

potatoes

australia

| Autumn - 2021



COVER STORY | KERRI-ANN LAMB SHARES HER NUFFIELD SCHOLARSHIP EXPERIENCE

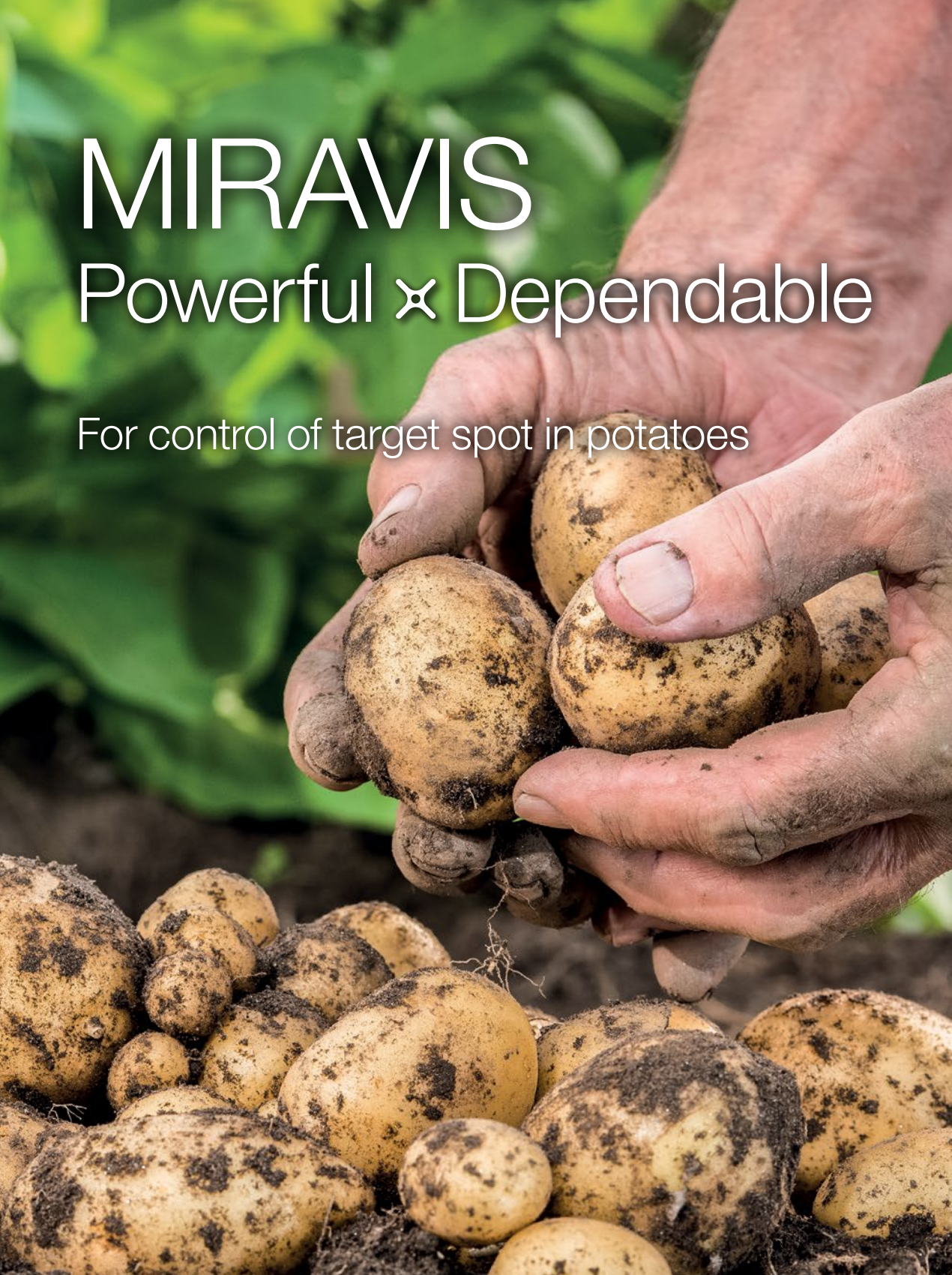
AUSVEG BOARD | MEET AUSVEG'S POTATO GROWING DIRECTORS

EXPORT OVERVIEW | TRADE CONTINUES THROUGH COVID-19 PANDEMIC

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Editorial

It has been a while since we have published *Potatoes Australia*. The last editorial for this publication – penned in October 2019 – warned of a hot, dry summer, with a warning from the Bureau of Meteorology to brace for more drought conditions.

The bureau was right. Australia suffered through the worst bushfire season in recent memory, with many people losing their homes, businesses and their communities.

What no one predicted was the chaos and disruption that was to come because of the COVID-19 pandemic. The pandemic has undoubtedly impacted every part of our lives, from how we live to how we work and how we interact with our friends and family.

But it is important to understand what hasn't changed in the midst of the trauma of the bushfires and the disruption and uncertainty of the pandemic.

Australian potato growers have continued planting, growing and harvesting high-quality potatoes for consumers around the world, and the need to innovate and adopt new technologies and practices has never been greater.

The industry still needs to be aware of the pests and diseases that can impact the productive quality of potato crops and how to mitigate their impact; while international travel has dropped off recently, it will undoubtedly return, and airfreight continues to increase the risks of exotic pests coming to our shores.

And finally, the Australian public continues to buy and eat Australian potatoes; demand for fresh potatoes has even risen as a result of the pandemic, which has been attributed to its versatility and its longer shelf life compared with other fresh produce commodities.

Vale David Montgomery AM

Since our last publication we were saddened to learn of the passing of potato industry stalwart David Montgomery, who passed away in November 2019.

David was the Crookwell Potato Association executive director from 1988 to 2009, and served as its public officer until his passing. He was also a founding member of the Horticultural Research and Development Cooperation, serving six years on its board.

David was a well-respected member of the international potato industry and was well-recognised for his significant contributions to the broader industry, including the first Australian to receive recognition from the World Potato Congress in 2006 and being awarded as a Member of the Order of Australia in 2013 for his lifetime of dedication to the potato industry and the broader horticulture and agriculture sector.

David was a much-loved and highly respected member of our industry.





Message from the CEO

It's been a little longer between editions of *Potatoes Australia* than we would have liked, so we are now delighted to be able to get this industry news out to you, particularly as we hope the worst of the effects of the pandemic are behind us.

Part of the reason for the delay has been changes made by Hort Innovation to the process of communicating the work undertaken using the potato research and development levies; we are hopeful that in the very near future we'll be able to include this important research in *Potatoes Australia* soon.

The industry has had a very eventful year, with a significant increase in the consumption of ware potatoes, while the market for fries was impacted by a significant increase in imports due to the collapse of that market in Europe. Tasmania found its harvest particularly hard going due to an exceptionally wet spring, while the loss of international workers has impacted growers and packers across the country.

AUSVEG, with several of the processors, is tracking the changing trade patterns closely. Although we've made governments aware of the risk to the local industry of cheap imports, it is also clear that we can only seek their intervention if there is a very clear and fact-base case made. This allows the government to take action within the defined rules of international trade.

Our advocacy work has been dominated by the labour shortages as a consequence of international border closures. We have had some success in having the Seasonal Worker Programme and Pacific Labour Scheme recommenced, although the industry still faces the challenge of getting workers through quarantine and onto farm. The problem is likely to be with us for some time and has highlighted the need for the horticulture industry to find ways of presenting itself in a more positive light, so we can attract Australians to fill the roles that exist at all levels of the industry.

Biosecurity continues to present a major threat to the potato industry. With funding from the Department of Agriculture, Water and the Environment, AUSVEG and Plant Health Australia have recently completed a National Potato Industry Biosecurity Surveillance Strategy, the details of which are included in this edition. This strategy will equip the industry with the data required to identify and co-ordinate surveillance priorities across the country, and to help ensure the industry remains informed, resilient, engaged and globally competitive.

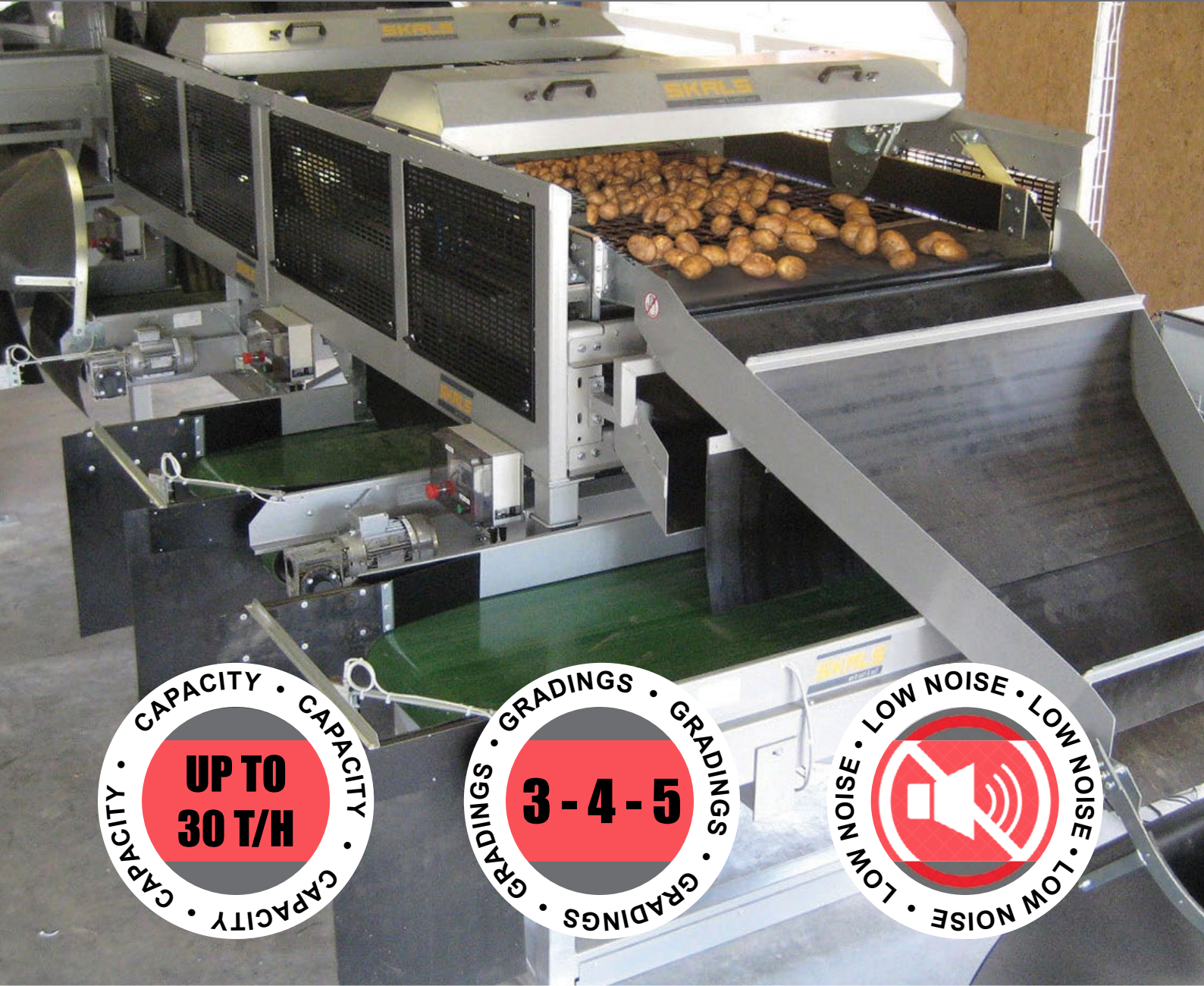
Hort Connections has been an increasingly popular opportunity for growers to meet, learn and socialise in recent years. After postponing the event in 2020, we are full steam ahead ensuring the event goes ahead without a hitch in Brisbane from 7-9 June. If, by then, you are comfortable with travelling to Brisbane, we'd love to see you there. The event only works when growers support it, and we have no doubt that the program of events will be better than ever, so please make every effort to be there!

James Whiteside
CEO
AUSVEG

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Potato growers continue to trade through COVID

Fresh potato exports from January to December 2020

Coming up to the anniversary of the start of the global pandemic, total fresh potato exports have seen a slight increase in value and moderate decline in volume compared to 2019. Based on data from the Global Trade Atlas, there was a 5.1 per cent increase in fresh potato export value, from \$31.3 million to \$32.9 million. Total fresh potato export volume declined by 13.5 per cent, from 45,315 tonnes to 39,217 tonnes over the same period.

Apart from South Korea, the other top markets for fresh potato exports – The Philippines, Singapore, Malaysia, Hong Kong and Indonesia – have all seen a substantial increase in trade value during 2020.

Demand in ASEAN markets remained strong for Australian fresh potatoes. Since the commencement of Indonesia-Australia Comprehensive Economic Partnership Agreement (IA-CEPA), Indonesia has seen

Australian potato grower-exporters have demonstrated strong resilience in their businesses and supply chains to continue to export during 2020 and their hard work is reflected in the latest trade data from January to December 2020. AUSVEG National Manager – Export Development Michael Coote reports.

an encouraging increase in exports, albeit off a relatively small base. Indonesian exports grew by 599 per cent in 2020, from \$0.4 million to \$2.9 million; export volume improved by 554 per cent from 712 tonnes to 4,656 tonnes.

The United Arab Emirates saw a dip of 26.1 per cent in value and a significant decline in volume of 83.2 per cent. The demand in other Middle Eastern markets remained strong, with Qatar recording an increase in export value by 28.9 per cent pushing the trade value from \$1.4 million to \$1.8 million; export volume increased by 33.9% from 1,150 tonnes to 1,540 tonnes (refer to Table 1 below).

Fresh potato exports by state

South Australia remained the strongest fresh potato export state, with an increase of 8.4 per cent in value and a dip of 14.3 per cent in volume compared to 2019. Western Australia had a significant increase in export value by 35.4 per cent

from \$5.5 million to \$7.4 million, with export volumes increasing by 29 per cent from 4,298 tonnes to 5,543 tonnes. Victoria had the strongest growth in this category with 42 per cent increase in export value from \$517,176 to \$734,600 and 61.2 per cent increase in export volume from 353 tonnes to 569 tonnes (refer to Table 2).

Seed potato exports from January to December 2020

Based on data from the Global Trade Atlas, there was a 20.8 per cent decrease in seed potato export value in 2020, from \$7.3 million to \$5.7 million; export volumes also decreased slightly by 0.6 per cent over the course of the year.

Thailand, Indonesia, Vietnam, Qatar, and Mauritius are the top five markets for seed potato exports. Thailand has seen a decline in trade with a significant drop of 60 per cent in value from \$3.2 million to \$1.3 million; export volume has dropped

Table 1: Change in fresh potato exports by destination market January to December 2019-2020

Trade Partner	2019		2020		▲ 2019/2020	
	\$AUD	Tonnes	\$AUD	Tonnes	\$AUD	Tonnes
World	\$31,349,042	45,315	\$32,945,912	39,217	▲ 5.1%	▼ -13.5%
Korea, South	\$10,268,624	17,013	\$7,748,869	13,061	▼ -24.5%	▼ -23.2%
Philippines	\$3,075,671	5,002	\$4,376,350	7,369	▲ 42.3%	▲ 47.3%
Singapore	\$3,571,284	2,248	\$3,968,107	2,445	▲ 11.1%	▲ 8.8%
Malaysia	\$2,976,872	2,725	\$3,802,226	3,391	▲ 27.7%	▲ 24.4%
Hong Kong	\$2,812,296	2,315	\$3,592,668	2,860	▲ 27.7%	▲ 23.5%
Indonesia	\$411,432	712	\$2,875,176	4,656	▲ 598.8%	▲ 553.9%
United Arab Emirates	\$2,822,775	9,257	\$2,085,324	1,555	▼ -26.1%	▼ -83.2%
Qatar	\$1,411,686	1,150	\$1,819,352	1,540	▲ 28.9%	▲ 33.9%
Taiwan	\$1,660,217	1,670	\$1,773,303	1,650	▲ 6.8%	▼ -1.2%
Brunei Darussalam	\$296,166	210	\$336,485	240	▲ 13.6%	▲ 14.3%



Table 2: Fresh potato exports by state January to December 2019-2020

State	2019		2020		2019/2020	
	\$AUD	Tonnes	\$AUD	Tonnes	\$AUD	Tonnes
South Australia	\$16,493,592	26,785	\$17,874,416	22,951	▲ 8.4%	▼ -14.3%
Western Australia	\$5,450,294	4,298	\$7,380,438	5,543	▲ 35.4%	▲ 29.0%
New South Wales	\$7,941,239	13,461	\$6,528,828	10,037	▼ -17.8%	▼ -25.4%
Victoria	\$517,176	353	\$734,600	569	▲ 42.0%	▲ 61.2%
Queensland	\$898,382	389	\$425,680	117	▼ -52.6%	▼ -69.9%
Tasmania	\$46,119	28	\$1,950	1	▼ -95.8%	▼ -96.4%
Northern Territory	\$2,240	1	\$ -	-	▼ -100.0%	▼ -100.0%

by 12.8 per cent from 1,247 tonnes to 1,088 tonnes. Indonesia has experienced an average decline of 7.2 per cent in both export value and volume. Qatar has seen 87.2 per cent increase in export value from \$356,898 to \$668,173; export volume has climbed by 73.7 per cent, from 266 tonnes to 462 tonnes.


Taiwan has recorded trade in seed potatoes for the first time in 2020, with 306 tonnes valued at \$416,175. Demand has increased by up to 33 times in Malaysia

and nearly 20 times in Singapore (refer to Table 3).

Seed potato exports by state

Western Australia is still the largest seed potato exporting state, despite a dip of 42 per cent in value and a dip of 17.8 per cent compared to 2019. South Australia had a substantial increase in export value of 67.3 per cent from \$1 million to \$1.8 million, and export volume has increased by 56.7

per cent from 850 tonnes to 1,332 tonnes. Victoria experienced positive growth with a 73.3 per cent increase in export value from \$326,238 to \$565,449, and a 61.3 per cent increase in export volume from 271 tonnes to 437 tonnes.

Find out more 

Please contact the AUSVEG office on 03 9882 0277 or email export@ausveg.com.au.

Table 3: Change in seed potato exports by destination market January to December 2019-2020

Trade Partner	2019		2020		2019/2020	
	\$AUD	Tonnes	\$AUD	Tonnes	\$AUD	Tonnes
World	\$7,305,409	4,647	\$5,782,397	4,620	▼ -20.8%	▼ -0.6%
Thailand	\$3,190,957	1,247	\$1,282,824	1,088	▼ -59.8%	▼ -12.8%
Indonesia	\$1,389,073	1,181	\$1,279,878	1,104	▼ -7.9%	▼ -6.5%
Vietnam	\$765,575	684	\$832,460	732	▲ 8.7%	▲ 7.0%
Qatar	\$356,898	266	\$668,173	462	▲ 87.2%	▲ 73.7%
Mauritius	\$1,089,510	902	\$576,156	466	▼ -47.1%	▼ -48.3%
Taiwan	\$ -	-	\$416,175	306	N/A	N/A
Singapore	\$12,245	7	\$266,601	147	▲ 2077.2%	▲ 2000.0%
Malaysia	\$7,083	5	\$241,422	175	▲ 3308.5%	▲ 3400.0%
United Arab Emirates	\$202,700	110	\$120,244	84	▼ -40.7%	▼ -23.6%
Hong Kong	\$58,088	29	\$76,146	43	▲ 31.1%	▲ 48.3%

Meet AUSVEG'S potato growing Directors

The AUSVEG Board of Directors is made up of representatives from our state member organisations, as well as Board-appointed skills-based Directors. AUSVEG has four potato growers on its Board: Geoff Moar from New South Wales, Renee Pye from South Australia, Pennie Patane from Western Australia and Michael Radcliff from Tasmania.



Pennie Patane
Western Australia

Pennie Patane and her husband Michael established their vegetable growing business in 1999, commencing with potatoes and moving into carrots, onions and broccoli. Their vertically integrated business supplies the retail sector, export markets and their own wholesale market floor.

Elected to the AUSVEG Board in January 2020, Pennie has a background in banking, and she married into the horticulture sector. Pennie has been a past committee member of the Potato Growers Association of Western Australia, and she is currently a member of the Hort Innovation Potato Strategic Investment Advisory Panel, as well as Chair of the Myalup Coast Growers. Additionally, Pennie is a member of the Harvey Agricultural College Advisory Panel.

Pennie's key interest is how we can get more youth interested in horticulture as a career.



Renee Pye
South Australia

Renee Pye is Marketing Manager for leading potato, carrot and onion packhouse Zerella Fresh.

Renee is involved in a number of key areas of the business, including new product development and marketing, and is an emerging leader in the South Australian industry. She has overseen the development of Zerella Fresh's Spudlite range, which has contributed significantly to the company's recent growth.

Renee is a committed industry representative, sitting on a number of Boards, including AUSVEG SA, the Murraylands Food Alliance and Hort Innovation potato marketing consultation committees.

She regularly works with politicians at the state level and has been the spokesperson for a number of key AUSVEG SA campaigns in labour attraction and securing key infrastructure investments for industry.

As a business, Zerella Fresh is one of the largest potato producers in Australia and it is planning major infrastructure investments in the Mallee and Northern Adelaide Plains regions.



Geoff Moar
New South Wales

Geoff Moar is the longest serving member on the AUSVEG Board. Geoff was elected to the Board in November 2004 and has served as Deputy Chair from 2011 to 2013 and as Chair from 2013 until 2017.

Geoff has grown potatoes since the late 1960s and supplies fresh and processed potatoes to the French fry production, crisping and fresh markets. He is a member of the NSW Farmers Association Horticultural Committee and is also a long-term board member of West Corugan Irrigation.

Currently, Geoff is Chair of the Murray Regional Strategy Group, representing the irrigation organisations in the Southern Riverina (along the Murray River).



Michael Radcliff
Tasmania

Michael Radcliff and his wife Heidi own and run Rhebanvale, a family-farm based in Wesley Vale, Tasmania. The operation produces a variety of vegetable products, including potatoes, broccoli, peas, beans, carrots and onions.

Michael was elected to the AUSVEG Board in December 2019.

Michael has been involved in the vegetable and potato industries for many years, having served on a range of industry committees and associations.

He currently serves on the Pre-farm gate Strategic Investment Advisory Panel, one of two Hort Innovation strategic investment advisory committees for the vegetable industry.

AUSVEG Board of Directors

Position	Name	State
Chair	Bill Bulmer	Victoria
Deputy Chair	Belinda Adams	Queensland
Grower Director	Mitchael Curtis	Northern Territory
Grower Director	Geoff Moar	New South Wales
Grower Director	Pennie Patane	Western Australia
Grower Director	Renee Pye	South Australia
Grower Director	Michael Radcliff	Tasmania
Skills-based Director	Simon Bolles	Victoria
Skills-based Director	Mark Napper	New South Wales

Find out more

Visit ausveg.com.au for more information on AUSVEG's Directors.

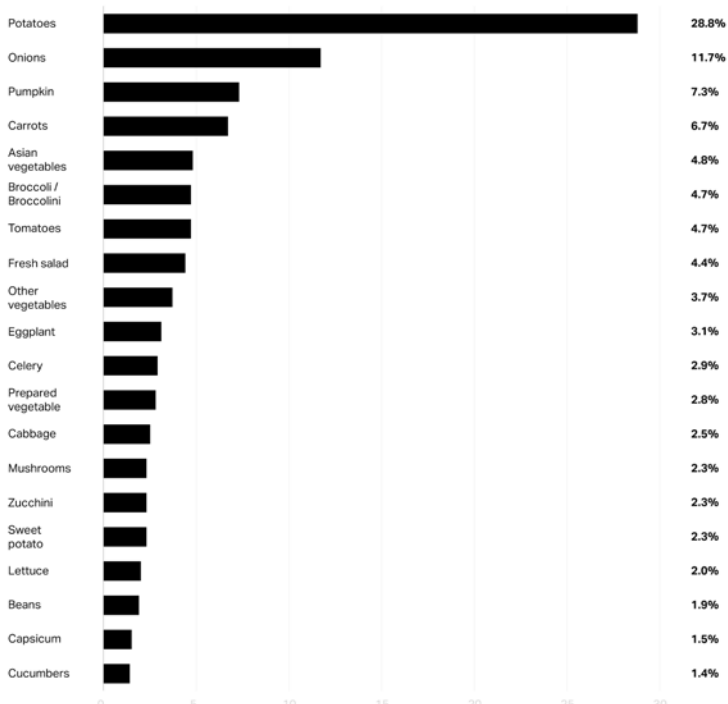
Harvest to Home COVID-19 trends – fresh produce annual wrap-up of 2020

As part of the Hort Innovation-funded Harvest to Home project, global information and measurement company Nielsen has produced a comprehensive wrap-up of the trends on the fresh produce industry following the impacts of the COVID-19 pandemic. AUSVEG presents a summary of the report.

Fresh produce trends

- 1.** Total grocery sales reached a three-year high during COVID with fresh categories taking out the top five growth contributors.
 - Grocery was the beneficiary of increased at home consumption to the detriment of food service.
- 2.** Bigger baskets, increased frequency and an increase in the repertoire of shops visited featured strongly in 2020.
- 3.** Benefiting from more meals at home, vegetables flourished last year with a three-year volume high; however, fruit fared less well and declined 4.7% on year ago.
- 4.** Longer lasting vegetables – important to shoppers during the early months of COVID-19 – took out the top four spots contributing the most to vegetable volume growth.
- 5.** Victoria, burdened with the longest period of lockdown, contributed the most to produce growth.
- 6.** Assisted by an increase in shop repertoire and consumers shopping more locally, other supermarkets such as IGA, Costco and Asian grocers, picked up share in 2020 to the detriment of major supermarkets.

Top 20 contribution to vegetable volume growth 52 weeks to 27 Dec 2020 vs prior year



NielsenIQ Source: Nielsen HomeScan. Other Vegetables and Brussels Sprouts, Peas, Peas, Peas, Spinach/Greens, Spring Onion (Contribution to Growth - Factors in the importance of the segment in total vegetable). © 2021 Nielsen Consumer LLC. All rights reserved.

2021 Produce Predictions

- 1.** Home cooking – Consumers will continue the trend of more home cooking. Ready-to-eat produce solutions that add interest to the ‘what’s for dinner’ question will supplement sales.
- 2.** Food as medicine – Consumers will prioritise health and wellness – fresh produce can capitalise on this with on-pack messaging highlighting key benefits (e.g., gut health, immunity boosting).
- 3.** E-commerce – Consumers will continue to purchase through this growing channel having experienced the convenience during COVID. Having an online strategy in addition to your Bricks & Mortar strategy will be important for 2021.
- 4.** Pre-packed vs loose – Pre-packed produce will continue to grow as a format, appealing to both convenience and safety concerns of consumers. Sustainability of packaging will be a future focus for industry.

Find out more R&D

Please visit harvesttohome.net.au to read the full report.

These data and insights were produced independently by Nielsen and shared through the Harvest to Home platform, supported through the Hort Innovation vegetable, sweetpotato and onion research and development levies. For more insights, visit harvesttohome.net.au.

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

Project Number: MT17017



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Tasmanian potato grower Tim Walker

Disease control unlocks yield potential

Tuber development and uniformity can be enhanced through greater attention to foliar disease management, from flowering to row closure and beyond. It's particularly important to consider the application of a foliar fungicide prior to row closure, as you might for any additional nutrition, helping extend the life of the canopy while assisting tuber bulking.

More and more growers have found the application of a preventive foliar fungicide just prior to row closure will lock in protection from target spot (also known as early blight).

Yields can be severely impacted where target spot is allowed to infect crops and take hold. To assist in the battle against target spot, Syngenta has produced MIRAVIS® – a Suspension Concentrate formulation that mixes readily with water and is applied as a spray.

For growers like Lachlan Hauser in the Lockyer Valley, who supplies the processing market, tuber size uniformity and consistency are vitally important.

"We first started using MIRAVIS in 2018," Mr Hauser said.

"Toward the backend of that season when we did have some target spot pressure, we really noticed the benefits where we did one strip half with MIRAVIS and one without."

Crop canopy

Target spot is caused by the pathogen *Alternaria solani*, which can bring about rapid defoliation of potato crops. Without a canopy, there can be no photosynthesis and no production of plant sugars, as well as no tuber bulking.

The ideal timing for MIRAVIS is just prior to row closure, so that it can penetrate the lower canopy where it will stop early infection of target spot.

Rainfast within one hour, the product locks in protection against these fungal spores for up to 21 days. This is especially important during periods of leaf wetness, be it from rain or irrigation.

Extending the length of a crop canopy by even 14 days can make a huge difference to potato yields, particularly late in the season when target spot pressure begins to build and can take over the crop.

Yield improvements

A potato grower on Tasmania's north-west coast, Tim Walker harvested greater than 70 tonnes a hectare in April 2019.

"Using MIRAVIS to control target spot gave me a significant yield advantage," he said. "Every day we can keep those leaves green, the yield is growing for us."

In-season target spot control began at flowering when conditions were more conducive for disease with an application of AMISTAR® TOP at 500 mL/ha. This was followed by the high label rate of the product at 375 mL/ha.

His decision to use and recommend it – as a farmer and lead agronomist

of Walker Ag – was supported by the fungicide's ease of use.

"About half of my clients used it that year and we didn't see any issues with compatibility," he said.

"The fact that it's rainfast within one hour and offers up to 21 days of protection means we're able to use it late."

Mr Walker said the efficacy of the fungicide had been no better demonstrated than on his own farm where he missed treating a 40-metre strip.

"I ran out and didn't bother going back. That strip, which wasn't treated, died off nearly three weeks sooner," he said.

"Even if it was only a couple of tonnes difference a hectare, it would be worth using but it's much better than that. There's a significant advantage with MIRAVIS. Sometimes it's these unintended trials that are the most telling.

"My only regret is that I didn't have a bigger paddock planted."

This fungicide is compatible with a range of foliar fertilisers enabling growers to make one tank-mix for nutrition and disease in some cases.

It has been proven to reduce disease infection and keep foliage greener for longer when used early at row closure, or when conditions are conducive for disease prior to symptom expression. Ultimately, improved greenness will unleash the crops maximise size and yield potential.

Find out more

Please visit [syngenta.com.au/potatoes/miravis-potatoes](https://www.syngenta.com.au/potatoes/miravis-potatoes). Readers can follow Syngenta on Twitter: @SyngentaANZ.

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We're always innovating, delivering world leading products and providing unrivalled support to our partners in the Australian potato industry. Through years of research and development, technology and testing, our comprehensive potato portfolio provides sustainable protection from storage, to planting, right through to harvest and beyond. We will continue to innovate, to evolve, to deliver. It's what we do.

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AUSVEG Advocacy update

Over the next 12 months, AUSVEG will carry on with working with government and industry stakeholders to advocate on the issues affecting potato growers and their operations. In this column, AUSVEG National Public Affairs Manager Tyson Cattle provides a detailed overview of the current issues, including labour.

Labour

Finding harvest labour continues to be the toughest issue facing horticulture growers.

The COVID-19 pandemic has had a significant impact on what was already a difficult issue for growers.

While industry and government have seen some success – namely visa extensions, changes to international student visas, Seasonal Worker Programme (SWP) restart and relocation assistance for domestic workers – industry still finds itself well short of workforce it needs.

Industry has continued to push the message to all levels of government, as well as to the broader public, that it is forecast to have a 26,000 workforce shortage by the end of March, courtesy of a report by Ernst & Young in 2020.

Yet so far, we have seen a small number of workers arrive from the Pacific Islands and not enough domestic workers are taking up the opportunity for relocation assistance.

The Victorian Government Seasonal Harvest Sign-on Bonus is a step in the right direction and demonstrates that the Victorian Government is listening to the concerns of industry, but further interventions to increase the available worker pool for horticulture businesses need to be considered to address the industry's labour shortage.

Industry has been working with all levels of government looking at all options to fill the harvest labour shortage, including engaging with a domestic workforce. However, industry has focused heavily on the Pacific Islands given Federal Agriculture Minister David Littleproud's comments that there are about 22,000 pre-vetted workers ready to come and work.

We have focused on those nations for a few reasons:

- There are a number of workers who are ready, willing and able to come and work in Australia.
- The visa programs such as Pacific Labour Scheme (PLS) and SWP have strong tracing capability through the Approved Employer process and significant pastoral care elements that help minimise the COVID-risk.
- The SWP and PLS are Foreign Aid programs to support our Pacific neighbours. The Pacific Islands have been decimated by COVID, not through infections, but by the lack of tourism into those countries impacting their economies.
- There have been limited COVID-19 cases in the Pacific Nations, in many nations they have remained COVID-free.
- Pacific Island workers are the best chance horticulture growers have available to them for a guaranteed workforce.

It is for these reasons industry will continue to push to bring in workers from these islands at scale.

Industry was, and is, pushing for a Pacific Island Bubble with COVID-free nations. However, with recent outbreaks here and abroad, as well as the risk of new strains of the disease, this has proven to be much more difficult in 2021.

This means industry and government must work through the current quarantine pathways, which is proving difficult. The states are at varying levels in this process. Queensland and the Northern Territory for example have an on-farm quarantine option, but some states such as New South Wales and Victoria are still yet to have a quarantine pathway at all for seasonal workers.

Politics between state and federal governments are also clearly at play, which is frustrating growers.

That being said, industry will not be sidetracked by political point scoring and continue to work with all governments to look for practical solutions to this complex issue, in the hope to ease pressure on growers during this difficult time.

HILA Review

While harvest labour has been a focus, the Horticulture Industry Labour Agreement (HILA) has now been operational for 12 months. The HILA was created in 2020 and allows growers to access skilled and semi-skilled workers from anywhere in the world for 31 horticulture occupations.

Through AUSVEG's work in negotiating the agreement, it has a 12-month review built into the agreement. AUSVEG will seek improvements to the HILA to better assist growers to be able to access the workforce they so desperately need.

If growers have any feedback on the HILA, they are encouraged to reach out to AUSVEG.

Harvest Trail Industry Service Collaboration

AUSVEG was recently successful in a bid for a project by the Department of Employment, Skills and Education (DESE) regarding opportunities in the Horticulture sector.

Over the next two years, AUSVEG will produce a range of videos showcasing skilled occupations and career opportunities within the horticulture industry and the day-to-day operations of the job.



The videos can then be shared across social media platforms and promoted to young people to pursue a career in our great industry.

Agvet Chemical discussion

There are a range of conversation being had with the APVMA around looking to improve access to chemicals for growers. AUSVEG is continuing to be involved in those discussions to ensure that growers have access to the best chemicals available.

Plant-based Labelling

AUSVEG is involved in discussions around plant-based food labelling and working to ensure growers who are growing plant-based foods are not disadvantaged or limited in this exciting and innovative space.

Health Star Rating for juice

The battle continues for all natural juices to receive an automatic 4-star health star rating if it has been untouched and unprocessed.

This is an ongoing advocacy challenge between health and agriculture portfolios, but we are hoping common sense prevails so that we avoid a situation where diet soda would receive up to 3.5 stars and natural juice receives as low as 2 stars.

National Labour Hire Licencing Scheme

AUSVEG is continuing to work with the Federal Government to introduce a National Labour Hire Licencing or Registration Scheme.

The Morrison Government committed to delivering a registration scheme in high-risk industries including horticulture at the last election and it needs to be introduced.

We understand this is a significant piece of the level playing field puzzle for the industry and we will be working to ensure a scheme is implemented nationally in 2021.

Agriculture Visa

The Morrison Government also committed to delivering an Agriculture Visa at the last election to help deliver a dedicated workforce for the sector.

With the ongoing issues surrounding harvest labour and accessing a productive workforce. The Agriculture Visa conversation will be raised again in 2021.

Horticulture Code of Conduct

The impact of the Horticulture Code of Conduct and its relative enforcement is still regularly raised with us at AUSVEG. There is a wide-ranging concern from members that the Code has either just been signed and forgotten about, or it is not being properly enforced.

AUSVEG, via the NFF Horticulture Council, recently met with Australian

Small Business and Family Enterprise Ombudsman Kate Carnell, who is keen to hear from growers about any issues they may be having under the code.

HARPS

The HARPS 2.0 consultation has recently closed. It will be a focus in 2021 to ensure it is working efficiently and working to purpose which is to help reduce duplication in the food safety space for growers.

Federal Election

A Federal Election will be called either the end of this year, or early 2022. AUSVEG will be working to best understand the issues that are most important to industry and put our best foot forward to get commitments at the next federal election from all parties.

Find out more

Please contact AUSVEG National Public Affairs Manager Tyson Cattle on 03 9882 0277 or email tyson.cattle@ausveg.com.au. Further details can be found at ausveg.com.au/ausveg-advocacy.

Planning for Hort Connections 2021 in full swing

Hort Connections is back! AUSVEG and PMA Australia-New Zealand Limited (PMA A-NZ) will once again deliver the premier event in the fresh produce industry. This year's conference and trade show will be held at the Brisbane Convention and Exhibition Centre from 7-9 June, and we cannot wait to welcome delegates to Hort Connections 2021.

AUSVEG and PMA Australia-New Zealand Limited (PMA A-NZ) are pleased to announce that the premier event for Australian horticulture, Hort Connections, is returning to Brisbane in 2021.

This year's theme is *Celebrating the international year of fruits and vegetables*, which will recognise the horticulture industry and the important role fruits, vegetables and floral industries play in human nutrition, health and wellbeing as well as global food security.

There are also a number of exciting additions and updates to the Hort Connections program. AUSVEG is currently working with a number of Queensland-based grower groups to provide components to the event that have never been seen before. Follow the AUSVEG and Hort Connections social media channels or keep an eye on the AUSVEG Weekly Update for further details.

Trade show: A must for delegates

The event will see the return of the expansive Hort Connections Trade Show. The Trade Show is always a hive of activity, and is a necessity for companies to exhibit their cutting-edge products, supply-chain solutions, technological innovations and horticultural support for growers and industry stakeholders.

With over 70 per cent of trade show booths sold, we recommend getting in quickly to book your spot. Booth registration details can be found online at hortconnections.com.au/exhibitors. For more information, please contact AUSVEG.

Pandemic response

As readers would be aware, the COVID-19 pandemic has brought many changes to the way in how we live, travel and interact. Hort Connections 2021 organisers acknowledge that this is an ongoing situation, one which they will continue to monitor as the event draws closer. Federal

and State Government advice will be heeded and there are contingencies that have been developed should issues arise in the lead-up to Hort Connections 2021.

Acknowledgements

AUSVEG and PMA A-NZ would like to take the opportunity to thank the event's major partners – Hort Innovation, the Queensland Government, Coles and Syngenta – in helping to bring together the industry through their support of Hort Connections.

Also, thank you to Fresh Markets Australia (FMA) for signing up to sponsor the Trade Show once again. We would also like to thank all of our sponsors who have jumped on-board in 2021 to ensure this event makes a triumphant return.

Awards for Excellence: Register your nominations now!

The 2021 National Awards for Excellence will be presented at the Hort Connections 2021 Gala Dinner on Wednesday 9 June. The Awards for Excellence are a fantastic way to acknowledge and recognise the outstanding contributions of individuals and businesses to the horticulture industry.

Once again, there are 11 awards categories that include the highly coveted Syngenta Grower of the Year, Corteva Young Grower of the Year and Boomaroo Nurseries Women in Horticulture award.

The award nomination form can be found hortconnections.com.au/award-nominations.



Find out more

Please visit hortconnections.com.au



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Fair Farms gains momentum with 50 per cent growth in certification

Growcom's Fair Farms program, which supports growers in proving their commitment to fair wages and decent treatment of the labour force in the horticultural industry, has started to gain ground with the number of certifications issued to farmers doubling since June 2020.

Fair Farms is a training and certification program for employers in the horticulture sector. It is designed to help farmers engage in fair and ethical work practices.

It provides growers with best-practice standards for the fair and equitable treatment of employees in a simpler, less expensive, locally designed auditable process that farmers can use to demonstrate they conform to the law and treat workers well.

Fair Farms National Program Manager Marsha Aralar said many growers had started the certification process since June 2020, with the program experiencing:

- a 48 per cent increase in the number of producers registered to participate in the program;
- an almost 50 per cent increase in those who had begun training to better understand their workforce obligations; and
- a 42 per cent increase in those who had completed their online self-assessments ahead of engaging in a more formal auditing process.

"This is a promising result and indicates a growing intent along the supply chain to demonstrate a commitment to fair and equitable work practices and eradicating exploitation," Ms Aralar said.

"At its heart, Fair Farms is about giving producers easy and affordable access to the resources they need to understand and conform with various laws that

underpin the fair treatment of workers.

"It's about levelling the competitive playing field by raising awareness and commitment to good work practices and conditions, while reducing the burden of unnecessary red tape for farmers."

Removing bad seeds

For the few that do not do the right thing, Fair Farms will help weed them out and – through industry and community sentiment – eradicate them from the market.

"It's not fair for exploitative operators to achieve the same prices in market as those operators who are paying and treating their workers fairly," Ms Aralar said.

"Decent operators are fed up with being tarnished with the same brush as a few opportunistic operators."

Ms Aralar said that Fair Farms, which had been designed in collaboration with businesses along the supply chain, was about creating a movement of those who want their produce delivered to the table having been grown ethically and to the highest standards.

"Consumers don't want wholesome foods like fruit and vegetables produced through unwholesome work practices," Ms Aralar said.

"With Fair Farms certification, growers will be able to show their commitment to fair and equitable work practices – and this will mean greater access not only to a more willing and able labour force, but to retailers, like Aldi, Coles and Woolworths, who want to meet the needs of customers who increasingly demand products that have been ethically sourced.

"Ultimately, the Fair Farms program is about ensuring Australia has a strong,

thriving horticulture industry that benefits not only individual farmers and the industry, but the broader community as a whole."

There are currently 10 potato growing businesses that have commenced certification, with two already certified – Patane Produce and M&J Baker Farms. More are expected to complete certification in the coming weeks.

Find out more

You can learn more about becoming Fair Farms Certified online at fairfarms.com.au



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Kerri-Ann Lamb. Photography by Rowena Dione.

Future Growth for Potatoes: current and emerging trends as drivers to growth and innovation

Potato grower Kerri-Ann Lamb from Killarney, Queensland, was awarded a Nuffield Scholarship with support from Hort Innovation through the fresh potato research and development levy. Through her scholarship, Kerri-Ann examined potato growers and packers' value-add facilities as well as supermarket offerings across Australia, New Zealand, Austria, Germany, Switzerland, Netherlands, United Kingdom, Ireland, Hong Kong and China, to identify main areas for driving change in the potato industry.

To ensure future sustainability and growth for Australia's potato industry, it's critical that producers continue to innovate to find responsive, modern and creative ways to meet consumer sustainability demands and expectations. That's according to Kerri-Ann Lamb who, with support from Hort Innovation, investigated how potato farmers across the globe are responding to the challenges of a changing industry.

Travelling across Australia, New Zealand, Austria, Germany, Switzerland, Netherlands, United Kingdom, Ireland, Hong Kong and China, Kerri-Ann met with growers, packers, product manufacturers, private companies, government institutes, retail outlets and trade shows to investigate drivers, emerging trends and opportunities for the potato industry.

She identified five key factors that are driving change within the potato industry, including:

- Environmental concerns both for consumers and producers.
- Evolving consumer behaviour and consumption patterns.
- Industry and messaging.
- Retail.
- Marketing strategies.

"Despite being the third most important food crop in the world behind rice and wheat, the potato industry is facing a slow decline in consumption. While travelling, it was very evident that successful farmers were those sharing their story with consumers, being transparent in their messaging and building trust between producer and customer," Kerri-Ann said.

"With consumers being increasingly focused on ensuring social responsibility in their purchase decisions, it has become more important than ever to tell the right brand story, particularly through the shared connection between sustainability and environmental impacts. This has led to sustainable packaging becoming a major consideration within the potato industry, as many producers rely on plastic packaging due to its efficiency and presentation."

"I met with only one small New Zealand company making decisions around responsible product packaging, that considered future trends and buying habits. Oakley's Premium Fresh Vegetables in Southbridge, New Zealand, packages its potatoes into small, recyclable, cardboard boxes that keep the potatoes

cool, moisture-free and protected from light. This packaging is not only great for the shelf life of the product and the environment, but the pack size is convenient and on-trend with recent consumer buying habits, enhancing the possibility of a sale to a sustainability-conscious consumer."

Further observations

Kerri-Ann said declining consumption, profit margins and a growing focus to address sustainability challenges within the potato industry has driven global innovation in both production and how the industry adapts to consumer trends.

"The potato industry has been operating the same way for a long time, but technology and automation is providing producers with the opportunity to address costs and maintain a competitive advantage," she said.

"Travelling to Belfast, Northern Ireland, I met with the owners of Mash Direct who have diversified their business, ranging from growing potatoes to providing mashed ready-to-heat potato products. Initially selling its products at the local



market directly, Mash Direct is now in its sixth generation supplying independent supermarkets to their stable customer base.”

“Having a strong customer focus, the business has built its expansion around sustainability and changing consumer trends by directly engaging with its customers and ensuring products are in line with their needs and expectations.”

Kerri-Ann said consumer preferences and eating habits are varied and complex, and for the potato industry to adapt, producers must diversify business offerings to maintain business viability.

“Optimising waste streams has become an opportunity for the potato industry to develop and deliver a socially responsible, high-grade value waste product for human consumption,” she said.

“In Yorkshire, England, I met with potato farmer David Rolling who developed Priority Vodka; a boutique potato vodka that is nurtured from seed potato to the bottle. Producing potatoes on their family farm, the potato vodka is made with fresh local spring water just down the road which minimises loss, waste and drives greater value to the business through diversification.”

“Australian potato producers have the capabilities to develop strategic and innovative opportunities in response to evolving consumer demands and shift potatoes to the ‘centre of the plate’.”

“Food is transforming, so the potato industry needs to develop a consistent messaging approach to consumers by having a better understanding of customer preferences and sending the right messages around health claims and

sustainability. Australian producers would benefit from better access to customer information in order to improve their product offering and identify and test new innovation opportunities.”

“It’s vital that farmers continue to innovate to find responsive, modern and creative ways to meet challenges, and create a viable future. Across the supply chain, the potato industry must adapt to changing consumers perceptions to remain productive and profitable. Greater awareness and action to meeting customer expectations who are seeking a healthy, socially responsible products will be critical to future success and sustainability of Australia’s potato industry.”

Kerri-Ann’s recommendations following her scholarship report

1. Consistent industry-led messaging should be developed around:
 - Health claims – sending the right messages around health claims are essential.
 - Sustainability – consumers are willing to demonstrate social responsibility so telling the correct story is immediately critical.
 - Provenance – tell a positive story about potatoes, how to use them, where they come from and freshness add an element of discovery for the consumer.
2. Producers need better access to customer and consumer information to explore emerging trends to improve their product offering in order to identify and test

- new innovation opportunities.
3. Healthy convenience products present opportunities for more value-added products as customers are time poor and seek simple nutrition solutions. This is a growth category where growers can work with business to business (B2B) customers as well as retail customers (B2C) to develop product offerings.
4. Successful implementation of value-added largely depends on a producer’s ability to be agile and make changes according to market and customer preferences. This must be at the forefront of product development.
5. Technological advances and turnkey machinery allow small agile producers to gain competitive advantages and open new markets.
6. Strategic and innovative delivery opportunities exist responding to consumer demands.
7. Potato producers can position themselves to compete with categories other than vegetables. There are also developing opportunities for potatoes as a base ingredient for ‘meat alternative’ and other products.

Find out more

To read Kerri-Ann’s report *Future Growth for Potatoes: current and emerging trends as drivers to growth and innovation*, please visit nuffield.com.au/kerri-ann-lamb-2019.

For more information, or to read more reports like Kerri-Ann’s, please visit nuffield.com.au/reports.

Applications for 2022 Nuffield Scholarships will open in May 2021. Please check the Nuffield website for more details: nuffield.com.au.

Nuffield scholarship for a horticulturalist from the potato industry is a strategic levy investment under the Hort Innovation Potato – Fresh and Potato – Processing Funds.

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: PT18001

**Hort
Innovation**

Serpentine leafminer enters Australia – what does this mean for the potato industry?

The serpentine leafminer (SLM; *Liriomyza huidobrensis*) is a plant pest from the family Agromyzidae that has a wide host range of plant species including broccoli, beet, spinach, peas, beans, chilli, cucumber, potatoes, cut flowers, melons, and a number of weeds. Extensive research has been conducted overseas into the effects of SLM on potato crops. Madeleine Quirk reports.

In late 2020, there were several confirmed detections of serpentine leafminer (*Liriomyza huidobrensis*) on field-grown vegetables in western Sydney, and in celery and beans in the Fassifern Valley region of Queensland. Following extensive surveillance and assessments on where the pest was found and commodities affected, it was deemed that SLM was not technically feasible to eradicate. This has seen a transition to management for affected industries.

Identification

Adult SLM range from 1.3–2.3 mm in length, with black and yellow markings. This pest is difficult to identify with the naked eye, and it is also difficult to distinguish from native leafminer species. Typically, specialist diagnostics is required to confirm whether an exotic leafminer is present.

Lifecycle

SLM has an egg, larval, pupal, and adult life stage. Female flies lay eggs directly into the leaf, and larvae begin to tunnel through the leaf tissue as they feed. After a number of days, the larvae exit the leaf and pupate in the soil before becoming an adult fly. Under the right conditions, the lifecycle can be completed in as little as two weeks, meaning several generations may be produced within a single crop.

Damage to potatoes

SLM damage is primarily caused by larvae feeding inside the leaves. Typically, this feeding causes long, narrow, spiralling 'mines' which appear as white or grey lines on leaves. While it has been shown that potatoes can tolerate significant foliar damage to leafmining before

interventions are necessary, high levels of infestation affect the plant's ability to photosynthesise, significantly reducing crop yields. When the adult fly feeds and lays eggs, there is also an increased risk of secondary infection.

Effects on potato industries worldwide

Serpentine leafminer has had a considerable impact on potato production globally. Native to South America, SLM is now considered present in Europe, the Middle East, Asia, Africa, North America, and Australia.

Until the 1980s, records indicated that populations of SLM were being managed by native parasitoids across South America. It was not until farmers began

intensively applying insecticides for the control of other pests, that parasitoids controlling SLM were knocked out, and SLM numbers spiralled (termed a 'secondary pest').

As a result, growers began to experience significant yield losses in their potato crop, with losses as high as almost 100 per cent being reported in Chile and Argentina. In Peru, yield losses varied between potato varieties but greater losses were seen in earlier maturing potatoes (up to 60 per cent) than later maturing potatoes (up to 30 per cent).

In Argentina, potatoes were reportedly severely damaged during tuber bulking but the severity of damage varied between provinces. Today, SLM is still seen as the most damaging pest in the coastal valleys of Peru.



Serpentine leafminer adult. Image courtesy Central Science Laboratory, Harpenden, British Crown, Bugwood.org.



Serpentine leafminer stippling damage to choy sum. All images on this page courtesy of Shannon Mulholland from NSW DPI.



Serpentine leafminer damage to cucumber.



Serpentine leafminer damage to squash seedlings.

Similarly, when SLM was first detected in Indonesia in 1994, it had a significant effect on potatoes, particularly at higher elevation of 800 – 1700 m. Yield losses of up to 70% were recorded as growers struggled to control the pest with conventional insecticides.

Integrated pest management crucial

While there are permits available for management of SLM in potatoes, taking an integrated approach to management of SLM will be crucial for the effective control of this pest.

The foundations of an integrated pest management approach include:

- Monitoring pest activity – apply your own economic thresholds to delay and reduce sprays to allow parasitoid populations to build.
- Avoiding broad spectrum insecticides – do not target leafminer flies with harsh broad spectrum chemicals. Consider soft chemicals when targeting other pests when leafminer activity is high, as they will harm your beneficial insect population.
- Understanding the role of parasitoids – understand the signs of parasitism to determine if visible leaf mining damage is associated with an active leafminer population.

In response to the recent detections, industry and government have prepared management options for growers, including IPM and chemical management options. Visit dpi.nsw.gov.au for further information.

What chemistry is available?

Currently, the chemistry available for potatoes in Australia includes:

- Cyantraniliprole (potatoes)
- <http://permits.apvma.gov.au/PER90387.PDF>
- Abamectin (root and tuber vegetables)
- <http://permits.apvma.gov.au/PER81876.PDF>
- Cyromazine (root and tuber vegetables)
- <http://permits.apvma.gov.au/PER81867.PDF>

What can you do?

- It can be difficult to distinguish SLM from native leafminer species by looking at the insect itself, so visual surveillance should focus on the damage created by the pest.
- Inspect your potato leaves regularly for signs of unusual leafmining activity.
- While SLM is transitioning to management, suspected SLM damage must still be reported immediately to the Department of Primary Industries or Agriculture by phoning the Exotic Plant Pest Hotline (see more information). This will assist government in understanding the pest's spread, and lead to better management.

Find out more R&D

For more information, visit the following websites.

- ausveg.com.au/mt16004.
- apvma.gov.au.
- dpi.nsw.gov.au.daf.qld.gov.au.
- planthealthaustralia.com.au.

Any unusual plant pests 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 on 03 9882 0277 or email science@ausveg.com.au.

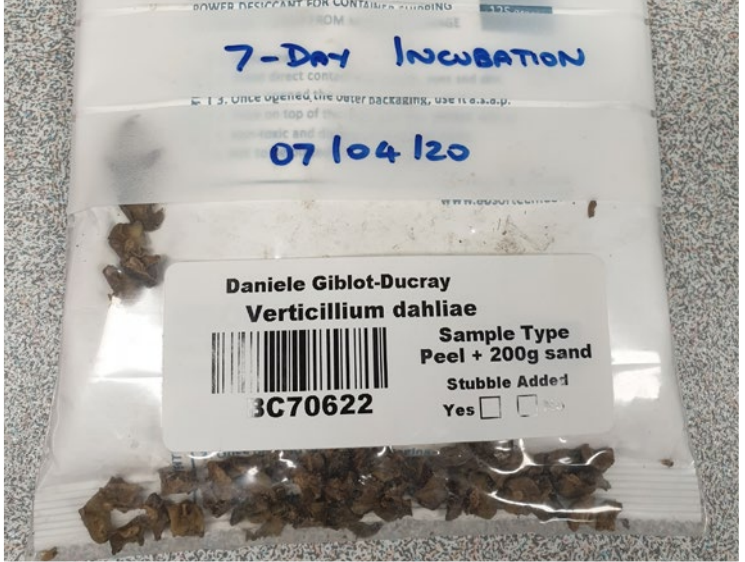


Figure 1. Tuber cores stored on desiccant just after collection (left) and after 7 days (right). Images supplied by SARDI.

New diagnostic service for CLso in potato tubers

In 2017, Hort Innovation commissioned SARDI to develop protocols for large-scale testing of potato leave, tuber and stem samples for area-wide surveillance of *Candidatus Liberibacter solanacearum* (CLso), the bacterium that causes 'zebra chip' disease in potatoes. A follow-up project in 2019/20 focused on developing a practical tuber sampling protocol that could be used by industry. *Potatoes Australia* spoke with Danièle Giblot-Ducray about the outcome of the projects.

In February 2017, tomato-potato psyllid (TPP) was detected in Western Australia. TPP is a destructive pest that can cause devastating losses for potato growers and the wider industry, and can vector *Candidatus Liberibacter solanacearum* (CLso).

Since then, the Western Australian Department of Primary Industries and Regional Development has been monitoring for CLso; fortunately, the bacterium has not been detected.

Early detection of CLso-infected seed lots is important to manage the risk of production losses. TPP can spread the bacterium from low numbers of infected plants to infect whole crops. A practical method of sampling seed lots was needed to support industry manage the risk if incursions are detected.

In response to the Western Australian TPP incursion, Hort Innovation commissioned a series of projects to accurately and reliably detect CLso to support surveillance and certification activities:

- *Diagnostic capability to detect Candidatus Liberibacter solanacearum* (CLso) (PT17000), undertaken by Agriculture Victoria (featured in June/ July 2019 edition of *Potatoes Australia*). The project aimed at more accurately detecting CLso, by determining how CLso is distributed in a potato plant and the best part of the plant to test.
- *Developing and implementing a high throughput diagnostic test for Candidatus Liberibacter solanacearum* (CLso) (PT17000), undertaken by Department of Primary Industries and Regions research division, South Australian Research and Development Institute (SARDI). The project aimed at developing high throughput diagnostics for CLso; that is, large-scale, fast turnaround testing.
- *Sampling for Candidatus Liberibacter*

solanacearum (CLso) (PT19001), also undertaken by SARDI. This project looked at developing a practical tuber sampling protocol. The aim was to deliver a fully operational surveillance capability for CLso.

These projects were strategic levy investments under the Hort Innovation Fresh Potato and Potato Processing Funds.

External assistance

External assistance was key to the success of the SARDI research.

For PT17000, the SARDI project team worked closely with researchers in the United States, who provided potato plant material infected with CLso. The freeze-dried material was imported using the appropriate quarantine channels, and therefore posed no risk to the Australian horticulture industry.

For PT19001, the SARDI team enlisted the help of a group of growers to evaluate the sampling protocol being developed and ensure practicality.

Towards large scale testing for CLso

"One of the recommendations from the National Diagnostic Protocol for CLso is to test 60 composites of five leaf midribs from a paddock, glasshouse or seed lot to get an appropriate diagnosis. This is a slow protocol and difficult to scale up," SARDI project team leader Dr Danièle Giblot-Ducray explained.

One of the features of the SARDI Molecular Diagnostic Centre (MDC) facilities is the ability to process and extract DNA from large samples.

"The aim of the project was to investigate whether our system could be used to scale up testing for CLso by processing large composites, while maintaining the sensitivity of detection,"



Figure 2. Customised sampling device for CLso surveillance.

Dr Giblot-Ducray said.

The Agriculture Victoria and SARDI projects both demonstrated that the best parts of the potato plant to test for CLso detection were specific sections of the stems and tubers and not the leaves (as previously thought). This was a vital finding.

“With the SARDI protocol, we have improved sensitivity 10-fold and can process composite samples of 50 stem or tuber sections. This significantly increases surveillance throughput and reduces costs,” Dr Giblot-Ducray said.

Additionally, SARDI designed a new, more specific DNA test to more accurately detect CLso.

“We recommend that anyone looking to detect CLso use our assay, which is available under MTA to any biosecurity lab in Australia.”

A new diagnostic service for CLso

Dr Giblot-Ducray outlined that before rolling out the new protocol as a service to industry, more work was needed to ensure samples submitted for testing were not deteriorating during transport and remained of a suitable quality for DNA-based testing.

“Collecting tuber samples rather than stem had been industry’s preference. However, tuber tissue is highly prone to rapid decay, so we needed a method to ensure samples arrive at the laboratory in good condition,” Dr Giblot-Ducray said.

With this in mind, the SARDI team investigated a range of preservation methods; calcium carbonate-based desiccant proved to be the most efficient and practical to preserve tuber samples (Figure 1). The team also designed a sampling device to assist with sample collection (Figure 2).

“In order to facilitate uptake by the industry, we needed an easy and efficient

system to collect the tuber samples. The industry input was invaluable in helping improve the sampling tool.” Dr Giblot-Ducray added.

Preparation is key

According to Dr Giblot-Ducray, now that TPP is established in Western Australia, the bacterium is more likely to arrive. Therefore, it is important that Australia has a standardised surveillance system.

“The SARDI lab is now ready to start testing and we are encouraging industry to implement a surveillance program,” Dr Giblot-Ducray said.

“Following an upgrade of the SARDI facilities, we can process composite samples from up to 70 paddocks or seed lots per day if required, which should be more than enough to cope with peak demand from an industry-wide surveillance program or seed

certification program.”

Coring devices and sampling instructions are available from SARDI upon request. A video demonstrating the sampling protocol should be available from the Hort Innovation website shortly.

Find out more R&D

Please contact Dr Danièle Giblot-Ducray at daniele.giblot-ducray@sa.gov.au.

These projects have been funded by Hort Innovation using the fresh potato and potato processing research and development levies and contributions from the Australian Government.

Project Numbers: PT17000 and PT19001

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A plant infected by CLso.

Managing pink rot in potatoes

Pink rot is a soil-borne disease caused by the pathogen *Phytophthora erythroseptica*. A factsheet – produced by RM Consulting Group – provides information on the pathogen, its lifecycle and management options.

Management options

Use the following options to help manage pink rot:

- Use Metalaxyl and Metalaxyl-M (mefenoxam)* according to label instructions.
- Keep soil moist (between field capacity and above wilting point) but without excess moisture.
- Use the PreDicta Pt service to identify areas that are infected with the pink rot pathogen.
- Avoid planting into soils that are compacted (> 2000 kPa with a penetrometer) and/or waterlogged. Consider using controlled traffic and/or minimum tillage practices to improve soil condition.
- Remove all volunteers and weeds that can act as potential hosts.
- Avoid mixing tubers from contaminated areas with other tubers during storage or better still avoid harvest of contaminated tubers.
- Rotate potatoes with other crops (for at least four years).
- Use clean, certified seed.

* Note: Metalaxyl is effective in Australia but resistance has been identified in the US where the active ingredient has been overused in the crop rotation. Metalaxyl is a chemical which has been shown in certain soils to develop enhanced biodegradation (i.e. the soil microorganisms use it as a food source and thus it is rapidly degraded before it can be effective). This is more likely to occur with repeated usage on many crops.

Potential management options

Research has shown that:

- Biofumigants such as mustards can be effective. Biofumigants should be used according to best practice advice.
- Low soil pH (<5) in the rootzone and low levels of free calcium in the soil solution may increase pink rot severity. Liming and soil application of soluble calcium fertilisers may alleviate this risk



Figure 1: In the early stages of pink rot infection, the rotted portion of the tuber is delimited by a dark line. Images on the page courtesy of P.S. Wharton.

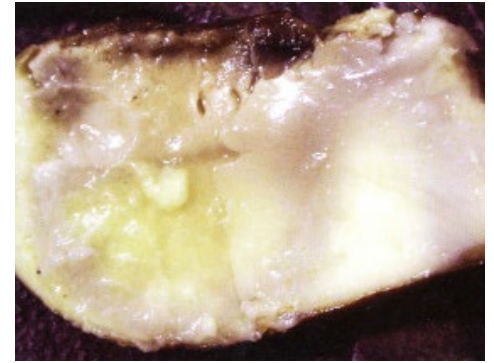


Figure 2: Pink rot infection is usually followed by secondary infection by anaerobic soft rot bacteria. These turn the tuber tissue soft, creamy and mushy.



Figure 3: Tubers infected with pink rot turn pink after exposure to air for 15 to 30 minutes. Arrows indicate diseased tissue.

(by increasing the pH and the soluble calcium). Further research is required to better understand this relationship.

The pathogen and disease

Pink rot of potato is an important soil-borne storage disease of potatoes worldwide. It is caused by the fungus *Phytophthora erythroseptica* and sometimes by *Phytophthora cryptogea*. Pink rot infection is often associated with secondary infection by anaerobic soft rot bacteria.

Key features of pink rot are that:

- Infections vary in virulence.
- Some cultivars are less susceptible but can still get the disease

to some extent.

- It can survive for long periods in the soil (up to seven years).
- It can be spread by tubers, water and soil.
- It develops rapidly at soil temperatures from 10 to 30°C with 25°C optimal for infection.
- It resembles blackleg in early infection stages.
- There are many plants that act as hosts, including many weed species.
- High humidity along with poor ventilation can cause heavy losses of stored potatoes.

Symptoms

Diseased plants are first observed in poorly drained (waterlogged) parts of the field and late in the season, near harvest. Disease symptoms are mostly characterised by stunting and wilting of plants.

Wilting starts from the base of the stem and progresses upward, causing leaf yellowing, drying and defoliation. Vascular discoloration and blackening of the underground stems may also be observed.

Similarly, roots may turn brown to black, and occasionally aerial tubers may develop. Symptoms on tubers are more obvious and characteristic of the disease. Tuber decay begins at or near the stem or stolon end of the tuber. Infected tissue becomes rubbery but not discoloured in the early stages of infection, and when infected tubers are cut open the rotted portion is bordered by a dark line visible through the tuber skin (see Figure 1).

The tuber skin (periderm) over the rotted portion is light brown in white-skinned cultivars.

Pink rot is not a slimy soft rot, and rotten tissues remain intact but spongy. When rotten tubers are cut open, the internal tissues are cream-colored and usually odourless. The tough, leathery, rubber-like texture of infected tubers distinguishes pink rot from bacterial rot disease where the diseased tissue becomes soft and pulpy and contains numerous cavities.

However, infected tissues are easily invaded by secondary pathogens, such as soft rot bacteria (*Pectobacterium* spp.), which produce the slimy symptoms often found in potatoes with pink rot (see Figure 2).

As tubers are exposed to the air, the colour of the infected tissue progressively changes from cream to salmon pink within 15 to 30 minutes (see Figure 3). After about one hour, the tissue gradually turns brown and then black. If the cut tuber is squeezed, a clear liquid may ooze out of the cut surface.



Pink rot in potatoes. Image courtesy of Michael Rettke from the South Australian Research and Development Institute.



Pink rot in potatoes. Image courtesy of Jordan Egge.

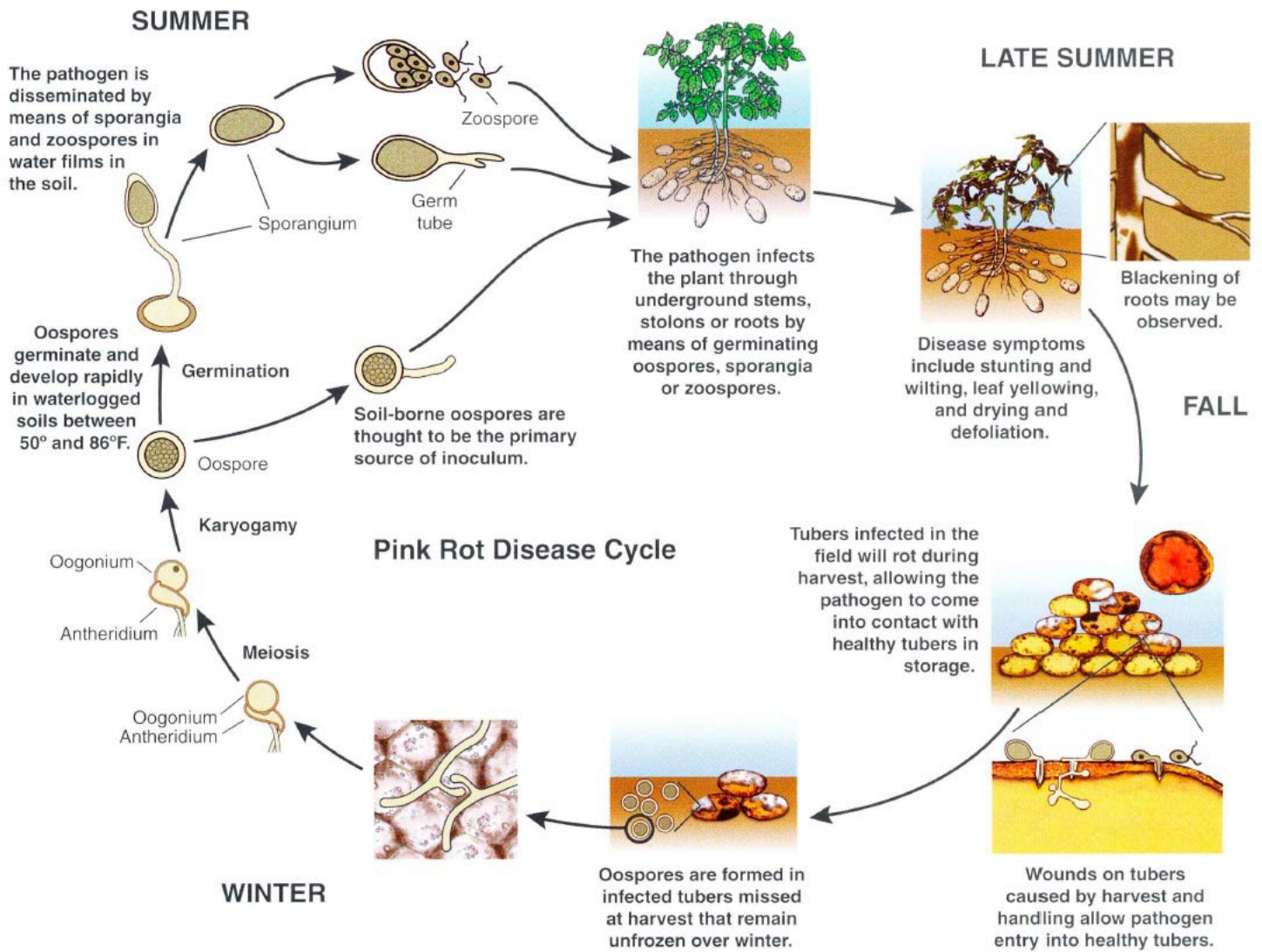


Figure 4: The disease cycle of the pink rot pathogen, *Phytophthora erythroseptica*. Illustrations courtesy of Marlene Cameron.

Disease cycle

The disease cycle of pink rot is shown in Figure 4. The pathogen can be transferred by:

Soil – to new fields via farm machinery and bins, and within an infested field during cultivation.

Tuber – the surface of healthy tubers may be contaminated with oospores from infected tubers that were missed during harvest (volunteer potatoes) or in cull piles that will end up in the soil after deterioration of the tubers.

Water – irrigation water is also an important source of movement of the oospores from one location to another within a field and among nearby fields.

Further research

The following pink rot research reports can be found by searching the project numbers on the InfoVeg webpage at ausveg.com.au/infoveg/infoveg-database.

- PT97026 – *Developing soil and water management systems for potato production on sandy soils in Australia*
- PT97004 – *Potato pink rot control in field and storage*
- PT01042 – *Potato pink rot control in the south east of South Australia*

A previous article entitled 'Controlling pink rot in Australian potatoes' appeared in *Potatoes Australia* – June/July 2017. The article can be found on page 31 at ausveg.com.au/app/uploads/publications/Potatoes-Australia_June-July_2017_Web.pdf.

Find out more

Please visit soilwealth.com.au/resources/factsheets/pest-and-disease-management/pink-rot-fact-sheet to read the full factsheet, including links to further reading and references.

This factsheet was produced under *Program Approach for Pest and Disease Potato Industry Investments*, a strategic levy investment under the Hort Innovation Fresh Potato and Potato Processing Funds.

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: PT17002

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L-R: PPAA Chair Allan Smith and PPAA Vice Chair Josh Opas. Images courtesy of the Potato Processors Association of Australia.

Update from Potato Processors Association of Australia

Like many industries, 2020 brought a year of demand uncertainty for the Potato Processing industry with food service deeply affected in several states of Australia. Although the demand for crisps was strong, the processors of French fries were at times eagerly searching for frozen storage space as lockdowns and restrictions saw a rapid drop in consumption.

The ability to be able to store product avoided the devastating food losses that impacted other industries. To find out how the market is faring in 2021, we meet and talk with the Chair of the Potato Processors Association of Australia (PPAA) Allan Smith, and the Vice Chair Josh Opas.

National Agronomy Manager for Snack Brands Australia, Allan Smith, was elected to the role of Chairman of the PPAA in October 2019. Allan has worked exclusively in the crisping industry over the last 20 years and prior to that played a role in sustainable agricultural resource management with the Queensland government. With crisping processing reliant on fresh supply, Allan and his teamwork with growers across Australia to facilitate year round supply to their Sydney based processing operations.

Allan talks about the current status of the crisping market.

"Despite creating volatility in demand, COVID-19 hasn't negatively impact overall consumption of crisping products. Although sales through outlets like petrol stations and convenience stores were affected, there was an overall incremental increase in consumption driven by demand through supermarkets," he said.

"The instability had impacts right

through to the growers supplying factories and their flexibility and support was appreciated.

"We see Australian consumption remaining solid and overall sales and consumption is expected to continue at 2020 levels.

"Some export of crisping potato and retail product is likely to continue, as is some importing; however, the industry remains relatively well insulated from mass import due to the nature of the product," Allan outlined.

Josh Opas has held the Vice Chair position with the PPAA since 2019 and is the National Agricultural Manager for McCain Foods (Aust) based in Ballarat. Josh has had a long career in horticulture and joined McCain in 2001 working as a Tasmanian-based field officer before several career moves saw him stepping into the role of National Agriculture Manager.

Josh shares the market outlook for the Australian French Fry sector.

"The arrival of COVID-19 resulted in volatility in the market, and some 12 months later we are just starting to see demand return to pre-lockdown levels," explained Josh.

"2020 was a challenging time for

processors; we needed to adjust our large-scale operations to supply more into the retail sector, and less into food services, which is not a trivial process."

While the outlook for consumption is encouraging, the ongoing impact of COVID-19 in the EU is seeing greater availability of product on the global market, and fry imports for December were the highest for 2020.

"We are seeing companies reinvigorating their capital works programs which is an encouraging move for domestic production," outlined Josh.

Find out more

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.

Quick Q&A with...

Barbara Hall, 2019 AUSVEG SA Researcher of the Year

Senior Research Scientist, Department of Primary Industries and Regions research division, South Australian Research and Development Institute (SARDI) – recently retired.

Crowned 2019 AUSVEG SA Researcher of the Year, Barbara Hall was recognised for her longstanding contribution and her work in providing plant pathology testing support to the horticulture industry. Her support has been essential to identifying and managing a number of key issues in South Australia. In particular, Barbara has been instrumental in helping advisors to better understand soilborne disease in the state and subsequent impacts on plant health and growth. Barbara retired from SARDI in January 2020.



2019 AUSVEG SA Researcher of the Year Barbara Hall (right) and Cam Wallace (left) from SA Water, the award's sponsor.

Can you please provide a short overview of your career as a researcher (to date)?

I started as a technician in the Horticulture Pathology laboratory at the Northfield Research Centre, when it was the Department of Agriculture. Most of my work was in the diagnostic area, and covered all horticulture crops – vegetables, tree fruit, viticulture and ornamentals. I also provided research support both in laboratory and field trials, working on whatever crop and disease were problems at the time. After several years' training, I worked up to be a senior research scientist, managing research projects involving field and lab work!

How long have you worked in the potato field?

I have done either research or diagnostics in potatoes for over 37 years.

What type/s of potato research have you conducted?

The potato projects I have been involved with were all about managing diseases, including understanding the epidemiology

of the pathogens involved. These included most of the major diseases: soft rot, pink rot, Rhizoctonia, black dot, target spot, late blight, early dying and viruses. We have also undertaken commercial trials evaluating products for control of these diseases. In addition, I have been a collaborator on projects about management of root knot nematode and development of the PREDICTA Pt testing service.

What do you enjoy most about potato research?

With any research, the enjoyment is in finding answers to questions. The collaboration with growers is a great way to learn about the crop and their experiences with whatever you are working on. And you hope that whatever you find is useful to them.

Where do you think more potato research needs to be undertaken (e.g. pest and disease)?

There are so many things that impact on producing a high-quality potato that we still don't understand. There are lots of blemishes and scurfing and tuber

damage for which we can find no cause. Finding out what causes some of these would be a great challenge. Development of additional tests for the PREDICTA Pt service would be useful; it doesn't solve the problem of how to manage the diseases, but it certainly helps with making those management decisions from a more informed position.

What does winning the AUSVEG SA Researcher of the Year award mean to you?

It was amazing to win an award that is recognition from growers and the grower community. It makes you realise that at least some of the work you have done is actually useful to them!

I'd just like to thank the growers for the years of cooperation, discussion, sharing of ideas, provision of their expertise and their levies for research funding! Research cannot be done in isolation, and if we don't grow and learn together then nothing happens.



Managing blackleg in potato crops

Blackleg is the major cause of potato seed downgrading and rejections in northern Europe. So, what is the issue for Australia? Some species described overseas cause serious potato diseases that have not been recorded in Australia.

Our 'pest-free' status is not assured though, for three key reasons:

1. There have been few potato crop surveys targeting these pathogens.
2. These bacteria have undergone several name changes over the past decades.
3. Several newly named species and subspecies have been reported with the use of genetic classification techniques.

The pathogens affect other crops and can be introduced with them or move around the country with them. Bulbs and vegetative plant material imported for the nursery and cut flower industries could be symptomless carriers of some of these bacteria.

What bacteria cause blackleg of potato?

In Australia, we have always referred to blackleg causing bacteria as *Erwinia* species:

- *Erwinia carotovora subsp. atroseptica* – *Pectobacterium* spp.
- *Erwinia carotovora subsp. carotovora* – *Pectobacterium* spp.
- *Erwinia chrysanthemi* – *Dickeya* spp.

Causes of blackleg in Australia:

- *P. atrosepticum*
- *P. carotovorum subsp. carotovorum*
- *D. dianthicola* – First detected in

potatoes in 2017, found in multiple states since.

- *P. carotovorum subsp. brasiliense* – First identified in potatoes in 2016 but reclassification of isolates in historical collections indicate that it has been here since the 1960s.
- *P. parmentieri (P. wasbiae)* – First identified in potatoes in 2019. Historical collections yet to be assessed.
- *P. polaris*
- *P. punjabense*

Identification of blackleg-causing species

You cannot differentiate blackleg-causing species visually. Laboratory testing is required for species identification in the form of DNA-based tests and isolating bacteria from the plant.

Identification is important. Blackleg-causing spp. have different optimal growth conditions, e.g. soil moisture and temperature.

Disease cycle and infection

Researchers in the United Kingdom gave identified that seed potatoes are the most important source of inoculum in the blackleg disease cycle. Infected seed potatoes may come from infected fields or may become infected during grading. Bacteria can live in spongy tissue of the tuber without causing disease.

The bacteria become active when environmental conditions are right – then disease occurs.



Soft rot of potato tuber caused by *Pectobacterium parmentieri*. Images courtesy of Agriculture Victoria.



Soft rot of potato tuber caused by *Pectobacterium parmentieri*.

Disease development

- Blackleg can occur at any time during the growing season.
- Development is favoured by cool, wet conditions at planting followed by warmer weather.
- When infected tissues break down, bacteria are released into the soil and travel in soil moisture to other plants.
- Blackleg causing bacteria do not survive in soil more than a few months; however, they may survive in crop debris, weeds, or volunteer potatoes.



Blackleg of potato.

Advice for growers

- Use certified, disease-free seed.
- Plant whole seed rather than cut seed, particularly in regions where tuber soft rot and blackleg diseases have been a problem (e.g. in warm or wet soils).
- Schedule planting to avoid periods when extremely wet conditions or high temperatures prevail.
- Use long crop rotations of 2-8 years, particularly for seed production (persistence in soil will depend on rotation and hygiene).
- Avoid risks of cross-contamination between alternative host crops such as ornamental bulbs or vegetable crops grown in the same fields, or using machinery or personnel that could spread bacteria on a farm e.g. on clothing or equipment. Good hygiene and having no host crops in rotation is important.
- Manage insect pests to avoid physical injuries to tubers, roots and stems that provide entry sites for bacteria.
- Have good nutrition and soil moisture management, maintain optimal calcium and magnesium levels in plants, do not overdo nitrogen, good irrigation management and adequate drainage.
- Maintain good storage conditions for seed and marketable tubers.



Blackleg of potato.

Find out more R&D

Please contact Dr Rachel Mann at rachel.mann@agriculture.vic.gov.au or Dr Doris Blaesing at dorib@rmcg.com.au.

Management options have been summarised by Dr Len Tesoriero, who was Project Lead of PT18000 – *Review bacterial blackleg disease and R&D gaps with a focus on the potato industry*.

The final report for this project is available on InfoVeg. Readers can search 'PT18000' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

Research on soils that suppress *Spongospora* root galling and powdery scab of potato

A three-year project focusing on powdery scab and its pathogen has recently been completed in New Zealand. In this article, Professor Richard Falloon from the New Zealand Institute for Plant and Food Research Limited reports on the outcomes of *Exploring Spongospora suppressive soils in potato production*, a strategic levy investment under the Hort Innovation Fresh Potato and Potato Processing Funds.

Powdery scab is an economically important disease of potato crops in Australia and New Zealand, and around the world. This is because the lesions on tubers diminish quality and marketability of seed, fresh market, and processing potatoes (see Figure 1). The powdery scab pathogen *Spongospora subterranea* also invades potato underground stems (see Figure 2) as well as stolons and roots, causing formation of galls. These infections obstruct water and nutrient uptake, reducing tuber growth and decreasing crop yields.

Spongospora diseases begin early in crop growth, with the release of zoospores from resting spores in contaminated soils and infected seed tubers. The zoospores infect potato roots, where the pathogen multiplies and produces many more zoospores that further infect roots and developing tubers.

Later in the season, many thick-walled survival structures (sporocysts, each containing many resting spores) are produced in root galls and in scab lesions on mature tubers. The resting spores can survive in soil for several years, making it

difficult to control powdery scab. Disease management recommendations include long crop rotations between potato crops, pre-planting assessment of *Spongospora* in soils, and use of disease-tolerant cultivars, pathogen-free seed tubers and appropriate crop management.

Disease suppressive soils give low amounts of diseases, even where pathogen inoculum levels are high. Naturally suppressive soils have been reported for several soilborne plant diseases. Soil physical and nutrient properties, and/or microbial populations, can contribute to disease suppression. Soil sterilisation makes soils with microbe-mediated suppression disease-conducive.

A long-term crop rotation trial in the Pukekohe vegetable growing region near Auckland, New Zealand, indicated that the trial site was powdery scab-suppressive, even when successive potato crops were grown for nine years. This inferred that identifying, maintaining and enhancing suppressive soils could be a sustainable strategy for managing *Spongospora* diseases.

About the project

A research project was instigated with goals to determine if different field soils had different powdery scab suppressive capabilities, and to identify factors involved in disease suppression. The project included scientists with expertise in plant pathology, soil science, molecular biology and microbial bioinformatics, working at The New Zealand Institute for Plant and Food Research Limited. Three large greenhouse experiments (as in Figure 3) were conducted during the growing seasons of 2017/18 (Phase 1), 2018/19 (Phase 2) and 2019/20 (Phase 3).

Each experiment included up to 12 different field soils, which were collected in July of each year and transported to a research greenhouse. Samples of the soils were analysed for fertility parameters and soil microbial activity, and for different potato pathogens (including *S. subterranea*), using the PREDICTA® Pt service that is offered by the South Australian Research and Development Institute. Microbial profiles of the soils were also determined, using gene sequencing of extracted bacterial and fungal DNA.

In each experiment, cv. 'Agria' seed tubers (very susceptible to powdery scab and root galling) were individually planted into large pots (see Figure 3). Half of the pots were inoculated at planting with *S. subterranea*, and the others were left uninoculated (experimental controls). The pots were watered regularly to give conditions suitable for *Spongospora* infection.

At two to three months after planting, half of the plants in Phase 1 and 2 were assessed for severity of root galling, and microbial DNA from rhizosphere soil was also analysed. At maturity in Phases 1, 2 and 3, tubers from the remaining plants were assessed for incidence and severity of powdery scab, and tuber yields were determined.

Greenhouse pot experiment from September 2018. Image courtesy of Peter Wright.



Summary

This project has demonstrated that some New Zealand field soils are suppressive to powdery scab. Abiotic soil factors (texture, OM content, pH, nutrient chemicals) influenced incidence and severity of *Spongospora* root galling and tuber powdery scab on potato plants.

Applications of Mn to soil and potato foliage reduced powdery scab in naturally low Mn soils. Soil microorganisms were also likely to be involved in suppression of *Spongospora* diseases, because heat treatments of suppressive soils increased these diseases (eliminated or reduced disease suppression).

This research has broadened understanding of the nature and possible causes of powdery scab suppression in field soils, and may contribute to future management strategies for the intractable quality- and yield-limiting diseases caused by *Spongospora subterranea*.

Project results Phase 1

The Phase 1 experiment showed that *Spongospora* inoculation of six of the soils increased severity of powdery scab on harvested tubers, but inoculation gave much less disease in the other six soils. Three soils with low clay contents (<30%) gave very little powdery scab in harvested tubers, which was likely because of their free-draining nature. Soil pH and nutrient concentrations were not associated with powdery scab incidence or severity. Apart from one disease-conductive soil already infested with *S. subterranea* and containing high organic matter (OM), soil OM levels were not related to powdery scab suppression. The effect of crop rotations on powdery scab was variable, but one soil with three previous potato crops in the last five years was disease suppressive.

Although pre-plant soil microbial communities were affected by soil type and cropping history, there were no obvious relationships between *Spongospora* diseases (root galling or powdery scab) and microbial communities of the 12 soils.

Phase 2

The Phase 2 experiment focused on six Pukekohe soils, of one soil type and all from within a 10 km zone. The experiment aimed to determine if powdery scab suppression was 'general' or 'specific' (transferable; involving specific microorganisms), and was associated with soil physical, chemical, or biological factors (including particular bacterial or fungal groups). Four treatments involving the six soils were applied, including: no added *S. subterranea* inoculum (experimental control); *S. subterranea* inoculation; inoculation + heat treatment; and a treatment to test transfer of suppression.

This fourth treatment, also with *S. subterranea* inoculation, used the six soils added separately to a known conducive soil (from Phase 1), at 10 per cent of each soil to 90 per cent of the conducive soil.

Previous crop rotation did not affect *Spongospora* diseases on the plants or harvested tubers. All six soils displayed some level of microbe-mediated disease suppression since heat treatment increased severity of powdery scab on the harvested tubers. Three of the soils were more suppressive than the others. Two soils gave possible 'specific' *Spongospora* suppression, with less disease where they were added to the conducive soil. One soil that contained pre-planting *S. subterranea* DNA gave low powdery scab severity, indicating disease suppression.

All six 'suppressive' soils contained high levels of manganese (Mn; 292–674 mg/kg), which were much greater than for the conducive soil (49 mg Mn/kg), suggesting a possible link between Mn content and disease suppression. Bacteria and fungi reported as being antagonistic to soilborne plant pathogens and/or promoters of plant growth were present in the disease suppressive soils, and may have contributed to powdery scab suppression.

Phase 3

The Phase 3 experiment assessed effects of different natural soil levels of Mn, or soil- or foliage-applied Mn, on development of powdery scab on potato tubers. This was to test the relationship with Mn indicated in Phase 2.

Twelve field soils, with natural Mn contents from low to very high (21 to 885 mg Mn/kg), were selected after micronutrient determinations of soil samples from 23 different fields. Four treatments were applied, including: no Mn applications and no *S. subterranea* inoculum at planting (experimental control) ('No Mn + not inoculated'); no Mn applications and added *S. subterranea* inoculum ('No Mn + inoculated'); Mn pre-plant soil application and added *S. subterranea* inoculum ('Soil Mn + inoculated'); and Mn soil application, Mn foliar applications and added *S. subterranea* inoculum ('Soil Mn + foliar Mn + inoculated').


The pre-planting soil application of Mn was at the equivalent of 1.04 kg Mn/ha, using chelated Mn microgranules (YaraVita™ Rexolin® Mn 13 EDTA). The first foliar Mn treatment was applied to potato plants six weeks after planting, and was followed by three further applications at three- to four-week intervals. Each foliar application was at the equivalent 1 kg Mn/ha (2 L/ha of YaraVita™ Mantrac Pro™ (50% Mn) in 200 L/ha of water).

Five of the soils contained resident *S. subterranea* DNA. For the 'No Mn + not inoculated' treatment, powdery scab was severe in two soils and moderate in three others. The 'No Mn + inoculated' treatment to the other seven soils gave much less powdery scab, indicating suppression of the disease.

The 'Soil Mn + inoculated' and 'Soil Mn + foliar Mn + inoculated' treatments both reduced powdery scab severity in three soils with low natural levels of Mn (21, 24 or 25 mg Mn/kg).

However, for one soil that had the greatest amount of pre-planting *S. subterranea* DNA and the greatest amount of natural Mn (885 mg/kg), powdery scab was very severe on the harvested tubers.

These results indicated that Mn soil and foliar applications to low Mn soils may reduce powdery scab, but not where natural *S. subterranea* inoculum levels are very high. The three very low Mn soils (<26 mg/kg) had the greatest OM contents (12 to 23.5 per cent).

Find out more 

Please visit plantandfood.co.nz.

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

Project Number: PT16002

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Strengthening Australia's plant biosecurity system at the border

A cross-industry horticulture project that has the potential to reduce quarantine testing lag times is underway. Faster quarantine testing will provide several benefits for plant industries (including potato), such as reduced costs to import plant material from overseas; ability to import more plant varieties to adapt to local environmental conditions; and a rapid and safe release of pest-free plants. *Potatoes Australia* reports.

Having strict biosecurity measures is paramount to stopping exotic pests and diseases from crossing Australia's borders. A robust biosecurity system is vital for protecting our eight-billion-dollar horticulture industry.

However, Australian growers need access to new plant material for their crops to remain globally competitive and to keep their businesses profitable. But one of the challenges they face is the time it takes for this material to become available. Currently, new plant material entering Australia can spend up to three years in post-entry quarantine facilities undergoing pathogen testing.

To address this challenge, new technology is being introduced through a project entitled Improving plant industry access to new genetics through faster and more accurate diagnostics using next generation sequencing. A multi-industry strategic levy investment under the Hort Innovation Citrus, Nursery, Potato – Fresh, Potato – Processing, Raspberry and Blackberry and Table Grape Funds, this project is supporting the adoption of 'next generation sequencing' in the screening of imported horticultural plant material in post-entry quarantine facilities. The project team is working closely with industry representatives and the Australian Government to address their needs and lead to policy adoption of the new methodology to accelerate quarantine testing at the border.

Finding genetic information

Leading this project is Associate Professor Roberto Barrero from the Queensland University of Technology (QUT). He explained how next generation sequencing can provide researchers and post-quarantine inspectors with the information they require, particularly in potatoes.

"In horticultural crops, including potato, we are keen to bring new varieties of plants to Australia that can provide benefits to our growers," Professor Barrero said.

"The new next generation sequencing technology allows us to get information about the genetics of imported potatoes rapidly. Importantly it also allows us to screen for the presence of potential viruses that might be in these plants.

"The technology has the potential to allow plants to move through the quarantine process much more quickly – allowing industry speedier access to new genetic stocks."

Previous research by the research team has demonstrated the approach's success and efficiency in testing for viruses, as well as genetic sequences that are related to viruses called viroids, in imported plants. The new Hort Innovation initiative is allowing the research team, in partnership with the Australian Quarantine agency, to conduct large scale trials to optimise a single assay to detect regulated and endemic viruses and viroids of interest to plant industries.

"We learned at the beginning of this collaboration that most of the virus surveillance work was already done by the plants themselves. Plants have immune systems and although they are not as sophisticated as humans' immune systems, they have the capacity to recognise viruses inside the plant cells and respond to them by chopping their genetic information into small pieces," he said.

"Next generation sequencing instruments can allow us to look at the information contained in these small pieces."

The research teams have worked together to develop a strategy where they use computers to reconstruct viruses that might be present in the plants that are being tested.

"Having the opportunity to provide more comprehensive information to importers – and the growers building their businesses around these commodities – can reassure them that they can receive a return on their investment," Professor Barrero said.

In collaboration with a research team at Agriculture Victoria lead, next generation sequencing approaches are being actively developed and optimised for the diagnosis of key culturable, fastidious and non-culturable bacteria. Significant progress is being made by a team led by Fiona Constable at AgriBio, La Trobe University. The availability of bacterial next generation sequencing assays will increase the resilience of genetic tests employed to detect exotic bacteria at the border.

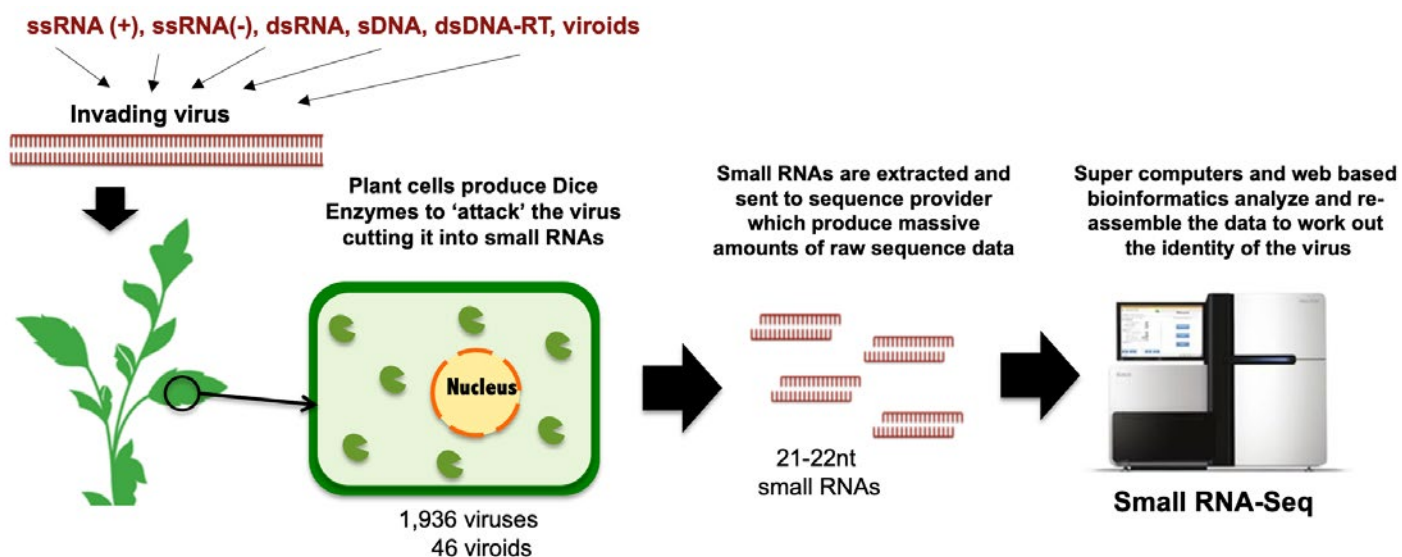


Figure 1. Overview of the next generation sequencing method. Plants harbour intracellular enzymes that recognise and cleave viruses into small RNA pieces which are then sequenced, and the sequence reassembled to determine the identity of viruses present in the plant. Supplied by Roberto Barrero.

Grower advantages

Professor Barrero said that establishing next generation sequencing technology will result in tangible benefits for potato growers, including cost-efficiencies and varietal access.

"Next generation sequencing technologies are becoming more and more affordable over time and one direct benefit to growers will be significant import cost savings," he said.

"Alternatively, imports savings can allow growers to import more plant varieties increasing the possibilities of one or more of these to adapt to Australian conditions."

Perhaps the most important benefit is that potato growers will have access to new potato material at least a year earlier than what they currently do.

"Accelerated access to new genetics will facilitate reaching the market with improved varieties more quickly, and should also increase the industry profitability," Professor Barrero said.



Figure 2. Plants grown within the Post Entry Quarantine facility at Mickleham, Victoria.

Long-term vision

It is hoped that post-entry quarantine facilities are adopting this technology for routine testing in 2-3 years' time, according to Professor Barrero.

"It's a very ambitious timeline to be able to offer this technology for a range of industries. Increasing the plant biosecurity system at the border is critical to prevent entry of a COVID-19-like organism for plant crops."

Find out more

Please contact Roberto Barrero at roberto.barrero@qut.edu.au.

This project has been funded by Hort Innovation using the citrus, nursery, fresh potato, potato processing, raspberry and blackberry and table grape funds.

Project Number: MT18005

**Hort
Innovation**

Growers urged to test to minimise soil-borne disease risk

PREDICTA Pt is a DNA-based soil testing service that allows growers to assess the level of soil-borne pathogens in a paddock prior to planting. In this article, researcher Michael Rettke from the Department of Primary Industries and Regions research division, the South Australian Research and Development Institute (SARDI), discusses how the service works and the benefits to potato growers.

Limiting the impact of soilborne disease on tuber quality should be front of mind for potato growers, with researchers estimating yield losses could be up to 15 per cent if not proactively managed.

Soil-borne diseases such as powdery scab, black dot, common scab, black scurf and silver scurf are prevalent in many potato growing regions, with high inoculum levels causing scabs or blemishes on the tuber when conditions favour disease. This affects the tubers marketability.

Researcher Michael Rettke says growers and their advisers should take advantage of testing to assess the risk of soil-borne diseases well in advance of planting.

SARDI – the research division of Primary Industries and Regions SA – conducts PREDICTA Pt soil analysis for potato growers across Australia. The testing is also linked with the project *Extension of the PREDICTA Pt potato diagnostic service* (PT15008), a strategic levy investment under the Hort Innovation Fresh Potato and Potato Processing Funds geared at improved potato yield and quality across Australia.

"PREDICTA Pt, which is available through trained agronomists, provides clear information on the specific diseases and the level of inoculum," Mr Rettke explained.

Mr Rettke said PREDICTA Pt testing can help potato growers improve the percentage of seed crops meeting certification and the productivity achieved in commercial crops by informing and monitoring management decisions.

"For example, growers should avoid growing highly susceptible fresh market potato varieties in paddocks where PREDICTA Pt has detected a risk of powdery scab," he said.

"If high levels of black dot are detected, growers should consider their scheduled planting time and variety choice in

combination with available treatments."

Pathogen levels in the soil, root systems and tubers can also be monitored after the application of soil treatments and biologicals as a way of evaluating treatment success and informing future management.

Mr Rettke says PREDICTA Pt can also help inform management decisions regarding root knot nematode.

"A high nematode risk may warrant whether a nematicide should be applied," he said.

"The cost of treatment can be justified when the risk is substantial.

"When a fallow period has been used to reduce population of root knot nematodes in the soil, we recommend testing to determine whether it is safe to plant for a successful crop."

Growers should also consider the rotation crops used in their approach to root lesion nematode management.

"PREDICTA Pt testing has found some rotation crops were increasing root lesion nematode numbers, so careful crop selection is required," Mr Rettke said.

"Testing has also demonstrated the benefits of applying soil treatments to control verticillium wilt in paddocks with high levels of inoculum.

"Treated area of crops performed well against untreated strips, but application should be informed by an understanding of inoculum load."

Managing disease risks

While growers cannot influence the environment, they can make sound management decisions to reduce their disease risk.

Such decisions could include variety choice, paddock selection, length of rotation, choice of break and cover crops, planting time, nutrition, soil management options, irrigation systems and paddock drainage.

"The more potato crops grown in a paddock, the greater the risk of soilborne disease that can affect future crops," Mr Rettke said.

Sampling strategy

Soilborne diseases often have a patchy distribution. Therefore, a sound sampling strategy needs to be followed to adequately detect the risk.

"PREDICTA Pt can be used to test potato peel, plant root and lower stem samples," Mr Rettke said.

"However, interpretation of results and disease diagnosis should be done by a diagnostician or agronomist, who can also pursue other lines of investigation."

Growers and advisers can contact SARDI for specific advice and information on disease risks.

Find out more

Please contact Michael Rettke at michael.rettke@sa.gov.au or visit pir.sa.gov.au/research/services/molecular_diagnostics/predicta_pt.

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: PT15008

**Hort
Innovation**

Biosecurity surveillance roadmap for the potato industry

Earlier this month, Plant Health Australia (PHA) in partnership with AUSVEG, released the National Potato Industry Biosecurity Surveillance Strategy (NPIBSS) and its associated Implementation Plan. The strategy was developed to provide a framework for national pest surveillance priorities and activities in the ware, processing and seed sectors of the potato industry.

Need for potato pest surveillance and monitoring

Overall, the potato industry is free from many significant exotic plant pests that impact production and trade of potatoes. This is in part because Australia has a comprehensive biosecurity system that minimises the likelihood of their introduction and establishment.

However, due to the ever-increasing volume of cargo, mail and people reaching our shores every year, protecting the potato industry from new exotic pests remains a continuous challenge.

New pests can threaten potato production by decreasing productivity, and by increasing management costs, increasing quarantine restrictions and reducing market access.

Other pests that are already present in certain growing regions are also a threat to the broader industry; biosecurity measures serve to minimise their spread.

“The National Potato Industry Biosecurity Surveillance Strategy demonstrates the government-industry partnership at work,” PHA CEO Sarah Corcoran says.

“The strategy sets out a clear biosecurity surveillance roadmap to build a resilient potato industry. It takes into account the

different types of surveillance, including targeted surveillance for specific pests, general surveillance activities and the crop monitoring being done by producers.”

Four goals of the strategy

The strategy is built on four interconnected goals that outline improvements to national surveillance.

The goal themes are:

- Collaboration and coordination.
- Early detection.
- Communication, awareness and training.
- Industry growth and business resilience.

The strategy recognises that surveillance activities must integrate with existing crop monitoring mechanisms and be supported with tools and systems that streamline information collection if they are to be widely adopted.

The NPIBSS Implementation Plan focuses on identifying and deploying tools, skills, diagnostics and data capture systems and integrating existing systems wherever possible to provide the best opportunity for implementation and adoption of the strategy over a five-year period.

Implementation of the NPIBSS

Implementation of the strategy will improve engagement and communication, identify and reduce barriers to surveillance and reporting, and promote national data capture and sharing that will assist and support domestic and international market access into the future.

AUSVEG, in partnership with PHA, will be establishing a pilot program to commence this implementation, including improving awareness about the need for surveillance, the impact of new pests, and mechanisms for reporting.

“This pilot will support development of a program that integrates current practices and provides real value to growers to protect their farms, along with facilitating data capture for market access,” AUSVEG National Manager – Engagement and Extension Zarmeen Hassan explains.

Key pests identified in biosecurity planning process

PHA, working in collaboration with government and industry, also recently coordinated and developed the Biosecurity Plan for the Potato Industry. Part of the process of developing a biosecurity plan is to identify the highest priority pests and diseases with the greatest potential impact. The pests identified in the biosecurity plan will guide the selection of target pests and diseases for surveillance activities included in the strategy.

The potato industry at a glance – what’s at risk

The potato industry is the single largest vegetable crop by volume and one of the largest horticultural industries in Australia, with an annual production of around 1.39 million tonnes, worth \$716 million in 2019/20 (*Hort Stats, 2019/20*).

Of this, processing potatoes account for the greatest proportion with approximately 900,000 tonnes, followed by ware production with approximately 444,000 tonnes.

Potatoes, being members of the Solanaceae family, share many of the pests and diseases that affect other members of the family, such as tomatoes, capsicum, chilli and eggplant.

These plants are hosts and can act as sources of pest and disease pressure for potatoes, just as potato crops can be a host and source of pests important to other crops.

Find out more



The NPIBSS was funded by the Department of Agriculture, Water and the Environment through the Agricultural Competitiveness White Paper, the Australian Government’s plan for stronger farms and a stronger economy.

Copies of the NPIBSS are available on PHAs website planthealthaustralia.com.au/strategies or printed versions may be requested from AUSVEG at zarmeen.hassan@ausveg.com.au.

AUSVEG's State Members

Introducing our state members

AUSVEG is the not-for-profit, peak industry body for Australian vegetable and potato growers. AUSVEG has State Member organisations across the country that appoint Grower Directors to the AUSVEG Board who provide state- and regional-level feedback and information to help inform national issues and agendas.



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WA Potatoes

The year started off well enough, with some early summer rains topping up dams and ensuring plenty of water for irrigation. Then in early February Perth, Peel and the South West entered its second hard lock down for 5 days due to COVID 19, followed by increased restrictions for another 9 days. Supermarkets were able to remain open and after initial panic buying, things settled down once again.

During the same period, WA was also impacted by extensive fires in the Perth Hills and heavy rainfall to the northern regions. Fortunately potato production was not directly effected by these emergencies.

In terms of the market, as the weather warmed up, demand has slowed down as usual at this time of year. Market capacity is high and prices have softened.

In order to keep a finger on the pulse WA Potatoes recently participated in a "Peoples Voice" survey of Perth residents. The aim of the survey questions was to find out how potatoes stack up against other supermarket products when COVID restrictions are put into place, and why people might choose to buy them during lockdown.

The questions were asked as part of a survey by Painted Dog Research, used as a means to gauge consumer behaviour in-the-moment. The data was collected from Friday 5th to Monday 8th February

2021, with the age range weighted as per ABS 2016 population statistics. So what did we learn:

- Of those who stocked up due to the recent COVID-19 lock requirements, potatoes tied second with rice as the most commonly stocked-up good with 14% of respondents saying that they did so. Pasta was the top ranked.
- The most common age group to stock up were under 30 year old respondents, with older demographics being less likely to stock up on any of those top 3 options (potatoes, rice or pasta)
- The most common main reason for stocking up on potatoes was due to their shelf life.
- When examining the top 5 reasons for stocking up the most frequently occurring are that they are easy to prepare, everyone eats them and their good shelf life.
- These insights can now be used to ensure that marketing and messaging is appropriately targeted during lockdown and other times of restrictions in Western Australia.

WA Potatoes has recently released their new Autumn/Winter magazine and continue to focus on digital, radio and print marketing channels.



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AUSVEG SA

AUSVEG SA has long held concerns about declining international worker numbers and its potential effect on the livelihoods of our members. In particular, we remain concerned about industry access to labour over a coming season where Australian horticulture is expected to be short by tens of thousands of workers. Over the past six months, we have undertaken a key campaign to advocate for a number of approaches to address this issue, which culminated in the South Australian Government putting forward a \$5 million package to alleviate seasonal labour shortages in the state. This is a win for industry and, while only a start, shows that with effective advocacy our industry can work together to address key emerging issues.

Components of the support package include:

- A Regional Jobs Support and Incentive Program for students to subsidise cost burdens and address impediments faced by students in taking up regional tourism and hospitality jobs.
 - A Regional Workforce Coordination and Collaboration initiative consisting of in-region facilitation to collectively support workers moving to regions to be delivered through the state's eight Regional Development Australia Boards across the state.
 - A support program to reduce the cost to industry for medi-hotel quarantine for Pacific Island workers.
 - A promotion and awareness campaign.
 - The establishment of a Regional Workforce Advisory Group to monitor progress of the overall program.
- AUSVEG SA will monitor the rollout of these initiatives closely.

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