracy of planting in some varieties. However, the process of cutting seed influences a change in its dormancy. In addition, cutting the seed breaks the skin and elevates the rate of respiration and biological activity in the tuber.

"Growers have a well-developed understanding of management and mitigation of seed piece break down risk. Weather is also a key factor in seed break down risk," Peter said.

**Stem count:** This was found to be a critical management focus for the industry, given that stem development per tuber is essential in driving yield. A key opportunity includes driving accurate stem counts per area.

**Planting seed:** While seed generation is well-controlled to reduce the risk of virus, seed tuber count (tubers per 10kg) is a variable of concern. Growers plant seed based on the expected seed size specification, but the areas planted per tonne of seed can vary significantly if the seed sample, while in specification, is bolder (i.e. more seed of a larger size).

"Improving accuracy of the seed lot planting potential will also reduce the risk of the potato grower running short of seed or wastage due to seed excess," Peter explained.

"This needs to be balanced for the seed grower, as seed yield and the seed price drives the return for the seed grower. Increased seed count in the 40mm to 50mm seed size will reduce the tonnes stored and handled, but still allow the potato grower to plant the planned area. This will deliver industry efficiency though lower freight cost, cool storage cost, handling time and storage capacity.

"In addition, the potato crop is sown at a rate to ensure yield, but often the crop is desiccated before natural senescence so as to control tuber size. This gap can drive saving on seed cost."

**Cool storage:** The management of temperature, air quality and carbon dioxide is critical to control seed age. As cool storage efficiency and accuracy depends on the technology used, an opportunity exists for growers to upgrade older cool storage systems using new generation sensors, variable speed fans and integration with smartphones.

There is also an opportunity to increase the automation and data logging of cool room conditions to allow growers to better understand the ranking of seed physiological age.

**Communication and planning:** Peter noted the importance of maintaining strong and robust communication between the seed grower and the potato grower, and encouraged growers to visit the seed crop while it is in production, and seed growers to visit the growing crop.

"Communication and sharing of longer-term planning from the end customer to the seed grower will drive better industry efficiency and reduce waste. Signals on change will help the pipeline deliver the correct variety, seed volume and size specification," he said.

The survey results also highlighted a need for increased communication to industry on the impact of stress on seed; timing of seed desiccation; and the time to transport seed to cool storage.

"Extension with growers to enable their better understanding of seed age and the cumulative stress during seed production, grading and storage will improve grower ranking of physiological seed age. The use of new technology can help the grower mitigate risk in storage and drive productivity."

Other opportunities included:

- Stress profiling during crop growth, particularly during post-tuber initiation.
- The need for calcium and other key elements in the seed nutrition profile.

## Next steps

Peter stressed the importance of sharing the key learnings of this project to help drive industry efficiencies in seed quality and management.

"This project reinforced many of the good practices that the Australian potato industry uses. The literature review shows the science of the practice to enable growers to understand the 'why'," he said.

"Potato seed, as a cost of production, is significant. It is a critical element in achieving plant density and yield. By improving seed physiological age, the management of plant density becomes less variable.

"Overall, the Australian industry has a good understanding of seed management and good practice, but there are many opportunities to improve."

**Find out more** R&D

For more information please contact Peter Philp on 0419 654 245 or peterkphilp@hotmail.com.

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

Project Number: PT16000

Hort Innovation

# Case study:
# **Cherry Hill Coolstores, Tasmania**


Image courtesy of Cherry Hill Coolstores.

For more than 30 years, Cherry Hill Coolstores in Latrobe, north-west Tasmania, has provided seed coolstore facilities to the local potato industry. The business also offers services such as bulk unloading, cutting, curing, grading and distribution of seed.

Cherry Hill comprises 16 coolstores and three large dry store areas, giving the business the capacity to handle 15,000 tonnes of seed potatoes per annum. Seed is delivered to the coolstores, ideally within 24 hours of harvesting, where a fungicide is applied. They are then stored in the coolroom at approximately 12-14 degrees Celsius to allow any harvest damage to heal.

"We spend a week pumping oxygen into the room and getting the carbon dioxide levels settled so the seed becomes dormant. That process takes a week to 10 days and then we start taking the temperature out of them until they're around two degrees," Cherry Hill Coolstores Managing Director Andrew Langmaid says.

To help maintain the physiological age of the seed as required by the grower, the temperature and carbon dioxide levels in the coolstore are controlled through auto-measuring and purging, with the option to use ambient air to assist with humidity and energy requirements. The coolstores are all controlled through a central computer system.

"Once the seed is delivered to us, carbon dioxide levels in the coolstores are extremely critical, as well as stability in temperature. Any fluctuations can age the seed quickly and we've got to keep a good handle on that."

Seed can be cut by hand, mechanically or using a mixture of the two processes. Cherry Hill can cut seed 3-4 days prior to planting, and it has also developed systems to cut seed pre-storage, which Andrew says is how the majority of its customers prefer their seed to be handled. This approach can indicate how the seed has recovered from the cutting process, and allow for more even crop emergence. It may also increase the yield for some varieties (around 3-4 tonnes per acre) and offer less seed risk at planting.

From Andrew's perspective, mechanical damage is the primary cause of seed breakdown and a key area for the industry to improve best practice and increase quality.

Further developments are underway at Cherry Hill, including the introduction of a second bulk unloading line, potato sampling camera, track and trace bin location system and PotatoPal app.

# Case study:
# **John Doyle, New South Wales**

The variation in soil types across John Doyle's farm in Berrigan, New South Wales, offers an additional challenge when it comes to the irrigation of his seed and processing potato crops to achieve a high quality product.

The soil makeup consists of a clay base with a top layer of sand, and while the sandy hills of the farm require additional irrigation, this approach floods the low lying areas. In addition to wasting water, it can also risk the quality of the potato crop, particularly during rain events.

"It seemed obvious to try to manage the soil types better and irrigate them accordingly," John says.

When the time came to upgrade some of the pivots in his irrigation system, John purchased new Valley pivots which offered the option of variable rate irrigation. This involves placing a solenoid on each sprinkler outlet for customised and targeted water application.

"The first thing we learnt was that when we came into a hot spell or a heatwave, the areas that were getting the water because of the clay being close to the top of the soil actually suffered because they didn't have enough water in them," John says.

"This year we invested in soil monitoring equipment so we can monitor where we are actually putting the water into the root zone of the potatoes."

The variable rate irrigation system is programmed from a soil electromagnetic survey, which determines the depth to the clay.

"You can overlay those maps into your pivot and it will water accordingly. You can change the amount of water that goes out through the sprinklers, from 100 per cent to 60 per cent or 20 per cent."

At the time of writing, John was in the middle of harvest and was pleased with the performance of his potato crops despite enduring three heatwaves during January, where temperatures soared above 40 degrees Celsius and often struggled to fall below 30 degrees in the evening.

"It's taken a fair bit of water management to keep the potatoes cool in the ground. That's where the variable rate is good – I'm not going to make those shallow clay soils too wet," he says.

"Particularly in a year like this where we've got record evaporation, it's very effective water management and we're just trying to keep everything alive. It's been invaluable."


Valley pivot with solenoid valves on the top of each sprinkler outlet.

# Case study:
# **Terry Buckley, South Australia**

Terry Buckley's decision to invest in a new potato seed coolstore on his property in Mount Gambier is paying off, with a noticeable increase in seed quality.
The coolstore, courtesy of Tolsa in the Netherlands, has a 2,500 tonne capacity across four rooms, and provides all the information that Terry requires at the touch of a control panel. The technology monitors carbon dioxide levels within the store and can automatically adjust these levels when the limit is exceeded.

The coolstore also features five thermometers per room which can be speared 400mm into the boxes to monitor the temperature at various locations throughout the store.

"It shows if you've got the temperature distributed evenly throughout your store and when you need to spend more time circulating the air to even up the temperature," Terry says.

While rarely used in the temperate climate of south-eastern South Australia, the coolstore also monitors outside temperature and humidity levels in the event that outside air is cooler than the inside air and of a suitable humidity to be incorporated into the room.

The coolstore is also directly linked to Tolsa's office in the Netherlands, allowing for real-time monitoring and easy access to troubleshooting, should any issues arise.

While the coolstore has only been in operation for two seasons, Terry has seen a noticeable difference in his potato production. In addition to growing seed potato crops, JFL Buckley & Sons also produces processing potatoes for the local market and exports some potatoes to Asia, so starting production with good quality seed is essential.

"Certainly the potatoes are performing better – the seed looks better when it comes out of the coolstore. The crops are growing longer than they used to because they're starting with better quality seed."

Despite being a fifth-generation farmer with around 40 years of potato growing experience, Terry is first to admit that you never stop learning when it comes to potato production.

"I've learned a lot over the years and there are things that I didn't realise were as important as they are," Terry says.

"I heard the information about physiologically old seed but I'd never really taken it seriously enough. We always thought our crops had irrigation and fertiliser issues, but it's only after I changed the coolstore technology that I realised how wrong I actually had it. I suppose you've got to change to realise where you were." R&D

L-R: PPAA Executive Officer Anne Ramsay, Hort Innovation Relationship Manager Jane Wightman, AUSVEG CEO James Whiteside and Hort Innovation CEO Matt Brand prepare for their tour at Simplot's Devonport facility in Tasmania.

# Developing relationships between processors and the horticulture industry

In January, industry members including AUSVEG CEO James Whiteside received the opportunity to tour Simplot Australia's vegetable and potato processing facilities in north-west Tasmania. Potato Processing Association of Australia Executive Officer Anne Ramsay reports.

To kick off the 2019 potato processing year, Simplot and the Potato Processing Association of Australia (PPAA) were delighted to have Hort Innovation CEO Matt Brand, AUSVEG CEO James Whiteside and Hort Innovation Relationship Manager Jane Wightman tour its Tasmanian-based processing operations. The group was hosted by PPAA Chair and Simplot Ulverstone Agricultural Manager Les Murdoch.

The tour commenced at the Devonport processing facilities where Simplot is the sole processor of an Australian-grown frozen vegetable product. Production Manager Malcolm Nield outlined the history of the factory, which started its life producing the milk flavouring product Ovaltine and now – through complex scheduling – processes peas, carrots, beans, broccoli, cauliflower and sprouts, plus smaller volumes of onions and potatoes.

With the majority of growers located within an hour's radius of the facilities, the vegetables are processed and frozen within four hours of harvest. It's a complex business, as the factory needs to cycle between the crops based on seasonal availability, with each crop requiring a change of processing and handling equipment. All of this wouldn't be achievable without a skilled and diverse workforce that includes full-time engineers, electricians, mechanics and a wide range of other roles and responsibilities.

The pea crop was on the processing line during the tour, where approximately 5,000 tonnes per day were scheduled to be processed over the following weeks. The peas are frozen and stored for up to six months in bulk before packing and shipment domestically. The processing technology is remarkable, with optical sorters able to detect and remove slight defects or colour variation in order to meet customer quality expectations. Peas are then individually frozen, with the process resembling thousands of peas bouncing down a ski slope – although the technical term is 'individual quick freezing'.

## Potato focus

The group then travelled to Ulverstone, where the dedicated potato processing facilities are turning close to 1,000 tonnes per day of fresh potatoes into French fries and other value-added products. Based on the strength of growth in consumption, Simplot has committed to a $50 million upgrade in its processing facilities over the next several years to strengthen its processing capability. Potatoes are stored on-site and in several stores around the state to allow year-round production.

The Ulverstone site has a commitment to strong workplace collaboration, engaging with the local workforce and "bringing out Tassie's best". A testament to this was the factory tour guide, Greg Wing, who has worked at the factory for 42 years and was quick to highlight initiatives that were delivering increased efficiency in order to achieve the company's annual productivity growth targets.

The tour wrapped up at Simplot's dedicated Agricultural Services offices. The team outlined its approach to working with growers to meet required volumes and quality while striving for efficiency and sustainable practices. A move to secure more storage has allowed harvest to take place during optimal soil conditions rather than be dictated by storage availability. Finally, a dedicated research and development team is working on some 50 projects, with a view to delivering ongoing productivity targets.

On behalf of the PPAA, I'd like to thank the Simplot team for putting together a comprehensive tour and being so generous with their time. A take-home message from the day was the value that comes from building relationships and the mutual benefits that flow from this. The PPAA looks to further develop ongoing relationships with Hort Innovation and AUSVEG.

**Find out more** R&D

For more information or to provide your feedback, please contact Anne Ramsay on 0400 368 448 or at ppaa.eo@gmail.com.

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# Wayne Tymensen: A trailblazer in potato pest management

Over two decades ago, Victorian potato grower Wayne Tymensen adopted an Integrated Pest Management (IPM) approach on his farm – and he was one of the first potato growers in Australia to do so. Despite early reservations, Wayne is now reaping the rewards of an integrated approach to pest management.

Wayne Tymensen is a second-generation potato grower based in Gippsland, Victoria. He has grown up around potato production, as his father worked on a potato growing operation before starting his own farm.

While Wayne used to grow about 120 hectares of potatoes each year for the crisping potato industry, this area has reduced to about 23 hectares and he is now involved in a seed-growing operation in the Otway Ranges. He has also diversified, and grows other crops such as maize, wheat and triticale. In addition, Wayne has been on the committee of seed certification authority AuSPICA (formerly ViCSPA) for well over 10 years.

Wayne is unusual in that he was one of the very first growers in Australia to change from an insecticide-based strategy to control insect pests to an Integrated Pest Management (IPM) strategy, which occurred in 1995. Not only was he one of the first in Australia, but he could also be considered a leader in using IPM worldwide. At present, pesticides are still the basis of pest control in countries such as the United States, the United Kingdom and the Netherlands.

## Journey towards IPM

Wayne first encountered the possibility of using IPM as a different approach to pest management over 24 years ago and thought that it was worth a trial. His next-door neighbour agreed. Wayne began by trialling an integrated approach on two paddocks (each about four hectares) and within two years, he was using IPM on the entire farm.

Wayne has now bought out his neighbour so the farms have effectively become one, and since 1997, IPM has been the basis of pest control. There has not been any thought of moving back to a pesticide-based approach, even though there have been many new products brought to the market over this period. Instead, Wayne has sought information on what pesticides could be used within his IPM strategy if required and as a result, he has not used chemical insecticides for over 10 years (although a couple of times he has applied a bacterial product, Dipel, for loopers).

Prior to 1995, Wayne and his father dealt with pests using a regular pesticide-based program with an insecticide applied approximately every two weeks – however there were more applications within that period if considered necessary. The idea of using a different approach based on minimal, (possibly no) insecticide applications was of interest because Wayne wanted a more sustainable method of dealing with pests, but there was caution in case it did not work. The growers decided to give it a try on two paddocks but certainly not the entire farm. The results were good, so they cautiously tried it on more paddocks the following year. With more positive results in the second year, they were encouraged to then adopt the new strategy based on minimal pesticide use on the entire farm.

Adopting a new approach required on-farm trials and spanned several years. Plus, it was not only Wayne that had to learn – his IPM advisor Dr Paul Horne also had to learn how to apply his entomology experience into a regular commercial advisory service for potatoes. It became a collaboration between grower and entomologist that allowed IPM adoption to occur, and after 20 years, this partnership is still going strong.

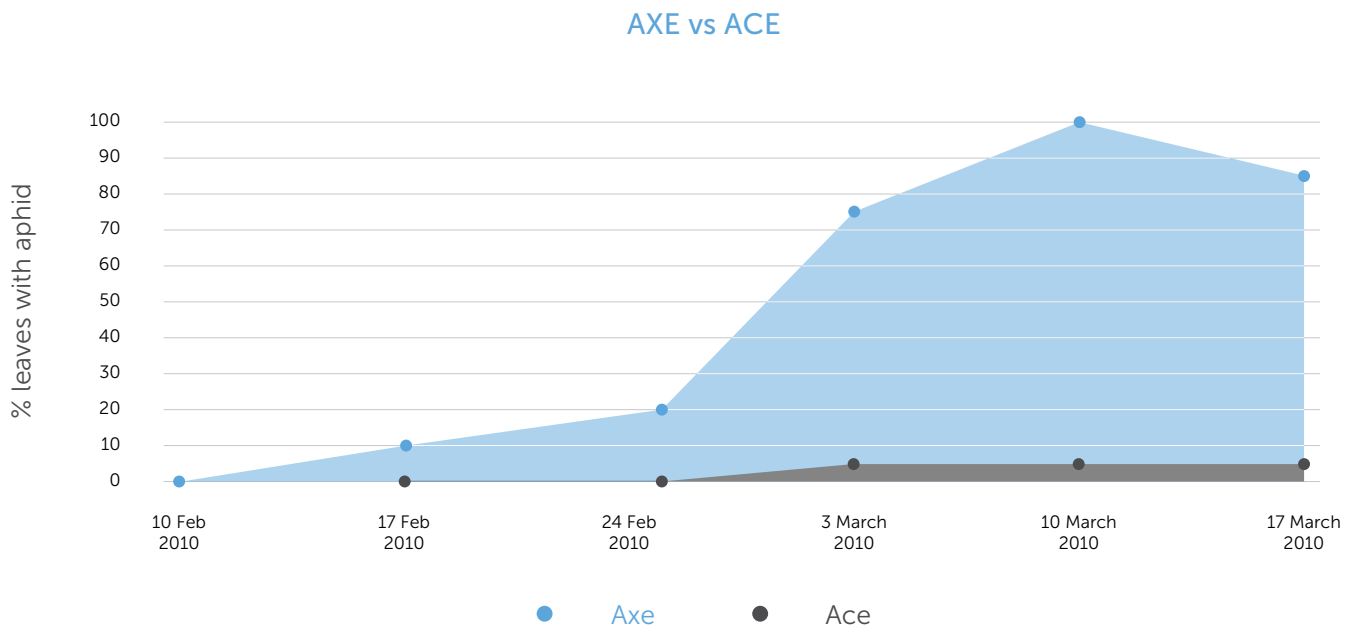
At present, no insecticides are applied to Wayne's potato crops unless there is a reason for doing so. If they are required, the most highly specific pesticide available is chosen. In most years, no insecticide is recommended or applied on any paddock and that is a big change that Wayne has seen on his own farm. This has not only given Wayne a reduced pesticide bill, but it also resulted in better control of pests. This second result is counter-intuitive, as previously Wayne would have thought that applying insecticides would always reduce pest numbers and applying less insecticides would increase pest numbers. He has seen the opposite occur, and now would like to encourage his neighbours to stop spraying routine insecticides as that would reduce the pest pressure on his crops. Control of pests, especially potato moth, has been greatly improved since using IPM. Improved irrigation methods have also helped with the cultural control of potato moth.

## Protecting the good bugs

Disruption of beneficials by pesticides has demonstrated to Wayne just how important the role of beneficial species is in his crops and how careful he needs to be in selecting pesticides.

In early 2010, Wayne called for a plane to apply a fungicide ('Ace'). However, a mistake was made, and half of the crop was sprayed with an insecticide ('Axe'). Weekly monitoring of aphids showed the difference in aphid counts in the two sections of the paddock. Aphid numbers rose in the section sprayed with 'Axe' because it killed the predators and parasitoids that would have eaten them, which is what occurred in the other half of the crop where there had been no disruption (see graph).

Victorian potato grower Wayne Tymensen has adopted an Integrated Pest Management approach on his farm.




Seeing this result emphasised to Wayne just how powerful biological control agents are in his crops. In the early days, not applying an insecticide was difficult when pests were around.

"The only disadvantage is you can feel helpless and a little on edge when the insect pressure is at its greatest," Wayne says.

"For example, when you have some very hot weather the potato moth numbers get very high with a crop of potatoes destined for storage. If you apply an insecticide, it feels like you have done something, but you could have actually made things worse."

According to Dr Horne, the IPM Technologies team often recommend a spray of "Axe" when the crop is dying down or is sprayed off after the beneficial species have done their job, but not during the life of the crop.

If he is concerned about insects or insect-vectored diseases, Wayne calls Dr Horne to discuss the potential problems and the options available for control. Given the length of time that Wayne has been using IPM, he is well aware of the advantages but remembers how he felt in the first few years.

"I think if someone is unsure about IPM but would like to give it a go, try a paddock and I would be very surprised if you didn't change over to a full integrated approach," Wayne says.

"In the last 20 years I have used fewer insecticide applications on all paddocks than I might have used in a single season per crop before IPM."

**Find out more** R&D

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

# Final farewell, and an invaluable biosecurity message

Dr Kevin Clayton-Greene has been AUSVEG's Biosecurity Adviser for the past seven years, with regular columns in *Potatoes Australia* and its sister magazine *Vegetables Australia*. In this edition, he bids farewell to readers with a reflection of how the biosecurity sector has developed since 2011, and shares a word of advice on how industry can overcome the challenges Australia will continue to face in the future.

This will be my final 'Biosecurity brief' to appear in *Potatoes Australia*, providing an opportunity to reflect upon the changes that have occurred in biosecurity over the past seven years and the challenges facing us in the future.

We have dealt with an average of 20 biosecurity incidents per year, many of which went to the Consultative Committee on Emergency Plant Pests (CCEPP). Some resulted in successful eradications while others such as tomato-potato psyllid (TPP) did not succeed; however, its spread within Australia has so far been contained. The savings to industry of these interventions is into the millions.

Through its active participation in all areas of biosecurity, AUSVEG is now treated as a respected partner in the biosecurity landscape. Communication with state and federal governments is two-way and while we do not always agree, our opinions are considered. This is a far cry from where we were at the beginning.

We have seen some significant improvements in jurisdictional harmonisation, although there is still some way to go in this area. AUSVEG has also played a leading role with some other industries, notably nursery and garden, in using common sense when it comes to regulation and interstate movements as they apply to pests of quarantine concern. These have often benefited not only our levy payers, but across horticultural trade in general.

## An ongoing battle

The challenge facing us in biosecurity cannot be overstated. The biggest is declining capacity in government. Despite the rhetoric, the fact is that all governments have cut back in this area – some more than others. In some cases, this has put the entire country at risk from incursions and unfortunately, in a highly urbanised country such as Australia, there are very few votes in biosecurity.

Just considering overseas passengers and the level to which they are increasing gives us a glimpse of what we face. Over the past 10 years, international passenger arrivals have doubled. Based on the most recent statistics, there is the equivalent of 282 aircraft arriving from overseas into Australia every day, bringing in an average of just under 56,000 people per day. Last year, there was also 568,000 tonnes of incoming air freight. Add to this the number of container movements, and the extent of the problem becomes apparent.

At a recent national biosecurity summit, the Federal Government noted that, according to its modelling, even a tripling of investment in biosecurity funding would be insufficient to cover the increased risk posed by the rise in international trade and passengers over the next 10 years.

## So what can we do?

As mentioned in many previous briefs, biosecurity rests with all of us through good personal or business biosecurity practices and early reporting. We have seen this pay dividends with incidents involving Khapra beetle and most recently brown marmorated stink bug (BMSB), where vigilance on the part of some people has resulted in successful eradications. Either of these pests (should they establish in Australia) will cost the country billions of dollars; Khapra beetle through its effect upon the grain and some horticultural industries, and BMSB through its environmental and pest impact on a large number of industries.

Nobody wants to be the first reporter but it cannot be emphasised enough the importance of early detections.

Lastly, it's been an honour to represent levy payers in biosecurity over the past seven years and I thank everyone for their support. AUSVEG has good capacity in biosecurity and will continue to play a leading role in advocating for levy payers.

**Find out more** R&D

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

# Supervisors and leading hands play key roles in fair farms

The Fair Farms Training and Certification program will be launched in mid-2019. At the core of the program will be the Fair Farms Standard, which sets out the criteria against which farm businesses will be audited and certified. A draft of the Standard is currently being tested during the pilot phase of the Fair Farms program. In this column, the Fair Farms team outlines some of the key issues to consider for supervisors and leading hands.

Many growers have a strong commitment to being good employers and operating a fair farm business.

During busy times in the season, when there are large numbers of workers on-site, a heavy responsibility falls on supervisors and leading hands in the field and packing shed. Selecting the right people to take on these roles, and providing them with adequate support and training, helps ensure your commitment is carried through to every employee.

The Fair Farms Standard requires that employees with staff management and supervisory roles have clear position descriptions that outline their roles, responsibilities, levels of authority and legal obligations.

When selecting supervisors, growers should look for people who share their commitment to fair and ethical conduct, and provide a workplace free from mistreatment, bullying or harassment.

## Supervisor obligations

Supervisors must have good communication skills and the right personal qualities to encourage optimal performance from workers. They require the necessary skills to appropriately manage poor performance or unacceptable conduct from workers, without resorting to abuse or harsh treatment.

Staff with supervisory roles should respond promptly to concerns raised by workers and know how to apply the dispute resolution process, if needed. Ensure supervisors understand their responsibilities – and also the limits to their authority.

On a practical level, supervisors should contribute to monitoring workplace safety issues and actively manage rest breaks and hydration to avoid fatigue and heat stress among workers.

Supervisors must know who are the qualified first-aiders on each shift and where to access first-aid kits. They should also be familiar with the farm's emergency procedures and be ready to guide workers appropriately in an emergency situation.

A good supervisor is willing to be accountable and acknowledge their own mistakes. They should also inspire and demand accountability from others.

Making an investment in the people who play leadership and supervisory roles around the farm pays off through a positive and productive workplace.

To register your interest in the Fair Farms Training and Certification Program, please visit growcom.com.au/fairfarmsinitiative/#!form/FairFarms.

**Find out more** R&D

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

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

Dr Corné Kempenaar measures nitrogen uptake in a potato canopy. Image courtesy of Dr Frits van Evert, Wageningen University and Research.

# Fine-tuning nitrogen applications in potato crops

Studies at Wageningen University and Research in the Netherlands has shown that measuring nitrogen uptake in potato crops using canopy reflection could help growers adjust the amount of fertiliser used. Heather Briggs reports.

Nitrogen levels in soil vary widely from year to year and are dependent on a number of factors such as temperature, which affects mineralisation of organic matter in the soil, and rain, which can wash the nitrogen down through the soil profile.

This is according to precision agriculture specialist Dr Frits van Evert from the Department of Agrosystems Research at Wageningen University and Research (WUR) in the Netherlands, who led the research into nitrogen application.

As a result, potato growers do not know exactly how much of the fertiliser they will need to apply at the beginning of the season. Dr van Evert explained that getting variable rate applications of fertiliser is crucial to growers on tight margins, as it can result in homogeneously ripening the crop and therefore causing less tuber damage during harvesting.

"Fine-tuning nitrogen applications can be done by measuring the potato canopy using reflectance, which provides information which can be used to adjust the nitrogen rate if it is found to be needed," Dr van Evert explained.

This can be done using satellites, drones or tractor sensors to measure the chlorophyll or weighted difference vegetation index (WDVI) in the canopy.

## Trials underway

To help spread the message, Dr van Evert is participating in a research programme entitled *Toward precision agriculture 2.0*, directed by WUR Senior Research Scientist Dr Corné Kempenaar who works closely with a group of potato growers to carry out test runs with sensor observations by drones.

"Dutch potato growers apply an average of some 250 kilograms of nitrogen per hectare per year," Dr van Evert said.

"It is applied in one session, just before or just after planting. Because weather conditions in the Netherlands vary significantly, more nitrogen may be lost in one year compared to another.

"In other words, the 250 kilos can be way too much, or much too little; it is rarely exactly the right amount."

Dr van Evert recommends applying two-thirds of the recommended amount of nitrogen at the start of cultivation, and then waiting until halfway through the season to decide how much – if any – of the remaining third needs to be applied.

"The level at which a plant reflects infrared, red and green light depends on the amount of nitrogen it contains. A plant with too little nitrogen has minor colour variations compared to a plant with sufficient nitrogen, and modern sensors can measure those differences," he said.

"The drone images show exactly where growers should apply more or less nitrogen on their fields, allowing farmers to use the product more efficiently."

Behind this recommendation is more than four years' worth of experiments with ware potatoes in sandy soil, which showed Dr van Evert and his team that the reflectance index WDVI correlates well with nitrogen uptake.

Experiments were also conducted with the sidedress application of fertiliser, which occurs between the rows of growing crops.

"The sidedress nitrogen rate should be calculated as the difference between a (fixed) desired nitrogen uptake and a reflectance-based measurement of nitrogen uptake," Dr van Evert said.

"We have also confirmed that the sidedress fertiliser should be applied at around the time of canopy closing."

The calculated nitrogen saving in these experiments was between 10-109 kilograms of nitrogen per hectare (at an average of 56 kilograms).

Over two years, the reflectance-based nitrogen sidedress system was tested at an additional two locations with ware potatoes in loamy soil and with starch potatoes in sandy soil. Nitrogen saving in these experiments was between 8-88 kilograms of nitrogen per hectare in both experiments, at an average of 44 kilograms.

"We found that yields with the sidedress system were generally at the same level as yields obtained with the recommended nitrogen rates for the Netherlands," Dr van Evert said.

### Potential benefits

Dr van Evert said that the experiments were set to work with the specific climate conditions in the Netherlands, so different climates would see some variance. Nonetheless, proof that the system works should encourage other growers to adopt such methods to work with greater precision.

"There are some important benefits to using reflectance measurements; they are cheap, require little effort, and the result is instantaneously available," he said.

"The challenge is that while many farmers in the Netherlands are willing to adopt a sidedress system, few are willing and able to collect petioles (a stalk that attaches a leaf to the plant stem) or soil samples on each of their several fields due to the labour costs which it would incur."

However, there is a possibility that the costs of such techniques could be spread across different uses such as herbicides and liming. Reflectance measurements could easily and routinely be collected during application of biocides to control late blight *(Phytophthora infestans)* and other diseases.

"There are many growers who apply the same rate of nitrogen every year, which can cost them money when lower rates are needed. It can also lead to leaching," Dr van Evert said.

"On the other hand, if insufficient levels are applied it can affect both yield and quality."

**Find out more** R&D

For more information, please contact Dr Frits van Evert at frits.vanevert@wur.nl or visit wur.nl/en/Persons/Frits-dr.ir.-FK-Frits-van-Evert.htm.

# Mapping Tasmanian potato producers

Potatoes have been an important part of Tasmanian farming since they were first planted in 1803. Today the gross value of potatoes to Tasmania is $106 million *(Tas. Agri-Food ScoreCard 2015-2016)*.

Protecting the potato industry from pests and diseases is vital to the continued production of potatoes in the state and is the aim of the Tasmanian Farmers and Graziers Association's (TFGA) latest project.

The TFGA, working closely with Biosecurity Tasmania, is embarking on a biosecurity project funded by the Tasmanian Government. The four-year Farm Biosecurity Engagement Project aims to raise awareness of farm biosecurity in Tasmania across all farming sectors, including potatoes.

A vital component of the project is mapping. Selected commodities throughout Tasmania will be mapped to create an understanding of where farms, and commodities, are located throughout the state and allow better communication with farmers when needed.

"Knowing where food is being produced in Tasmania is one of the first steps in reducing the impact of a pest or disease incursion and in the management of an outbreak," TFGA Farm Biosecurity Officer Mandy Bowling said.

"Knowing exactly where farms are and being able to communicate with farmers quickly when there is a possible threat allows for a rapid response and guarantees all farmers have a say in the management of a potential pest or disease that could impact their farm."

The first commodity on the list to be mapped is potatoes.

"Potatoes were selected because of the current threat of diseases on Australia's mainland, including tomato-potato psyllid, to the Tasmanian potato industry. The economic value of potatoes to Tasmania and the potential for large losses due to diseases and pests were also considered," Ms Bowling said.

A variety of stakeholders will play a key part in the creation of a map and database of potato farms, including farmers, farmer groups, processors, consultants, agents, other on-farm visitors and the general public. Once the map is complete, the information can be used when needed to inform producers of any pest or disease threats.

"This map will be very important in helping to protect the Tasmanian potato industry and ensuring all farmers are accounted for and represented. It will also give an overall understanding of potato production currently in Tasmania," Ms Bowling said.

**Find out more** R&D

For more information or to take part in the project, please visit tfga.com.au or contact Mandy Bowling on 03 6332 1800 or 0418 354 785 or mandy.bowling@adelaide.edu.au.


TFGA Biosecurity Project Officer Mandy Bowling.

# TPP surveillance during the 2018-19 potato growing season

**While it has been two years since tomato-potato psyllid was detected in Western Australia, surveillance for this destructive pest continues around the country. AUSVEG National TPP Coordinator Alan Nankivell reports on the activities undertaken in each state over the past six months and future surveillance plans.**

Tomato-potato psyllid (TPP) was detected in Western Australia in February 2017. The national response resulted in a Transition to Management period where the scope of TPP infestation was investigated. Market access for potato tubers from WA to the rest of Australia ceased. To assist decision makers to remove the trade barriers placed on WA, evidence had to be gathered during the WA 2017-18 growing season and trapped TPP were tested for *Candidatus* Liberibacter solanacearum (CLso), the bacterium that is vectored by the psyllid and can cause zebra chip in potato.

All jurisdictions undertook TPP surveillance during the same time. The outcome was that no CLso was found in WA. Further data showed that the psyllid was not present in the rest of Australia, and by the end of 2018, all jurisdictions had approved market access for potato tubers from WA.

However, the need for ongoing national surveillance is now even more important because of the ongoing presence of TPP as the vector for CLso. As a result, jurisdictions have considered their TPP plans which they have implemented during 2018-19.

## Western Australia

TPP surveillance commenced over a four-week period in October 2018. Traps were set in locations where the psyllid was identified as having high population levels during the previous surveillance round. A further monitoring period is scheduled for February/March 2019. A total of 1,960 TPP will be tested for CLso. Approximately 70 per cent of TPP was collected during October 2018, and no CLso was found. Results will be reported to the Plant Health Committee.

## South Australia

During the 2018 growing season, over 100 properties were sampled with no TPP found.

The same surveillance plan will be repeated in 2019. A collaborative approach will be taken with government working with commercial properties from across susceptible commodities. This will provide a wide geographical sample of South Australia's growing areas using yellow sticky traps. Results will be available in autumn 2019.

## New South Wales

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

With industry highly engaged and educated on this pest, TPP surveillance in NSW is focusing on community gardens and nurseries primarily in the Sydney Basin, with supporting surveillance on the north and south coast planned for early 2019. To date, 12 community/school garden sites in Sydney have had sticky trap surveillance completed, with no TPP or other exotic psyllid species detected.

## Victoria

Victoria has commenced 2018-19 surveillance for TPP. Surveillance is being conducted across various host industries including tomato and potato crops, and across geographic locations that will include community gardens and backyards.

Victoria will once again be working with industry to co-deliver surveillance throughout key production areas. Surveillance will occur on 90 properties, building on the 300 properties that were surveyed last season.

## Tasmania

Tasmania has conducted surveillance in urban areas across the state that are likely pathways for TPP. This builds on last year's survey where the potato industry, along with nurseries and community gardens, was a focus. The survey will include a variety of hosts in backyards and also include some community gardens.

Kits, which include four yellow sticky traps, are being sent out to volunteers. Two traps were deployed in December/January and two traps in February/March. To date, about 50 properties have been nominated with new volunteer properties still requesting traps. The traps will be mapped and an assessment made on any pathway gaps where further surveillance may be needed. Industry surveys will be undertaken in the new year.

## Queensland

Queensland is continuing a specific surveillance program for TPP during 2018-19. The surveillance will include the use of yellow sticky traps in production areas on commercial properties growing TPP hosts, as well as in nurseries and urban areas within the state.

The number of properties to be surveyed in each production area will be dependent on the presence of host plants as well as the size of the area and number of growers in production.

The minimum number of properties to be surveyed in each production area is provided in the table adjacent.

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

## Australian Capital Territory

The Australian Capital Territory undertook limited psyllid surveillance around garden centres in 2017-18, on the request of the New South Wales Department of Primary Industries. ACT has no plans to do further surveillance unless requested by NSW.

## Northern Territory

The Top End has commenced 2018-19 surveillance for TPP. Surveillance is being conducted across various host industries including tomato, capsicum, chillies, eggplant, potato and lucerne as part of general surveillance activities. This work will cover a range of geographic locations, including commercial properties, community gardens, backyards and nurseries.

It is planned that surveillance will occur on 137 properties and build on the targeted trapping work that was conducted last year across 61 properties as part of the Northern Territory's area freedom processes.

| Area | # of Properties |
|---|---|
| Brisbane | 3 |
| Lockyer Valley | 15 |
| Bundaberg | 15 |
| Bowen/Burdekin | 15 |
| Atherton Tablelands | 10 |

**Find out more** R&D

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

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

Project Number: MT16018

Hort Innovation


L-R: Sebastian and Frankie Galati pictured outside Spudshed's Midland Store in Western Australia. Image courtesy of David Baylis, Community News.

# Frankie Galati

**Age:** 29

**Location:** Manjimup, Myalup, Parkfield (in the south-west – over 500 hectares)

**Works:** Galati Group

**How did you first become involved in the potato industry?**

I was born into the industry. The Galati Group of Companies was birthed out of a family business that started two generations before me. There is a long history of fighting for the rights of potato farmers to be able to grow sufficient produce to service the expanding market.

**Your family opened the first Spudshed in Western Australia over 20 years ago. What does Spudshed provide to consumers over in the west in terms of fresh produce?**

We provide good fruit and vegetables at an affordable price and value for our customers, and also continue to supply sustainable and profitable produce for the future.

**What does your role as the CEO involve, and what are your responsibilities?**

I have a lot of responsibilities. I work across the business operationally, financially and culturally. I like to take a 'hands-on' approach and get involved in all aspects of the business.

**What do you enjoy most about working in the potato industry, and how do you maintain your enthusiasm?**

Eating potatoes! And I am grateful for all the opportunities that the industry provides for our company and the community.

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

Finding good water availability, and also land that is suitable and feasible to grow on.

The increasing costs of production keeps us focused on innovation as well as being environmentally conscious.

**Where do you receive your practical advice and information from?**

A whole range of resources, economists, growers and my own research. I also rely heavily on agronomists, and other agricultural specialists who keep us on the cutting edge of crop protection and efficiency of resource uptake.

**You pursued a modelling career which led you to places around the world, including Sydney, Paris, Milan and New York. Why did you decide to return to the family business?**

Because I wanted to study business and chose to work with my family.

**You also completed a commerce degree at Notre Dame University in Western Australia. How has this assisted you in your current role within the Spudshed business?**

This degree has given me the foundation I require to oversee the financial aspects of the business as well as the ability to manage it more effectively. It has given me the professional tools to secure the future of the family business.

The Galati boys.

**Where do you see opportunities for growth in the Australian potato industry?**

I see opportunities for export and pushing the local market to pursue those avenues. I would also like to see the health benefits of potatoes being publicised.

**Where do you see both yourself and Spudshed in five years' time?**

I see Spudshed continuing to be a sustainable business and continuing to be strong retail player. We would like to continue to provide consumers with fruit and vegetables that are of a high standard. Being sustainable and environmentally-conscious is at the core and heart of the business both now and into the future.

**What is your vision for both the Western Australian and the national potato industry in the future?**

A continual growth and availability of potatoes with a growth in the export market, as well as variety.

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

I think my father, Tony Galati, put the Western Australian potato industry on the map and if there were more people like him, it would help bring more focus to this industry.


The Spudshed store in Baldivis, Western Australia.

Serpentine leafminers (*Liriomyza huidobrensis*) could pose a serious threat to the potato industry if they were to establish in Australia.

# Serpentine leafminer: A threat to the potato industry

Serpentine leafminers *(Liriomyza huidobrensis)* are small flies belonging to the family Agromyzidae. They seriously affect solanaceous crops (such as potato, tomato and eggplant), as well as crops in the Asteraceae, Cucurbitaceae and Fabaceae families. Currently, Australia remains free of this species of leafminer, which is now well established in nearby countries, including Indonesia. If the pest establishes itself in Australia, it could threaten the local potato industry. AUSVEG Biosecurity Officer Madeleine Quirk reports.

The *Research, Development and Extension program for control, eradication and preparedness for vegetable leafminer* (MT16004) was developed in recognition of the extensive impact that vegetable leafminer (VLM; *Liriomyza sativae*) could have on the vegetable and nursery industries if it were to move into production areas with no management plan in place. Project partners include Cesar, Plant Health Australia, Northern Australia Quarantine Strategy (NAQS), the University of Melbourne and AUSVEG.

Project partners have since identified *Liriomyza huidobrensis*, commonly known as serpentine leafminer, as a pest that requires immediate further research and development of preparedness in case it establishes in Australia.

The following article addresses the leafminer's distribution, effect on potatoes, ability to resist chemicals, and establishment potential in Australia.

MT16004 is a strategic levy investment under the Hort Innovation Nursery and Vegetable Funds.

## Leafminer identification

Adult serpentine leafminers range from 1.3-2.3mm in length, and females are slightly larger than males. Distinctive features include dark bristles on the head, brownish-yellow antennae with dark end segments, and dark side walls of each body segment.

Serpentine leafminer eggs are slightly translucent and off-white and are barely visible to the naked eye. Colourless larvae hatch from the eggs and turn pale yellow-orange. During later instars, the larvae turn solid yellow-orange. Larvae develop inside the leaf tissue and vary in size but they can reach up to 3.2mm in length. The larvae form irregular serpentine mines which tend to be restricted by veins and are generally found towards the base of the leaf. The third (final) instar larvae exit the leaf and pupate externally to the leaf, usually in the soil below the plant.

## Worldwide distribution

The serpentine leafminer originated in the highlands of South America and is better adapted to cooler climates than VLM. It is now established in Africa, Asia, Central America, Europe and North America (in glasshouses in Canada, but not in the United States). Australia remains free from the serpentine leafminer, which is now well established in Indonesia (since 1995) and has been recorded in West Timor.

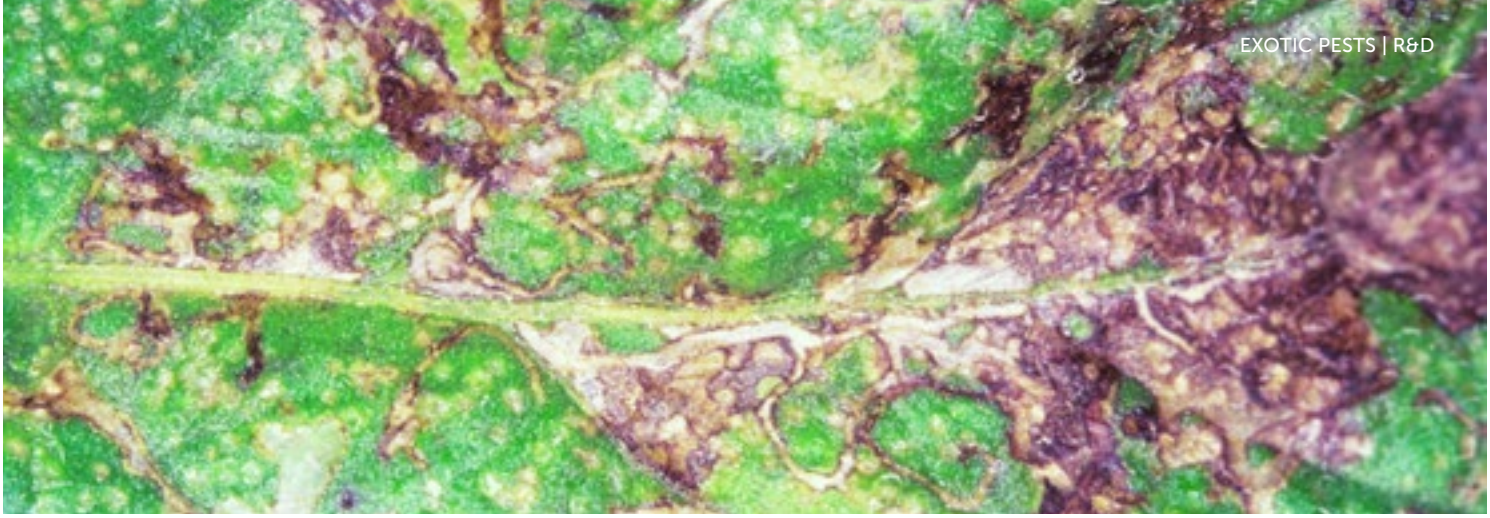
In California, *Liriomyza langei* was first described in 1951 and subsequently synonymised with *L. huidobrensis*. However, it was subsequently reinstated as a separate species in 2001. This polyphagous species can only be distinguished morphologically from *L. huidobrensis* with great difficulty, so molecular testing is required to differentiate the two species accurately.

## Effect on potato industries worldwide

Worldwide, the serpentine leafminer is a serious pest of arable crops, vegetables and ornamental crops grown in glasshouses or in the field. Larvae tunnel inside the leaf tissue and create visible 'mines' on the leaf surface. Leaf mining reduces photosynthetic activity and can result in premature leaf drop. Plant damage is also caused by female flies using their ovipositor (a tubular organ which can rasp through the leaf surface to allow eggs to be laid inside the leaf tissue) to make feeding punctures as well as depositing eggs.

Serpentine leafminer damage reduces crop marketability and yield, resulting in economic losses to growers. In potatoes, feeding punctures are visible all over the plant as it grows. Initial infestation begins in the lower third of the plant, which eventually leads to necrosis in the above-ground plant tissue and subsequent defoliation. Larval damage is worse in a fully grown plant than a developing plant.

When the pest first became established in Indonesia, yield losses up to 70 per cent were recorded as farmers struggled to control the pest with conventional insecticides. A research paper compiled by Plant Health Australia (2009) highlighted Indonesia as a high-risk entry pathway for serpentine leafminer to Australia.



*Liriomyza huidobrensis* damage to a potato leaf. Image courtesy of Merle Shepard, Gerald R.Carner and P.A.C Ooi, Insects and their Natural Enemies Associated with Vegetables and Soybean in Southeast Asia, Bugwood.org.

Potato growers in South America, particularly in Peru, Bolivia, Brazil, Chile and Argentina, have experienced substantial potato yield loss due to serpentine leafminer. In Peru, yield losses varied between potato varieties and greater yield losses were seen in earlier maturing potatoes (up to 60 per cent) than later maturing potatoes (up to 30 per cent). In Argentina, potatoes were severely damaged during tuber bulking but the severity of damage varied between provinces.

## Chemical and biological control

Translaminar insecticides such as abamectin, cyromazine, neem, and spinosad, which penetrate the leaves and subsequently contact the larvae, are effective for control of the serpentine leafminer.

However, serpentine leafminers can rapidly develop resistance to a number of chemical groups, particularly synthetic pyrethroids and organophosphates, which can make control extremely difficult. Applications of broad-spectrum insecticides often result in larger leafminer populations as the pesticide reduces natural enemies such as parasitic wasps and spiders. This was experienced in Costa Rica, where farmers over-applied chemicals in an attempt to contain leafminer populations on snow peas, and in Indonesia, where the majority of potato farmers sprayed insecticides twice weekly but were dissatisfied with the results.

Worldwide, many species of parasitoid wasps have been recorded attacking the serpentine leafminer. MT16004 project partners are currently finding a number of endemic Australian parasitoids attacking non-pest species of leafminers, which should be effective biological control agents for VLM. It is highly likely that the same suite of parasitoids in Australia will assist in the control of the serpentine leafminer.

## Risk of spread and establishment in Australia

Serpentine leafminer is most likely to enter Australia through importation of infested ornamental host plants, cut flowers, leafy vegetables and seedlings. Invasion could also occur via wind, assistance from humans or illegally on plant material. Unhatched eggs pose the most risk as they are difficult to detect in visual inspections.

Dispersal and establishment of leafminer species has occurred rapidly across the globe and the serpentine leafminer has become a destructive pest of potatoes in some, but not all potato growing areas where it is found. In China, the serpentine leafminer moved through 27 provinces over a six-year period, covering more than 394,000km². If the serpentine leafminer were to become established in Australia without control mechanisms in place, it would have a significant effect on horticultural production.

VLM was detected on multiple islands across the Torres Strait between 2008 and 2015. VLM was then detected on the most northerly point of the Australian mainland, Cape York Peninsula, in 2015.

Scientific literature suggests that this same pathway is a high-risk entry pathway for the serpentine leafminer, reaffirming the need to increase industry efforts to be aware of and to prepare for this pest.

**Find out more** R&D

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

For further information, please contact AUSVEG's Extension and Engagement Team on 03 9882 0277 or email science@ausveg.com.au.

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

Project Number: MT16004

Hort Innovation

## Further reading

*The invasive Liriomyza huidobrensis (Diptera: Agromyzidae): understanding its pest status and management globally* – Weintraub PG et al. 2017. Journal of Insect Science 17 (1), 28 https://academic.oup.com/jinsectscience/article/17/1/28/3051723

*Threat Specific Contingency Plan – Serpentine leafminer Liriomyza huidobrensis* – Plant Health Australia (2009) http://www.planthealthaustralia.com.au/wp-content/uploads/2013/03/Serpentine-leaf-miner-CP-2009.pdf

# How to resist herbicide resistance

Potato crops are susceptible to a range of weeds that can impact crop yield and quality, and as a result require an integrated and planned approach to management. Syngenta Solutions Development – Technical Lead Scott Mathew outlines the steps potato growers should take when implementing their weed management program, which involves a combination of crop protection products and cultural practices.

There are many benefits of effective weed control, including better use of available water and nutrients by the crop, resulting in increased yields and profits. In potatoes, the most critical weed control window is around four to six weeks after planting. Because there are so few herbicide modes of action for use during this stage, the pressure is on to retain the options we currently have.

Limiting the risk of these herbicides developing resistance should be at the top of every potato grower's weed control strategy.

Over-reliance on any single herbicide group will not only select for resistance, but may also change the weed spectrum, thereby allowing a more difficult weed or weed species not controlled by that particular herbicide group to become dominant. Weed control strategies should take an integrated and planned approach and not rely solely on the use of chemicals, or any particular chemical group to control weeds.

## Integrated weed management programs should include:

- Running the weed seed bank down to low levels prior to cropping. Stopping weeds from setting seed is the key here during the fallow period leading into cropping. This can be done effectively with whatever means growers have available including: broad-spectrum knockdown herbicides; spray-topping or hay-freezing late in the season; mowing/slashing; and heavy livestock grazing.
- Crop rotation or crop sequencing with pasture or other crops can facilitate easy control of major potato weeds through use of wider cultural practices. Cereal cropping, as well as hay and silage production can set the potato crop up for a great start, providing the weeds are controlled. They can also provide an effective break to help manage important potato diseases.
- Using broad-spectrum knockdown herbicides or mechanical methods to control weeds just prior to planting is vital to reduce the weed seed bank. Before sowing, form seedbeds and pre-irrigate where possible to encourage weed seeds to germinate to enable the effective use of an appropriate knockdown herbicide application.
- Avoid sowing contaminated seed or using unclean machinery. Farm hygiene is important, and these are often the most common causes of introduced weed seed.
- Once the ground has been prepared and the crop is in the ground, your in-crop weed control options become more limited and will depend on what weeds are expected to emerge with the crop. Now, your herbicide choice needs to be selective and targeted. In 2014, Syngenta released BOXER GOLD® as a unique option for selective pre-emergent control of a range of grass and broadleaf weeds in potato crops. Containing 800g/L prosulfocarb and 120g/L S-metolachlor, BOXER GOLD has become an important way to control annual ryegrass (including Group A and Group D resistant populations), barnyard grass, nightshade, capeweed, fat hen, fumitory, glossy nightshade, redroot amaranth, summer grass and toad rush along with suppression of common thornapple and fierce thornapple. The combination of Group J and Group K modes of action presents producers with a unique mix of active ingredients to help with resistance management and broaden the spectrum of weeds controlled.
- Rotate chemical groups and don't rely on any one group. It's better to use one product and do everything possible that gets the best from that herbicide and then move on to another mode of action group. To control weeds that may already have emerged and as a further step to reduce resistance developing, BOXER GOLD can be tank-mixed with SPRAY.SEED® at recommended label rates and timings for knockdown and residual weed control.
- Vigorous crops that compete strongly and close the row over quickly will reduce the amount of light reaching germinating weeds, making them much less competitive – so pay attention to irrigation and nutrient management.
- As a further step, applying a knockdown herbicide or desiccant while the crop is in the senescence stage will assist with reducing weed seed bank in future crops and make harvest easier.

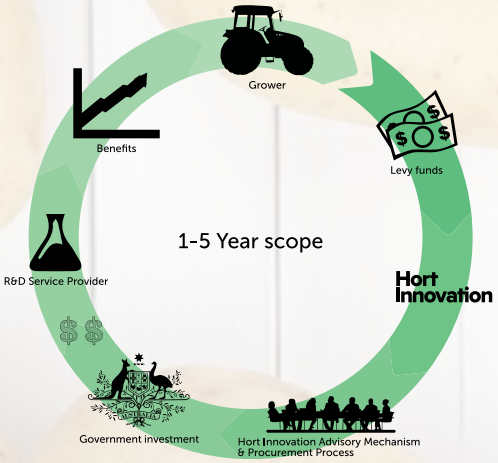
**Find out more** R&D

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

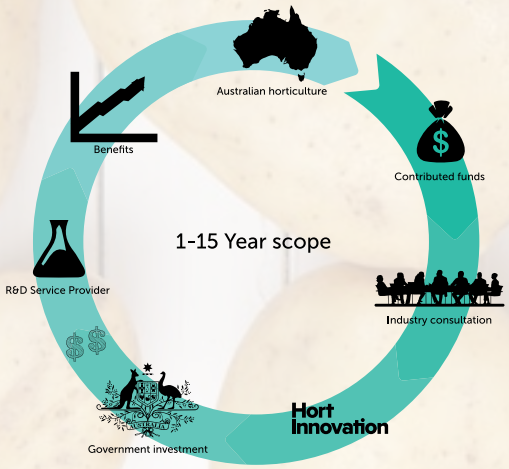
The R&D content for this article has been provided to *Potatoes Australia* to educate Australian potato growers about the most relevant and practical information on crop protection technologies and their on-farm applications.

# THE FRESH POTATO R&D LEVY AT WORK

## STRATEGIC LEVY INVESTMENT




## HORT FRONTIERS




## WHO PAYS THE FRESH POTATO R&D LEVY?

The levy is paid by growers who produce and sell either fresh or processing potatoes in Australia.

The total levy charge is set at 60 cents per tonne for fresh potatoes and 50 cents per tonne for processing potatoes and must be paid by the producer of fresh potatoes or the owner of processing potatoes. The Federal Government also provides funding in addition to grower levy payments. Once paid, the research and development levy funds are managed by Hort Innovation.

## HOW IS LEVY MONEY INVESTED?

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

All investments through the Potato – Fresh Fund are made with advice from the industry's Strategic Investment Advisory Panel (SIAP) – a skills-based panel made of panellists from across the fresh potato industry, the majority of whom are levy-paying growers.

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

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

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

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

## HOW CAN GROWERS GET INVOLVED?

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

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

Hort Innovation | POTATO – FRESH FUND

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

A biosecurity officer inspecting a bee hive for bee pests and disease. Images courtesy of Biosecurity Queensland.

# State biosecurity update: Biosecurity Queensland

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

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

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

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

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

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

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

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

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

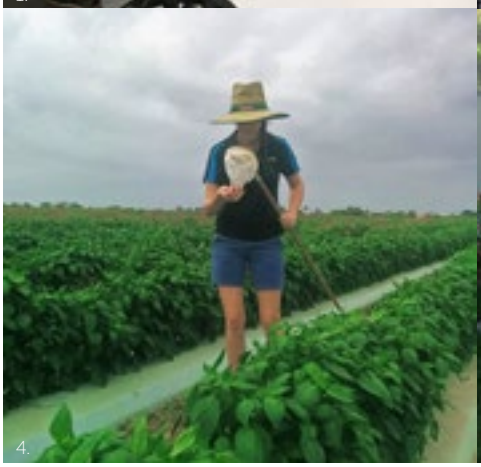
Action plans will be co-developed for each of the themes to align and build on the goals outlined in the strategy. For these plans to be successful, they will need to ensure they are monitored and reported in an accountable way.

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

## Roles and responsibilities of Queensland's Biosecurity Officers

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






1. Conducting fruit fly surveillance operations. 2. Biosecurity Queensland's Plant Biosecurity Laboratory maintains a large insect collection to support the diagnosis of suspect exotic plant pests. 3. Inspecting tomato plants for disease. 4. Tomato-potato psyllid surveillance.

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

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

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

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

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

## A shared responsibility

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

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

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

**Find out more** R&D

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

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

For further information, contact AUSVEG Biosecurity Officer Madeleine Quirk on 03 9882 0277 or madeleine.quirk@ausveg.com.au.

The Farm Biosecurity Program is funded by the Plant Health Levy.

## About the Queensland *Biosecurity Act 2014*

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

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

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

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

## General Biosecurity Obligation

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

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

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

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

# Advancing production across the Australian horticulture industry

The Advanced Production Systems Fund is one of seven funds developed by Hort Innovation to facilitate longer-term strategic R&D programs that aim to secure the future of the horticulture industry. *Potatoes Australia* spoke to Hort Innovation Business Development Manager Dr Alok Kumar about the most recent investment in advanced production systems involving tree genomics.

To complement traditional strategic levy investment, Hort Innovation has developed the Hort Frontiers strategic partnership initiative to support research that will address major challenges facing the horticulture industry in the future.

The projects within the Hort Frontiers initiative are relevant across the horticulture industry. They are considered long-term investments (with a five- to 15-year horizon) and are likely to attract additional public and private funding as co-investment. The potato industry, like all commodities, is set to benefit from the investments made under Hort Frontiers as the diversity of investors includes organisations from along the value chain.

There are currently seven strategic funds in Hort Frontiers: Advanced Production Systems; Asian Markets; Fruit Fly; Green Cities; Health, Nutrition and Food Safety; Leadership; and Pollination.

The Advanced Production Systems (APS) Fund was identified as one of the key needs of the horticulture industry through an open and transparent public consultation process.

Hort Innovation Business Development Manager Dr Alok Kumar said that the key objective of the APS Fund is to develop future "smart farms" for the Australian horticulture industry to address key issues including labour, water, and biotic and abiotic stress.

"It is likely to increase productivity and profitability of Australian horticulture through cropping system intensification, farm automation and innovative tools and technologies," he explained.

There are three investment themes for the APS Fund: tools and advanced technologies; systems design: practice and management; and innovation and disruption.

"The APS Fund aims to develop new tools that are likely to benefit growers by reducing labour (farm automation), crop intensification (indoor cropping), improve genetics and provide tools to manage biosecurity, etc. Several of these programs are likely to benefit the potato industry," Dr Kumar said.

## Major investment

In December 2018, Hort Innovation announced a new investment targeting the innovation and disruption theme of the APS Fund. *National Tree Genomics Project* (AS17000) is a $13.3 million, five-year research project that will deliver tools and technologies for the industry to improve the efficiency of tree breeding, architecture and physiology.

This will include developing a genomic toolkit for tree breeders and researchers to better understand how genes control traits that are valuable to Australian growers. A genome is an organism's complete set of DNA, including its genes, and in this instance the kit will focus on traits such as tree size, yield, disease resistance and tree maturity.

The project aims to build a complete DNA map that will visualise the genetic make-up and variability of the nation's five leading tree crops, which represent 80 per cent of the total volume of horticultural tree crop production in Australia.

"There is a significant gap in the understanding of different aspects of tree biology, particularly in crops such as mango, macadamia and avocado. Other crops included are almonds and citrus," Dr Kumar said.

"It is critical for the future of Australian horticulture that modern tools and technologies are available to diverse stakeholders, including researchers, so that horticulture growers are globally competitive and highly profitable."

The program will be delivered by a number of domestic and international research and commercial partners such as the Queensland Alliance for Agriculture and Food Innovation (QAAFI), which is embedded within the University of Queensland and the Queensland University of Technology. AS17000 is funded through co-investment and there are no levy funds invested in the program.

Western Sydney University, Bioplatforms Australia, Beijing Genome initiative and Jain Irrigation are also currently involved and Dr Kumar said it is likely that new partners will join the program in the future.

## Get involved

Hort Innovation encourages potato industry members to submit a concept or contact Dr Kumar to discuss investment opportunities available in the APS space.

Each Hort Frontiers Fund is guided by an Expert Advisory Panel (EAP). The EAP for the Advanced Production Systems Fund is:

- Ingrid Roth – Roth Rural & Regional.
- David Bell – Hidden Valley Plantations.
- David Cliffe – Narromine Transplants.
- Ed Fagan – Mulyan Pty Ltd.
- Lachlan Donovan – The Avolution.
- Mark Uebergang – Agromillora.
- Ian Bally – Department of Agriculture and Fisheries, Queensland.
- Grant Thorpe – Plant & Food Research Australia.
- Dr Alok Kumar – Hort Innovation.

**Find out more** R&D

For more information, please visit hortfrontiers.com.au or contact Dr Alok Kumar on 0418 322 070 or at alok.kumar@horticulture.com.au.

To submit an idea for a future project, visit Hort Innovation's Concept Proposal Form at horticulture.com.au/about/investing-is-our-business/concept-proposal-form.

This project has been funded by the Advanced Production Systems Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with funding from a range of co-investors and contributions from the Australian Government.

hort frontiers Strategic partnership initiative | ADVANCED PRODUCTION SYSTEMS FUND

# Update on fresh potato levy investment

## New investments 2017/18

| | |
|---|---|
| PT17000 | Diagnostic capability to detect *Candidatus* Liberibacter solanacearum (CLso) |
| PT17000 | Developing and implementing high throughput diagnostic test for *Candidatus* Liberibacter solanacearum (CLso) |
| ST16008 | AgVet collaborative forum |
| ST17000 | Generation of data for pesticide applications in horticulture crops 2018 |
| PT16000 | Extension activities for the Australian potato industry – pest and disease app |
| PT16000 | Extension activities for the Australian potato industry – literature review and survey |

## Ongoing investments

| | |
|---|---|
| PT15007 | Potato industry communication program 2016-2019 |
| PT15008 | Extension of the PreDicta Pt potato diagnostic service |
| PT16001 | Impact of groundwater quality on management of centre pivot grown potato crops |
| PT16002 | Exploring *Spongospora* suppressive soils in potato production |
| PT16004 | Review of the national biosecurity plan for the potato industry and development of a biosecurity manual for potato producers |
| PT16005 | Potato industry minor use program |
| MT16009 | An IPM extension program for the onion and potato industries |
| MT16018 | National tomato potato psyllid (TPP) program coordinator |

## Investments completed in 2017/18

| | |
|---|---|
| PT16003 | Navigating the wealth of soil health information and identification of opportunities |
| MT15032 | Monitoring and evaluation framework for the industry Strategic Investment Plan |
| MT15033 | Strategic Investment Plan |
| MT16016 | Surveillance of tomato potato psyllid in the eastern states and South Australia |

During the 2017/18 financial year, all Australian levy paying horticulture industries also contributed to across-industry projects addressing issues that affect horticulture as a whole.
Visit horticulture.com.au for financial documents and information on this program.

# Regional Updates

## Seed Potatoes Victoria

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Seed Potatoes Victoria
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The early summer rain gave our crops a good start and they are growing well. Unfortunately, with the rain stopping we have now rolled into 'irrigator season', or 'irritation season' as many potato growers refer to it. The time of year when we never seem to stop checking, changing, moving, repairing and cursing at all of our irrigators, old and new. There always seems to be a never-ending list of problems that can go wrong from one day to the next! One Gippsland grower feels that he has had his lot this season already, with two irrigator computers burnt out; a broken drive chain; a gearbox that had to be replaced; a gear drive on a gun that broke and had to be replaced; a broken hose that had to be welded back together; a lift pump replaced; and an irrigator piston drive that came apart – all causing a lot of frustration and money!

Following on from our last article in *Potatoes Australia* is an update on our New Zealand tomato-potato psyllid (TPP) tour from 12-15 February. Potato industry members from across Australia travelled to New Zealand to learn about TPP and how industry is managing this pest. It's likely to be only a matter of time before TPP arrives in many Australian states and industry members are being proactive and doing their best to prepare.

The tour also provided an excellent opportunity for strengthening international partnerships, networking and learning about alternate farming methods, with the Potatoes New Zealand and Plant & Food Research Grower Field Day, multiple farm visits, and an International Potato Dinner in Ashburton on 13 February. AUSVEG CEO James Whiteside and Board members also joined the group for dinner in Timaru, providing further opportunity for collaboration and sharing of ideas.

At the time of writing, 22 members from Victoria, Tasmania and Western Australia registered for the tour. To find out more, please contact Elizabeth Wharton from Sebright Adventures on 0484 902 702 or Pauline McPherson from Seed Potatoes Victoria on 0409 805 166.

## Crookwell Potato Association Incorporated

**Matthew Gay**
Crookwell Potato
Association Incorporated
President

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The Crookwell area has received a lot of rain since my last regional report: the recorded amount at the Crookwell Post Office for December was 67mm. From talking to people around the district, totals varied across the area from 50-140mm. As it was mostly storm rain, some properties got double the amount on different parts of their farms, which really helps a lot of properties with farm water storage and especially for future irrigation. The rain event was mainly in the Crookwell Shire, closer to the township. Unfortunately, outer lying areas did not receive good runoff water.

This event helped potato growers who planted early; their crops are now exploding and look fantastic. The later crops have been set back somewhat with too much water, especially in low paddocks, but they are making a good recovery.

The days leading up to and over Christmas were very hot and the soil moisture was used up quickly. We are very lucky to have our irrigation dams topped up because it is looking like we will need water as the heat continues.

With our climate being somewhat volatile of late, it makes decisions on the farm even harder. For example, last season suited crops planted late whereas this season, early crops are the go.

The forecast for our last rain event was from 10-20mm across different weather sites, with one predicting up to 60mm. With so much variance in prediction, and ultimately getting it wrong, most farmers have lost confidence in the weather forecasters. We noticed on our property a lot of ant nest building and also frog activity leading up to the deluge. Sometimes you have to 'feel' the weather and use your own instinct to get a more accurate account of what Mother Nature has in store.

Hopefully the rain events in the future can be spread over all Australian farms. If I could, I would gladly share some of the rain that has fallen here in the past month.

**Jordan Brooke-Barnett**
AUSVEG SA
Chief Executive Officer

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Produce Markets
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## AUSVEG SA

South Australian logistics company Symons-Clark has recently come onboard as an AUSVEG SA Corporate Partner, offering specialised knowledge and expertise in logistics and transport approvals.

Increased access for B-double and B-quad road trains has been an issue for many large horticultural enterprises across the region and state but despite past efforts, progress has until now been largely stagnant on this issue.

This corporate partnership will allow Symons-Clark to work with any other growers throughout the state interested in pursuing B-quad road train access to their properties and integrated logistics solutions as a way to save considerable amounts on their freight and handling costs. AUSVEG SA is also happy to advocate on behalf of growers and support any future applications.

Interested growers should contact either the AUSVEG SA CEO Jordan Brooke-Barnett on 0404 772 308 or Jason Clark of Symons-Clark on 0408 880 522.

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## AUSVEG VIC

AUSVEG VIC has launched its Energy Efficiency Calculator on the AUSVEG VIC website. The Energy Efficiency Calculator enables growers to assess different areas of their business and how their energy consumption is being used, including refrigeration, lighting, process, irrigation and hot water. A grower is then able to look at suggested solutions for each area of their business and become more energy efficient and reduce their energy spend.

As the new year has commenced, there are a few dates for Victorian growers to save into their calendar, starting with the annual AUSVEG VIC Awards for Excellence which will be held at Kooyong Tennis Club on Friday 3 May.

Another opportunity not to be missed by Victorian growers is Hort Connections 2019, which is being held between 24-26 June at the Melbourne Convention and Exhibition Centre. This event will present Victorian growers with a fantastic opportunity to attend and discover new technology while hearing from leading local and international speakers.

The Victorian Labour Licensing Bill in 2019 will be enacted and growers should be thinking about whether or not their current labour hire contractor is going to comply with the new laws that will be enforced.

AUSVEG VIC is looking forward to working with growers throughout 2019.

# Calendar

### 11 May
### Crookwell Potato Festival
### Where: Crookwell, New South Wales

Celebrating over 150 years of growing potatoes high on the Southern Tableland of New South Wales, the 2019 Crookwell Potato Festival will feature a special guest, His Excellency Breandán Ó Caollaí, the Irish Ambassador to Australia. The festival will also feature Irish potato dishes, Irish music and much more.

Further information: crookwellpotatofestival.com.au

### 24-26 June
### Hort Connections 2019
### Where: Melbourne Convention and Exhibition Centre

Early bird registrations are now open for Hort Connections 2019, where AUSVEG and the Produce Marketing Association Australia-New Zealand (PMA A-NZ) will once again join forces to present the biggest event in Australian horticulture, which is set to deliver another world-class program and trade show to growers and whole-of-supply-chain companies alike.

Further information: hortconnections.com.au

# Young Potato People

G'day again,

Another year has passed by and we are well into the next one. The wheels keep turning, and the potatoes keep growing and being harvested. We also continue to push ourselves in order to make bank. So, why do we do this? Is it to feed the world? Is it to keep ourselves busy so we don't get bored? Is it for money? I guess you could say that it is for all sorts of reasons, but the main one is money.

Money makes the world go 'round, it is the source of all evil, and no matter how much you have, you always want more. The thing with money is that without it you can't eat or have the latest smartphone (for older readers, a smartphone is like a normal phone but it has a touch screen). Everything in our society is based around money.

As farmers, it seems we are at the bottom of the food chain when it comes to money; we are often told what price our product will be sold for and how it needs to be presented.

They say farming is the only business that you sell at wholesale price and buy everything at retail.

But we keep going in order to make bank and support our families. And at times support our fishing addictions. We put in the hard yards to keep feeding the world and we hopefully make a bit of money along the way. But really, we do it for the lifestyle, and the chance to be featured in a magazine or on television. And maybe become famous...

Stu


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