

potatoes

australia

| June/July - 2019



JAMES DOWNEY | YOUNG GROWER PROFILE

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NEW RESEARCH | IMPROVING DETECTION OF CLSO IN POTATO PLANTS



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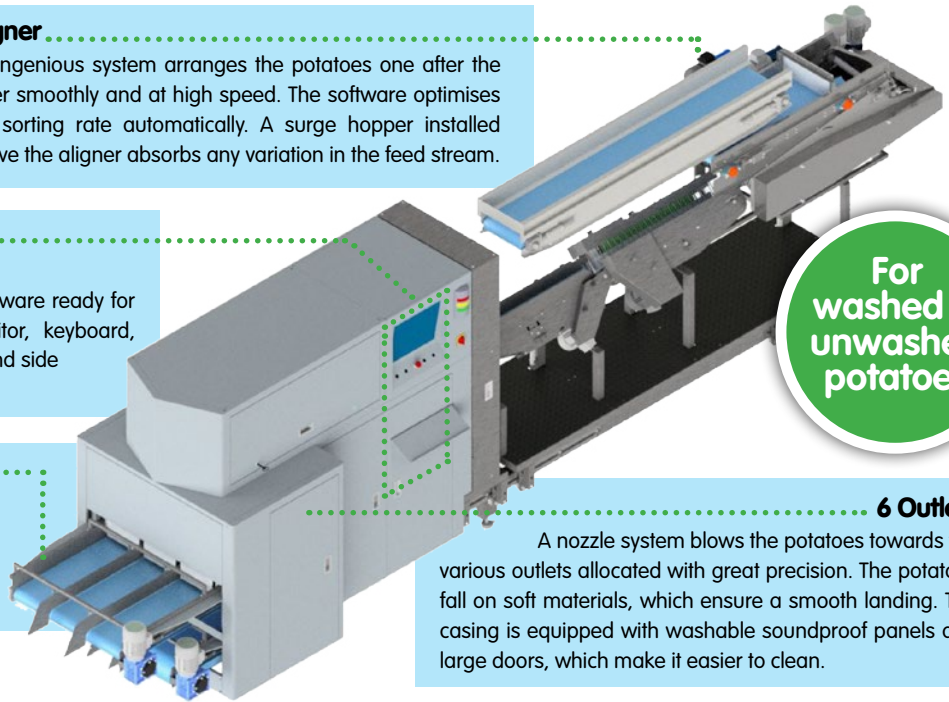
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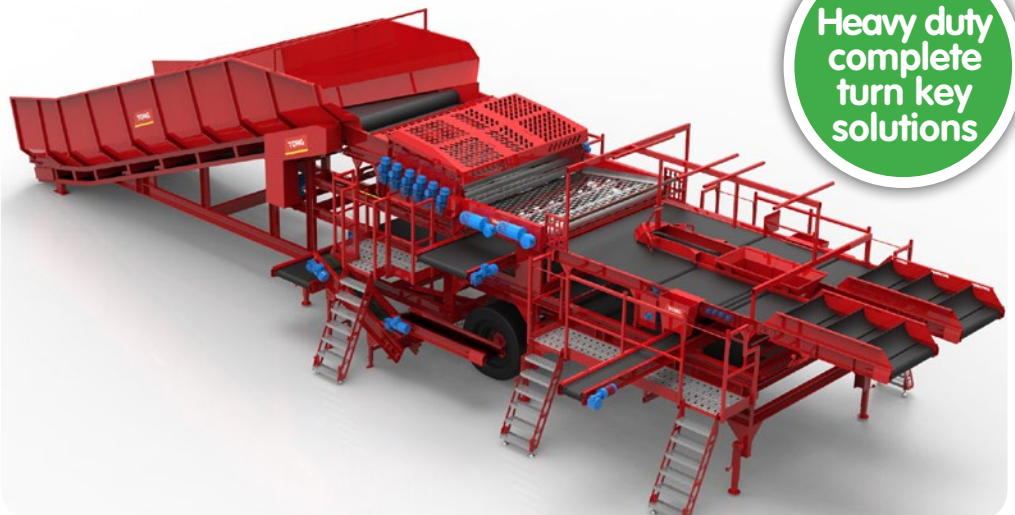
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Heavy duty complete turn key solutions





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Editorial

It's hard to understand exactly how much effort goes into growing a potato until you've worked in this industry. Of course this is no news to a grower, but for an outsider, there is a multifaceted and heavily unappreciated story behind every roast potato, French fry or crisp that we eat.

From its scientific beginning in the lab as tissue culture, through to its development into mini-tubers, multiple generations of seed and finally the ware product, the humble potato is surprisingly complex in its development, perhaps more so than any other vegetable. Put simply, it isn't an easy task to grow quality potatoes.

Since completing my first edition of *Potatoes Australia* in 2014, I have been fortunate to delve into the world of potatoes and all of the intricacies that go with it. Now after five years and the production of 30 editions, it's time for me to say goodbye to this magazine

and AUSVEG as I move on to the next challenge.

I'm proud to say that *Potatoes Australia* has evolved significantly in a sector that still appreciates the value of traditional print media, and as a result it is more representative of the Australian potato industry in its entirety. We share developments and updates across the seed sector, including certification, to processing, fresh production, the supply chain and the consumer.

We have covered the results of projects funded by the fresh and processing potato research and development levies as well as independent projects both locally and overseas, including the latest potato industry news and updates. Our grower profiles are always a highlight of every edition, as we take you around the country to share the stories of the dedicated people who are the beating heart of this industry.

I'd like to thank everyone who has helped to put this magazine together over the years – from the researchers who have patiently explained the details of their projects, as well as the many supply chain members and stakeholders who work together to make this industry what it is today – but especially the growers who have so warmly welcomed me onto the farms and given up their time for a chat. This magazine also wouldn't be possible without those who have contributed content over the years and the dedication of AUSVEG staff, particularly my colleagues Shaun Lindhe and Michelle De'Lisle, and AUSVEG Director Geoff Moar.

It's clear to me that the Australian potato industry is well positioned for a productive, profitable and sustainable future.

Dimi Kyriakou – Editor



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Message from the CEO

The Coalition's victory in the recent Federal Election was an unexpected surprise for most, but importantly, provides us with the opportunity of continuing to work with them on a number of fronts.

AUSVEG was active in its advocacy on behalf of potato and vegetable growers and will work to ensure that all commitments made by the Coalition in its campaign will be followed through. AUSVEG will also continue to advocate on matters of importance for growers, particularly around the creation of an Agriculture Visa to deal with the crippling labour shortage affecting our industry.

Following the election, AUSVEG welcomed the Federal Government's appointment of Deputy Nationals Leader Bridget McKenzie as the new Minister for Agriculture.

We have met with Senator McKenzie since her appointment and are eager to work closely with her and all members of the government to ensure Australia's potato and vegetable growers can continue to be productive, profitable and globally competitive.

We would also like to thank the Hon. David Littleproud MP and Senator the Hon. Richard Colbeck for their valuable contributions as the former Minister and Assistant Minister for Agriculture and Water Resources respectively, and are hopeful of continuing our working relationship with them in their new roles.

The Australian agriculture industry is fortunate to have many strong and passionate advocates that are committed to supporting the industry and the many thousands of workers who help to produce our food and fibre. However, we need to remain focused on removing threats and barriers to producing healthy, high-quality vegetables – these include threats from pests and diseases, worker shortages, increasing market access and removing trade barriers to broaden our customer base. Removing these threats will allow growers to run a more efficient and effective business and help our industry play its role in agriculture reaching its \$100 billion target by 2030.

A handwritten signature in white ink that reads "James Whiteside". The signature is fluid and cursive, written on a teal background.

James Whiteside
CEO
AUSVEG



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Developing a plan to protect Australia's potato industry

Over the past 12 months, Plant Health Australia (PHA) has undertaken a project that aims to decrease the risk of exotic pests affecting the Australian potato industry. One of the components of this project is the *Potato Grower's Biosecurity Manual*. PHA Biosecurity Planning Coordinator Dr Victoria Ludowici explains how the manual can assist growers in identifying exotic pests such as the Colorado potato beetle.

Published in May 2018 and distributed with this magazine, the *Potato Grower's Biosecurity Manual* is a valuable resource to help growers protect their farm as well as the wider industry from pests, diseases and weeds.

The manual is a guide to farm biosecurity measures for potato growers and their staff, along with contractors, processors, researchers and consultants working in the potato industry.

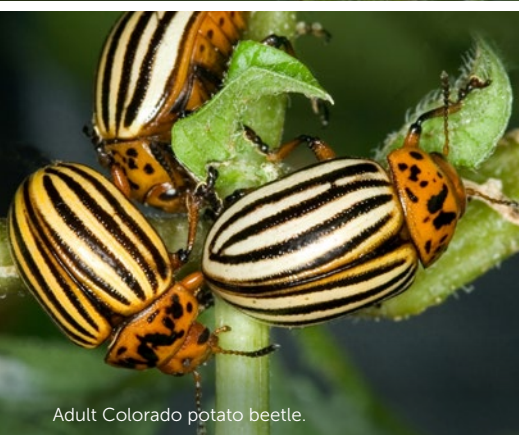
Farm biosecurity protects Australia's potato industry from new pests and diseases from overseas. As well as impacting crop health, these pests could restrict access to domestic and international markets.

The manual was developed by Plant Health Australia in consultation with AUSVEG as well as potato growers across New South Wales, Victoria and South Australia. As the peak industry body for vegetable and potato growers, AUSVEG has endorsed the manual.

Images courtesy of David Cappaert, Bugwood.org



Larvae of Colorado potato beetle.



Adult Colorado potato beetle.

Beetle threat

The manual provides fact sheets on some of the most concerning exotic pest and disease threats, such as Colorado potato beetle (*Leptinotarsa decemlineata*). This serious pest is widespread throughout Europe, Asia, Mexico and the western region of the United States, where it is both difficult and expensive to control and insecticide resistance is a major issue.

Adult beetles and larvae feed on the stems, leaves and growing tips of its hosts, which include potato, eggplant, capsicums, tomato and other solanaceous plants.

The beetle's feeding causes leaf defoliation, which is the most obvious sign of the pest's presence during in-field inspections. It also produces a sticky black excrement, which is left behind when it feeds. While the defoliation and leaf tatter caused by the beetle is like the damage caused by other insects, the black sticky deposits can help to identify the pest.

This is a great example of why it is important for growers to check their crops frequently and be familiar with common pests so it is easier to detect unusual symptoms.

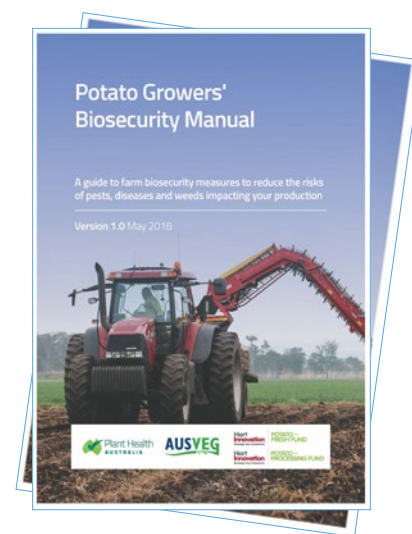
Beetle larvae and adults can be seen easily on young plants as they have a distinctive appearance. There are no beetles with a similar morphology (shape and structure) native to Australia. Adult beetles are about one centimetre long and have five dark line markings on each wing cover, with a yellow to red underlying colour.

The larvae are also brightly coloured and grow to 1.5 centimetres in length. Initially they are bright red with a black head and legs, but this changes to a pale orange before pupation.

Growers are advised to shake potato plants and observe the ground around them for beetles, and check nearby solanaceous weeds which could host this pest.

Adults can fly short distances within a host crop but they have been known to travel up to 160 kilometres when assisted by strong winds. The larvae and adults can also be transported as 'hitchhikers' on plant material, produce, machinery and packaging.

To protect against pests like Colorado potato beetle, do not plant tubers from unknown sources, as they could be the source of new pests and diseases.



Find out more R&D

For further information, please contact Plant Health Australia on 02 6215 7700 or biosecurity@phau.com.au.

An electronic copy of the *Potato Grower's Biosecurity Manual* and further information about farm biosecurity are available at phau.com.au, farmbiosecurity.com.au/profiler and ausveg.com.au.

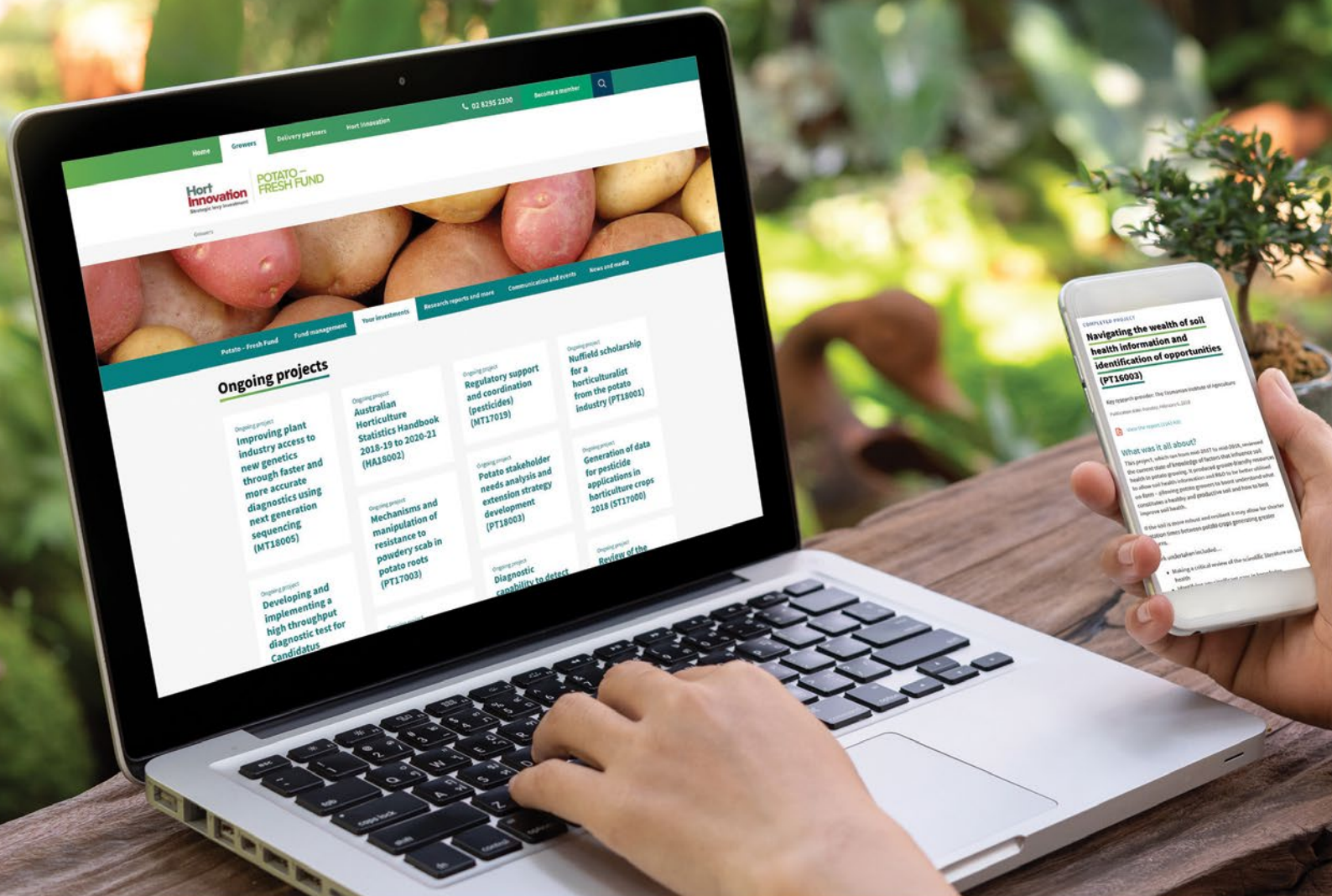
Review of the national biosecurity plan for the potato industry and development of a biosecurity manual for potato producers was funded by Hort Innovation using the fresh potato and potato processing research and development levies and contributions from the Australian Government.

Project Number: PT16004

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Potato industry works together to develop a crop monitoring strategy

An industry consultation workshop was recently held to better understand the potato industry's approach to the crop monitoring and surveillance of exotic (those that are not present in Australia) and notifiable pests and diseases. AUSVEG National Manager – Engagement and Extension Zarmeen Hassan and Biosecurity Project Officer Shakira Johnson report on the workshop and what was discussed.

In early May, AUSVEG and Plant Health Australia facilitated an industry consultation workshop with all sectors of the potato industry (including the ware, processing and seed industries in relevant states and territories) to understand the who, what and where of the industry's approach to surveillance of high priority pests and diseases affecting the potato industry. The workshop was one of the first steps towards developing the National Potato Industry Biosecurity Surveillance Strategy (NPIBSS).

The threat of pests and diseases not yet established in Australia affects all facets of the potato industry, highlighting the need for a coordinated approach that is shared across these groups. In addition to these 'exotic' threats, the surveillance strategy seeks to include pests that have established but are restricted in distribution and under official control (e.g. tomato-potato psyllid, potato cyst nematode and *Dickeya dianthicola*).

Identifying biosecurity risks

Plant Health Australia has received funding through the Federal Government's Agricultural Competitiveness White Paper to improve industry preparedness and to develop an industry-wide strategy. The intent of the Department of Agriculture and Water Resources funding for this strategy is to contribute to and 'kick-start' the development of an industry-run and funded surveillance system for the high priority pests and diseases identified in the most recent biosecurity plan for the potato industry. It is intended to fit below this broader plan but be more strategic than the *Potato Growers' Biosecurity Manual*.

The aim of this strategy is to improve crop monitoring and market access outcomes for potato production in both commercial and urban/peri-urban areas; improve grower capability to detect and report exotic pest incursions; and identify issues and opportunities for the establishment of a national potato biosecurity surveillance program. Engaging all sectors of the potato industry is central to the project to ensure that the development of the NPIBSS is informed by the potato industry's capacity and needs.

The recent industry workshop included consultation on current activities and requirements for a NPIBSS and aimed to understand and identify gaps in current surveillance activities conducted within the industry. Objectives of the industry consultation specifically addressed each of the following objectives:

- Understand the capability and preparedness to detect and report incursions.
- Agree on the benefits of monitoring/surveillance.
- Identify what monitoring is happening in the potato industry:
 - Who does what, when and how?
 - How, by whom and where are records kept?
- What is the willingness to contribute to surveillance?
- What resources are required to actively contribute to surveillance/crop monitoring?
- Identify ways of collecting and sharing relevant data.
- What value/benefit does industry want from contribution to surveillance/crop monitoring?

Pest and disease threats

To assess the current state of awareness of biosecurity issues in the potato industry, workshop participants were given a handout of stock images of various relevant pests and diseases and/or their symptoms and asked to "guess the pest". This exercise showed that pests of current relevance and those with major awareness-raising campaigns were more easily identified (e.g. tomato-potato psyllid). Furthermore, pests with distinguishable features and larger sizes were more likely to be correctly identified (e.g. Colorado potato beetle). Meanwhile, pests that had more ambiguous features and relied on symptoms for identification were less likely to be positively identified (e.g. *Candidatus Liberibacter solanacearum* or CLSo, and late blight of potato).

This biosecurity awareness exercise highlights the difficulties in keeping industry informed about relevant biosecurity risks and mirrors the challenges faced by industry and government in their approach to correctly identifying a high priority pest or pathogen.

These activities generated a lot of discussion, and with such a diverse collective of industry representatives, allowed for well-rounded feedback on a variety of themes covered throughout the day. Discussion generated by this exercise also highlighted issues for the industry, such as the reluctance to be the first reporter and the need to recognise and address cultural and language barriers.

Pilots and surveillance strategy

The project team is now collating all the valuable information collected during the workshop and will apply this to the development of two industry-based pilot surveillance programs to be rolled out in the middle of the year. The program will revisit the same group of stakeholders following pilot surveillance programs in selected locations around Australia to incorporate the learnings and endorse the final surveillance strategy before submission to the Federal Government. Ongoing individual consultation will continue throughout the life of the project.



Overall, our industry recognises the need for a unified front to combat issues surrounding biosecurity and pests and diseases. It was acknowledged that sharing data and information collected during crop monitoring is important for the success of the industry. The team will continue to consult with industry, as well as state and federal government, to deliver a strategy the potato industry can be proud to support.

Find out more R&D

If you would like to have input into the development of the strategy or for more information, please contact AUSVEG National Manager – Engagement and Extension Zarmeen Hassan at zarmeen.hassan@ausveg.com.au.

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Cornell University, USA

Dr Calum Wilson PhD, MSc (Distn), BSc (Hons), *Professor in Plant Pathology.*
Dr Wilson's research portfolio is diverse with work across a range of plant pathogens and crops.
Conference Topics: Common and Powdery scab and soil diseases
Tasmania Institute of Agriculture, Australia

Howard Hinds – *Consultant. Providing independent consultancy services for carrot diseases and disease modelling parsnip and potato crops.*
Conference Topics: Carrot diseases and Disease Modelling
Root Crop Consultancy Ltd, United Kingdom

John I Keer BSc, PhD – *Technical Manager. Specialising in Crop nutrition, protection and soil management.*
Conference Topics: Management of Potato Cyst Nematode (PCN), control of late blight and weed control options in potatoes
Richard Austin Agriculture Ltd, United Kingdom

Dick Neale – *Technical Manager specialising in grass weed control, crop establishment, cultivations and crop nutrition and integration with precision farming techniques.*
Conference Topics: Getting the right break crop/How healthy is your soil
Hutchinsons Crop Protection, United Kingdom

Dr Len Tesoriero BSc, MSc, PhD – *Consultant*
Conference Topics: Baby leaf and Spinach, Lettuce soil-borne disease management and Sclerotinia control
Crop Doc Consulting Ltd instead

Bronwyn Braithwaite BHortSc (Hons) – *Laboratory Manager, Crop Consultant*
Bronwyn will be conducting a separate workshop on the day
Topic: Brassica blackrot
Plant Diagnostics, Christchurch

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Photography by Heath Holden.

Rich Tasmanian potato growing legacy continues

Nathan Richardson and his family own a mixed farming operation on the outskirts of Devonport in Tasmania's north, which includes growing processing potatoes for Simplot. In addition to managing the family business, Nathan is the Chairman of the Vegetable Council within the Tasmanian Farmers and Graziers Association. He spoke to Michelle De'Lisle about this role, the changing landscape of potato growing in Tasmania, and the challenges this presents to growers.

For over a century, Nathan Richardson's family has been farming the fertile grounds of north-west Tasmania.

The Richardson's current operation is a 125-hectare farm, located 18 kilometres east of Devonport. It is where Nathan and his wife Janine, along with his parents Rex and Janet, grow potatoes for the processing sector, cereals, hemp, fat lambs, poppies and broiler chickens. Prior to this, the farm was a dairy, beef and ewe lamb operation while several other vegetables were grown up until the early 2000s.

Nathan enjoys the potato growing branch of the operation, and the Richardson family has been supplying Simplot's Ulverstone processing plant with potatoes since it opened in the early 1960s. Nathan's passion for horticulture is reflected in his role as the Chairman of the Tasmanian Farmers and Graziers Association (TFGA) Vegetable

Council, a role that involves liaising with vegetable growers on a daily basis, listening to their concerns and extending independent advice.

Born to farm

Nathan's farming career began when, at just 16 years old, he finished high school and completed a farm apprenticeship through education and training service provider TasTAFE.

"From there, I learnt from my parents and that has morphed into the role I currently have today," he says.

Nathan oversees both on- and off-farm aspects of the business, from the paddock to financial management and planning. His father Rex has a more relaxed role these days, assisting his son with livestock husbandry and irrigation while Janine also helps with livestock husbandry and farm accounts. Nathan's parents also cover his role when he's away at meetings.

"I still get on the tractor and do all the spraying. I have a complete manager's role in our day-to-day operations. We have 1-2 part-time workers throughout the year and we manage them as well," Nathan says.

In 1992, Nathan began attending TFGA meetings as a Vegetable Council representative through the Rural Youth Organisation of Tasmania. Five years later, he joined the TFGA Potato Committee as an area representative.

"Since then, I've been fortunate enough to be on the negotiating committee for Simplot growers and did that for about seven or eight years. For the past three years, I've been Chairman of the Vegetable Council within the TFGA."

Industry focus

Nathan says the TFGA is important for Tasmanian farming and businesses as it tackles government policy, discusses major industry issues and provides a voice for the state's farmers and producers.

"It gives our industry a profile and on a personal basis, it's also given me a way in to talk to some pretty high-level people, whether it's in government or big multi-national businesses. It's quite rewarding to sit down with some high-level management of these companies as a farmer and a grower representative," he says.

It has also allowed Nathan to travel internationally to attend events such as the World Potato Congress, which was most recently held in Peru in 2018.

"We've met some absolutely fantastic people on these trips. We've got networks around the world which are very valuable when you want to know something. You can't put a price on that information," Nathan says.

Meanwhile, the Tasmanian potato industry received the exciting news in March that both Simplot and McCain are expanding their processing plants, a move that Nathan welcomes.

"Any time there's money invested in processing something in Australia, that's a good thing. It gives people surety that we're going to have an industry in the future," he says.

"Simplot has a good history of reinvesting into the plant at Ulverstone, but this one's quite significant in the fact that it's another production line (specialty battered lines), which means it wants



Nathan Richardson with his wife Janine and children Bianca and Hayden.

our potatoes and likes doing business here in not only Tasmania, but Australia," Nathan says.

"It also means that the Australian consumer wants to keep buying our product. That's where we're getting a win."

Addressing challenges

Despite the positive steps that are being taken by Tasmania's major potato processors, Nathan believes there will be ongoing issues for growers in the state.

"The challenge is to try and get the message through to the Australian processors, packers and supermarkets that growers need to be adequately compensated so they can reinvest in their businesses."

"We also need to update equipment; we need to move with the times and that takes capital. We need to be paid more for our product because our farming production system is very expensive compared to other parts of the world – but it's in line with doing business in Australia. What we really need is a hit in the back pocket from everyone that our operations do business with."

There are other challenges that growers face, including attracting staff and the next generation of workers to join the business.

"The biggest concern I have for the future of Australian agriculture is that growers and farmers may become very hesitant in suggesting to their children to come and take on farming as a future. That does extend into our current problem around the country of being able to attract really good staff.

"Our challenge is the decade after decade lack of sustainable profitability,

and our businesses not being able to compete in the workforce as far as the salaries we can offer. And that has to change."

One way to encourage younger people onto the farm is more education around the career opportunities that are available in agriculture.

"The industry is very technology-based now and there are a lot of fields within farming that you can do without drenching a sheep or planting a potato. There are great ways to open doors in agriculture; whether it's developing an app or studying irrigation and soil and crop production systems or data management, right through to managing regulation and compliance."

Long-term vision

Nathan is always searching for new technologies and innovation as he strives to continue to invest in efficient systems to produce environmentally sustainable and healthy crops into the future.

Additionally, Nathan has high hopes for the Tasmanian potato industry, including its expansion.

"I think our ability to grow more potatoes is there in nearly all areas of the state. Potato is one of the very few crops that grows in nearly any soil type and weather conditions," he says.

"There will be importance placed on sustainable farming systems, and Tasmania is definitely at the forefront of that. We record a better average rainfall and have fewer extreme weather events, such as floods, cyclones and heatwaves, that put pressure on mainland production systems.

"We have really good levels of investment in irrigation systems around the state. Our population is growing both in Australia and around the world, and we're going to have to produce more. That's what I think the future is: to keep producing more while looking after the environment."

On a national level, Nathan would also like to see more Australian potatoes tread the path to exporting to our Asian neighbours.

"We need to focus on export. I saw the latest export figures for Australian potatoes into countries in south-east Asia, and the volumes that we export is nothing compared to what European countries are getting in there. We're the closest to south-east Asia geographically and we need to work out how, as a country, we can export and compete on the world stage."



Improving detection of CLso in potato plants

In 2017, a project was commissioned to improve the diagnostic capabilities relating to *Candidatus Liberibacter solanacearum* (CLso), the bacterium that can be carried by the tomato-potato psyllid and can cause 'zebra chip' disease in potatoes. *Potatoes Australia* spoke to Agriculture Victoria research scientist Dr Rachel Mann about the project and what it has uncovered.

The tomato-potato psyllid (TPP) is a destructive pest that can cause devastating losses for potato growers and the wider industry. Coupled with its potential to carry *Candidatus Liberibacter solanacearum* (CLso), which causes zebra chip in potatoes, it is clear why research into this pest and the disease it can vector has never been so important.

The psyllid was first discovered in Western Australia in 2017, and since then the state's Department of Primary Industries and Regional Development has been monitoring for any signs of CLso. So far, no detections have been recorded.

Meanwhile, Agriculture Victoria and Plant and Food Research New Zealand researchers, including Dr Rachel Mann, have facilitated a project that aimed to more accurately detect CLso in surveillance and certification activities; in particular, how CLso is distributed in a potato plant and the best part of the plant to test.

A strategic levy investment under the Hort Innovation Fresh Potato and Potato Processing Funds, *Diagnostic capability to detect Candidatus Liberibacter solanacearum* (CLso) (PT17000) also aimed to identify gaps in the international protocol for testing for CLso.

"When the incursion happened in Western Australia, all of the laboratories in Australia used the National Diagnostic Protocol for testing. That's a ratified protocol through a national committee and it is aligned with global protocols such as the International Plant Protection Convention (IPPC)," Dr Mann said.

"When it came to sampling, the recommendations were based on a reference for tomato plant sampling,

where the tomato plant was held under experimental conditions and infected artificially. That is a gap in the international protocol for testing for CLso in potato, so we put this project together to improve the information we include in the National Diagnostic Protocol for sampling a plant in the field and testing in the lab. That was the main driver of the project."

Proficiency tests were also conducted across the country to determine if laboratories could positively detect the bacterium on material using the current protocol.

Looking across the ditch

The Agriculture Victoria project team has been working closely with our trans-Tasman neighbours, who have been battling TPP and zebra chip in potatoes for over a decade. Led by Dr Rebekah Frampton and Dr Grant Smith from Plant and Food Research New Zealand, trials conducted in New Zealand have produced some promising results that will change the way potato plants are tested for the presence of CLso.

To understand the distribution of CLso in a potato cultivar, artificial cage trials were conducted in the field in New Zealand where potato plants at the flowering stage were infested with TPP that carried CLso. These crops were grown for a further six weeks in natural conditions.

"Over a six-week period, these plants were sub-sampled weekly. Each plant was cut into small pieces and those pieces were tested for the presence of CLso. This enabled us to see how long it took for the bacteria to be detected and which parts of the plants we could detect the bacteria in," Dr Mann explained.

"That was one part of the trial. We also took plant samples from the field that were either symptomatic or asymptomatic and did the same thing. We cut them all up into small pieces and tested whether it was a positive detection of CLso or not, and where in the plant we were able to detect it, and then collated the results."

Project results

The New Zealand-based trials revealed the best areas of the potato plant to test for CLso. It was not the leaves, as previously thought.

"The below ground tissue, the stems and the tubers were the most reliable tissue types to detect CLso. That was reflected in both the cage trial and the field plants," Dr Mann said.

"We went a bit deeper and looked at the distribution of CLso within individual tubers. Overall it was highly variable as to what part of the tuber had the highest concentration of CLso. For this reason, the results indicated that you may need to take multiple samples from the one tuber to accurately test for the pathogen."

Dr Mann added that it was more likely to be detected in the vascular tissue at the stolon end of the tuber, where the tuber meets the main stem of the potato plant.

"Even though it might not have been the place where CLso was in the highest concentration, we regularly detected it there."

As a result of this discovery, it was recommended to change the testing advice issued by the National Diagnostic Protocol and its global counterpart (which it closely aligns with currently).

Further research

Dr Mann outlined several aspects that could be followed up as a result of this project, which will ultimately help to ensure that future surveillance and testing for CLso in Australia is as accurate as possible.

"This research has only been done on one cultivar, so it's important to know if the distribution of CLso in other cultivars of the potato is going to be the same and if this sampling strategy is the best for all cultivars of potato," she said.

"The distribution of CLso in the tubers was a small part of the project. The results showed that the distribution of CLso within the tuber was uneven and we would need to do more larger-scale research to determine reliable sampling methods of tubers to support certification programs. It would be a really good outcome for industry if we could do that."

Dr Mann also identified tuber storage and its effect on the concentration and detectability of the pathogen in the tuber as a potential area for further research, as well as looking at different environmental conditions.

"We were in the South Island of New Zealand – what would happen if we were in a drier climate or under irrigation?

“All of those factors would be very important to look at,” she said.

In addition to this project, another strategic levy investment is taking place at the South Australian Research and Development Institute (SARDI) entitled *Developing and implementing a high throughput diagnostic test for Candidatus Liberibacter solanacearum (CLso)* (PT17000).

This research is closely related to the work being completed at Agriculture Victoria, however SARDI researchers are developing protocols for automated, large-scale testing of potato leaves and tap root samples for area-wide surveillance of CLso. If these diagnostic protocols for high-throughput systems are found to be successful, they will also contribute to change on both the national and international stage.

The bottom line

While CLso has not been detected in Western Australia, it is still important for potato growers to plant certified seed to ensure the country can remain CLso-free, as well as keep other exotic plant pests at bay. Growers are also advised to continue monitoring their crops and keep an eye out for indicators of CLso, as zebra chip disease can significantly reduce the yield and health of potato crops.

“Growers should remain vigilant about looking out for symptoms and getting on top of CLso if it does arrive here,” Dr Mann said.

“Overall, I think the industry should be absolutely impressed with the amount of sampling that the Western Australian industry and government have done to test for CLso in Western Australia. The evidence they’ve gathered to demonstrate that CLso is not present is really impressive, and that stands for all of Australia.”



CLso cage trial at Plant & Food Research in Lincoln, New Zealand. Image courtesy of Rebekah Frampton.



Researcher Jess Furlong. Image courtesy of Rebekah Frampton.



CLso-infected tuber. Image courtesy of Elisse Nogarotto, Agriculture Victoria.



Swollen node. Image courtesy of Rebekah Frampton.

Find out more

Please contact Dr Rachel Mann at rachel.mann@ecodev.vic.gov.au.

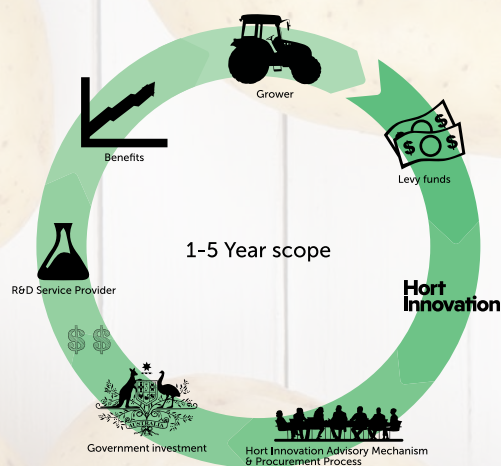
This project has been funded by Hort Innovation using the fresh potato and potato processing research and development levies and contributions from the Australian Government.

Project Number: PT17000

**Hort
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THE FRESH POTATO R&D LEVY AT WORK

STRATEGIC LEVY INVESTMENT



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.

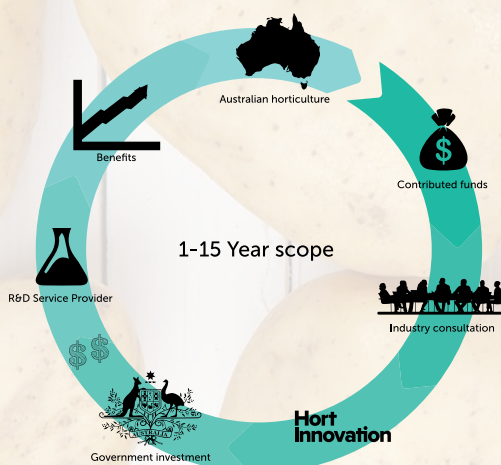
Strategic levy investments have a one- to five-year scope and the R&D is designed to directly benefit growers in the potato industry. Project topics range from pest and disease management to biosecurity matters, with findings communicated through a variety of channels, including *Potatoes Australia*.

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.

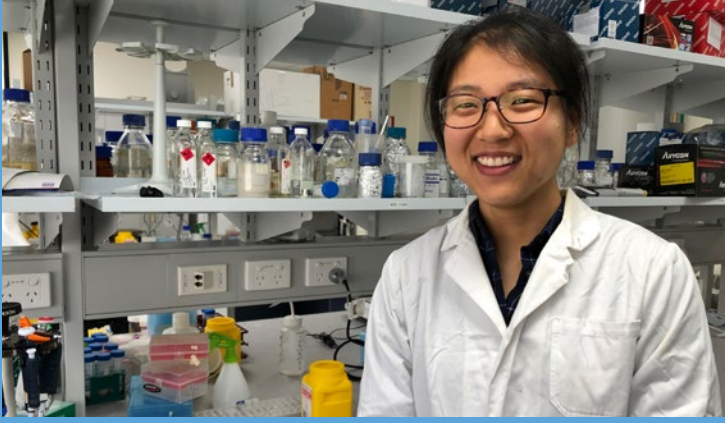
HORT FRONTIERS



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).



Mee-Yung Shin.



Varun Iyer.

Mee-Yung Shin and Varun Iyer: Where are they now?

In 2017, *Potatoes Australia* featured two students undertaking potato research at Australian universities. In this edition, Mee-Yung Shin and Varun Iyer provide an update on their studies, and their plans for the future.

Mee-Yung Shin
PhD in Agriculture,
University of Melbourne

Mee-Yung Shin is currently studying the host-pathogen relationship of potato and two major *Verticillium* wilt pathogens – *Verticillium dahliae* and *Verticillium albo-atrum*. This research aims to gain a better understanding of the implications that these diseases may have on crops and ultimately lead to increased knowledge about *Verticillium* wilt and its impact on Australian potatoes.

"The primary aims of my research are to characterise the pathogenic effect of *Verticillium* pathogens in resistant and susceptible potato cultivars; investigate their respective physiological impacts; and formulate a model for early disease detection," Mee-Yung said.

To conduct this research, Mee-Yung has used a wide range of techniques, including assessing plant colonisation and quantitative PCR (polymerase chain reaction) to detect pathogen loads in plants. PCR is a testing technique that can analyse DNA, even in minute quantities. She has also monitored early disease progression using near-infrared and thermal imaging techniques.

"The greatest challenge during my project has been in ensuring I maintain clear direction and purpose throughout my project," she said.

"It has been difficult to not feel discouraged when serial errors have occurred for months on end, and to maintain morale during times of slow project progression. I have learnt that it is absolutely crucial to be patient when undertaking research, and to be adaptive to change as the narrative of your investigation is often not what you expect."

So far, Mee-Yung's research has shown that *V. dahliae* is a more serious pathogen of potato in Australia.

"It consistently leads to more severe symptoms of disease and also infects a greater portion of individual plants," she said.

Next, Mee-Yung will finalise experiments investigating the use of non-invasive and portable machines to detect *Verticillium* wilt before symptoms present, and she is hoping to submit her thesis towards the end of 2019. Once she has completed her PhD in Agriculture, Mee-Yung is looking to go abroad to expand her knowledge base and gain an insight into how researchers and industry members around the world approach different problems.

Varun Iyer
Master of Biotechnology and Bioinformatics,
La Trobe University

Natural common scab suppressive soils have been identified in various locations worldwide, and their suppressive characteristics are dependent on soil microbiology. Varun Iyer's research investigated the diversity of the soil bacterial community in common scab suppressive soils, and the combined genetic material in common scab suppressive soil using DNA technology. His research aimed to profile bacterial communities in common scab suppressive and conducive soils, and to identify bacterial species that may be responsible for this disease suppression.

"Glasshouse studies demonstrated that the suppressiveness of common scab was biological in nature (with good microbes involved) and did not depend on the physiochemical properties of the soil," Varun said.

"Fungal DNA isolated from the common scab suppressive soil was performed but it did not yield satisfactory results. Due to time constraints, the experiment was not repeated."

Differences in the bacterial community composition were observed between the common scab suppressive and non-suppressive soils, Varun said.

"Furthermore, several bacterial genera were identified that may be contributing to the disease suppression, which corresponds to the previous studies performed to date," he added.

Varun said that identifying the common scab suppressive mechanisms will help researchers develop control measures for improving disease suppression in the field.

"This study might possibly lead to the development of certain agricultural practices to increase disease suppression or help in creating artificial genetic material to assist in common scab management. In the future, these will improve the quality and market value of potatoes, benefiting growers and the potato industry."

Varun completed his Master of Biotechnology and Bioinformatics in May 2017. He is currently working at Biocon Research Limited in India, but he has plans to undertake a PhD in agricultural bioscience and establish himself as a research scientist in both academic and industrial sectors.

Find out more 

Mee-Yung Shin is supervised by Professor Paul Taylor at the University of Melbourne and Dr Tonya Wiechel at Agriculture Victoria. Varun Iyer was co-supervised by Dr Tonya Wiechel at Agriculture Victoria.

For more information, please contact Professor Paul Taylor at paulwtj@unimelb.edu.au or Dr Tonya Wiechel on 03 9032 7347 or at tonya.wichel@ecodev.vic.gov.au.



Millie Shinkfield.



Sophie Riley.



Mango soft serve containing potato purée.

Potato dips, buns and ice cream: A way of the (waste-free) future?

Former University of Adelaide students Millie Shinkfield and Sophie Riley completed their Bachelor of Food and Nutrition Science degrees in 2015 and 2017 respectively, and both chose to focus on value-added potato projects during their Honours. They spoke to *Potatoes Australia* about their research and what they discovered about the humble spud.

As previously reported in this magazine, the Australian potato industry is the most significant but disproportionate contributor to horticulture production waste.

According to Potatoes South Australia, the state produces around 80 per cent of Australia's supermarket potatoes, as well as contributing heavily to the chipping industry. Of this total, approximately 80,000 tonnes of product is graded out as waste due to strict retailer standards.

Former University of Adelaide Food and Nutrition Science students Millie Shinkfield and Sophie Riley recognised this was an issue and decided to pursue research that focused on value-adding potato products.

Millie and Sophie were keen to gain knowledge in food technology rather than nutrition and dietetics research, as they were both interested in the technology components of their Bachelor of Food and Nutrition Science degree and wanted to pursue this area further. The opportunity arose to conduct a potato project as part of their Honours, which Millie began in 2016-17 and Sophie continued in 2018, and they were intrigued by the innovation aspects and benefits to the local community.

Spud study

Millie's project aimed to examine the attributes of four potato cultivars grown in South Australia, and explore the potential products in which each variety could be used.

"Potatoes naturally come in a huge variety of shapes and sizes, so I cut each potato into one-centimetre slices and boiled a standard weight of slices in a standard volume of boiling water. All were boiled for the same amount of time, except for the low-GI variety,

which required longer to soften due to the differences in composition," Millie explained.

"There were also a lot of variables to deal with due to measuring multiple attributes over multiple timeframes, but I ended up with a lot of interesting data."

Once the standardised method of cooking and mashing/puréeing potatoes was perfected, Millie measured changes in colour, pH, texture (pressure output from a standard probe), and moisture over five weeks' storage.

"The suitability of each potato cultivar in a dairy-free dip product was then explored. Further from Honours, I worked for the FOODplus Research Group to continue exploring applications for potato purée. This included potato buns, gluten free buns, wheat and gluten free crackers, gnocchi and savoury pies," Millie said.

Sophie continued this research by using the potato purée to create a basic ice cream base, which presented its challenges.

"We first incorporated the potato purée at a very high percentage to see how much we could utilise the purée to reduce waste," she said.

"However, due to the high starch and water content in the potato, the ice cream came out rock hard! As customers desire a fluffy, creamy and soft ice cream, we then decided to incorporate the potato at 0/10/20 and 30 per cent of the total. From here, we formulated the ice cream and conducted physical, chemical and sensory analysis of the iced dessert."

Key findings

During the project, Millie found there were big differences in certain aspects of the potato cultivars, which combined with the existing knowledge that some varieties are better suited to certain cooking methods than others.

"Overall, the white skinned potato was found to have the best versatility, but all performed well in the dip products (they did not split from the oil, were glossy and had good flavour). I was happy with the dips produced – especially the smoked salmon and dill dip using local smoked salmon off-cuts, which is an added waste-reduction bonus," she said.

"I would love to see this on the shelf as a South Australian product. The products I developed at FOODplus were successful

too, with high whole potato purée contents (up to 30-40 per cent for some products). My favourites were the gluten free crackers and potato hamburger buns; I think these have a lot of potential if they are taken on by industry."

Meanwhile, Sophie's results showed that purée formulations of 20 and 30 per cent created a substantial decrease in total solids, fat, sugar and energy in potato ice cream. The addition of a potato purée caused significant increases in hardness and melting time, but a decrease in the overrun; that is, the air that adds to the 'fluffiness' of ice cream.

"The sensory evaluation findings reported no significant difference of potato purée in the appearance and aroma of the samples, but changes in sweetness, flavour and texture became significantly more undesirable ($p < 0.05$), particularly for the higher levels of potato. Overall, the ice cream could be very successful with a little more tweaking – especially with the rise in demand for plant-based and dairy-free iced desserts," Sophie said.

Further research

Currently Millie and Sophie are working for Mexex, a wholesale contract manufacturer specialising in sauce products. Millie is working as a Quality Assurance Assistant, and Sophie is a Customer Service/Freight and Logistics Assistant, but also works in quality assurance from time to time.

The pair is eager to continue working in the food technology sector.

"The pressing issue of food waste, and the requirement for innovation across multiple industries to alleviate this, is such an interesting area of research. I'd like to continue gaining experience in the local food industry before applying my skills to further my research in this area," Millie said.

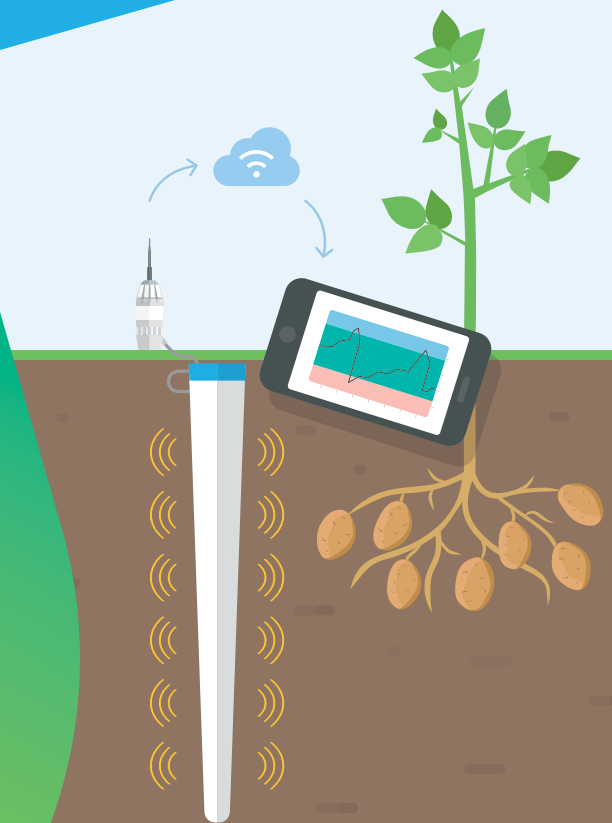
Sophie agreed with her workmate.

"Definitely down the track it would be interesting and exciting to carry on with further study in the field of reducing waste in the food industry – whether it be further research and more depth into creating an ice cream with potato, or using another 'waste' fresh product," she said.

"After gaining experience in the food industry it would be good to see just how production lines work and the issues that can arise with sourcing ingredients or packaging."

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Find out more 

Please contact Dr John Carragher from the University of Adelaide, Food Innovation School of Agriculture, Food and Wine at john.carragher@adelaide.edu.au or Potatoes South Australia Chief Executive Officer Robbie Davis at robbiedavis@potatoessa.com.au.



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Industry seeks regulatory assurance should TPP spread

In this edition, National TPP Coordinator Alan Nankivell discusses the latest activities being undertaken by Australia's eastern states to safeguard trade should tomato-potato psyllid spread, or the bacterium it can carry be discovered. Growers are also encouraged to get involved in a range of TPP consultation sessions around the country in June and July.

In December 2018, the regulators from South Australia, New South Wales, Victoria and Queensland agreed to a commitment (with clarification) for business continuity across the four states, known as the eastern bloc. The clarification was that the movement of potato tubers would continue if it was found that tomato-potato psyllid (TPP) had spread from Western Australia.

Members of the Plant Health Committee are seeking an industry statement, endorsed by all industry stakeholders, that if TPP and the bacterium it can vector – *Candidatus Liberibacter solanacearum* (CLso) – is found in the states of New South Wales, Queensland, South Australia or Victoria, that potato tubers will not be subject to interstate trade barriers.

Industry stakeholders are wanting business continuity without the possibility of trade barriers even if TPP is detected in the four states and is found to have CLso. It should be noted that approximately 80 per cent of all fresh potatoes move across state borders and approximately 60 per cent of processing potatoes move between the four states. The potato tuber supply for both fresh and processing comes from all four states.

Industry stakeholders in the eastern states do not want to see a repeat of the

Western Australian experience where growers lost millions of dollars in product because it could not move out of the state. It is their view that the industry would be economically devastated if trade restrictions were imposed within the four states making up the eastern bloc, as hundreds of employees would be put out of work and growers would lose their livelihoods.

Maintaining vigilance

With the establishment of TPP in Western Australia – and supported by the international experience – it is considered only a matter of time for TPP to arrive in other states. Therefore, it is paramount that there is ongoing surveillance for TPP across the nation as well as ongoing testing of TPP in Western Australia for CLso. Interestingly, there has been no CLso detected in TPP over the last two seasons.

There are several other important factors to consider; firstly, that TPP has been found in very low numbers in potato fields in the west. It is the Western Australian potato industry's view that current on-farm management practices to manage other pests is also keeping numbers low. Secondly, the international experience with TPP/CLso is that both the pest and bacterium is managed in the field and at the processing facilities. This has required the introduction of new on-farm practices, including Integrated Pest Management approaches and waste management at the factory; however, business is continuing to grow.

Although TPP is now considered as endemic to Australia, CLso is still considered an exotic plant pest and therefore would trigger the Emergency Plant Pest Response Deed (EPPRD) if detected. Under current arrangements, the respective states take responsibility

for managing incursions of exotic pests. Industry stakeholders are seeking an articulated process as to how the TPP/CLso complex would be managed to mitigate the spread of the complex and ensure that trade would continue.

Industry stakeholders cannot stress enough the major economic impact that any form of quarantine – where the movement of tubers was curtailed – would have on the industry.

Get in touch

A series of consultations is planned with growers, grower groups and industry bodies across the four states within the eastern bloc to discuss the opportunities to ensure that potato tubers continue to move between states regardless of an incursion of TPP/CLso. The date for the consultations will be organised in collaboration with your respective state organisation and you will be notified.

I look forward to receiving your considered comments by email at alan.nankivell@ausveg.com.au or on 0428 260 430 by 25 July.

Find out more R&D

Please contact National TPP Coordinator Alan Nankivell at alan.nankivell@ausveg.com.au. Tomato potato psyllid (TPP) National Program Coordinator has been funded by Hort Innovation using the fresh potato, potato processing and vegetable research and development levies and contributions from the Australian Government. Project Number: MT16018

**Hort
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Masterclass students on a field trip with Jan Vydra from Fresh Leaf Farms Limited.

Changes to horticultural masterclass introduced

Following a successful two years since its introduction, the Masterclass in Horticultural Business course is now open for mid-year entry and part-time study options to allow additional flexibility for students to complete the program.

The Masterclass in Horticultural Business was launched in 2017 by the University of Tasmania, in partnership with some of the world's leading names in horticulture, including New Zealand's Lincoln University, the Wageningen Research Academy in the Netherlands and Hort Innovation. The 10-month program is delivered predominantly online, with several face-to-face workshops and on-farm experiences, and is designed to give anyone already working or studying in Australian horticulture a pathway to leadership through the development of business and management skills; a comprehensive industry understanding; and invaluable networks with some of the sector's savviest growers and industry members.

The course runs on the traditional university term timetable, but until now has only been available annually as a full-time program to be commenced in term one (each February). To allow students to better tailor the program to their busy professional lives, the Masterclass will now be available for commencement in term three on 15 July, with the option to study part-time.

Developing a business plan

The Masterclass is based around the development of each student's personal strategic business plan via a range of engaging, interactive and flexible learning methods. Upon completion of the program, participants will present their strategic business plan to a panel of experts from both the education and professional sectors. This allows students to build the knowledge needed to take their careers further and develop a fully realised pathway for the future ahead.

The Masterclass is designed to accommodate each student's individual needs and ambitions. Previous participants have included:

- Those looking to undertake the course as succession preparation for the businesses they work for.
- Those looking to start their own horticulture business, or have started their own business and want to take it to the next level.
- Those working in horticulture who are looking to upskill for career progression ambitions or strengthen their current positions with broadened business capabilities.
- Those who have been involved in running a horticulture business for some time, but who are looking to bring that business up to speed in the contemporary horticulture and consumer landscape.

The course is also designed to be accessible for those with no previous academic or tertiary education experience. Entrance to the course is determined by each participant's experience in the field.

Course structure

The course is divided into the following modules:

- Horticulture management.
- People and culture.
- Supply chain management and logistics.
- Financial management and law.
- Horticulture marketing and communication.
- Global trends and international business.
- Innovation and entrepreneurship.
- Business development and strategy.
- Portfolio and practice.

These modules are delivered using a dedicated online platform. Alongside this, student interaction is encouraged via online groups. The program also includes three face-to-face interactive weekend sessions where participants undertake workshops, have access to teachers and supervisors, get to know their fellow students, and visit a range of farms to learn from some of the best in the business.

Scholarships available

The Masterclass in Horticultural Business will cost students around \$10,000.

However, just like any tertiary program, this can be paid upfront or over time using the HECS-HELP scheme. To find out more about the HECS scheme, visit studyassist.gov.au/help-loans/hecs-help. There is also a select number of vegetable industry scholarships available for anyone currently working in the sector.

Applications for the July intake of the Masterclass in Horticultural Business are now open. To learn more and apply online, visit the University of Tasmania at utas.edu.au/tia/study/masterclass-in-horticultural-business.

Find out more R&D

More information about the Masterclass in Horticultural Business can be found at hortfrontiers.com.au/leadership-fund.

Global Masterclass in Horticultural Business is funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from the University of Tasmania and contributions from the Australian Government.

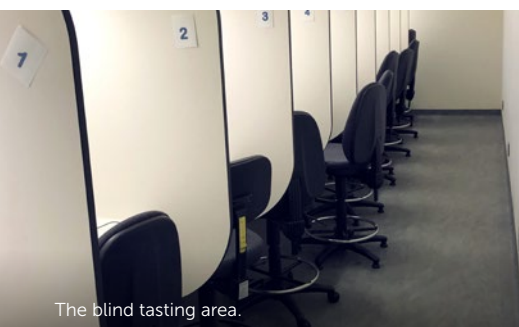
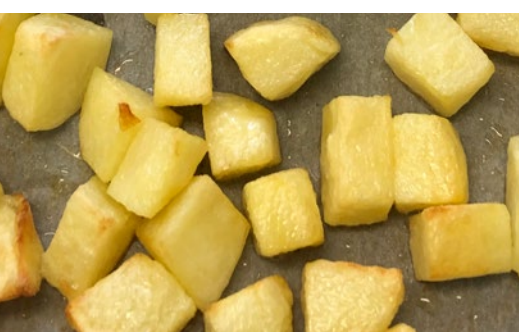
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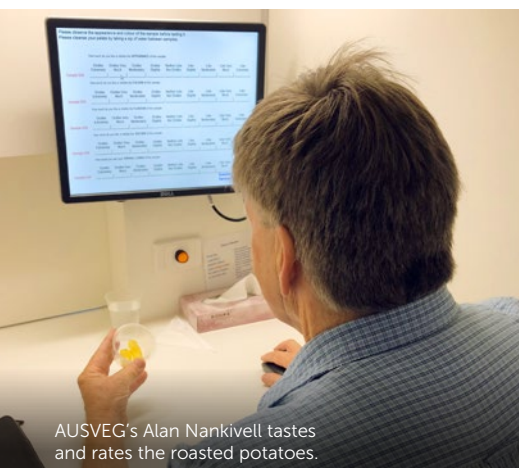
Sensory and consumer testing benefits potato producers



Gayle Smith prepares the potatoes for tasting.



The blind tasting area.



AUSVEG's Alan Nankivell tastes and rates the roasted potatoes.

Earlier this year, *Potatoes Australia* featured an article on researchers in South Australia who are conducting sensory and consumer testing for the state's food producers. In this article, South Australian vegetable producer Zerella Fresh explains why the company participates in this sensory testing and how the process can better inform the type of potato varieties that are stocked on supermarket shelves.

Over the past few years, the South Australian Research and Development Institute (SARDI), the research division of Primary Industries and Regions SA (PIRSA), has been conducting sensory and consumer testing for South Australian food producers, including the potato sector, as part of a broader food technology program funded by PIRSA. Recently, the team at *Potatoes Australia* was given a behind-the-scenes tour of the process and the customers who take part in this testing.

In the sensory space, various projects are undertaken for a range of customers, including growers, industry associations, individual companies or large retailers. An example of an individual business getting involved in sensory and consumer testing is South Australian growing operation, Zerella Fresh.

Zerella Fresh produces in excess of 100,000 tonnes of potatoes, 40,000 tonnes of carrots and 30,000 tonnes of onions each year, and has been proactive in testing which varieties of potatoes are best placed for retailers including Woolworths, Coles and Aldi.

A sensory experience

When *Potatoes Australia* visited SARDI's sensory testing facility, sensory and consumer testing was well underway using 200 kilograms of Zerella Fresh potatoes across five tasting sessions. It was the second major sensory test for the growing operation, while in-house testing is undertaken every two weeks.

"We grow 100 controlled varieties every year, but the ones that we want to continue with – if they meet some

of the agronomy requirements on the farm side – we'll put them forward for testing," Zerella Fresh Quality, Health, Safety and Environment Manager Daniel Guadagnin said.

"This is to gauge the consumer experience. If they do perform well here, we'll continue the development process and potentially grow them commercially."

Taste is a major factor when determining which potatoes to supply to retailers.

"It's fine if they yield well, the quality is great and they've got shorter growing times resulting in less water inputs. But at the end of the day, it's the consumer who is buying them, so you also need to make sure that they taste great and they also cook up well," Zerella Fresh Marketing and Media Manager Renee Pye added.

Zerella Fresh meets with retailers including Coles, Woolworths and Aldi around once a month to discuss how products are performing and the varieties being tested. Sensory and consumer testing has proved to be beneficial for Zerella Fresh in terms of understanding consumer needs and taste preferences, and using this data in retailer discussions.

"When it comes to tenders, we get asked to deliver what we think consumers want and the reasons why we think that," Ms Pye said.

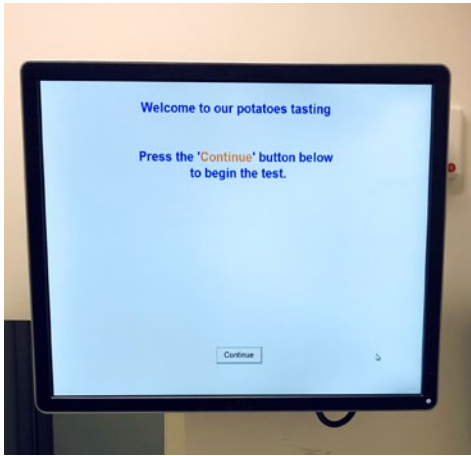
"These sensory analyses really help to back-up that argument and we can also work together to start growing a commercial volume of other samples, if they yield well and work for the consumer."

Zerella Fresh's Spud Lite variety passed the sensory and consumer test after Managing Director Mark Pye sourced this low-carb variety from the Netherlands in 2013.

"It tested well for taste and cooking. We also did tests to compare it as a low-carb option – because what's low-carb in Holland may not be low-carb here, with the soil differences and the growing environment," Ms Pye explained.

"It came back as low-carb, which was really good. And then we did the full screen testing and investigated the legal side so we could potentially market it as a low-carb potato."

The company's Daisy variety was also successfully tested and commercialised after it proved to be ideal for baking and frying.



In the meantime, the growing operation is awaiting the results from its latest sensory venture.

“Once we get the results, we’ll have a roundtable discussion internally and see if there are any other marketing campaigns we can do and if there is an outlet that we can develop,” Mr Guadagnin said.

Find out more **R&D**

Please contact Renee Pye on 0400 766 093 or at reenepye@zerella.com.au or visit zerellafresh.com.au.

Potatoes on the menu for tasting participants

AUSVEG representatives recently visited SARDI to undertake a potato tasting and tour the sensory facility located at the University of Adelaide’s Waite Campus. SARDI was recruiting consumers to sample a range of cooked potato varieties and provide their feedback.

Potato-loving participants were able to sample five cooking methods for potato, including boiled, fried, roasted, baked and mashed. AUSVEG staff joined other consumers in tasting roasted potato varieties.

Firstly, we observed the process in the tasting facility, which was organised by SARDI sensory scientist Dr Yaelle Saltman. Dr Saltman and her assistant Kate Hodgson were busy sending samples to individual cubicles where consumers blind-tasted the roasted potatoes.

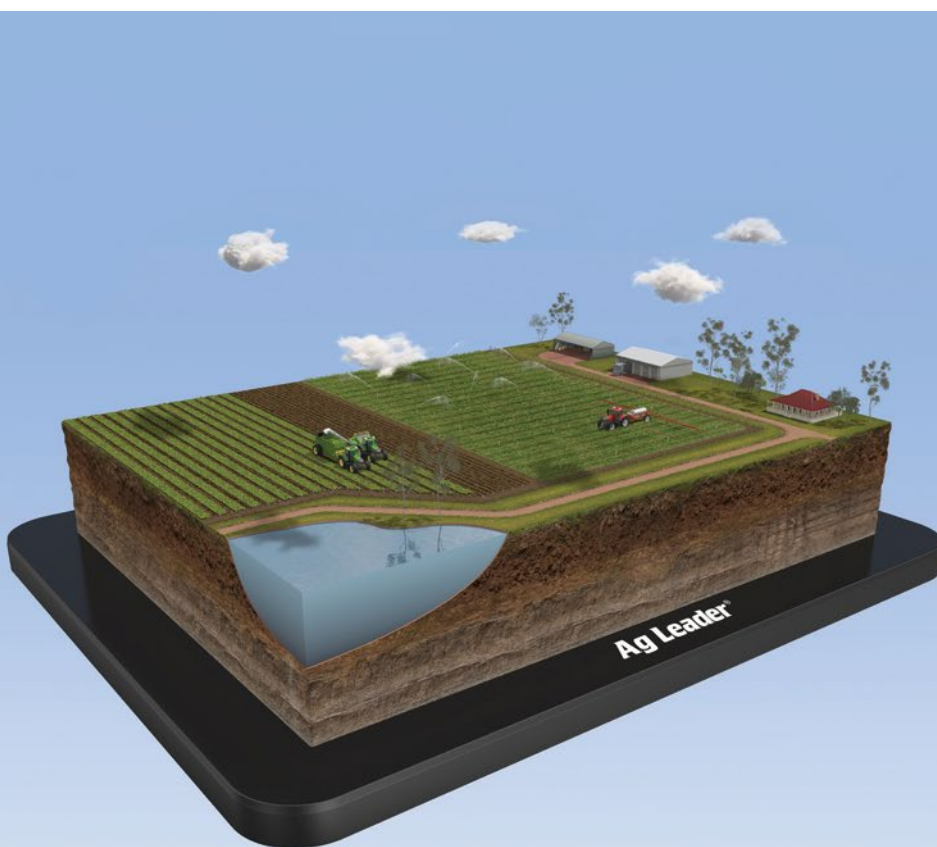
AUSVEG staff then tasted a sample of roasted potatoes, before rating the level of like or dislike (in a 9-point hedonic scale) from ‘dislike extremely’

to ‘like extremely’. The overwhelming opinion was more towards the higher end of the scale (roasted potatoes are generally very tasty!) and it was a fascinating insight into how these tests are conducted.

Following the tasting, staff visited the main kitchen where the potatoes were prepared and cooked by microbiologist-turned-chef Gayle Smith. Gayle was keeping a very close eye on the oven, where all the potatoes were cooked for the same time at the same temperature to maintain consistency (and not influence the sensory results).

AUSVEG would like to thank SARDI Food Technology Program Leader Dr Andrew Maronich, Dr Saltman and their team as well as Zerella Fresh for organising the potato tasting.

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



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Western Australian seed potatoes open for business

The Western Australian Certified Seed Potato Scheme plays a vital role in the state’s potato industry, and has overcome recent challenges to continue to produce quality, clean seed. The Western Australian Department of Primary Industries and Regional Development Diagnostic Laboratory Services – Seed Testing and Certification Manager Mike Davies provided this update.

The Western Australian potato industry has been through a tough time over the past few years. The demise of the Potato Marketing Corporation in 2016 and the 2017 detection of tomato-potato psyllid (TPP) in the Perth metropolitan area, as well as *Dickeya dianthicola* in Western Australia, had direct impact on potato producers and created uncertainty within the industry.

Since that time, the seed potato industry has fought to overcome adversity through good practice. With support from the Western Australian Department of Primary Industries and Regional Development (DPIRD) and the Minister for Agriculture and Food, it has returned to producing high-quality potato seed that takes its place among the best in the world.

While Western Australia has continued to export high-quality seed to international markets, the domestic borders were closed to the state in light of TPP detections. While not a significant pest in its own right, TPP can be a vector for the bacterium *Candidatus Liberibacter solanacearum* (CLso) which causes zebra chip in potatoes and ultimately can result in significant loss in the industry.

Western Australia has undergone a rigorous surveillance program over the

past three years, trapping many thousands of psyllids and testing for the presence of the bacterium. The statistically significant monitoring effort has shown that the bacterium is not present in Western Australia, a position accepted at a national level by the Department of Agriculture and Water Resources.

Western Australian seed potatoes can now enter eastern state markets and trade has resumed.

Best practice seed potato certification schemes

DPIRD has played a pivotal role in the delivery of the industry’s seed potato schemes since its implementation around 1994. Our scheme’s rules are based on the National Standard and allow us to implement a higher standard where we consider it necessary.

This best practice process overseen by DPIRD incorporates training, field inspection, tuber inspection, high traceability through specialised databases and strong record keeping to support the industry and to facilitate the expansion of our export markets.

The successes in recent years are well-reflected in the results of ongoing virus testing and the absence of blackleg symptoms and other diseases across the Western Australian schemes.

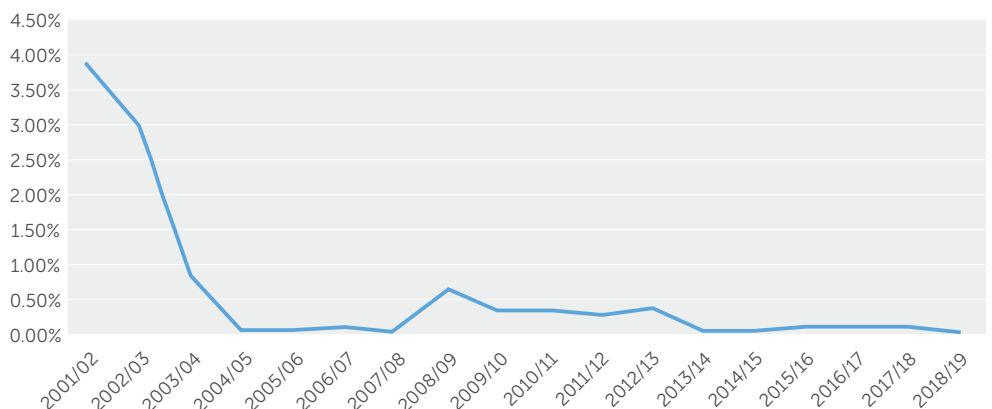
Virus levels at an all-time low

Western Australia has conducted long-term virus surveillance within our seed potato schemes. This surveillance has been funded by the potato industry in Western Australia through the Australian Produce Commission Potato Producers’ Committee.

Surveillance of generation two sown crops (producing generation three seed) enables the schemes to identify potential virus problems before they become widespread. Any virus detections can be eliminated out of the schemes early.

The focus and commitment to virus elimination is reflected in the near zero level in 2018-19. Samples are collected and tested in the DPIRD virology laboratory. There were no detections of potato leaf roll virus, potato virus Y, potato virus X or potato virus S across the surveillance program and only one

Western Australian seed potato (generation 3) virus testing results



Courtesy of Western Australian Department of Primary Industries and Regional Development.



detection (at low levels) of tomato spotted wilt virus. These results assure our markets that virus levels are negligible in Western Australian seed.

Potato spindle tuber viroid (PSTVd)

PSTVd is known not to occur in Western Australian seed potato producing areas. Over the past three seasons, DPIRD has conducted surveillance for this pathogen on behalf of industry. Every property producing seed potatoes has been sampled and tested for the presence of PSTVd. There have been no detections of the pest. This surveillance provides important data to support the claims that PSTVd has not been detected in Western Australian potato growing regions.

No detections of blackleg in WA seed schemes

Blackleg caused by *Dickeya dianthicola* and *Pectobacterium* spp. is an emerging issue for Australia. In 2017, Western Australia had a detection of *Dickeya dianthicola* within the schemes. This initiated an incident response from DPIRD and a tightening of the Western Australian seed schemes with relation to blackleg.

Since 2017, inspectors have been vigilant in the assessment of crops and no symptoms of blackleg have emerged.

Colin Ayres: Representing seed potato producers in the west

Colin Ayres is Chair of the Seed Potato Growers Association of Western Australia, an advocacy group that looks after the interests of the state's seed potato growers and the wider industry. As a respected third-generation potato grower in his own right, Colin runs a 100-hectare certified seed potato operation under a state scheme that he describes as "robust".

"Having an independent certification body in Western Australia has been one of our biggest assets, from an industry point of view. And we're looking for that to continue," he said.

"The biggest asset of DPIRD doing the seed certification is when we trade overseas, we have Department of Agriculture labelling, which is pretty transparent. It gives customers confidence that what they're buying is authentic.

"Since the introduction of pathogen-tested mini-tubers, we've seen the virus levels really cleaned up, and this is now to a point where our virus levels are very low in Western Australia. The WA scheme is probably well ahead of the game."

The scheme is ever-evolving, and Western Australian seed producers can have their say on what changes should be implemented.

"We're continually looking at different things to improve, so the scheme is a work in progress at any given time. It certainly hasn't been written and forgotten," Colin said.


"We have a voice there and if there's a rational, reasonable argument, chances are it will gain some traction. There are some good checks and balances along the way to keep that scheme coming along."

Colin said that hygiene and traceability are key to growing clean, quality seed potatoes. Paddock planning is a must to avoid inter-generational contamination – ensuring mini-tubers, low-generation crops and high-generation crops remain separate. It is also vital to clean machinery when moving between paddocks, varieties and generations.

Recently Colin, his wife Janine and son Chris invested in a state-of-the-art potato seed grading line after seeing it in action in Europe. The Visar Optical Sorter can sort unwashed potatoes consistently and efficiently, and recognise up to 16 types of defects in an unwashed potato. It can also allow for manual input to tailor the size of any tuber in a particular line during grading.

Colin said that high-quality grading is relative to producing high-quality seed, and it is vital to have a consistent product – particularly with the opportunity of increased domestic and international trade.

"It gives us an option to grade to a very high standard without the labour costs. We can size to whatever our customers require. It gives us a lot more options to give our seed a better outcome for our growers."

Find out more 

Please contact Mike Davies on 08 9368 3505 or michael.davies@dpird.wa.gov.au or visit agric.wa.gov.au.

Machinery specialists offer local support to growers

Potato growers in Australia and New Zealand rely on a range of machinery and equipment to improve efficiencies and increase productivity in their businesses. In Tasmania, a family-owned business works with growers on a range of solutions to suit specific harvesting, bulk handling, grading, packing and palletising requirements.

While the golden age of manufacturing in Australia may be over, potato growers can take comfort in the fact that there is still some equipment that is manufactured on home soil – specifically, the Apple Isle.

Tasmanian business Dobmac Agricultural Machinery (established in 1983) is one of the last local manufacturers of potato planters, a title that General Manager Mark Dobson wears proudly. In addition to supporting Australian workers and the economy, one of the benefits of local manufacturing is the ability to add versatility, flexibility and local ongoing support to customer orders.

The potato planters feature a positive clamp style mechanism and hydraulic drive system providing in-cab control of seed, fertiliser and liquid chemical rates. Dobmac offers customisable options to suit all soil and terrain types, (i.e. disc or tine openers, track eradicators and disc closers or ridger bodies). The company also offers equipment for soil preparation, planting and harvesting through to washing, sorting and packing systems, as well as consultancy and project management.

In each case, Dobmac personally interacts with growers and international suppliers to offer bespoke solutions that will best suit its customer requirements. It is common for this process to extend for as long as 2-3 years, and often includes collaborating with several suppliers to integrate drawings and control systems.

“We operate one-on-one with customers. We’ll sit down with growers and look at their requirements; what they’re trying to achieve; what they’ve currently got; how they want to change it; and go through the whole process to come up with something that’s going to suit what they need both now and into the future,” Mr Dobson said. “Getting to know customers and their business operations is a very rewarding part of my job.”

Dobmac can manage the whole project from concept to completion. This includes co-ordination of intricate design layouts; foreign currency purchases; freight and transport; installation; commissioning; operator training; and ongoing customer service and support.



Dobmac General Manager Mark Dobson.

Local knowledge

Annual machine servicing and maintenance is also available to ensure equipment is running efficiently. In cases where machinery and equipment are imported from Europe and the United Kingdom, the company’s local technicians learn how the machines operate and how to fix any issues should they arise once the equipment has been delivered to the grower.

“We send technicians to Europe and the United Kingdom for training and if it’s a new installation, we’ll often bring a technician out from Europe to make sure that we know as much as possible. The customer can then get the correct training with their specific equipment,” Mr Dobson said. “Our extensive range of spare parts and after-hours technical support helps reduce customer down time.”

Along with its Ulverstone facility, Dobmac has two technicians and a large spare parts warehouse in Pukekohe on New Zealand’s North Island, while in 2018 it partnered with New Zealand Tractors to provide spare parts to New Zealand’s South Island.

The Dobmac team and representatives from its three largest suppliers will be available to speak with potential and existing customers at Hort Connections 2019 (visit stand 154-156).



Find out more

Please contact 03 6425 5533, visit dobmac.com.au or find Dobmac on Facebook: 'Dobmac Ag Machinery'.



Managing a young workforce

When employing workers under the age of 18, there are a number of employment laws to abide by as well as guidelines to follow to ensure their safety on the job. In this column, the Fair Farms team discusses how to make the workplace a safe and productive place for minors.

A rite of passage for many Australian teenagers is their first part-time or casual job. These jobs have numerous benefits: they develop skills and experience; it prepares them to be productive members of society; and increases their self-esteem and resilience.

Despite these benefits, workers under the age of 18 are particularly vulnerable in the workplace. In fact, the agriculture industry has the highest rate of serious injuries for young workers. This may be because they are:

- Still developing their skills.
- Lacking experience to judge risk.
- Hesitant to ask questions or report issues.
- Enthusiastic to make a good impression.

So, how do you effectively manage young workers to ensure they learn valuable skills and stay safe? Fair Farms promotes some key processes and behaviours to ensure work does not interfere with minors' education, health, development or safety.

Child labour: Fair Farms advocates that no child under the age of 13 should be employed. Children are at high risk of injuries, especially on farms. You should check the ages of all workers and keep a register as evidence of this.

State laws: Each state and territory has its own youth employment laws that cover when minors can start work, and any restrictions on what hours they can work. At a minimum, work should never interfere with minors attending school. You can find more information at fairwork.gov.au/find-

[help-for/young-workers-and-students/what-age-can-i-start-work](#).

Health and safety: You should consider the age and skills of young workers, to make sure the tasks and responsibilities they undertake are appropriate. In considering this, workers under the age of 18 should not:

- Work with or around harmful chemicals.
- Use or operate machinery.
- Work without supervision.
- Work in very loud environments.

Make sure you also pay special attention to how long minors work for, when they work and any additional or tailored training they might need around safe work practices.

Work environment: Teenagers' minds are still developing, so you should be careful and make sure the work environment is appropriate. This includes avoiding exposure to:

- Vulgar language.
- Alcohol.
- Non-prescription drugs.
- Images or conversation of a sexual nature.

The key to making sure all of these procedures work is to create and foster a culture of awareness and consideration. Talk to other workers when you employ minors and discuss the special considerations everyone has to ensure a safe and productive workplace.


These and other important topics are covered in the Fair Farms Standard, which sets out the accepted principles of fair and ethical employment in horticulture.

For more information, including how to become a Fair Farms certified employer, visit growcom.com.au/fairfarmsinitiative or email fairfarms@growcom.com.au.

Fair Farms: Project Implementation Update

Fair Farms training and certification is the horticulture industry's proactive response to identified problems around workplace compliance. This important industry-led initiative went live on 11 June 2019. From this date, growers and other participants can register to begin their training and certification pathway.

The official launch of the program will take place at Hort Connections 2019 in Melbourne from 24-26 June. If you are attending, please feel free to meet the Fair Farms team at Growcom's trade booth (stand 110-111). We look forward to seeing you there!

Find out more 

Visit fairwork.gov.au and growcom.com.au for more information regarding your obligations as an employer.

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



No quick fix for acrylamide in processing potatoes

Since it was discovered in potatoes 17 years ago, acrylamide continues to be an issue for the global potato processing industry. At the European Association for Potato Research (EAPR) meeting in March 2019, Rothamsted Research Professor Nigel Halford provided an update on regulations and progress towards low acrylamide risk potatoes. Heather Briggs reports.

Acrylamide is a huge challenge for the potato sector, Rothamsted Research Professor Nigel Halford told the audience at the European Association for Potato Research (EAPR) meeting held earlier this year in the United Kingdom.

The substance is formed when the amino acid, asparagine, interacts with sugars in the presence of heat, such as making chips or crisps or baking bread. Classed as a probable, Class 2A cancer risk, acrylamide was first discovered in starchy foods in 2002.

Almost immediately the big food producers worked on reducing tuber sugar concentration, achieving a huge drop by 2011. Since then, levels have plateaued – partly because if they fall any lower, they would lose the very characteristics that consumers are looking for (such as crunchiness), Professor Halford said.

New legislation on acrylamide came into force last year, setting a new European Benchmark level at 750 parts per billion (ppb) for crisps and 600 ppb for chips.

One of the challenges the potato industry faces is long-term storage, as this plays a key role in acrylamide formation.

“When potatoes are stored in cold or refrigerated conditions, and then taken out and fried or roasted, they generate higher acrylamide levels,” Professor Halford said.

“While processing potatoes are already stored warmer, those destined for the fresh market are generally kept at colder temperatures – including those stored by retailers and consumers.”

Tuber dormancy is maintained longer at lower store temperatures and helps delay sprouting, so there is less need for sprout suppressants (which are under the eagle eye of the regulator). However, potatoes kept in cold storage convert starch into sugar as the tuber protects itself from the potential effects of frost on osmotic pressure, leading to higher sugar levels.

High sugar levels also affect fry colour, which results in undesirable deeper colours for the processing sector and contribute to the production of acrylamide.

“We need to engage with the threat acrylamide imposes,” Professor Halford said.

Variety differences

While sugar is the main focus, bringing down asparagine levels is also important. Varietal differences play a key role in reducing acrylamide, and Professor Halford pointed out that processors have developed varieties with lower sugar.

As the potato industry moves towards lower acrylamide, there have already been important changes with markets lost and won on acrylamide potential: old crisping favourites such as Pentland Dell have lost out to the likes of Markies, which has a slower increase in sugars during long-term storage.

A choice of varieties with reduced asparagine concentration in the tuber would also be helpful, Professor Halford added.

In the United States, Simplot has recently begun to market low-acrylamide biotech (genetically modified; GM) potato varieties which have reduced tuber activity of an asparagine synthetase gene. Known as Innate Generation 2, it also has better sugar stability during storage.

“There is absolutely no prospect of the development of commercial GM varieties in Europe, but new biotech techniques (genome editing) may be applicable,” Professor Halford said.

“What happens in the field can also affect levels of asparagine; moderate drought stress can help keep it relatively low, and irrigation can raise concentration. While this may suggest that growers should perhaps only irrigate for crop health, it is not the answer as different varieties may behave differently to water stress and there is no single, unifying potato tuber drought stress response.”

Professor Halford noted that nitrogen application can increase acrylamide-forming potential in potatoes but the

effect is type-dependent, with French fry varieties showing an increase in response to nitrogen that is not apparent in chipping/crisping varieties.

“Even within type, different varieties exhibit different responses – making the situation even more complicated,” he said.

Sulphur application at 15 kilograms per hectare mitigates the effect of high nitrogen application on the acrylamide-forming potential of some varieties. Quality control in processing is also crucial; optical sensors are being developed to control measures. For example, crisps could be made from potato flakes and asparagine broken down before cooking. However, such methods add expense and would require the use of additives.

Professor Halford said research has discovered that the proportion of glucose to fructose impacts acrylamide formation, with a high ratio of glucose to fructose having potential benefits.


Another recommendation is blanching French fries and adding glucose back. While the processing sector has already made good steps forward to mitigate the problem, the professor said the rest of the industry also needs to take it forward.

“One of the challenges is how to inspire smaller companies, such as restaurants, to not only choose ware varieties with low sugar levels, but also to cook them to a lighter colour and not to put the potatoes back in the oven for a further 10 minutes so they are served with a darker colour,” Professor Halford said.

“Breeders and agronomists also have a big part to play in addressing this important problem.”



Professor Nigel Halford.

Find out more 

Please contact Professor Nigel Halford at nigel.halford@rothamsted.ac.uk.

Bringing a touch of Ireland to Crookwell

The annual Crookwell Potato Festival is a true community event that brings local growers, businesses, community groups, visitors and townsfolk together to celebrate the local potato industry, raise the profile of the potato and recognise its significance to the New South Wales district.

On 11 May, a record crowd of around 3,000 people attended the 2019 festival, which raised a significant amount of money for local charities and community groups. The Charity Spud Auction took centre stage at the festival and only one tuber (‘Cranberry Red’) was put up for auction, raising \$2,000 (see more on page 35).

This year’s festival had a strong Irish flavour with the Embassy of Ireland Deputy Head of Mission Eamonn Robinson and his wife Sara Milne in attendance.

Mr Robinson spoke about the history of the potato and its historical significance to both Ireland and Australia, while live performers entertained the crowds with Irish music throughout the day. This approach was well-received and there are plans to incorporate a theme into each festival going forward.

Other highlights of the event included cooking demonstrations by Lyndey Milan OAM from Flame Media and Juliet Cullen from Excelsior Peak Wines

in Tumbarumba.

Upper Lachlan Shire Council Events Marketing Officer Brian Faulkner said organisers were very pleased with how the event unfolded, adding that it gave a boost to the town’s retail outlets and eateries.

“It brings a lot of people into town and raises the profile of the town in general; even if people don’t come for the potato festival itself, they hear about it and think ‘that’s really interesting, I’ll come to Crookwell and check it out’. There are a lot of flow-on effects,” Mr Faulkner said.

Grower focus

The Crookwell Potato Association and its growers also pitch in to help on the day and give attendees a chance to speak to local producers. CPA President Garry Kadwell conducted tours to showcase biodiversity on his farm, while others sold bags of potatoes for a gold coin donation.

It is this inclusiveness and ability to bridge the gap between grower and consumer that makes the festival so unique.

“It’s a festival around the potato – but it’s more than that. It enables people to interact directly with the growers who produce the potatoes and it brings the whole community together,” Mr Faulkner said.



L-R: Garry Kadwell, auctioneer Ric Opie and Lyndey Milan OAM with the Cranberry Red tuber.



Eamonn Robinson and Sara Milne present to the audience.



Members of the Crookwell Potato Association with Eamonn Robinson and Sara Milne.

Find out more

Please visit crookwellpotatofestival.com.au.



Photography by LJM Photography.

James Downey

Age: 31

Location: Wallace, Victoria

Works: Downey & Co Trust

Grows: Innovator, Snowden, Bliss and FL (fifth generation) potatoes; oats and barley

How did you first become involved in the potato industry?

I was born into the potato industry with both my parents running and working the family farm. When I was 19, my father passed away; my mother Elisabeth continued to run the farm and I would help her out. I am a boilermaker by trade and when I finished my apprenticeship at 21, I became more involved with the running of the farm. The past six years, I have taken on more responsibility and running of the farm with help from Mum.

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

I am responsible for the day-to-day operations of the farm in partnership with my mother. My responsibilities include feeding the livestock, and depending on the time of the year, organising planting/harvesting/grading potatoes, including any contractors that would be needed to complete these. I put in solid set sprinkler systems to water the potato crops and use irrigators.

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

I enjoy the end of the potato season, as you see where all your hard work has gone to with the finished product.

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

Diseases such as potato virus Y (PVY) are a challenge. We do our best to try and buy clean seed to avoid PVY. Other challenges are: common scab, powdery scab and, at times, grub. We keep our rotations of paddocks as long as possible to stop these occurring. The market is very much a

supply and demand market, which can be tough at times.

The weather itself is a challenge but we do our best with extra watering/labour during drier periods and ensuring harvesting potatoes out of lower areas of paddocks before any water damage from rain can be done.

Where do you receive your practice advice and information from?

I get a lot of advice from other growers. I attend the local seed grower meetings where current disease threats and how to overcome them are often topics of discussion. I recently went on a study tour to New Zealand where we visited working farms. We discussed the methods, equipment, practices etc. that were used at each farm.

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

We have updated our grader which has made our grading process easier with the ability of split loads. While we are still using sprinkler systems to water crops, we are aiming to move to using either a centre pivot or laterals in the next three years.



James and his mother Elisabeth on-farm.

What areas of research are important to the potato industry and seed certification?

Prevention and treatment of diseases and threats to the crops.

In your opinion, what is the importance of seed certification in the potato industry?

The importance of seed certification in the potato industry is to set standards within the seed scheme which help to produce good quality potatoes.

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

There seems to be more demand for potatoes now than when my father was running the farm. The demand for seed seems to be gradually increasing each season.

Where do you see yourself in five years?

Over the next few years, I plan to increase the amount of seed potato that we grow – and in five years' time I hope that we are at double of what we currently grow. I am hoping to upgrade our watering system to centre pivot/lateral to reduce the manual workload when it comes to watering.



Managing surface water in potato crops

Surface water in potato crops can lead to loss of yield and reduction in potato quality. Through the innovative use of precision agriculture, Simplot Farming has been able to manage this issue more efficiently to help improve crop outcomes. Simplot Farming Agronomist Angus Galloway outlines some of the key processes and learnings from installing surface drains in potato crops.

The precision ag journey started last season when Simplot farming partner Joe Cook shared a video of the 'Wolverine Extreme' rotary ditcher, which can be viewed on YouTube.

This tool is used to place large permanent surface drains in paddocks that are easy to drive through with machinery and spread the spoil from the drain far enough to avoid an embankment on the side of the drain. The distance the spoil was being spread over was a distinct advantage from current practice, although the size of the machine was far too impractical for 'in-crop' drainage. The task was set to build a much smaller rotary drainer that could be put onto a small tractor with row crop tyres that had the capability of spreading drain spoil over a wide area without creating a barrier to water movement. Eventually, a working prototype was developed that cut a neat 60-centimetre drain with a ridge on one side.

The next challenge was getting the drains into the right place in the paddock. Precision Ag Consultant Ruben Wells from Ag Logic developed a drainage plan, which included an EM38 map to see where soil type changes occurred across the paddock. This was then ground-truthed and any areas where major drains existed, or areas deemed too risky for production, were left out of the plantable area. The information collected was then put through T3rra Design™, a software program that used the GPS information collected from the EM survey to develop a 3D model of the paddock where row orientation could be decided and



The 'Wolverine Extreme' rotary ditcher.

in-crop drains could be planned.

Once the planned drains had been developed, they were sent to Ag Leader SMS software where they were converted into guidance lines for the auto steer system in the tractor. This allowed the tractor operator to install the drains exactly where the modelling indicated to provide maximum benefit.

This has improved the accuracy of drains and enables excess water to flow freely from the paddock instead of pooling and creating wet holes, as has been experienced in previous years from improper 'by eye' drain placement. Some of the drains were placed in very obvious spots in the paddock and others were placed in more subtle locations.

When installing the drains, Simplot Farming Manager Scott Morris often said that the GPS wanted him to put the drain in a particular spot, and it didn't look like the correct place from the tractor. After looking from many angles and walking around it was obvious that the GPS was right. Using the GPS also enabled drains to be installed into the paddock with confidence at night if required and post emergence, given its small footprint and minimal soil movement.

Gaining skills and knowledge

This has been a season of learning and what has been obvious is that more

drains are required in a crop, especially where there is a change in soil type. Placing drains in low flat collection points where water will pond is very important, although it has been observed from this season's drainage work the importance of cutting water off before it collects in the flatter areas. Having the ability to control the depth of drains and maintaining continuous fall is also important. Joe Cook is developing a depth control unit controlled by GPS for the upcoming season.

When people talk about precision ag, many growers are unsure about how it can be implemented on-farm, or where to start. From first-hand experience, there are very few suppliers within the industry that are able to back up what they sell, but with a bit of persistence, determination and vision around the outcomes that you would like to see, there are people within this space that are very valuable. The precision drainage project that Simplot Farming has embarked upon has been running for 12 months, and has utilised the skills and lateral thinking of many to improve the yield and quality of potato crops.

Find out more

Please contact Angus Galloway on 0419 835 290 or at angus.galloway@simplot.com.

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



Paddock rotation a cornerstone of disease management

As growers assess paddocks for their suitability to plant potatoes during the coming season, it's timely to run through some of the major considerations regarding paddock history and crop rotations. Syngenta Senior Technical Services Lead Scott Mathew explains.

The influence of recent paddock history on disease pressure really can't be overstated. Clean break crops are a cornerstone of sustainable farming and help growers to optimise yield and quality.

The types of crops or pastures available for rotation will depend on the region, climate and soil conditions, but the overall goal should be the same. It is to have a clean break to minimise disease, and maintain or build soil fertility.

Break crops or pastures can improve the balance of nutrients, organic matter and soil microorganisms. The mostly unseen world of soil-residing micro-creatures is possibly the one that benefits the most from clean break crop rotations.

For example, legumes can boost soil nitrogen and their presence can stimulate the growth of a whole range of beneficial soil microorganisms. Barley and canola are good break crops too. They reduce soil disease levels and offer opportunities to gain control of troublesome weeds.

However, one of the biggest pitfalls of today's potato growing is the availability

of suitable paddocks. Current land values and the pressure to keep paddocks in high-value crops has increased crop frequency, and that in itself elevates the risk and likelihood of soil diseases.

Prior to planting

Experience has shown two-year rotations heighten problems with *Rhizoctonia* along with other diseases such as common scab and pink rot.

Using the paddock history, growers should ascertain which diseases have been problematic in the past. Take note of any soil-borne diseases and have a fungicide strategy in place to cope with these diseases.

For any number of reasons there may be situations where the paddock history is poor, unknown or unavailable. In these scenarios, I would recommend a PREDICTA Pt soil DNA test. This is a great service that helps growers identify which soil-borne pathogens pose a potential risk. More information on PREDICTA Pt testing

can be found at the PIRSA website (pir.sa.gov.au), including information on how to submit samples.

Establishing which soil-borne diseases are present is the best way to develop the most cost-effective management plan.

At planting

Armed with the right information, growers should prepare the area to be cropped, remove any weeds and in particular self-sown potato plants because these can harbour diseases that can be transferred to the new crop.

Plant certified seed whenever possible. Grown under strict hygiene regulations, clean certified seed reduces the risk of introducing seed-borne diseases to the crop.

When considering if a seed treatment fungicide or in-furrow remedy is best, growers need to think through where the source of infection is most likely to come from.

Potatoes that have the potential to carry disease on the seed piece is where treating with a product like VIBRANCE PREMIUM® would be of value. This product is the only potato seed treatment to offer fungicidal activity on six key diseases (black spot, common scab, fusarium dry rot, silver scurf, black scurf and gangrene).

If the crop is likely to be infected from black scurf or silver scurf already present in the soil, an in-furrow treatment such as AMISTAR® 250 SC would be of value, or RIDOMIL® GOLD 480 SL for pink rot control.

More information on ways to maximise the effect of seed-borne and soil-borne fungicide treatments is available at the Syngenta Australia website.

Find out more

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.

A Biosecurity Tasmania officer ready to check passengers from the Spirit of Tasmania ferry.

State biosecurity update: Tasmania

State and territory governments are responsible for the management of biosecurity within their jurisdiction. In this edition of *The Front Line*, AUSVEG Biosecurity Officer Madeleine Quirk speaks to Biosecurity Tasmania General Manager Lloyd Klumpp about the state's current priorities and future opportunities in the biosecurity space.

Biosecurity is integral to safeguarding Tasmania's agricultural resources, the economy, the environment and communities against pests and diseases.

Biosecurity Tasmania was established and funded by the current Tasmanian Government in 2014, as its key arm for providing biosecurity, animal welfare and product integrity activities. Its mission is to protect Tasmania's community, industries and environment from the impact of pests and diseases; maintain Tasmania's reputation for safe and ethical products; and secure continued market access for these products.

Biosecurity Tasmania General Manager Lloyd Klumpp said that an intelligent risk management approach is integral to the biosecurity system in Tasmania.

"This means biosecurity decision-making is based on the principles of cost-effective risk management," Mr Klumpp said.

In line with its intelligent risk management approach, Biosecurity Tasmania provides core services including surveillance and regulatory activities pre-border, at the border and post-border; risk analysis and mitigation planning for animal and plant biosecurity and market access; diagnostic services; animal and plant traceability activities; systems to support market access; and biosecurity awareness communication and engagement programs.

Biosecurity Tasmania is also responsible for the coordination of the state's emergency preparedness, response and recovery, including – where feasible – eradication of new and emerging pests and diseases.

Strong partnerships help to maintain fruit fly free status

Biosecurity successes can only be achieved through cooperation and participation of all stakeholders, including industry and the general community.

In early 2018, an incident response was initiated following an incursion of Queensland fruit fly in northern Tasmania. Effective containment was a key initial priority for the incident and once the extent of the fruit fly incursion was determined, the next challenge was to ensure that all relevant landowners, fruit growers and impacted community members within the control area, and the general public more widely, were made aware of the imposed restrictions around movements of fruit fly host material from inside the control area to outside the control area.

"We were pleased to be able to reinstate mainland Tasmania's fruit fly free status on 9 January this year," Mr Klumpp said.

"Response efforts have continued on Flinders Island following the detection of a single male fruit fly as part of ongoing monitoring efforts in mid-December 2018."

Biosecurity Tasmania has maintained the existing control area restrictions for the Furneaux Group of Islands until further notice and it is continuing to respond to the fruit fly detection there by undertaking property inspections, spot baiting activities, fruit and larval surveys and the deployment of additional fruit fly traps.

Biosecurity Tasmania places great value on its existing partnerships with industry and the general community. From this incursion, the Tasmanian community now

has a greater awareness regarding fruit fly, and biosecurity more broadly.

"This increased awareness is evident by the number of community members who have contacted Biosecurity Tasmania in recent weeks because they have observed something suspect in their fruit or vegetables," Mr Klumpp explained.

"Although many of these enquiries turn out to be false alarms, it gives Biosecurity Tasmania confidence that the message regarding fruit fly vigilance in Tasmania has been well received."

Future opportunities

Through the experience of the last 12 months, Biosecurity Tasmania is better prepared to respond to biosecurity incidents. To this end, there are several initiatives in motion in the biosecurity realm.

Looking beyond the current response, an independent review into the fruit fly response will be conducted. Terms of Reference are currently being developed for the review, which will commence shortly. A review of Tasmania's Biosecurity Import Requirements for fruit fly host produce and other operational standards will also be conducted.

The government will soon introduce to parliament a Biosecurity Bill, which will modernise and streamline biosecurity regulation in the state; apply modern technologies and further research and development to enhance risk management; increase collaboration with industry stakeholders regarding biosecurity awareness and incident preparedness; and increase community education to ensure ongoing vigilance for biosecurity threats.

Find out more

Please visit dpi.pw.tas.gov.au/biosecurity-tasmania.

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.

Regional Updates



Garry Kadwell
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Crookwell Potato Association Incorporated

In my first Regional Update, I would like to thank our past Crookwell Potato Association President Matthew Gay for his commitment to our association and the potato industry. Matthew successfully guided the implementation of our Quality Assurance Scheme after the withdrawal of the Department of Primary Industry certification, which was a long and difficult process.

This year's harvest commenced in very dry conditions, so crops have to be irrigated carefully to allow safe harvesting in order to minimise product damage. Yields are good, but insect harm due to the dry conditions has made some crops difficult to grade.

Seed orders are strong, ensuring affirmative sales for crops that have been currently harvested. The current dry period has allowed the harvest to commence and continue unimpeded, but is causing sizable concern for water storage prospects next season. Hopefully winter rainfall will alleviate the worry of this situation.

In other news, the Crookwell Potato Festival was held on 11 May, giving great

opportunity to showcase potatoes and growing in general. In a challenging commercial climate, we need to constantly promote our wares and our image as professional farmers. Potato displays and sales, along with farm tours and live entertainment were on the agenda. Celebrity guests included Embassy of Ireland Deputy Head of Mission Eamonn Robinson and TV personality chef Lyndey Milan OAM, who cooked up a storm with some new and exciting gourmet potatoes.

A major highlight of the festival is the Charity Spud Auction, at which the first tubers of a newly released potato cultivar are sold to the highest bidder. In a twist this year, only one tuber was put up for auction. Weighing in at 80 grams, the succulent 'Cranberry Red' spud raised \$2,000. If you do the maths on this, it equates to very respectable \$25,000 per kilogram or a whopping \$25,000,000 per tonne! The winning bid was put in by Divall's Earthmoving and Bulk Haulage, long-time supporters and major sponsors of the festival.



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Seed Potatoes Victoria

We've planted our precious early generation seed in carefully prepared soil that we have tested for potato cyst nematode (PCN) freedom and nutrient levels. Eelworm, whitefringed weevil and black beetle are sitting in wait so we deal with them without delay. Emergence is good and we are grateful for products to help control Rhizoctonia, Fusarium, pink rot and seed-piece breakdown that threaten the new plants.

Time to nurture the crop now, knowing if we over-water we'll see powdery scab and if we under-water, common scab. If we do both (under- and over-water) we expect second growth, bottle end and hollow heart. So far, so good, and we monitor the crop for signs of potato virus Y, potato leafroll virus, tomato spotted wilt virus, target spot or something worse: the dreaded psyllid yellows or *Dickeya*.

It's late summer and the crop is ripening. Potato moths are everywhere after the warm night and the grub is after those hard-earned spuds bulking just under the surface. Spray or irrigate? You can't do both on the same day.

The bank manager says, "What about the overdraft?"

The wife says, "You need a rest."

And the fuel company says, "We need a cheque."

Things are moving fast now, and the tops are taken off; a lovely crop harvested and graded and sent off to a happy customer and you're thinking about the next season.

Hats off to those professional seed growers who front up each year to invest a heap of effort and money to play Russian roulette in this minefield and succeed more often than not.



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AUSVEG SA

South Australia's leading growers, researchers and industry members have been recognised at the 2019 AUSVEG SA and William Buck Vegetable Industry Awards for Excellence.

More than 250 growers and industry members gathered at the Arkaba Hotel on Wednesday 22 May to celebrate the important contributions to the potato, vegetable and wider horticulture industry, and showcase their leadership, dedication and innovation.

The winners of the Awards for Excellence are as follows:

- Mark Pye, Zerella Fresh – Grower of the Year.
- Daniel Hoffmann, Hoff Family – Young Grower of the Year.
- Jason Clark, Symons Clark Logistics – Industry Impact.
- Bianca Marrone, Marrone Fresh –

Women in Horticulture.

- Barbara Hall, South Australia Research and Development Institute (SARDI) – Researcher of the Year.
- Peter Petsios, SA Tomato Co – Biosecurity Award.

We are fortunate to have so many growers, researchers and other industry members who are among the best in the world at growing fresh produce for local and international consumers. I would like to congratulate the award winners and thank them for their continued dedication to our industry.

The winners will be nominated in their respective categories at the National Awards for Excellence, which will be held during Hort Connections 2019 at the Melbourne Convention and Exhibition Centre from 24-26 June.



Potato Growers Association
of Western Australia Inc

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WA Potatoes

In May 2019, WA Potatoes (with support from AUSVEG) welcomed Marc De Beaufort, Campaign Director of the *Imagine a World Without Potatoes* program, to Australia.

The program is coordinated by the International Potato Center (known by its Spanish acronym CIP) in Peru. It aims to lift the profile of the humble potato and remind consumers not to take it for granted, with the overarching goal to increase consumption.

Major players and market competitors such as PepsiCo and McCain are on board, with the goal to deliver the same message worldwide and ask customers to imagine their lives without potatoes. The campaign has signed on over 50 partners in 28 countries and has led to ambitious strategies to promote potato consumption in China, India, Belgium and Peru amongst others.

The campaign will kick into gear later this year and hopes to bring together even more potato sectors in other nations to promote and raise awareness of the benefits of this crop.

As the only members of the program in Australia currently, WA Potatoes is working on a range of activities and utilising the campaign to benefit the Western Australian industry. This includes developing a strong international network to support future activities, especially related to exports, as well as using the

program to initiate discussions within Australia around marketing and promotion of potatoes.

Western Australia is currently the only state in Australia with a generic marketing program for potatoes so the opportunity to link with our international counterparts and learn from their experiences was very attractive.

Marc has worked as a consultant for the CIP on a variety of projects related to major media outlets like the BBC and other campaigns related to the potato. He has wide-ranging experience in communications, having directed various social and political campaigns in different countries around the world.

Recently Marc worked with the potato industry in China to develop a major potato display at the Hort Expo in Beijing, which runs from April to October and receives over 10,000 visitors a day. The display has gained a great deal of interest through the Chinese media and provides a great opportunity for the *Imagine A World Without Potatoes* message to be shared.

WA Potatoes has been able to join in showcasing its industry through the Hort Expo and hopes to visit during the next few months.

Industry organisations and businesses can find more information and join the program at worldwithoutpotatoes.org.



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Tasmanian Farmers and Graziers Association

It is an exciting time in the Tasmanian potato industry, with the upcoming expansion of the McCain and Simplot chip plants. The news of the expansions comes as potato producers look to negotiate their contracts with Simplot and McCain and highlights the scale and growth of Tasmanian potato production.

Both the Simplot and McCain expansions are major investments, expected to cost \$53 million and \$40 million respectively. The Simplot upgrades will create larger storage and refrigeration facilities to hold more than 300,000 tonnes of potatoes.

With the expansion of the McCain plant, it will be McCain's main French fry facility in Australia and New Zealand. The investment into these facilities secures the future for Tasmanian potatoes and encourages their ongoing production well into the future.

With such investments, the protection of the Tasmanian vegetable industry from risks such as pests and diseases is as important as ever. Pests such as the tomato-potato psyllid (TPP) pose significant risks to our industries.

The possibility of TPP coming onto Tasmanian farms is very real, with an outbreak already seen in Western Australia.

Awareness of pest and disease risks and transmission is important for protecting our potato industry. The implementation of biosecurity measures is vital not only at the national and state level, but at a farm level as well. We encourage all Tasmanian producers to employ farm biosecurity measures and to monitor their farms for pests and diseases. It is at this point we recognise and acknowledge the work of Dr Kevin Clayton-Greene as the AUSVEG Biosecurity Advisor, and we wish him all the best for the future.

The expansion of potato processing facilities in Tasmania is positive for the state's potato industry. Ensuring the protection of this industry and all potato production through biosecurity is important not only to producers but to the Tasmanian economy. To ensure a continued bright future and growth of all industries in Tasmania, we encourage producers to implement farm biosecurity measures.



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AUSVEG VIC

Victoria's first Labour Hire Licensing Scheme, designed to protect workers and crack down on dodgy operators, came into force on 29 April – with contractors given six months to sign up or else face significant penalties.

The Scheme was created in response to the independent Victorian Inquiry into the Labour Hire Industry and Insecure Work, which uncovered widespread abuse and exploitation of workers across Victoria.

Under the Scheme, providers of labour hire services will be required to hold a licence and hosts will only be allowed to use licensed providers. AUSVEG VIC advises that you should have started consulting with your labour hire contractor about their plans for obtaining a licence. Employers that use unlicensed providers face fines of up to \$500,000.

In other news, AUSVEG VIC hosted the annual Victorian Awards for Excellence

on Friday 3 May at Kooyong Tennis Club with 200 people in attendance.

AUSVEG VIC would like to congratulate the following award winners:

- Grower of the Year – Jeremy Haw from Hussey & Co.
- Young Grower of the Year – Carl Young from Red Gold.
- Environmental and Sustainability Award – Michael Evans from Mulgowie Farming Company.
- Community Stewardship Award – Karl Riedel from KR Consulting.
- Women in Horticulture – Carmel Ingram from Bonaccord Ingram.
- R&D Adoption and Industry Impact Award – Mark and Darren Schreurs from Peter Schreurs & Sons.

The award winners will represent Victoria at the National Awards for Excellence at Hort Connections 2019 in Melbourne from 24-26 June.



VGA trading as AUSVEG VIC



Young Potato People

G'day again,

Hopefully all is going well in your neck of the woods. It seems we are halfway through the year now.

We have just come out of one of the driest summers we've ever seen, and straight away my mind is on how we will continue to produce a good quality crop if it gets any drier. Water is the most valuable asset when we are growing high-value crops and if we continue to have such dry growing periods, water will become harder to get our hands on. So, we need to do more with less water to help protect this liquid asset. We need to invest more into better infrastructure to be able to handle water more efficiently than we have before and we need to invest in irrigation equipment that uses every drop of water for the purpose intended.

This can be a challenge – finding the capital to be able to invest in such things for a start, and then finding the time to chase up the best deal.

There is also the cost of the power (or diesel) to run the pump. A cost which continues to go up and is yet another thing we will have to deal with in dry years. Because the more hot and dry weather we get, the more we will need to run the irrigation pump. Some people have managed to incorporate solar into their systems in order to bring the cost of running down. Others have installed more efficient electrical systems to manage the power better. Again, the issue with any of the options is the cost to put it in.

It would seem that our energy costs are only going to get higher, and our water is going to get harder to access in the coming years. If you've got the money to invest in these areas, you will be helping yourself out further down the track.

Farming isn't a normal profession; it's a complete lifestyle. If you can afford to make the future a bit more comfortable – even if it is to help the next generation coming through – I think it would be well worth it.

Cheers,

Stu





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