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February/March 2016

Pete Scaman

Young grower

Steven Childs

Potato paradise on
Kangaroo Island

The Front Line

Zebra chip
management in NZ

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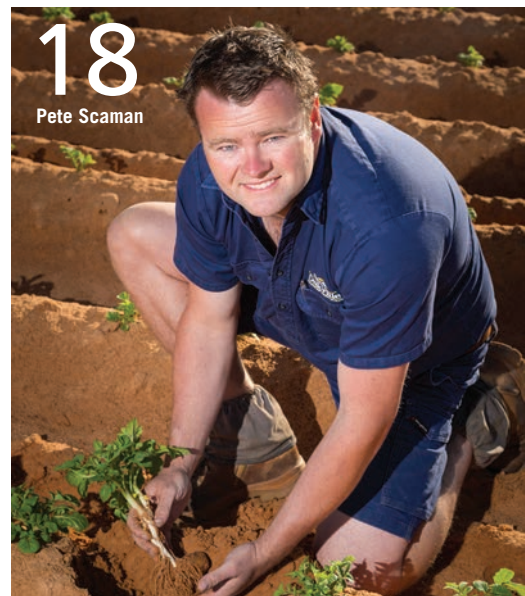
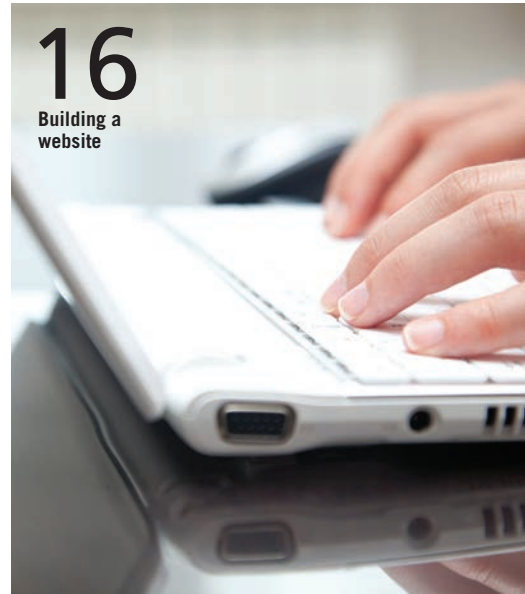
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AUSVEG Chairman and CEO messages



Geoff Moar

AUSVEG Chairman

It was with great excitement that AUSVEG recently announced the details of the 2016 National Horticulture Convention, which will be held from 23-25 June at RACV Royal Pines on the Gold Coast. AUSVEG will once again host the prestigious event alongside Apple and Pear Australia Limited (APAL), as well as the Central Markets Association of Australia in partnership with Fresh Markets Australia (CMAA-FMA).

The inclusion of these industry powerhouses in hosting the Convention highlights the important role that vegetable, potato, apple and pear growers and wholesalers play in Australian horticulture and the importance of collaboration for the benefit of all industry members. Thanks to this strong partnership, we are certain that the 2016 Convention will surpass last year's record attendance, where over 1,400 international and domestic delegates took part in a variety of business and networking events.

The Convention caters to all needs, from small family growing operations to multi-national supply chain companies, and I strongly encourage growers to register as soon as possible to take advantage of early bird savings. Delegates will benefit greatly from the opportunity to hear from highly regarded presenters throughout the Convention, meet leading agribusinesses at the expansive Trade Show and network with their peers at the largest event on the Australian agricultural calendar.

In other news, AUSVEG is pleased to announce that Belinda Adams, a leading vegetable grower from Queensland, has been appointed a Director of AUSVEG. Mrs Adams is responsible for all production,

staff, raw material purchasing, customer liaising, product development, marketing and sales at Coastal Hydroponics, a family-owned and operated business that produces salad ranges, bunched herbs and hydroponic lettuce.

Mrs Adams received the AUSVEG Grower of the Year award in 2014 as well as the AUSVEG Women in Horticulture award in 2013. Her knowledge and expertise combines to make her a perfect candidate to represent the Australian vegetable and potato industries at the national level.

I would like to welcome Mrs Adams to the role and I look forward to working with her on many important issues for the benefit of Australia's potato growers. I am confident that Mrs Adams will be a great asset to AUSVEG and will help to ensure the continued success of the organisation and the wider industry.

Geoff Moar
Chairman
AUSVEG



Richard Mulcahy

AUSVEG Chief Executive Officer

One of the biggest current threats to the Australian horticulture industry is the continuing decline in the number of backpackers visiting Australia under the Working Holiday Maker program. As many growers will know, the industry relies heavily on backpackers to harvest crops in peak seasonal periods when timing is critical and local labour is in short supply.

AUSVEG has been monitoring the decline over the past two years, noting that over 34,000 fewer visas were granted in 2014-15 than in 2012-13. This includes a nearly 60 per cent decline in workers from Ireland and a 26 per cent decline in workers from Taiwan and South Korea. It is likely that multiple factors are affecting this drop in backpacker numbers, including the weakened Australian dollar, which may be lessening the appeal of the program in some of our partner nations.

AUSVEG is also aware that Australia's international reputation has suffered serious damage following the exposure of unconscionable treatment of foreign workers by some labour hire firms. The risk of falling prey to these unscrupulous firms may also be deterring backpackers from working in Australia and, while this is undoubtedly a concerning trend, it is one that we are working hard to change.

As a solution, AUSVEG recently put forward a proposal to introduce a tougher registration system for labour hire companies to put a stop to the exploitation of foreign workers. In the meantime, we will also continue to work with government and growers to uphold the reputation of the Australian horticulture industry as a fair, safe place to work.

In other news, we were pleased to see the Hon. Barnaby Joyce MP, Federal Minister for Agriculture and Water Resources, recently stand up for a stronger country of origin labelling system in Australia, despite political pressure from New Zealand.

AUSVEG has been an outspoken advocate for country of origin labelling reform for many years, as we believe it is imperative that Australia moves away from the confusing and ambiguous country of origin labelling system that is currently in place. Countries such as the Czech Republic have already embraced stronger food labelling laws, and we do not want to see Australia fall behind the rest of the world.

AUSVEG will continue to campaign for effective reform for the benefit of both Australian growers and consumers.

Richard J Mulcahy
Chief Executive Officer
AUSVEG

AUSVEG Chairman

Geoff Moar

AUSVEG CEO

Richard J Mulcahy

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**FRONT COVER:**

Pete Scaman

Photograph by asbCreative.com

This issue of *Potatoes Australia* features an insight into some of the latest technology being used in the global potato industry. On page 28, we look at the use of drones in Scotland, where scientists are exploring the potential to create three-dimensional images to accelerate their potato breeding programs and assist in developing more sustainable agriculture.

We also examine research by NASA in partnership with the International Potato Center, which aims to grow potatoes in Mars-like conditions. The aim of this research is to one day build a controlled dome on Mars that is capable of farming crops, but also to highlight the potential for potatoes to feed millions of people living in the world's most impoverished areas (page 22).

On page 24, we explore a new research project that analyses the surveillance of natural dispersal pathways in Australian horticulture. One part of the research will focus

on the potential for Tomato-potato psyllid to enter Australia from New Zealand through standard wind trajectories and other severe weather events, and investigate the ways to strengthen the surveillance of these natural pathways.

In our Grower profile this issue, we meet Steven Childs who explains why Kangaroo Island is a great place to grow potatoes. Steven and his partner Kerryn Muntz also operate a farm-stay accommodation business, which comes in handy when recruiting backpackers for seasonal work (page 26).

On page 18, Young grower Pete Scaman tells us how he came to Australia as a backpacker and fell in love with Australian horticulture. He now works as the Farm Manager at Oakville Potatoes in South Australia and believes a great opportunity for the industry is to educate consumers about the nutritional benefits of potatoes.

One of the best ways for



growers to market their business to potential clients and the general public is through their website. We interview New South Wales marketing specialist Cecelia Haddad, who has some excellent tips for growers who are interested in improving the online presence of their business (page 16).

From websites to the trading floor, we also visit the new

Melbourne Market to take a look at its improved features and layout. The facility is modern and fresh, providing a critical link between growers, wholesalers, retailers and the fresh produce supply chain (page 30).

In this edition of *Potatoes Australia*, we also focus on Australia's labour hire system, and provide an overview of the improvements that are necessary to ensure a fair go for all seasonal workers (page 10).

Last but certainly not least, on page 8 you will find an update on the 2016 National Horticulture Convention, which promises to be bigger and better than ever. The event will be held at RACV Royal Pines on the Gold Coast and will feature an expansive trade show, numerous speaker sessions and unique networking opportunities with vegetable, potato, apple and pear growers as well as wholesalers.



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Mark it in your calendar: 2016 Convention announced!

THE HIGHLY ANTICIPATED NATIONAL HORTICULTURE CONVENTION IS SET TO RETURN TO THE GOLD COAST THIS YEAR, WITH A PROGRAM THAT IS BIGGER AND BETTER THAN EVER. DELEGATES WILL ENJOY PRESENTATIONS FROM ENGAGING SPEAKERS, AN EXPANSIVE TRADE SHOW, ENTERTAINING SOCIAL EVENTS AND MORE.

AUSVEG is extremely excited to announce that the 2016 National Horticulture Convention will return to the Gold Coast from 23-25 June, with the stunning RACV Royal Pines set to provide the perfect backdrop for the event.

This year's Convention will add another horticultural heavyweight to the mix, with the Central Markets Association of Australia in partnership with Fresh Markets Australia (CMAA-FMA) joining AUSVEG and Apple and Pear Australia Limited (APAL) as co-hosts for the event. This partnership highlights the important role that wholesalers play in Australian horticulture along with vegetable, potato, apple

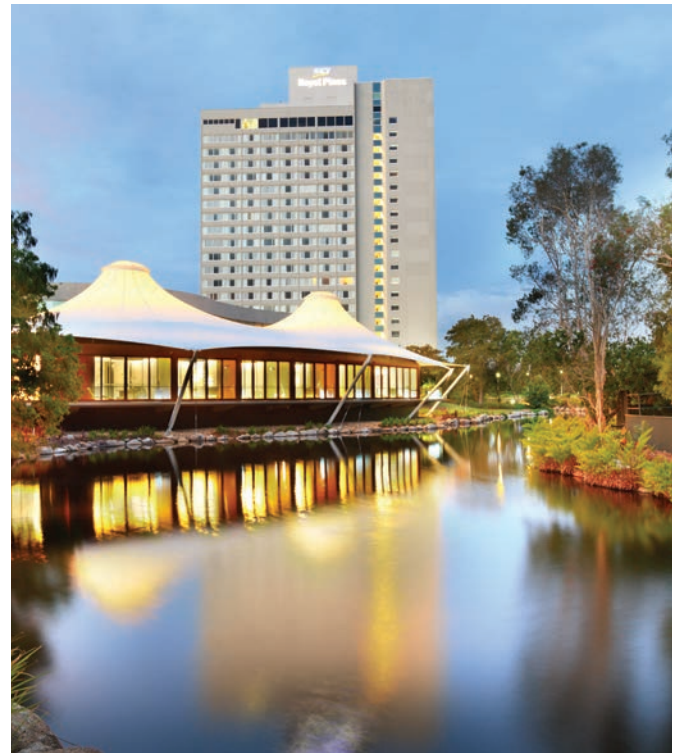
and pear growers, providing more value than ever before.

The venue

Situated on 100 acres, half-way between the pristine coastline and the lush hinterland, RACV Royal Pines features three world-class golf courses along with award-winning restaurants and accommodation – a setting that is bound to ensure this year's delegates can rest and relax after a busy day at the Convention.

The program

The partnership between AUSVEG, APAL and CMAA-FMA will look to build on last



year's record attendance, where over 1,400 international and domestic delegates took part in a variety of business, social and networking events.

The National Horticulture Convention is the premier event in Australian agriculture, attracting delegates from across the entire horticultural landscape. The event caters for all needs, from small family operations through to multi-national supply chain companies. The ability to build on the success of the 2015 National Horticulture Convention is vital for the entire industry, and by combining three of the largest organisations in Australian horticulture, the 2016 Convention will provide

something for every delegate.

The Convention will see a number of exciting new developments in 2016, along with the return of many events that have helped make the Convention what it is today. Delegates will once again be able to make their way through the expansive Trade Show, which will offer access to a wide range of leading horticultural businesses. The engaging speaker sessions, vibrant social program and National Awards for Excellence Gala Dinner will all combine to shape the biggest event on the 2016 Australian agricultural calendar.

With the 2016 Convention set to break current attendance records, we strongly encourage all members of the Australian horticulture industry to keep an eye out for registration and accommodation details to ensure that you receive the significant savings on offer through the early bird rates.



Registrations are now open.

For more information please contact AUSVEG.
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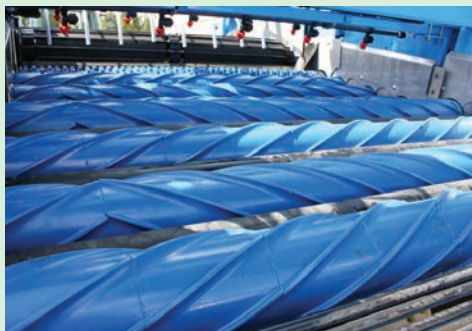
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A fair go for seasonal workers: improving Australia's labour hire system

THE RISE OF EXPLOITATIVE LABOUR HIRE FIRMS IS ENDANGERING THE REPUTATION OF THE AUSTRALIAN HORTICULTURE INDUSTRY, POTENTIALLY DETERRING FOREIGN WORKERS FROM RETURNING. AS THE INDUSTRY IS HEAVILY DEPENDENT ON THESE FOREIGN WORKERS IN PEAK SEASONAL PERIODS, AUSVEG HAS PROPOSED A NEW SYSTEM OF ACCREDITATION FOR LABOUR HIRE COMPANIES THAT PROMISES TO RESTORE CONFIDENCE TO BOTH GROWERS AND WORKERS.

Australia's vegetable and potato industries rely on the participation of tens of thousands of casual workers, including backpackers and foreign students, many of whom come to Australia for the opportunity to earn a wage to sustain them during travel or study. Unfortunately these workers can fall prey to unscrupulous labour hire companies that exploit their vulnerability in a number of ways, including underpayment and subjection to unlawful working conditions.

Due to a chronic shortage of local workers and an inability to take on the administrative burden of contracting seasonal labour, Australian growers often have no choice but to turn to

labour hire companies during the busiest times of the season.

Growers deal with the constant worry that if they do not harvest their crops within a critical period of time, the crops will go to waste. Labour hire firms provide a vital service, aggregating labour across multiple farms to provide continuity of work for growers and workers alike. Growers, however, currently have no satisfactory way of knowing for sure whether the company they have contracted to source labour is operating legally and fairly.

Growers are encouraged to have a signed agreement with their labour hire firm to ensure that correct wage and working conditions are adhered to.

However, this current system, despite being well-meaning, is not strong enough to properly deal with those labour hire firms that use exploitative practices. The lack of effective regulation in the sector allows companies that are identified as breaking the law to simply shut down and spring up again as a new enterprise, in a practice known as 'phoenix activity'.

Australia's reputation at risk

The issue is clearly a significant one. Not only is a breach of human rights taking place, the international reputation of the Australian horticulture industry is at risk of being seriously damaged. This can already be seen in statistics from the Department of Immigration and Border Protection, which show that over the past two years, the number of 417 visas issued has dropped by more than 34,000. The concerning drop in numbers can also be partly attributed to changing economic conditions in partner countries such as employment levels and currency fluctuations.

A 417 visa is a 'Working Holiday' visa that can only be obtained by a person between

18 and 31 years of age and allows the holder to stay in Australia for up to one year and work for up to six months with any one employer.

The impact of a decline in people travelling on these visas could be devastating for Australian horticulture businesses. With more export opportunities available than ever before and ongoing pressure for growers to meet ever-increasing quotas, damage to labour supply means that businesses cannot achieve their potential. This does not only affect individual businesses; due to the nature of the problem it will be the entire Australian economy that also shows the damage, something that could have repercussions for the whole country.

A new plan

To prevent such a situation, it is imperative that the industry acts now. AUSVEG has proposed a new plan that aims to resolve the problems of the current system. This plan proposes that the Federal Government introduces an official Register of Approved Firms. To be eligible for inclusion on this list, labour hire companies would need

AUSVEG's proposed accreditation scheme would require approval from four organisations:

- The Australian Taxation Office.
- The Department of Employment.
- The Department of Immigration and Border Protection.
- The statutory body in charge of occupational health and safety in the state in which the firm is registered (e.g WorkSafe Victoria).

Benefits to growers

- Easy access to more productive and efficient workers.
- Risk of legal action against growers is minimised.
- Growers can be confident that they are using fair, safe labour hire companies.

Benefits to workers

- Easy access to fair, safe working conditions.
- A better experience of Australian seasonal work.

approval from four government departments, including the Australian Taxation Office, the Department of Employment, the Department of Immigration and Border Protection and the statutory body in charge of occupational health and safety in the state in which the firm is registered.

For these bodies to grant approval, companies would need to prove a history of compliance with Australia's workplace, industrial relations and taxation laws and be subject to regular inspection or auditing to demonstrate continuing compliance.

This accreditation would not exist simply as a symbolic hurdle to be checked off by companies. The Register of Approved Firms should be made easily available to the public by being posted on the websites of both the Department of Employment and the Department of Immigration and Border Protection. It should also be widely promoted to anyone looking to access a temporary work visa in Australia as well as within the industry to give growers the confidence that their hired labour is being treated fairly.

The importance of a fair system

Under this proposed model, both growers and workers would be protected from unscrupulous companies. Both parties would be able to easily choose a labour hire firm that is operating fairly and legally, with the intended result being that workers are more productive and more likely to return to the same farms time and time again.

The importance of this intended outcome cannot be overestimated. The Australian horticulture industry is heavily reliant on foreign seasonal workers and these workers must be protected to ensure the industry's continued success. It is the hope of AUSVEG that the Federal Government and all sectors of the industry will support the proposal and together implement an effective reform, one that will restore integrity to Australia's labour hire system and allow the horticulture industry to thrive.



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Potato tuber moth. Photo courtesy of Central Science Laboratory, Harpenden, British Crown, Bugwood.org.

Tackling Potato tuber moth with IPM

WITH POTATO TUBER MOTH DAMAGING POTATOES AND OTHER SOLANACEOUS CROPS IN AUSTRALIA, ENTOMOLOGIST JESSICA PAGE SPOKE WITH *POTATOES AUSTRALIA* ABOUT INTEGRATED PEST MANAGEMENT OPTIONS TO CONTROL THIS AND OTHER POTATO PESTS.

Potato tuber moth (*Phthorimaea operculella*, PTM) is generally accepted as a significant chewing insect pest of potatoes, and also attacks other solanaceous crops including tomatoes and weeds.

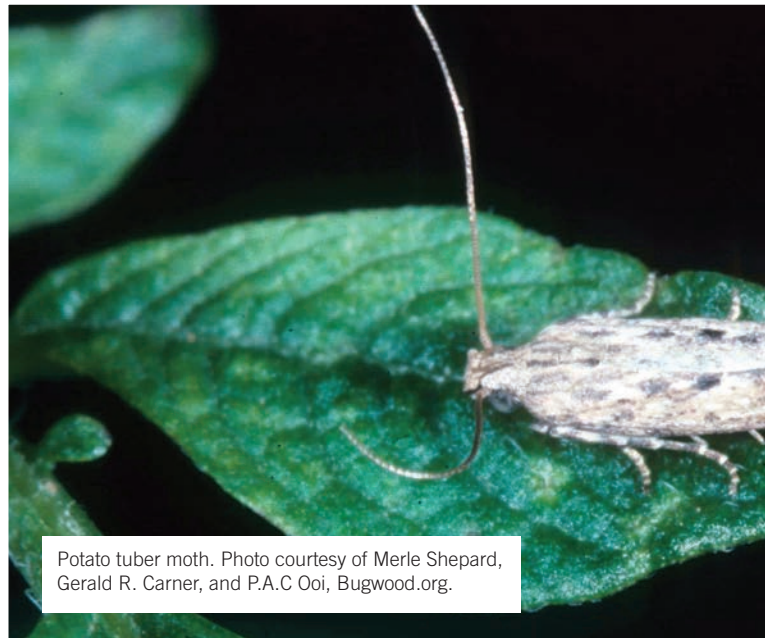
PTM larvae tunnel into leaves and stems, and cause wilting, leaf tissue loss and the promotion of rots. Potato tubers are also attacked by larvae, which either develop from eggs laid on tubers or migrate from the plant's foliage. These larvae are particularly tough, and have been reported to tolerate extreme temperature fluctuations, remaining alive even when tubers are frozen.

PTM originated in southern and central America, with most of the species distributed in

equatorial regions. However, since the beginning of the 20th Century, PTM has been found in Europe and is now widely distributed all over the world.

PTM infestations are currently causing widespread damage to potato crops in Australian growing regions. These moths, which are about 8mm long with dark flecks on their wings, can invade crops from early stages through to harvest. They also invade and infest stored tubers or seed potatoes.

Jessica Page, a specialist in Integrated Pest Management (IPM), told *Potatoes Australia* that local weather conditions are a major driver behind infestations of PTM, with hot, dry weather leading to increased insect populations.



Potato tuber moth. Photo courtesy of Merle Shepard, Gerald R. Carner, and P.A.C Ooi, Bugwood.org.

"The average life cycle is about three to four weeks in warm weather; so the warmer it is, the quicker that goes – and vice versa. If the weather is cooler, the life cycle will be longer," Ms Page said.

Considering the significance of PTM as a pest for potato crops, identifying and implementing sustainable control options for this chewing insect pest is a priority for the Australian potato industry.

The IPM approach

Alongside Dr Paul Horne at IPM Technologies Pty Ltd, Ms Page has helped potato growers in several Australian states to implement IPM strategies to deal with a range of potato



pests. The IPM approach often studies the life cycle and ecology of a pest and tries to exploit any weaknesses.

According to Ms Page, IPM strategies have three main components.

“In order of importance, the first is biological control – that’s things like parasites of potato moth, and that would include predators of aphids, and also predators of other pests,” Ms Page said.

“Then there’s the cultural controls, which would be very important for PTM. That would include soil management, making sure there’s good coverage and that there’s no cracking, as well as variety selection, time of planting, etc.”

For PTM, beneficial insects used as biological controls also include introduced species,



Potato tuber moth larva. Photo courtesy of Central Science Laboratory, Harpenden, British Crown, Bugwood.org.

particularly wasps such as *Orgilus lepidus*, *Apantelese subandinus* and *Copidosoma koehleri*. These species parasitise PTM and attack eggs or larvae within leaves and exert considerable pressure on both PTM and aphids.

Cultural controls, meanwhile, primarily involve soil management and appropriate irrigation. Dry, cracked soil exposes growing tubers to infestation by adult moths or larvae, while well-timed irrigation can prevent cracking and keep soil moist, which helps it to resist penetrating larvae or moths and also favours sturdy plant growth.

“Once there’s no green cover, and the moths have laid their eggs on the ground, you want to stop the caterpillars getting into the tubers. That’s where rolling and the covering comes in – anything that can improve the cover will help,” Ms Page said.

“Basically, it’s just trying to stop the caterpillars reaching the tubers. So the better the cover, the less chance of that happening.”



Potato tuber moth damage. Photo courtesy of David Jones, University of Georgia, Bugwood.org.



Potato tuber moth damage. Photo courtesy of David Jones, University of Georgia, Bugwood.org.



As a third back-up to these components, Ms Page said that growers should also consider crop protection products for pest control.

IPM benefits

According to Ms Page, IPM has been effectively used in the Australian potato industry for decades, and is delivering tangible benefits to growers.

“Growers have been using IPM for a long time now. Some of the growers that Dr Horne has worked with have been using it for 20 years, and some of them haven’t put on a foliar insecticide in that time,” Ms Page said.

“They’ve sprayed other products, but no foliar applications, and have had no losses.”

However, Ms Page said it is important to adapt IPM

strategies to evolving situations, including changes in the available chemistry and other control options.

“As new products become available, and others get withdrawn, that strategy has to be flexible, improved and updated as it goes along.

“The other thing is making sure the information is continually passed on, because sometimes techniques just get forgotten, and strategies get forgotten.”

i For more information about the Potato Industry Extension Program, contact AUSVEG. Phone: (03) 9882 0277 Email: info@ausveg.com.au

This project is funded by Horticulture Innovation Australia using the Fresh Potato Levy and funds from the Australian Government. Project Number: PT11004

Zebra chip: Management and current research in New Zealand

CANDIDATUS LIBERIBACTER SOLANACEARUM AND ITS TOMATO-POTATO PSYLLID (TPP) VECTOR CONTINUE TO PERSIST IN NEW ZEALAND SINCE THE INCURSION OF THE ZEBRA CHIP COMPLEX IN 2006. IN A BID TO INCREASE THE EFFECTIVENESS OF ZEBRA CHIP MANAGEMENT PRACTICES, RESEARCHERS IN NEW ZEALAND ARE DEVELOPING INTEGRATED PEST MANAGEMENT STRATEGIES TO CONTROL TPP POPULATION GROWTH.

In this edition of the *Front Line*, we interview Dr Jessica Dohmen-Vereijssen, Crop Protection Specialist at Plant and Food Research in New Zealand, to gain an insight into current management practices of Zebra chip in the country and how these practices are changing as a result of new scientific research.

Q. What management practices are currently being used in New Zealand to control Zebra chip?

Current management practices include:

- Use of benign insecticides early in the season to aid biological control of Tomato-potato psyllid (TPP).
- Use of sticky traps or degree

day thresholds to commence a spray program.

- Including agricultural oils into a spray program to lower the number of conventional insecticides used in a season.
- Keeping the crop covered with insecticides until harvest, which means that in some cases a herbicide combined with an insecticide is used to deal with regrowth and presence of psyllids on the regrowth.

Q. Have there been any issues with current management practices?

One of the main issues is that the incidence, importance and timing of TPP varies markedly between potato growing regions, as well as the presence of crop and non-crop host plants.

Therefore, our research focus



Tomato-potato psyllid damage. Photo courtesy of Whitney Cranshaw, Bugwood.org.

over the last two years has been on developing regional reduced insecticide management strategies, mainly targeting process growers.

Another problem is insecticide resistance – awareness is growing in this area, especially where growers have to control aphids and TPP. Both sucking insects are controlled with similar insecticides.

One other problem is the different needs of the three end-uses. Historically, our research mainly focused on process crops. The aim is to keep incidence and/or discoloration by Zebra chip under process industry thresholds. These less intensive spray programs can also be used in fresh market crops. However, the seed growers probably need a more intense insecticide program to keep *Candidatus Liberibacter solanacearum* (CLso) out of seed production lines.

Q. Has there been any research into non-host incubators of CLso?

Over the years, weed species belonging to different families were tested for CLso, but only one sample of African boxthorn (*Lycium ferocissimum*) was found positive for the pathogen. A Plant Biosecurity Cooperative Research Centre program is looking into weed hosts of CLso.

The role of non-crop host plants in relation to TPP ecology was researched in two regions in New Zealand, as well as molecular testing of weed material from these two regions. Two new weed species (*Solanum pseudocapsicum* and *Datura stramonium*) were found positive for CLso.

Q. Is there a new strategy being formulated for managing Zebra chip?

Yes. The new strategy involves the development of reduced insecticide management for each of the main potato growing areas. These new management strategies should be able to fit into an Integrated Pest Management (IPM) system.

We are still in the development phase, but information on our research and results is conveyed to growers and industry through the Foundation for Arable Research, which manages the Potatoes New Zealand R&D program (see www.far.org.nz/research/potatoes for information on psyllid/CLso research).

Q. What will the future management of Zebra chip in New Zealand involve?

I am hopeful a tolerant/resistant potato cultivar will be



Tomato-potato psyllid. Photo courtesy of Whitney Cranshaw, Bugwood.org.

developed, which will reduce the need for intense insecticide programs. While we have selected breeding lines with reduced expression of Zebra chip, we have yet to produce cultivars with a complete absence of symptoms.

Whether or not these cultivars will be developed, the future lies in sustainable management strategies that fit into an IPM program. For organic growers, mesh covers or agricultural oils will need to be researched in more detail.

In the future, the CLso genomic and Zebra chip biochemistry research should offer clues about how the disease is caused, and hence provide possible new options to directly target the bacterial pathogen or the metabolic interactions between the bacterium and the plant.

Other current research is trying to understand psyllid-to-psyllid behaviour, the mechanism of CLso infection

and implications for genetic resistance/tolerance, the genetic makeup of psyllid populations and researching disruptant/attractant-based tools.



For more information, please contact Dr Jessica Dohmen-Vereijssen at Jessica.dohmen-vereijssen@plantandfood.co.nz.

Any unusual plant pest should be reported immediately to the relevant state or territory agriculture agency through the Exotic Plant Pest Hotline (1800 084 884).

For further information, see the farm biosecurity website at www.farmbiosecurity.com.au, or contact AUSVEG National Manager – Scientific Affairs Dr Jessica Lye at jessica.lye@ausveg.com.au or AUSVEG Assistant National Manager – Scientific Affairs Nicholas Schmidt at nicholas.schmidt@ausveg.com.au or (03) 9882 0277.



Tomato-potato psyllid damage. Photo courtesy of William M. Brown Jr., Bugwood.org.

The Zebra chip complex

Tomato-potato psyllid (TPP) and *Candidatus* Liberibacter solanacearum (CLso) have never been detected in Australia; therefore, they are classed as notifiable exotic plant pests. Detection of either TPP or CLso would result in the assembly of the Consultative Committee on Emergency Plant Pests in order to determine the potential for eradication under the Emergency Plant Pest Response Deed.

TPP can act as a vector, or carrier, of the bacterium CLso that causes Zebra chip.

When the toxins from TPP and infection by CLso are combined, the results can lead to plant stunting, chlorosis and early dieback. Tubers tend to be smaller and exhibit brown discolouration of the vascular ring when cut, which becomes especially obvious when frying, making potato crisps largely unmarketable.



Zebra chip causes brown discolouration when cut, which becomes especially obvious when frying potatoes.

NZ seed potato developments in Zebra chip

Dr Andrew Pitman, Microbiologist in the Molecular Bio-Protection Team at New Zealand Plant and Food Research, has worked closely with the New Zealand potato industry in its response to the discovery of *Candidatus* Liberibacter solanacearum (CLso) and its association with Zebra chip.

To date, his work on this bacterium has supported the accreditation of diagnostic facilities for use in New Zealand and has established the impact of seed tuber-borne inoculum of this pathogen on commercial potato production.

“The seed tuber industry in New Zealand is now putting in place

a process for certifying their crops for CLso, which primarily involves determining field symptoms (rather than testing the end product),” Dr Pitman said.

“This is in response to the growing symptoms detected in seed tuber crops in the major seed tuber growing region in New Zealand (Canterbury). It is probable that the increase is due to a higher prevalence of the psyllid as a result of more conducive climatic conditions over the last couple of years.

“Uptake of prescribed spray regimes has been variable. This may have led to more issues for some growers.”



Tap into the internet to boost your business

MANY POTATO GROWERS HAVE GONE ONLINE IN RECENT YEARS, JOINING THE DIGITAL REALM TO PROVIDE THE GENERAL PUBLIC WITH EASIER ACCESS TO INFORMATION ABOUT THEIR BUSINESSES. BUT TO ENSURE YOUR BRAND IS PROMOTED EFFECTIVELY, IT IS IMPORTANT TO BUILD A HIGH QUALITY WEBSITE THAT STANDS OUT FROM THE CROWD. STEFANIA BOSTOCK SPOKE TO MARKETING SPECIALIST CECELIA HADDAD TO FIND OUT MORE.



In a world where information exchange is instant and network connections are forged with a click of a mouse, first impressions have never been so important.

Most entrepreneurs recognise that a well-oiled website can make – or break – their company's image. Potato growers, too, have cottoned on to the power of digital media, using 'smart' technologies to tap into online markets to attract new buyers.

Cecelia Haddad, Director of Marketing Elements, a public relations consultancy based in

New South Wales, says business owners are often surprised to learn that you do not need to spend a fortune to develop a professional-looking website.

"Anyone can build a website, but the quality of that website and how you market it will determine its effectiveness," she said.

"Of course, resources – time and money – are a key factor in deciding whether or not to enlist the help of a professional.

"There are some excellent templates online that guide users through each step of the website-building process – you

don't have to be a web designer or tech-savvy by any means."

Presentation is key

Ms Haddad said that it is important for potato growers to think about their website in terms of their brand and image.

"Unlike the 'real world', people won't be able to visit your farm like you might visit a store to make a purchase, so your website needs to be your presence in the public eye," Ms Haddad said.

She added that high-quality content is vital in ensuring a website appeals to the consumer and compels them to return.

"This doesn't mean it needs to be flashy or complicated. The key is to keep it simple, eye-catching and easy to navigate," Ms Haddad said.

"Good quality images and a clean layout are essential, as is accurate content and operating links – and make sure your text is free from grammar or spelling errors."

When developing a website, Ms Haddad suggested that growers consider the following three questions: Who do I want to see my website? What do I want to tell them? What do I want my web visitors to do?

"Visitors to your site shouldn't have to spend hours trying to locate the information they need to make an informed decision about your business," she said.

Learn to educate

Even if you are not selling direct to the public, potato growers can reap the rewards that come with giving their website an interactive spin. Ms Haddad explained that offering added value can position businesses as "experts" in their field.

"Not everyone knows how to cook the best mashed potatoes or which type of potato is more suitable for roasts or chips," she said.

"As a consumer, you want to buy from someone who knows their stuff. Educating potential buyers gives them more confidence in your product and in doing so, your business can enjoy a boost in credibility."

Online recipes are also effective in adding value as they can be downloaded and printed, encouraging interaction with your business.


"Changing the recipes seasonally means you are adding fresh content to your site, which will help it to maintain a top ranking on Google and other search engines," she said.

Make it user-friendly

With the increasing number of smartphones flooding the market, Ms Haddad says websites need to be producing content that is optimised for mobile and tablet use. While it is very tempting to "go live" immediately when the site has been built, she warns that you should always take the time to check the site for errors.

"It's a great opportunity to fix any bugs before you officially launch it to the world," Ms Haddad said.

"Their first visit is the most important so it pays to get it right before you launch."

 For more information, visit www.marketingelements.com.au or call (02) 8021 1277.



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Pioneering the Future

Q&A Young grower profile

Name: Pete Scaman

Age: 29

Location: Nildottie, South Australia

Works: Oakville Potatoes

Grows: Red Rascal, Melody, Lady Christl



Nildottie,
South Australia

Photography by asbCreative.com



How did you first become involved in the potato industry?

I was born and bred on a cereal and potato farm in Lincolnshire, UK so it was only natural that I continued my passion for growing. To further my knowledge, I studied Agriculture at Harper Adams University. I travelled to Australia as a backpacker and fell in love with the country lifestyle and great opportunities in farming.

What is your role in the business?

My role is Farm Manager. I'm involved in the entire management process on farm, from planning the pivot sites to the planting, growing and harvesting of the crops.

How would you describe your average day at work?

The thing I love about my job is that there isn't really an average day on the farm; it's always different.

Generally speaking, my mornings consist of briefing the

farm crew, then a walk through the crops. Of course, my day can change quickly if I need to troubleshoot any issue that may arise.

What do you enjoy most about working in the potato industry?

The challenge of getting top quality potatoes to Aussie consumers. I love how quickly the crop grows and being able to see the crop change from day to day. I enjoy being outdoors and the wide variety of jobs.

What are the biggest challenges you face working in the industry?

Input costs are the biggest challenge – namely crop protection and fertiliser. The biggest one this year has been the price of water. Mother Nature has also had its challenges with the heat and little to no rainfall.

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

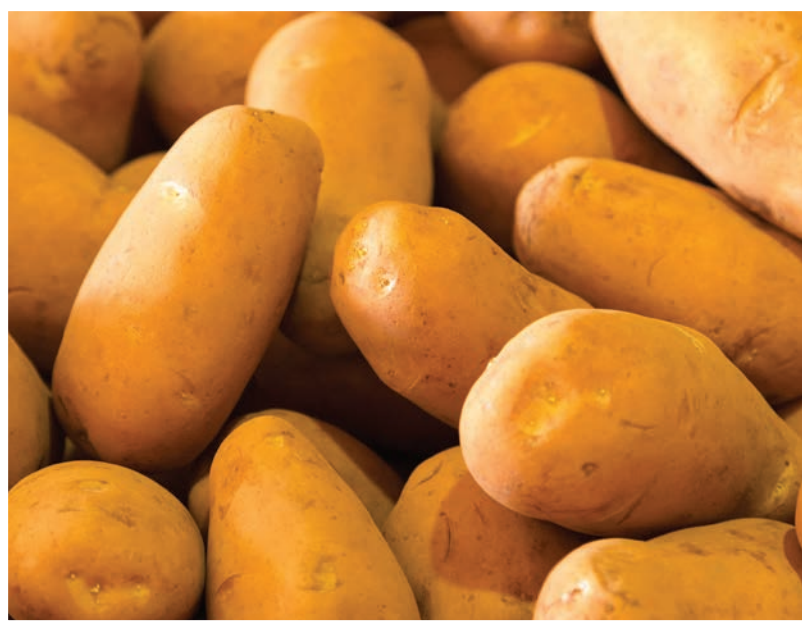


Potato consumption is in decline in this country. I believe there is a huge opportunity to implement strategies aimed at educating shoppers on the nutritional benefits of potatoes. Potatoes have received a bad rap in the media in recent years with the rise in popularity of low-carb diets. What a lot of people don't know is that potatoes are lower in carbohydrates than other popular side dishes. There is a huge opportunity to promote the versatility of potatoes.

I would still be involved in farming – something with a challenge and outdoors.

Where do you see yourself in five years?

Still in the same job, continuing to learn new practices and growing top quality potatoes.



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

I think there's a great opportunity to incentivise young up and comers – rewarding them for growing good quality crops. This will create opportunities to rise up in the business.

If you weren't working in the potato industry, what would you be doing?





Silver scurf transmission in potato crops

SILVER SCURF IS A SERIOUS DISEASE THAT HAS SPREAD THROUGHOUT POTATO GROWING REGIONS IN AUSTRALIA. A RECENTLY PUBLISHED STUDY FROM THE UNITED STATES LOOKED AT WHETHER SOIL OR SEED IS MORE IMPORTANT IN THE TRANSMISSION OF THIS DISEASE, CONDUCTING EXTENSIVE TRIALS OVER THREE YEARS. *POTATOES AUSTRALIA* REPORTS ON THE FINDINGS.

Silver scurf, caused by *Helminthosporium solani*, is a significant disease within the potato industry due to the occurrence of fungicide-resistant strains, increased disease severity and significant financial losses as a result of blemished tubers. A study, led

by Dr Jeffrey Miller in the United States and recently published in the *American Journal of Potato Research*, was conducted with the aim of determining whether seed or soil is the primary source of infection for Silver scurf on progeny tubers.

Previous research on

this topic had not delivered conclusive results, and there was concern from some within the industry when a scientist at Oregon State University began evaluating seed tubers for the level of *H. solani* infection prior to planting as a way of providing potato producers with an estimate of the potential Silver scurf threat to their crop.

“Research had already documented that seed could be a source for Silver scurf, but there was some strong debate about the relative importance of seed and soil,” Dr Miller explained.

“Some scientists associated with potato seed certification agencies argued that the role of the pathogen on the seed was of minor importance. They felt that testing seed for Silver scurf was



a waste of time, and that these tests were only being done as a way to generate information that could be used against a seed grower.”

Dr Miller and his team decided to conduct an extensive study on this issue, collecting data over three years with 19 different combinations of location, year and rotation lengths. The study also looked at the effect of fludioxonil and mancozeb seed treatment for the control of Silver scurf in field conditions.

Project overview

Over the course of the project, the researchers conducted multiple trials. Seed tubers were selected from two separate sources each year of the study, to obtain seed with and without



An example of Silver scurf on a potato. Photo courtesy of Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org.



Silver scurf affected roots. Photo courtesy of Charles Averre, North Carolina State University, Bugwood.org.



An example of Silver scurf on a potato. Photo courtesy of Robert Wick, University of Massachusetts, Bugwood.org.



H. solani infection. Disease-free seed tubers had never been exposed to field conditions (pre-nuclear), while infected tubers were selected from generation three (G3) seed tubers which had been exposed to three cycles of field generation. Prior to planting, both pre-nuclear and G3 seed tubers were screened for *H. solani* using microscopy.

The two types of seed tubers were each divided into two lots. One was treated with fludioxonil and mancozeb while the other was left untreated. The four lots were planted at six different locations, with field crop histories of either short (less than three years), normal (three to five years) or long (over five years) rotations. Trials were conducted multiple times at some locations in fields with

different crop histories. This resulted in a total of 19 different combinations of location, year and rotation.

Tubers from all locations and lots were sent each year to the Hermiston Agricultural Research and Extension Centre to test for the incidence and severity of Silver scurf disease.

The role of seed

It was found that progeny tubers grown from the infected G3 seed tubers had significantly higher levels of infection than those grown from the disease-free, pre-nuclear seed tubers, regardless of the location the tubers were grown in. Meanwhile, the use of fludioxonil and mancozeb was found to significantly reduce infection.

These findings demonstrate the importance of seed-borne infection, and support the theory that Silver scurf incidence on progeny tubers has the potential to increase with successive field generations due to transmission through seed.

"I was surprised by the results," Dr Miller said.

"I expected soil to play a larger role than what was observed. I was fairly confident that seed would also play a role, but I was surprised by the lack of Silver scurf (found in progeny tubers) at most of the sites when we planted disease-free seed tubers."

The results also showed that contamination during storage and handling poses a high risk for initial infection of early generation seed. This is because conidia (fungal spores) that are produced on infected seed tubers can move throughout a storage area via the ventilation system. Growers are therefore encouraged to store potato seed lots separately.

Test your seed

The findings of this study are hugely beneficial to potato growers, as it gives them the knowledge required to help prevent Silver scurf disease from impacting their crop.

"Growers can test their seed

to estimate the Silver scurf risk to their developing crop," Dr Miller confirmed.

"If they do have seed which is known to have Silver scurf, they can treat it with a seed treatment to reduce disease development on their harvested crop."

Dr Miller is passionate about this issue, continuing his research to enable a better understanding of the disease and how to manage it.

"We have been doing work looking at materials that can be applied after harvest but prior to storage to minimise Silver scurf. Many of these products are very safe with respect to mammalian toxicity. However, what is needed is a survey to determine how sensitive the Silver scurf fungus is to the seed treatments and to the post-harvest products."



For more information please contact Dr Jeffrey Miller at jeff@millerresearch.com.





Next step: Potato farms on Mars?

A JOINT PROJECT BY NASA AND THE INTERNATIONAL POTATO CENTER WILL ATTEMPT TO GROW POTATOES UNDER MARS-LIKE CONDITIONS TO RAISE AWARENESS OF THE POTATO'S POTENTIAL TO FEED MILLIONS OF MALNOURISHED PEOPLE LIVING IN THE WORLD'S MOST IMPOVERISHED AREAS. *POTATOES AUSTRALIA* EXPLAINS.

The recent film *The Martian*, starring Matt Damon, was a huge success around the world, but few people would have considered it to be loosely based on reality. Now it seems that some aspects of the film – specifically, the attempt to grow potatoes on Mars – may not have been as far-fetched as they seemed.

Back on Earth, a team of world-class scientists on a project led by NASA and the International Potato Center (CIP), will be experimenting with growing potatoes in conditions

that closely simulate the extreme conditions on Mars.

Soils almost identical to those found on Mars have been sourced from the Pampas de La Joya Desert in Peru and the Martian atmospheric conditions will be replicated in a laboratory. The tests will begin by using several potato varieties that are so rare, they are identified by numbers rather than names.

A life-saving crop

While the project aims to help scientists take a step closer to

farming in space, another major goal is to raise awareness of the resilience of potatoes and their ability to grow in extremely harsh conditions. The team believes that by funding further research and more farming in impoverished parts of the world, it may be possible to save millions of lives.

Malnutrition is a leading cause of death in many countries where poverty is rife and farming conditions are harsh. Potatoes may hold the solution as, apart from being an incredibly robust crop, they are also highly nutritious. They are an excellent source of vitamin C, iron and zinc, and contain critical micronutrients that are often missing in the diets of vulnerable communities.

Tough spuds

CIP Head of Communications Joel Ranck said the best way to learn about changes in the environment is to grow crops under the conditions of a planet that died two billion years ago. The atmosphere on Mars is almost 95 per cent carbon dioxide and these conditions can benefit a potato crop, whose yield is two to four times

that of a regular grain crop under normal Earth conditions.

For many years, CIP has been testing the ability of potatoes to grow in unlikely places. Its research has found the potato to be a robust, adaptable vegetable that can be grown at altitude or sea level, in the tropics or the cold. It is also incredibly water efficient, up to seven times more than cereals such as wheat and corn.

Mr Ranck hopes to spread the message that if potatoes can be grown in such extreme conditions as those found on Mars, then lives can potentially be saved on Earth.

Down to earth

The findings from this research may lead to exciting new opportunities for potato growers here on Earth, particularly in Australia where heat and drought can make horticulture a challenging pursuit.

If there is a way for potatoes to thrive in the desert conditions of Mars, perhaps more of Australia's arid land could be used to produce this nutritious food.





with Scott Mathew

Once rows reach canopy closure, getting the fungicide application down on to the lower leaves becomes difficult.

GIVEN THE WARM, DRY WEATHER EXPERIENCED AT THE START OF THE PLANTING SEASON, IT SEEMS MANY GROWING REGIONS DID NOT HAVE THE USUAL DELAYS IN PLANTING CAUSED BY WET WEATHER. AS A RESULT, MOST CROPS ARE AT A SIMILAR GROWTH STAGE. SYNGENTA TECHNICAL SERVICES LEAD SCOTT MATHEW DISCUSSES THE APPLICATION TIMING OF A NUMBER OF CROP PROTECTION PRODUCTS.

Why is the application timing of crop protection products so important?

Many crop products must be applied at, or before, a certain growth stage of crop timing. For example, the relatively new herbicide for potatoes BOXER GOLD® must be applied according to the label, which

clearly states that you must apply after planting, after the first cultivation, but no later than 25 per cent potato shoot emergence.

There are a couple of major reasons for this, which include:

- **Crop safety:** If the product is applied to a potato crop that is past 25 per cent emergence, then the risk of the application causing damage to the potato

plant is increased. This effect is generally transient in nature and the crop can grow out of it; however any set back in the early growth stage of a potato crop may have a negative impact on yield.

- **Efficacy:** If the product is applied before cultivation and the soil is then mechanically disturbed, it can dilute the herbicide layer in the soil, thus reducing the length of weed control. Furthermore, if the soil containing BOXER GOLD is thrown up on the planted row, increasing the level of the product in the soil, it may increase the risk of crop damage.

penetration (with a properly calibrated and operated sprayer) down on to the lower leaves where Target spot (*Alternaria solani*) infections are more likely to infect first.

Therefore, good coverage and spray penetration into the lower canopy can be achieved. Once the rows reach canopy closure, getting the fungicide application down on to the lower leaves becomes much more difficult. As a result, the fungicide efficacy decreases.



Is it critical that I get a fungicide application prior to row closure?

In general terms, potato plants prior to row closure have a canopy structure that still allows you to achieve good fungicide

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

Monitoring a natural threat to the potato industry

A NEW RESEARCH PROJECT THAT ANALYSES THE EXISTING SURVEILLANCE OF NATURAL DISPERSAL PATHWAYS IN AUSTRALIAN HORTICULTURE IS CURRENTLY UNDERWAY. IN PARTICULAR, RESEARCHERS WILL WORK WITH THE AUSTRALIAN POTATO INDUSTRY TO INVESTIGATE THE POTENTIAL FOR THE HIGHLY DESTRUCTIVE TOMATO-POTATO PSYLLID TO ENTER AUSTRALIA FROM NEW ZEALAND USING THESE NATURAL PATHWAYS. DIMI KYRIAKOU REPORTS.

When it comes to possible pest incursions in Australia, one of the easiest points of entry is through long distance natural dispersal pathways, which can be formed through standard wind trajectories or severe weather events such as cyclones.

For the Australian potato industry, this threat is highly significant as Tomato-potato psyllid (TPP), which carries the Zebra chip causative bacteria and is currently found in New Zealand, could potentially enter Australia by hitching a free ride

via these pathways.

To investigate this further, a one-year desktop study was conducted as part of a Plant Biosecurity Cooperative Research Centre (CRC) project to understand the natural dispersal of pests and diseases into Australia. After conducting workshops, presentations and discussions with stakeholders, there was overwhelming agreement that the pests and pathogens using these pathways should be identified and prioritised.

Dr Alan Yen, Research Leader

at the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR) and Associate Professor in the School of Applied Systems Biology at La Trobe University, said the study found that long distance natural dispersal is a substantial and underestimated biosecurity risk.

“The surveillance methods were very biased towards certain groups of insects and some of the potentially important groups of disease-carrying insects were not being collected properly. Secondly, we found that there were a number of pathways into Australia from the north, east and the Pacific, as well as winds that were coming from Africa to Australia,” Dr Yen explained.

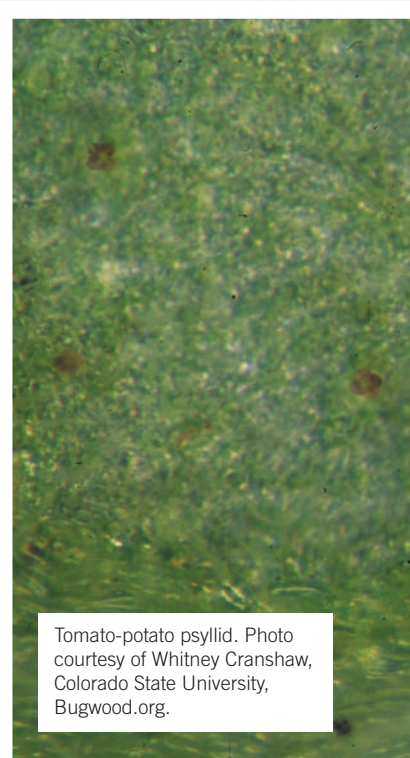
“We then back-modelled some of the insects and diseases that were supposed to have come in by wind and worked with the Bureau of Meteorology to look back at possible points of origin during certain periods to find out how they moved through Australia.”

The results of this desktop study led to the development of a new three-year Plant Biosecurity CRC project that will review current surveillance strategies along natural dispersal pathways and

ultimately develop optimal surveillance systems for high priority species, as well as preparedness plans for specific industries.

New project

The three-year project is currently being conducted by DEDJTR with the Federal Department of Agriculture and Water Resources (Northern Australia Quarantine Strategy), Plant Health Australia and the



Tomato-potato psyllid. Photo courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.



Tomato-potato psyllid. Photo courtesy of Dr Alan Yen.



Yellow sticky traps are a common surveillance method used by growers. Photo courtesy of Dr Alan Yen.



Zebra chip symptoms.

methods and if they're aware of natural dispersal, and trying to see if we can develop a more effective method of surveillance," Dr Yen said.

"The three selected pathways will provide greater detail for modelling to get more accurate information on the timing of winds coming into Australia and their points of origin. That's one of the important things for industry to know; what time of year should they be looking for key pests and diseases.

"We will also review the horticulture industry biosecurity plans to see where they have taken account of natural dispersal as a means of pests and diseases coming into Australia."

Impact for potato growers

This latest project is an opportunity for Australian potato growers to get involved and share their experience of keeping TPP at bay.

"We want to liaise with growers and find out what their current surveillance methods are and what sort of traps they're using. After our review of tracking methods, hopefully we can suggest if there are more effective methods and develop new traps and get some growers involved in trials," Dr Yen explained.

"If potato growers are currently monitoring TPP they are probably using yellow sticky traps. There are issues with these traps as they catch a lot of insects and you have to go through trap by trap to identify the pests. Part of our review is to see if there is a quicker method of identification so we can come up with a better, simpler, cheaper surveillance system that is quicker and gets a result."


Ultimately, Dr Yen hopes the project will benefit the Australian potato industry in myriad ways.

"Hopefully in terms of natural dispersal, we can help growers be more aware of surveillance for TPP at particular periods of time. If we can help them develop a more effective surveillance system by the end of the project, that will be good and to their benefit."

Victorian Biosecurity agency as partners and the Tasmanian Department of Primary Industries, Parks, Water and Environment and the Bureau of Meteorology as a collaborator.

The project will work with specific horticulture industries to focus on three natural dispersal pathways. The citrus industry will be the focus of the northern pathway from Papua New Guinea to Australia; the sugar industry for the Pacific pathway from Indonesia to north-west Western Australia; and the potato industry for the pathway from New Zealand to Australia.

"The obvious model we are using for the New Zealand pathway is TPP. We will be liaising with the potato industry and growers to get a better idea of their current surveillance

 For more information please contact Dr Alan Yen on 03 9032 7351 or alan.yen@ecodev.vic.gov.au.



Left to right: Potato growers
Kerryn Muntz and Steven Childs.



Potato paradise on Kangaroo Island

GROWING POTATOES ON KANGAROO ISLAND HAS ITS CHALLENGES, BUT FOR STEVEN CHILDS AND HIS PARTNER KERRYN MUNTZ, THE BEAUTIFUL SCENERY, DISEASE-FREE ENVIRONMENT AND MILD CLIMATE MAKE THIS THE PERFECT PLACE TO GROW SPUDS. STEPHANIE EAVES CHATS TO STEVEN AND KERRYN ABOUT THEIR SUCCESSFUL OPERATION.



Kangaroo Island, which lies off the coast of South Australia, is Australia's third-largest island, home to the famous Flinders Chase National Park and numerous endangered species. It is here, in this remote and stunningly beautiful pocket of Australian wilderness, that Steven Childs and his partner Kerryn Muntz run their successful farming operation.

A third-generation farmer who grew up on the island, Steven had, for a long time, farmed sheep and cattle with much success. Six years ago, he spotted an opportunity to diversify.

"Rodney Lade (a fellow grower) was leasing land from

me to grow certified seed potatoes. I could see a viable farming enterprise, so we went into business together and formed a partnership called Island Horticulture," Steven says.

Since its inception, the business has grown to produce around 100 hectares of certified seed potatoes each year. Crops include approximately 40 varieties of seed potatoes, which supply mainland commercial potato growers with seed for crisping, fresh and processing markets.

An accommodating farm

Steven and Rodney employ



Photography by Sean McGowan



Left to right: Business partners Rodney Lade and Steven Childs.

five full time workers and, during the harvest period, can also employ up to 10 seasonal workers. Since the location is so remote, seasonal workers must live on the farm. This is no problem for Steven and Kerryn, as they also operate a thriving accommodation business on the property.

"We've been operating Flinders Chase Farm Stay for over 20 years," Kerryn says.

"It provides an affordable, comfortable style of accommodation within a relaxed, friendly farm environment. And it also complements the farming business, as it provides accommodation for the farm's seasonal workers."

This venture has proved to be incredibly valuable to the business, as it entices backpackers with the promise of seasonal work, comfortable accommodation and close proximity to the island's spectacular natural attractions.

The accommodation also attracts families, school groups and other holiday makers who enjoy the chance to get away from the hustle and bustle of metropolitan life. Guests are welcome to observe the daily operations of the farm, including sheep shearing, potato grading and more, depending on the season.

A unique environment

Aside from the scenic location,

Steven believes Kangaroo Island offers the perfect environment for potato cultivation.

"It's a great place for growing seed potatoes due to the island being a quarantined region for potatoes," Steven explains.

"The only way potatoes can be brought onto the island is if they have come from a laboratory for cultivation or if they have been washed or brushed and packaged for consumption.

This eliminates the possibility of disease, ensuring a healthy, viable future for certified seed potato production to supply the mainland commercial growers."

Steven is thankful for these conditions, which contribute to his success as a potato grower.

"Thanks to its isolation and mild climate, the island provides a disease-free environment that produces healthy, high-yielding crops," he confirms.

While Steven and Kerryn enjoy living far from the mainland, it does produce certain challenges. Freight is expensive and relies on a ferry that only leaves the island a few times a week, so accurate planning is essential.

"It is very important to be organised," Steven says. "The ferry only runs on certain days and if you miss it, your customers won't be happy."

Looking ahead

Steven and Kerryn, along with business partner Rodney, are always on the lookout for ways to improve their seed potato operation.

"We're always striving to improve and enhance our current operations," Steven says.

"We conduct trials on things like crop density; we make sure we get good agronomy advice and implement the recommended practices."

In a move to grow the business further, Steven and Rodney are in the process of developing a pine forest into a viable farm. They hope that this will result in increased production of crops, since Kangaroo Island's clean, disease-free seed continues to be in demand.

Above all, Steven and Kerryn enjoy being part of the potato industry and are happy to be living in such a beautiful area of Australia. Steven explains that he wouldn't change his life for anything.

"It's satisfying and rewarding to produce good, healthy crops in a challenging industry," he says.





Drones put new potato varieties on the horizon

THE INTERNATIONAL DEVELOPMENT OF NEW, MORE ROBUST VARIETIES OF POTATO IS BEING ASSISTED BY DRONES. SCOTTISH TRIALS ARE TESTING THE POTENTIAL OF THESE DRONES TO ACCELERATE POTATO BREEDING PROGRAMS AND ENSURE NEW VARIETIES CAN THRIVE IN CHANGING CLIMATES. *POTATOES AUSTRALIA REPORTS.*



The Scottish potato industry is recruiting some high-fliers to take potato breeding into the future.

Scientists who are attempting to breed new varieties of potato believe that their trials may be assisted by state-of-the-art drones, which have the potential to quickly and accurately analyse crop development. The drones are mounted with a camera and controlled remotely, taking hundreds of photographs as they fly over the crop. These photographs are then collated to create a three-dimensional model of the crop.

The project is a collaboration between James Hutton

Institute's Dr Ankush Prashar and the University of Dundee's Dr Hamlyn Jones, who are working with specialist firm Survey Solutions Scotland to investigate whether three-dimensional imaging can be used to analyse traits such as crop yield.

Repeat and compare

Survey Solutions Scotland spokesperson Jock Souter explained that the area of each crop is geo-referenced to the Scottish Ordnance Survey system to show exactly where the images are captured,

ensuring repeated surveys of the same area can be conducted. It is then possible to overlay subsequent images on top of the originals to compare and accurately chart changes.

The drones fly at around 80km per hour at 120 metres above the ground. On a typical site, the drones will take between 600 – 1,000 photographs. These photographs are then merged together to create a composite, and from there a very precise three-dimensional model can be built on a computer. Scientists can study the three-dimensional model to determine how each crop is developing and how it is coping with a variety of climate scenarios.

Accelerated trials

Until now, potato trials have required researchers to study potatoes after harvesting. However, this new technology makes it possible for researchers to study the height, density and health of the potato crop's foliage, as well as the response of the crop to shortages of water and nutrients during its growth.

Dr Prashar believes that the ease of analysis will give

the drones the potential to substantially accelerate his work in developing new varieties of potato.

The development of new varieties is an important venture. Given the increase in unpredictable weather events across the world, it is crucial for scientists to accurately measure crop development under different climate scenarios. The information gathered can then assist in the creation of varieties that are more robust and better suited to certain climates.

The future of agriculture

There is significant potential for drones to increase the efficiency of potato breeding, and researchers are excited to see the advances that could result from this new technology. By combining three-dimensional imaging with optimised breeding schemes, the development of new, resilient potato varieties could be accelerated, paving the way to more sustainable agriculture.



For more information please visit the James Hutton Institute at www.hutton.ac.uk.



Back to school: Gauging the effect of liquid seaweed on Kipfler potatoes

TASMANIAN RESEARCHER DR MIKE WALKER RECENTLY INITIATED A STUDENT TRIAL TO EXAMINE THE EFFECT OF LIQUID SEAWEED ON THE YIELD AND TUBER SIZE OF KIPFLER POTATOES. *POTATOES AUSTRALIA* SHARES THE FINDINGS.

The Kipfler variety of potato is notorious for producing many tubers, few of which are of marketable size.

Previous trials using Ectol, a liquid seaweed-based product, have shown that when it is applied after tuber initiation, it results in more marketable tubers with less size variation (see the article “Reducing variation in tuber weight with liquid seaweed” published in *Potatoes Australia* August/September 2015).

A trial was therefore conducted on Kipfler potatoes at Ulverstone High School in Tasmania as part of an industry school partnership with Farmers Marketing Network Pty Ltd,

which produces Ectol, using a class of 25 students as field technicians. Tasmanian researcher Dr Mike Walker coordinated the trial.

Project overview

The trial area comprised a grid of 25 one square metre plots (set out as five by five) with one plot for each student. They each planted four seed tubers in their plot and monitored the progress, weeding as necessary.

Each row of five comprised untreated controls at each end (plots one and five), with one in the middle (plot three).

This left plots two and four for the liquid seaweed treatment, which Dr Walker applied. After

tuber initiation, he added a litre of a 1:100 dilution of Ectol to each of the plots using a watering can at four weekly intervals, with the last applied a week before harvest.

The students did the harvest and Dr Walker stressed the importance of harvesting all tubers, no matter how small.

Main findings

The five blocks were labelled A to E and 1 to 5 in each block. As blocks A and E were effectively “guards”, Dr Walker concentrated on C4 and C3 which were in the middle, and weighed each individual tuber in the two samples.

The results are shown in Table 1. It can be seen that:

- The treated tubers weighed in at eight per cent more overall than the control, despite a lower number of tubers (about 28 per cent fewer).
 - The average weight of the treated tubers was 50 per cent higher than the control.
 - There were 60 per cent more tubers above 70g and 45 per cent more above 50g in the treated plots.
 - There were 50 per cent fewer tubers weighing less than 10g.
- Commercially, 45 per cent more tubers above 50g is probably the most significant finding.

Based on this trial, it was concluded that Ectol applied to Kipfler potatoes after tuber initiation produced a significantly greater marketable yield from significantly fewer tubers.

For the record, the students enjoyed the experience, as did the teacher.

Table 1: Results

	Treated tubers (T)	Control tubers (C)	T/C
Total tuber number	76	106	0.75
Number below 10g	19	50	0.38
Total tuber weight (g)	4361	4029	1.08
Average tuber weight (g)	57	38	1.5
Tubers over 70g	2749	1711	1.61
Tubers over 50g	3208	2207	1.45
Tubers below 10g	88	265	0.33



For more information on this project or to obtain the complete data set, please contact Dr Mike Walker at wipl@activ8.net.au.





Peter Kyriakou (left) speaks to a trader at the Melbourne Market.

A new era for the Melbourne Market

THE NEW MELBOURNE MARKET IN THE CITY'S NORTHERN SUBURBS IS IN FULL SWING, AFTER OFFICIALLY OPENING ON 31 AUGUST 2015. DIMI KYRIAKOU VISITED THE FACILITY DURING ONE OF THE BUSIEST TRADING TIMES OF THE YEAR TO SEE THE MARKET IN ACTION.



The trading floor.

When I was growing up, one of the highlights of my school holidays was a trip to the Melbourne Market. As a wide-eyed country kid from Yarrowonga – a small town on the banks of the Murray River in northeast Victoria – I would often look for any excuse to visit the bright lights and busy streets of Melbourne.

Luckily for me a simple excuse was at hand, as my family owned a fruit shop for the best part of 43 years. So during the school holidays, my sister and I would take it in turns to plead, bribe and ultimately convince our Dad, Peter Kyriakou, to join him on the weekly run to the market in West Melbourne. Every Sunday afternoon he would drive for four hours to the Melbourne Market and, after a short rest, make the rounds to buy produce and load the truck to return to Yarrowonga soon after sunrise on Monday morning.

Fast forward to December 2015 and I once again had the chance to visit the Melbourne Market with my Dad, but this time there was no begging involved. In the week leading up to Christmas, Dad and I along with AUSVEG VIC State Manager Kurt Hermann made our way to the purpose-built facility at Epping to see the new market in action during one of the busiest trading times on the Australian vegetable industry's calendar.

A fresh atmosphere

From the moment you turn into the entrance of the Melbourne Market, you immediately recognise that there really is no comparison between the new site and its predecessor. The Epping facility was certainly built with the modern market in mind, providing a critical link between growers, wholesalers, retailers and the fresh produce

supply chain.

The site itself spans approximately 60 hectares with room to spare, acting as a strong base for more than 1,800 individual fruit and vegetable buyers to source their produce in the early hours of the morning for distribution across Victoria and Australia. The warehousing space, which in itself takes up 120,000 square metres, is the largest warehousing precinct of any central market in Australia.

Next door to the wholesale fruit and vegetable market is the flower market, which features approximately 60 stand holders who occupy 140 stands and supply fresh flowers to over 700 floristry businesses.

The 21st Century market also does its bit for the planet, as the new facility aims to reduce the overall environmental impact of the site. It is equipped to harvest and treat rain and stormwater, generate solar

electricity and allow for better management of waste to achieve a recycling target of 95 per cent. Stall holders are also encouraged to dispose of waste in accordance with recycling and waste management procedures.

While the previous West Melbourne site was more centrally located, the Epping site remains close to many of the city's major freeways and is well placed to provide logistical advantages that can open up opportunities for traders to export.

Layout and function

After extensive research and consultation with industry, the Melbourne Market Authority aimed to build a site that could allow businesses to conduct their tasks more easily, safely and with the ability to manage costs more appropriately.

At Epping, the fruit and



Photography by Luka Kauzlaric

the heightened importance of safety at the new market, a demerit point system is also in place, where traders can lose points for disregarding the rules. Undercover parking borders the edge of the market, allowing stall holders to deliver produce to a loading zone next to the parking bay, which is located near trading stores in the buyers' walk. This aims to increase the overall efficiency of the market and ensure that trade occurs quickly and easily.

Business as usual

vegetable wholesale market is divided into two main sections. The trading floor has the capacity to hold 330 stands across an area of 12,500 square metres, while the buyers' walk contains 156 permanent stores where businesses can display and store produce.

While the trading floor may appear to be smaller in size than the previous site, it is certainly designed to be safer, as it features separated pathways for pedestrians and forklifts. In an effort to reinforce

Although the market has now been open for more than five months, it has been a significant change for many traders, especially those who have been working in the Australian vegetable industry for decades. And, as with any event in life, a major change can take a while to get used to.

However, the atmosphere of the market remains positive, with many of the stall holders and retailers carrying on with business as usual, as they continue to experience the new era of the Melbourne Market.



CALENDAR of events



23-25 June 2016

2016 National Horticulture Convention

Where: RACV Royal Pines, Gold Coast QLD

What: Co-hosted by AUSVEG, Apple and Pear Australia Limited (APAL) and the Central Markets Association of Australia in partnership with Fresh Markets Australia (CMAA-FMA), the highly anticipated National Horticulture Convention will return to the Gold Coast with a program that is bigger and better than ever. Delegates will enjoy presentations from engaging speakers, an expansive Trade Show and more.

Further information: Please contact AUSVEG on (03) 9882 0277 or email convention@ausveg.com.au or visit www.ausveg.com.au/convention.

1-2 June 2016

Europatat Congress 2016

Where: Brussels, Belgium

What: This year's Europatat Congress will allow potato professionals to learn how to anticipate and respond to changes driven by the technological revolution, a growing demand for sustainability, new trade patterns, demographic shifts and modern consumer behaviour. It will present a unique opportunity to network with industry leaders from the potato and fresh fruit and vegetable sectors.

Further information: www.europatatcongress.eu



Research program puts plant health under the microscope

POTATOES AUSTRALIA LOOKS BACK ON A COLLABORATIVE FIVE-YEAR PROGRAM THAT HAS PRODUCED IMPORTANT INFORMATION THAT WILL HELP POTATO GROWERS TO REDUCE THEIR EXPOSURE TO THE COSTS OF MAJOR DISEASES OF POTATOES. STEFANIA BOSTOCK REPORTS.

The Australian Potato Research Program Phase 2 (APRP2) commenced in 2009, comprising five dedicated research projects centred on soil and plant health with a primary focus on major soil-borne diseases, including Common scab, Powdery scab and *Rhizoctonia*. A sixth project, largely designed and operated in line with recommendations of the Pyksis Report (2009), provided independent management of the program.

The program was funded by Horticulture Innovation Australia using the Processed Potato Levy and voluntary contributions, with funds from the Australian Government. Voluntary and in-kind contributions were provided by national and international

research bodies and industry organisations.

Project leader, Scott Williams, said the program's goal was set to focus on research programs that had the potential to improve the productivity of Australian processing potato growers and processors to help ensure the industry remained competitive.

"A survey undertaken as part of the program estimated that *Rhizoctonia*, Common scab and Powdery scab collectively cost the commercial processing potato industry up to \$18.4 million annually – mainly as a result of discarded diseased tubers on farm, treatment costs and reduced plant yields," he said.

He explained that the findings generated by APRP2 would facilitate further research into

complex diseases like Powdery scab, enabling quicker – and cheaper – evaluations of potential treatment options.

"Potato growers can apply the new tools and management options to improve soil and plant health and, in turn, improve crop growth and yield, while saving money and minimising their efforts on inputs and land management."

Soil-borne pathogens

A project led by the South Australian Research and Development Institute (SARDI) developed a commercial DNA-based pre-plant soil testing service, PreDicta Pt. The service enables growers to identify fields (or parts of fields) that are "at risk" of specific diseases –

namely Powdery scab, Black dot and Root knot nematode – before planting.

Delivered to growers since its launch in mid-2013, it has been designed and established to operate as a standalone commercial service post-project. It is planned to expand the risk prediction capabilities of PreDicta Pt to include Common scab, *Verticillium* and *Rhizoctonia*.

Growers can access PreDicta Pt via agronomists accredited by SARDI to interpret the result and provide advice on management options to reduce the risk of disease losses.

Knowing the disease risk prior to planting can also help towards its mitigation by informing pre-season decision-making and monitoring and

improving practices, such as crop rotation strategies.

Seed potato health

The Tasmanian Institute of Agriculture focused its research on the role of tuber inoculum on resulting disease in progeny crops. The work showed that the current visual ratings of some diseases used by seed certification authorities correlated well with DNA levels found using the PreDicta PT test on tuber peel.

Irrespective of the method used to assess the pathogen load, the presence of pathogens on seed was generally associated with an increased risk of disease. The research team also established a clear relationship between planting diseased seed and progeny crop outcomes.

Other findings revealed that planting heavily diseased seed tubers that had been graded to remove those that are visually diseased represents a significant risk to growers, as high levels of pathogens can still remain on the graded seed, which can result in subsequent crop disease.

The studies emphasised the importance of using the highest health certified seed, particularly when planting into soil without a history of disease or when growing elite early-generation seed.

IPM strategy

The aim of this work was to deliver control methods to deal with Tomato-potato psyllid

(the vector of Zebra chip) that are compatible with an overall Integrated Pest Management (IPM) strategy if this pest should arrive in Australia.

Undertaken in New Zealand by IPM Technologies, Plant and Food Research and Potatoes NZ, the research established that key insect predators that occur in New Zealand and Australia will prey on all stages of the Tomato-potato psyllid given the opportunity.

Field trials were conducted in commercial crops where the IPM approach was applied involving the use of biological, cultural and border sprays. Insecticides were also applied, but selectively. Significantly, the commercial crops that were produced carried no signs of Zebra chip.

Today, growers on the South

Island of New Zealand and those in the more severely affected North Island are successfully using an IPM approach to manage the psyllid. It is hoped that the Tomato-potato psyllid never reaches our shores but, if it does, Australia will at least have strategies to address it.

Disease mitigation

Research by Canadian-based A&L Laboratories and the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR) developed new tools to identify soils that may have an inherent ability to suppress disease.

The research was effective in demonstrating that bacteria

isolated from the rhizosphere of potatoes and screened for disease suppression were able to reduce Common scab on progeny tubers when used in the field as seed treatment.

Additional work by DEDJTR showed that the manipulation of certain soil chemistry proved effective for controlling Powdery scab.



The Australian Potato Research Program Phase 2 was funded by Horticulture Innovation Australia Limited (HIA) using the Processed Potato Levy and funds from the Australian Government.

Project Number: PT09039





Stu Jennings

Wow!

It's February 2016 already. I hope Santa found his way to your place and that the weather has been kind to you and your spud crop. There is only one way to describe summer in our part of the country and that is DRY, which of course means irrigation, and lots of it!

Recently in Thorpdale, the Victorian Farmers Federation, Turbo Reel Irrigation, Reinke

and ViCSPA put on a BBQ where we talked about key issues affecting our business, including worker entitlements, labour hire and, of course, irrigation and water management.

Many spud growers of course are already using centre pivots, but due to our hills, trees and power lines, pivots have not been so common here. It was very interesting to investigate their potential and now all the locals want a few of them! All in all, it was a very educational evening and even better to catch up with local growers and talk about how everyone is going. It may not seem like a lot, but it can help to put things in perspective. If there is a grower meeting in your area, get along – there's always something to gain!

If you haven't already thought about it, check out the chance to visit leading grower operations with the Industry Leadership and Development Missions operated by AUSVEG and supported by Horticulture Innovation Australia. These missions are a great way to travel and see things you wouldn't otherwise see and at a great price for growers.



I also had the pleasure of a 'drop-in' from fellow YPP Luke Bartlett in December. It was heartening to think that being in our little group was making a difference and encouraging our members to get in touch. As a result of Luke's visit, I now pledge to do the same when I'm next on a road trip. I'll post my plans on Facebook in advance and see if any of you will have me!

Snap happy

Speaking of trips... I'm pleased to say that in conjunction with ADAMA and AUSVEG, we have just confirmed a great prize for our 2016 YPP Photo Competition.

Simply by joining the fun and posting a picture on the YPP Facebook page while you are out and about on the farm, you'll be in the running to win a trip to the Gold Coast this June to attend the National Horticulture Convention at RACV Royal Pines.

Go to our YPP Facebook page and upload your pic – along with a clever caption – for the chance to be chosen as the winner. The best pic and caption will earn flights to the Gold Coast and accommodation at Royal Pines, along with a full delegate pass to all the events at the Convention including the Gala Dinner and Young Grower activity (which I hear is going to be a blast this year).

If you are already planning on going – and I hope you are – you could be going for free! Get snapping as the competition closes on Monday 1 May.

Cheers,

Stu



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