

potatoes

australia

October/November 2013

**Geoff
Moar**

**Elected
AUSVEG
Chairman**

**Mark
Hanrahan**

**Driving
forward
efficient
production**

**Root knot
nematode**

**Tackling the
threat**

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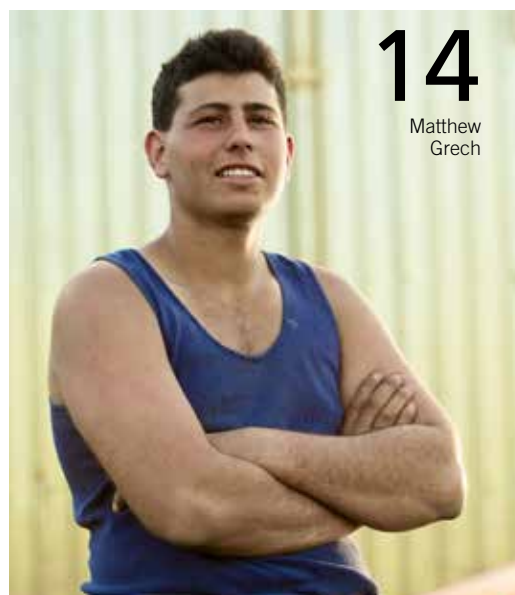
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Geoff Moar

AUSVEG Chairman

September was an important month for both the nation and the Australian horticulture industry, with the Federal Election seeing the Liberal-National Party Coalition take the reins of government, and the appointment of the new Federal Minister for Agriculture, The Hon. Barnaby Joyce MP. I congratulate the Coalition on its victory and AUSVEG looks forward to working closely with the new Minister to achieve better outcomes for Australia's potato producers.

Prior to the election, the Coalition put forward its *Policy for a Competitive Agriculture Sector*, outlining several positive initiatives, including \$100 million for Rural Research and Development Corporations (RRDCs) and \$15 million for small exporters, to aid Export Certification registration costs. I welcome the Coalition's pledge to Australian agriculture, including horticulture, in what is undoubtedly a challenging period for the industry.

As a grower myself, I am concerned at the mounting pressures placed on our industry by the threat of increasing imports of foreign food products and the rising costs of energy, water and other inputs. I am hopeful that the Coalition's plan for agriculture will address these issues in due course, to ensure that Australian potato growers and processors can remain competitive and on the cutting edge of global horticultural production. Close cooperation between the Federal Government and our sector is paramount for preserving the strength of our industry.

On a positive note, I am

looking forward to welcoming over 1,000 members of the Australian and international horticulture industries to the 2014 AUSVEG National Convention, Trade Show and Awards for Excellence, to be held from 19 – 21 June at the Cairns Convention Centre in Queensland. The Convention is the premier event for networking within the horticulture industry and will bring together some of the world's best horticulturists, researchers and supply chain members for an exciting three days in Australia's tropical north.

Our Trade Show is the biggest in Australian horticulture, with around 80 booths displaying the latest innovative technologies, products and research and development (R&D) initiatives. Expressions of interest for the Trade Show are now welcome and I encourage prospective exhibitors to register their interest with AUSVEG as soon as possible.

I look forward to joining you all in Cairns in June for our fifth and what may well be our biggest Convention ever.

Geoff Moar
Chairman
AUSVEG



Richard Mulcahy

AUSVEG Chief Executive Officer

The Potato Industry Extension Program was implemented in early 2012 to bridge the gap between industry R&D activities and the implementation of their outcomes by growers and processors. Over the last one and a half years, the Program has been instrumental in effectively communicating the outputs of beneficial R&D findings to potato levy payers.

A special R&D workshop was held in Pemberton, Western Australia last month, drawing together a mix of growers, agronomists and other stakeholders from the region, to hear from a leading expert from the international potato community.

Professor Richard Falloon from Plant and Food Research New Zealand discussed the impact of Powdery scab and his latest research into soil-borne diseases of potatoes. Joining him was the Department of Agriculture and Food Western Australia's Brenda Coutts, who presented on issues relating Potato virus Y. With the physical appearance of potatoes increasingly important to retailers, Yara's Matthew Wetherall provided attendees with valuable advice on how to achieve optimal skin and tuber quality. The workshop demonstrated the high level of interest from the industry for extension initiatives that can provide practical advice to growers.

Last month, Simplot Australia also held a series of events in northern Tasmania as part of its Potato Futures program, which the Potato Extension Program participated in. The events focused on topics such as variable-rate irrigation, land

mapping, precision agriculture and DNA testing for soil-borne pathogens.

Meanwhile, AUSVEG recently relocated to a more accessible and better equipped headquarters in Camberwell, in Melbourne's east, as it continues to advocate on behalf of growers. To mark the occasion, AUSVEG held the official opening of the offices on August 29, with attendance from around 150 industry and supply chain members. Notable attendees included Mr Josh Frydenberg MP, Federal Member for Kooyong and recently appointed Parliamentary Secretary to the Prime Minister; the former Premier of Victoria, The Hon. Ted Baillieu MP, State Member for Hawthorn; AUSVEG Board Members and Victorian Potato Growers Council Chair Frank Rovers. The occasion also saw Geoff Moar, New South Wales potato grower, being elected as the new AUSVEG Chair succeeding John Brent.

The outstanding support provided by many in the industry, as well as the wider community, enables AUSVEG to undertake important initiatives that aim to assist in improving the future viability of Australian potato producers.

Richard J Mulcahy
Chief Executive Officer
AUSVEG



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**FRONT COVER:**

Geoff Moar

Photograph by A Wuttke

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Mark Hanrahan

It is imperative that Australian potato growers are aware of the latest advancements in scientific knowledge and crop management practices that could help to address both present and future challenges to the sector. The ongoing threat of pest and pathogen incursions, for instance, requires all industry stakeholders to take an active interest in R&D developments.

Included in the October/ November 2013 edition of *Potatoes Australia* is a wrap-up of the two-day Australian Potato Research Program Phase 2 (APRP2) Symposium, held 18-19 September in

Melbourne. The event focused on communicating the latest outcomes achieved within the program, including strategies for managing key potato diseases such as Rhizoctonia, Powdery scab, Common scab, Potato early dying, Bacterial wilt and other disease threats (page 16).

Tracing the history of pathogens is of critical importance to developing successful management and quarantine practices. *Potatoes Australia* takes a look at the research of Dr Rebecca Gau from the Swiss Federal Institute of Technology in Zurich, which maps out the evolutionary and

dispersal history of Powdery scab (page 32). The work of Dr Frank Hay, from the Tasmanian Institute of Agriculture, is also highlighted, which provides a practical approach to managing the threat posed by nematodes (page 22).

This edition also includes the regular International R&D update, with a summary of new research from the Cranfield University in the United Kingdom, which compares the greenhouse gas emissions associated with producing potatoes, basmati rice and pasta (page 12).

VISY Industries is on the forefront of packaging innovation. General Manager Insights and Innovation at Visy Industries, Richard Macchiesi, recently presented at the 2013 Emerging Technologies in Horticulture Seminar. A wrap-up of his informative presentation regarding packaging technology that will benefit Australian food producers is provided on page 26.

The 2013 AUSVEG National Convention, Trade Show and Awards for Excellence hosted

a variety of presentations from some of Australia's leading industry personalities. Pam Hawkes, former potato grower and part-owner of undefeated thoroughbred racehorse Black Caviar, discusses her road to success (page 24).

Meanwhile, in the regular Potato Extension Program update, we recount the success of the Program's recent visit to Tasmania, which saw the Program hit the road to speak one-on-one with potato growers about implementing R&D projects on-farm, as well as participation in the Simplot Potato Futures events. The Program's involvement in the recent APRP2 Symposium is also highlighted (page 29).

This edition of *Potatoes Australia* also profiles budding young grower Matthew Grech (page 14), and Victorian potato grower Mark Hanrahan (page 18). Mark discusses his exposure to new technologies while attending the 2013 Potato Growers' Study Tour to the USA and Canada, and the challenges of running a one-man operation.

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Potato Extension Program



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AUSVEG welcomes Fresh Potato Industry Advisory Committee members

Mr Kim Weir from New South Wales, Mr Sam Humphries from South Australia and Mr Andrew Powell from Victoria have joined the Fresh Potato Industry Advisory Committee as new representative members.

The new participants took part in their first meeting earlier last month at the offices of Horticulture Australia Limited (HAL). AUSVEG looks forward to their contributions and wishes them all the best in their new roles.



New member of the Fresh Potato Industry Advisory Committee, Mr Sam Humphries.

International Horticultural Congress to convene in Brisbane

The 29th International Horticultural Congress will take place in Brisbane from August 17-22, 2014. The event is expected to attract 2,500 delegates from around the world.

The Congress will be hosted at the Brisbane Convention & Exhibition Centre by the Australian Society of Horticultural Science, the New Zealand Institute of Agricultural and Horticultural Science, and the Secretariat of the Pacific Community, under the auspices of the International Society for Horticultural Science.

A number of high-calibre international scientists will travel to Australia for the event, offering an invaluable opportunity for the Australian vegetable industry to take advantage of the event's global focus. Held every four years at various sites around the world, the Congress is a world forum, covering all aspects of

horticulture and horticultural science.

The theme of the 2014 congress is 'Horticulture - sustaining lives, livelihoods and landscapes' and addresses the key issues of health, poverty, food production and the environment. It will showcase advanced technologies that are becoming globally significant in a world with a rapidly growing population, less cultivatable land and an environment under threat.

Despite being the 29th congress, it is only the second time it has been hosted in the southern hemisphere. The Scientific Program Committee is assembling an exciting and stimulating scientific program of 39 separate symposia, with some of the areas of interest listed to the right.



International
Horticultural Congress
Website: www.IHC2014.org



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- High Value Vegetables including Root & Tuber Crops: Production, Supply & Demand
- Water Scarcity, Salination & Plant Water Relations for Optimal Production & Quality
- FAO/WHO Horticulture for Nutrition Workshop
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- Molecular Biology in Horticulture
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- Biosecurity, Quarantine, Managing New Pests & Market Access

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Ask the industry



with Scott Mathew

SCOTT MATHEW FROM SYNGENTA DETAILS SOME OF THE MOST IMPORTANT STEPS TO TAKE IN THE LEAD-UP TO PLANTING POTATO SEED.

Some commercial growers still seem to believe their potato crop management starts when they receive seed and start planting. And yet, there is plenty of hard-gained experience out there that shows the steps leading up to planting are critical and can have a huge impact on final crop yield and quality. The purchase of top quality seed is one of the most significant and cost effective investments a commercial grower can make.

Question: How do I ensure I get good seed?

The answer lies in good communication. The seed producer needs to have a very clear understanding of what the commercial growers' needs are. Communication should be two-way, open and understood by both parties.

As a commercial grower, you should specify your requirements as early as possible to ensure you give your seed producer every opportunity to deliver seed that meets your requirements. These requirements may include:

- The size range of the seed potatoes you require, which will depend on whether

you intend to plant whole or cut seed.

- The maximum tolerable level of disease/virus that may be present in or on the seed, because this will impact on what management strategies you will need to adopt in the commercial phase.
- Any other factors you feel may influence your management plans when growing out the commercial crop.

Make sure your specific requirements are accepted by the seed producer prior to committing to purchase the seed. Take an ongoing interest and be aware of how the seed crop is progressing throughout the season.

Once quality seed has been delivered, the very next step is often where growers can fall down in their overall crop management.

Question: What else will help your crop get off to the best start?

If commercial growers are to reap the full benefits from purchasing good quality seed, it is imperative to correctly handle and store the seed leading up to planting. All too often I see good quality seed stored in badly maintained, dusty or poorly ventilated sheds with temperatures that fluctuate

widely. Do not store potato seed in these conditions if you want the best results. Such storage conditions can cause the seed to be infected with diseases such as silver scurf and also lead to premature physiological ageing.

Other factors, such as grading the seed using poorly maintained or dirty equipment, increases the disease infection risk. Simple precautions such as removing soil from graders, seed cutters and elevators using high pressure water can make a big difference and it costs nothing.

Washing down, sweeping or vacuuming storage and grading areas to prevent soil and debris build up will also help you grow a clean crop that gets off to the best possible start.



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Potatoes confirmed as the smart and sustainable carbohydrate of choice

POTATOES ARE THE MOST SUSTAINABLE CARBOHYDRATE COMPARED TO RICE OR PASTA ACCORDING TO A NEW STUDY FROM CRANFIELD UNIVERSITY IN THE UNITED KINGDOM (UK).

A recent study comparing the environmental consequences of consuming potatoes grown in Great Britain compared with other carbohydrates has shown that up to the point of retail, potatoes have a potentially lower environmental impact than basmati rice or pasta.

The study compared British-grown white potatoes, Indian basmati rice and Italian pasta, and explored two environmental indicators: greenhouse gas emissions (GHGE) and the potential impact on water scarcity, up to the point of delivery at the retailer.

"Our results showed that on

both a dry and fresh weight basis, Indian basmati rice has the highest greenhouse gas emissions and potential impact on water scarcity of the three carbohydrates," said Dr Adrian Williams, principal research fellow from Cranfield University. 'Fresh weight' refers to the weight of the item before water

is withdrawn, while 'dry weight' refers to the weight determined by means of drying processes, which removes all water content from the item.

The potential impact on water scarcity was measured by the consumption of 'blue' water – water which is withdrawn from surface and groundwater

resources and not returned in the short-term. The potential impact was then scaled by a factor that balanced the local water supply and demand. The study found that the amount of blue water consumed in the production of 1kg of fresh weight basmati rice is around 100 times the amount used to produce either British-grown potatoes or Italian pasta. Italian pasta has three times

the potential impact on water scarcity compared with British-grown potatoes on a fresh weight basis.

Dr Williams explained that for all three carbohydrates, most of the blue water consumption is associated with the cultivation of the crop and used for irrigation.

"The main difference between the three carbohydrates is that Indian rice is fully irrigated in the early part of the cultivation,

whereas only part of the British potato and Italian durum wheat crop (for pasta) is irrigated to supplement rainfall," he said.

"Although the amount of water consumed in processing basmati rice is in fact very small compared with water use to grow the crop, because it is geographically more localised, it can have a significant impact on water resources."

Dr Williams said that the

study's findings showed that a portion of potatoes has the lowest impact on greenhouse gas emissions and water scarcity, with 30 per cent of the impact on GHGE and one per cent of the potential impact on water scarcity, compared to an equivalent portion of Indian basmati rice.

Potato Council UK's Head of Marketing and Corporate Affairs, Caroline Evans, said that not only are potatoes nutritionally more beneficial than rice or pasta, there is now evidence to show that they are also more sustainable than alternative carbohydrates by portion size.

"This is a really positive message for our industry and our focus now will be on working together to communicate these messages to Government and other key stakeholders, as well as to consumers," she said.

"Combined with the evidence to support their healthy credentials, this research is ideally positioned to help us inform key audiences to ensure potatoes get top billing when it comes to recommending the types of food we should be eating."



To see the full report go to:
<http://bit.ly/16hb00C>



Q&A Young grower profile

Name: Matthew Grech

Age: 20

Location: Theresa Park, NSW

Title: Grower/Farm Manager

Works: Grech Farm Trading Pty Ltd

Grows: Atlantic Snowden crisping varieties, Merlin

How did you first become involved in the potato industry?

When I was little I loved helping dad on the farm. As I grew older, I developed a passion for farming, especially growing potatoes.

What is your role in the business?

Growing up I was always with dad on the farm. Since purchasing another property, and me finishing year 12, my role is now taking care of the original farm, including planting, watering and harvesting the potatoes while dad works on setting up the new farm. Dad and I work together; we discuss how things should be done.

Can you describe your average day at work?

No day is ever the same or boring. I have just finished planting, but there is always tractor work to be done. Also at the moment we're still harvesting cabbage. I also water the potatoes and do repairs and maintain the machines we use.

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

I love the challenge of growing a good crop. But most of all, the greatest reward is when the crop is finished. After months of looking after it, we are able to sell a high quality product. That makes me happy.



Theresa Park,
NSW

What are the biggest challenges you face as a grower?

Rising costs of all expenses. Cost and unskilled labour and the concern of imported potatoes taking over.

Nowadays we have to work more efficiently - any profit can only be made from better yields due to the constant price increase on things such as diesel, electricity, fertiliser and chemicals. We are not able to pass it onto the consumer so we have to burden the cost ourselves.

What do you see as the biggest threats to the Australian potato industry?

I think the biggest threat is the concern of cheap imports grown to non-Australian standards, and the diseases they may also bring in.

Also, people are not consuming and eating potatoes or vegetables as much anymore.

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

People these days are more educated and don't just want to work hard with minimal pay rewards. There needs to be an incentive for young people to join the horticulture industry. Unless you are born into it, you don't understand the time, effort and commitment it takes to growing a crop. Perhaps if better education was given throughout schools to show that farming is a serious industry, and with hard and dedicated work ethics young people can make a difference. If they know there is a rewarding future in the industry, more young people may be interested. The industry is so hard to get into on your

own as it is so expensive to get going. You need to be able to purchase land, tractors and equipment, all costing a lot of money. The Government needs to help young growers like they do in other countries.

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

I would still be in farming growing other vegetables or maybe working as an ag contractor.

Where do you see yourself in five years?

Still growing potatoes and vegetables, hopefully getting higher potato yields and expanding the business.

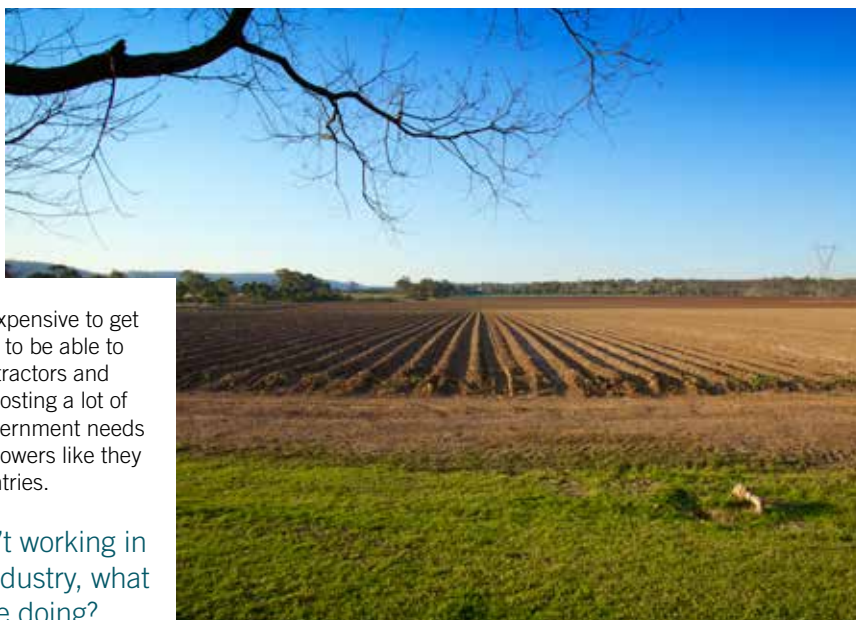
What did you gain from participating in the 2013 Potato Growers' Study Tour to the USA and Canada?

I discovered that we are lucky in Australia in some ways because we don't get some of the diseases and pests that the USA and Canada have. For example, the Colorado potato beetle is a real nasty pest and we really don't want to get that here.

Another one would be Zebra chip. It would cost the [Australian] industry millions of dollars trying to control it. The tour helped me gain an understanding on how important it is to keep these diseases and pests out of Australia.

What was the highlight of the tour for you and why?

It would have to be the sheer scale of the potato industry in the USA and Canada - how they can harvest 3,000 acres in just two weeks. Another highlight would have to be the water volumes used and quality of water which are both very high.





Showcasing potato science: APRP2 Symposium brings together horticulture's brightest minds

FROM FRIENDLY BACTERIA TO NEMATODES AND SCABS; SEVERAL OF THE MOST IMPORTANT ISSUES FACING THE AUSTRALIAN PROCESSED POTATO INDUSTRY WERE DISSECTED, EXAMINED AND DISCUSSED AT THE AUSTRALIAN POTATO RESEARCH PROGRAM PHASE 2 (APRP2) SYMPOSIUM IN MELBOURNE LAST MONTH, WRITES JAMIE RACICOS.



Effective extension of information acquired through levy-funded research and development (R&D) is vital to ensuring that these projects deliver benefits to members of the Australian potato industry, particularly levy payers. With the project approaching its final year of operation, the Australian Potato Research Program Phase 2 (APRP2) recently held a Symposium in Melbourne, to provide the industry with a detailed update on its achievements and future direction.

From 18-19 September, researchers, potato levy payers and industry representatives gathered at the Mantra Hotel, Tullamarine, to hear about the latest research conducted by APRP2, including the management of key potato diseases including Rhizoctonia, Powdery scab, Common scab, Potato early dying, Bacterial wilt, as well as other conditions affecting potato crops. Highlights of the event included addresses by 'Dr George Lazarovits and Plant and Food Research New Zealand's

Professor Richard Falloon. Previously featured in *Potatoes Australia*, both investigators are involved in a soil health/disease mitigation program investigating the manipulation of soil nutrients and potential ameliorants to soil health.

Dr Lazarovits discussed his team's investigation of the rhizosphere. The rhizosphere is the zone of soil surrounding the potato plant root where the biology and chemistry of the soil are influenced by colonising microorganisms – a number of which can release antibiotic compounds and improve nitrogen fixation. He also stressed the importance of soil health, stating that 'tired soil syndrome' was a significant factor in the loss of crop productivity.

Professor Falloon outlined his research into the individual nutrient factors affecting Powdery scab pathogen (*Spongospora subterranea*) infections in potatoes, which aims to determine the effectiveness of various nutrient applications on pathogenic activity within the plant. Professor Falloon has found that

ammonium nitrate, boron and elemental sulphur are the most effective additives in reducing the number of *Spongospora* root galls.

Representatives of the South Australian Research and Development Institute (SARDI), Department of Environment and Primary Industries Victoria (DEPI VIC), the University of Melbourne, Tasmanian Institute for Agriculture (TIA), Flinders University, ViCSPA and IPM Technologies were also present to discuss their respective research activities within the program, including an across-industry investigation into the impact of nematodes and an update on the Predicta Pt DNA soil testing service. In addition, several PhD students involved with the program shared their work with the group.

While the two-day conference was technical in nature, a half-day industry session was held on the second day of the Symposium to provide potato levy payers and other industry representatives with a straightforward overview of APRP2's outputs in a panel-style discussion. This provided

attendees with an invaluable opportunity to interact directly with the researchers involved in the program. In addition, AUSVEG Special Projects Coordinator, Luke Raggatt, presented on the Potato Industry Extension Program and outlined its role in communicating and extending beneficial R&D outcomes to potato levy payers.

An additional grower information evening was also held following the industry session of the Symposium, in Creswick, near Ballarat. Presentations were given by Professor Richard Falloon and Dr George Lazarovits, who emphasised how their research could be applied practically. Attendees found the event worthwhile and the level of engagement between growers and researchers was high.

The Australian Potato Research Program Phase 2 (Project PT09039) will conclude in September 2014. For copies of Milestone and Final Reports, please contact AUSVEG directly on (03) 9882 0277 or email info@ausveg.com.au.

Potato industry well represented by top appointments at AUSVEG



New AUSVEG Deputy Chair, David Addison.

Potato growers Mr Geoff Moar and Mr David Addison have been elected to the two top jobs at AUSVEG. Mr Moar, based in the Riverina district of New South Wales, was elected to the position of AUSVEG Chairman in August, with the announcement made at the unveiling of the new AUSVEG office in Camberwell, Melbourne. Mr Moar has grown fresh and processed potatoes for the crisping and fresh markets for the past 40 years, and has served as a Director of AUSVEG since 2004.

Mr Addison was also elected as Deputy Chair. Mr Addison

manages an onion packing, potato and vegetable growing operation based in Moriarty, Tasmania, and has done so for over 35 years. He supplies potatoes, vegetables and other products such as poppies, cereals, livestock and pyrethrum to both the processing and fresh sectors, and is a past member of the Processed Potato Industry Advisory Committee (IAC).

Mr Moar says he is looking forward to serving both the potato and vegetable industries in his capacity as Chairman of AUSVEG, and is proud to have seen the organisation grow to

become the strong National Peak Industry Body that it is today.

"AUSVEG now finds itself in an incredibly strong position, with a determined CEO, access to every political grouping in the nation, a strong balance sheet, a very capable and well-qualified staff and an experienced and visionary board," he said.

"As Chairman of AUSVEG, I will strive to ensure that Australian vegetable and potato growers see action on the political front on issues such as Country of Origin Labelling laws, costs of production, the

dumping of foreign product and anti-competitive supply arrangements. I will also work to see that Australian vegetable and potato growers see investment in Research and Development activities which best suits our needs. I encourage Australian growers to get in contact with AUSVEG if they have any issues they feel we can assist them with."

Mr Moar also congratulated former Chairman Mr John Brent for his achievements during his five year tenure, and thanked him for his contribution to the industry over that time.



AUSVEG Chairman, Geoff Moar, with potato grower Terry Buckley.



Photographs by Brandon Rooney.



Mark Hanrahan: Driving forward efficient production

A PARTICIPANT ON THE 2013 POTATO GROWERS' STUDY TOUR TO THE UNITED STATES AND CANADA, POTATO GROWER MARK HANRAHAN IS APPLYING THE KNOWLEDGE HE GAINED FROM THE TOUR BACK HOME ON HIS OWN FARM, WRITES FELICITY POWELL.

Growing up to 1,900 tonnes of potatoes for processing and peeling each season, Mark Hanrahan, based in Mollongghip, Victoria, is emblematic of the determined yet pragmatic approach often found amongst Australian growers.

Mark has a long history working with spuds, having left school to help out on his parents' potato farm. After taking a break driving earth-moving equipment in the Northern Territory, he came back to central Victoria and

began driving freight transport to northern Queensland. Then in 1995, when land became available, Mark borrowed some money and signed a small contract with a processor, where his career in the Australian potato industry really began. He has operated his potato farm ever since, growing the Russet Burbank, Innovator and Atlantic varieties, alongside 1,200 lambs and 70 head of cattle.

To this day, Mark continues to freight potatoes across Australia for off-farm income. In January of each year, he begins moving

potatoes out of Warrnambool into Melbourne and Ballarat. He also transports out of South Australia into Ballarat and Melbourne, accompanied by the odd local journey, as well as transporting his own loads of potatoes. The whole process finishes up in September.

"I do approximately 99 per cent of the driving myself, and I've carted potatoes out of most areas of Australia, except Tasmania, only 'cause you can't drive there," he says.

Although Mark finds himself traversing Australia for most

of the year, he's always happy to return to his home base in Mollongghip, near Ballarat. He says it's a very good area to grow in, with high rainfall and easy access to bore water.

"We have good water supply, it's a drought-proof water supply. In fact we like it dry here - the drier the better," he says.

Mark is able to keep his spuds growing in the ground for 10 to 11 months, due to the excellent condition of his 'red chocolate' soil. Last month, Mark was only just digging potatoes that were planted in November last year.



Photographs by Ian Wilson.



"I don't think there's another place in the world they can do that, to be honest," he says.

From the very beginning, Mark has performed a majority of the tasks on the farm himself, therefore keeping his labour costs down.

"I do all the work on my own. If I can buy a machine where I can do away with labour I'll certainly buy it to make myself more efficient," he says.

Although he may consider himself a one-man operation, Mark admits that he gets by with a little help from his family - wife, Cathy and five kids: Danny, Abbey, Sam, Billy and Ellie, aged four to 14.

"They're a big help. I'd have a tough job without them helping me as well. The eldest does some of the tractor work and the

others do their bit on the back of the harvester. Two out of the five kids - Danny and Billy - tell me they're going to be farmers," Mark says.

Seasonal workers also drop in to help Mark on the farm from time to time.

"The only time I employ anybody is two backpackers at digging time which lasts for about eight to 10 weeks. They're very good. Over the last few years we've had Germans, New Zealanders and Irish people coming to work for me," he says. "I think more farmers should be using [seasonal workers] because they're more willing to work because what we pay them over here, the award wage, is more than what they get over in their own countries."

It was Mark's success in and

commitment to the Australian potato industry that saw him selected as one of nine potato levy payers to participate in this year's Potato Growers' Study Tour to the United States (US) and Canada. The tour gave attendees the opportunity to deepen their knowledge of different approaches to potato production, which could help to strengthen not only their own operations, but also other growers around them, by sharing the knowledge gained with their peers.

The group visited farming and processing operations in Boise, Idaho, in the US, before moving on to visit the University of Idaho Potato Research Centre to discuss disease and pest management. In Canada, the group stopped by growing regions in New Brunswick, Prince Edward Island and Quebec City, finishing off the tour with a day at the Potato Association of America's annual conference, which featured a

one-day symposium on potato R&D.

During the trip, Mark became keenly interested in the techniques US and Canadian growers are using to combat potato viruses such as Potato virus Y (PVY), particularly their use of mineral oils. PVY has become a significant concern for producers in the New Brunswick area, and Mark believes it is likely that growers in Australia will be using these same mineral oils to fight against similar diseases in the near future.

Mark was also impressed by new advances in cooling technology for potato storage sheds, where air ducts have been incorporated into the cement floor, thereby blowing cool air up evenly through the whole floor. He is hoping to see this technology developed in Australia in the not-too-distant future, and will be keen to adopt the technology when it becomes

continued over page ▶

“It was a worthwhile trip. I definitely learned a lot while I was over there.”

- Mark Hanrahan

available.

As well as fostering a growing interest in emerging technologies while on the tour, Mark was happy to reconfirm that the quality of potatoes produced in Australia continues to be amongst the best in the world.

“One thing we did notice was that the French fry chips in America and Canada, in the shop, weren’t of good quality like what we have in Australia. We found that Australia [does] have the best quality chips. It was a worthwhile trip. I definitely learned a lot while I was over there,” he says.

Back on home soil after the tour, Mark is tackling the typical challenges faced by growers across Australia one day at a time. He says that farmers are not only against the wall with input costs driving up the cost of production, but that they also have to compete against cheap imports flooding the market, which have increased with the help of European subsidies. Mark believes that the Australian Government needs to improve anti-dumping laws to help address this pressing issue.

“If the Government decides to do something about it, it’ll save our jobs and our industry. By doing that we’ll create employment and more business,” he says.

“The potato industry is struggling at the moment. I’d call on fast food retailers, like McDonalds, Hungry Jacks and Yum (owner of KFC) to back the farmers and advertise on



Photograph supplied by Mark Hanrahan.

their products that they buy all Australian-grown potatoes.”

Despite these challenges, Mark remains undeterred and sees himself growing and transporting potatoes across the country for a while yet.

“I’ll continue growing for a long time - hopefully with my existing processors - but [if] things change, we [will] have to change as well.”



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Drs. Suzie Jones (left) and Frank Hay (right) of the Tasmanian Institute of Agriculture inspecting potato tubers.

Tackling the threat of Root knot nematode

ROOT KNOT NEMATODES ARE A SERIOUS PROBLEM IN AUSTRALIAN POTATO CROPS, WITH THE POTENTIAL TO CAUSE YIELD LOSS AND TUBER DAMAGE. A MAJOR AUSTRALIAN RESEARCH PROJECT HAS RECOMMENDED HOW GROWERS CAN BETTER DETECT AND MANAGE THE PATHOGEN IN THEIR PADDOCKS, WRITES KAREN SHAW.

An important part of the four-year research project, 'Managing the nematode threat' (MT09067), involved producing a web-based booklet that includes information about DNA soil testing; outlines resistant break crops; and provides details on the biology of the disease.

The groundbreaking research

found that nematode species *Meloidogyne fallax*, which is more prevalent in cooler climate potato crops, can survive in soil at low levels for more than 360 days without a host. Another important finding was that while the presence of Root knot nematode (RKN) often leads to symptoms on the tuber, there were occasions when DNA

testing showed evidence of the pathogen, despite no visible tuber damage.

Research project leader and plant pathologist Dr Frank Hay, from the Tasmanian Institute of Agriculture (TIA), believes this finding raises future issues for the seed potato sector, such as whether seed tubers should be DNA tested for RKN.

"Our current certification system is based mainly on visual tuber assessment," says Dr Hay.

Survey

To understand more about the nematode species in vegetable and potato growing regions, the project conducted a national survey. Revealingly, it showed

that RKN is widespread. For example, of 62 potato crops tested in Tasmania, some 69 per cent had RKN, with the predominant species *M. hapla* and *M. fallax*.

Similar results were found in South Australia. Of 51 potato paddocks tested, 72 per cent had nematodes, with prevalent species being *M. fallax* and *M. hapla*. In warmer regions, *M. javanica* was more common.

Root knot nematode is recognised worldwide as one of the more severe pathogens of vegetables and potatoes. Figures from the study show that in 2010, in Tasmania alone, RKN damage accounted for 39 per cent, or about 1,700 tonnes, of all potatoes rejected by the seed certification scheme.

In the past, chemicals have provided the main method of control, but Dr Hay says there has been a steady reduction of effective chemicals available on the market due to environmental concerns. For example, this year the Australian Pesticides and Veterinary Medicines Authority (APVMA) has recommended withdrawing one of the more commonly used nematicides, fenamiphos.

"This leaves a large gap in growers' arsenal to control Root knot nematodes," says Dr Hay.

"There are some new chemical controls seeking registration through the APVMA. But this takes time. To better help growers, our research

focused on promoting an approach with less reliance on chemicals and more on pathogen detection and management."

An important new development in the battle is the commercial release of SARDI's Predicta Pt soil testing service, developed as part of research undertaken for APRP2. "This [service] will allow farmers to test their soil for different species of Root knot nematode. It will also enable growers to quantify the amount of the nematode in the soil before planting," explains Dr Hay.

"This means farmers [will] have information to make decisions about whether to plant a particular paddock and identify any Root knot nematode species present," he says.

Break crops

The research also found that planting a break crop between potatoes can also help reduce nematode numbers. "For example, in South Australia we tested a range of plants against all five Root knot nematode species. We found that particular varieties of lucerne, tall fescue, oats and perennial rye grass were poor hosts of Root knot nematode species. In warmer climates, such as Queensland, we found that jumbo sorghum was a useful between-crop plant," he says.

"You get some plant species



Potato tubers with root knot nematode damage.

or varieties that are highly resistant to one or two Root knot nematode species, but susceptible to another. So that's where it's important to know what species of Root knot nematode you have in your paddock. It also helps with effective rotation planning," Dr Hay explains.

The release of the nematode web booklet will mark the conclusion of this particular project. But Dr Hay believes there is scope for more research into Root knot nematodes.

This collaborative project comprised researchers from TIA, South Australian Research and Development Institute (SARDI), Department of Agriculture and Food Western Australia (DAFWA), Department of Agriculture Fisheries and Forestry Queensland (DAFF Qld), Plant and Food Research New Zealand, Biological Crop

Protection and Crop Protection Research in Victoria.

The project was funded by HAL using the National Potato Levies (fresh and processed), the National Vegetable Levy and Voluntary Contributions from industry, with matched funds from the Australian Government.

THE BOTTOM LINE

- Root knot nematodes cause obvious tuber damage that result in crop losses. But new research has found that in some cases Root knot nematode can cause yield loss without obvious tuber damage.
- The use of certified seed is a useful method of reducing the risk of nematode entering the field.
- The introduction of SARDI's Predicta Pt DNA soil detection tests gives growers a chance to monitor nematode levels in crops.
- There are limited chemical options for controlling nematodes short-term. But longer term new chemicals will become available.
- Growers need to look at other methods of control such as planting resistant break crops to keep Root knot nematode populations low.



Further information:
Project MT09067
The Root knot nematode booklet will be available soon at www.tia.tas.edu, or contact Dr Frank Hay on 03 6430 4907.
Predicta Pt inquiries:
Michael Rettke
(08) 8303 9414 or
michael.rettke@sa.gov.au



Potato tuber with external symptoms of Root knot nematode damage.



Peel removed showing internal symptoms.



Pam Hawkes: From spuds to Black Caviar

PAM HAWKES IS A FORMER POTATO GROWER AND PART-OWNER OF CHAMPION RACEHORSE, BLACK CAVIAR. SHORTLY AFTER ADDRESSING DELEGATES AT THE 2013 AUSVEG CONVENTION, SHE SPOKE TO *POTATOES AUSTRALIA* ABOUT HER EXPERIENCE OF OWNING ONE OF THE MOST CELEBRATED HORSES IN RACING HISTORY.

At the time of her retirement in April of this year, Black Caviar was listed by the International Federation of Horseracing Authorities as, simply put, the world's best horse. She is the only horse in 100 years to be undefeated in 25 races, and has earned \$7.95 million on the race track.

Black Caviar is jointly owned by a group of Australian racing enthusiasts, one of whom spent much of her life growing potatoes. Pam Hawkes helped out on her father and uncle's potato farm as a child, and continued to grow the crop until she retired several years ago.

"My father had two other brothers and they grew a lot of potatoes up in the Gembrook

area around Yellingbo and also a few potatoes at the farm in Keysborough," Pam says. "I'm leaving that now to Barry, my husband, my son, Richard, and daughter, Andrea."

Growing up in a rural area allowed Pam to discover a love of horses that would heavily influence the life she has since led.

"I'd always been obsessed with horses from a very young age," she says. "All I ever wanted to do was be near them, be around them. The children started getting bigger horses and they were going off and helping various people around near where we live, working as strappers and track riders, and then the bug just seems to bite

you, really."

"I love everything about [horses]," she says. "I love the way they move, I love the way they sound when they're eating, just everything, really. I think if a horse likes you, it's a wonderful friendship."

She describes getting into horse-racing as a natural progression, borne from her love for the animal. With a group of friends, she consistently attended Melbourne's Spring Racing Carnival, where she became inspired to actively participate in the sport.

"We noticed how much fun everyone else was having and we thought we should have some of this fun too," she says. "I can distinctly remember

saying, 'Well, I'm in but I only want a fast one'."

Once the decision had been made to own a racehorse, the group engaged trainers to select a colt or filly, which they found at the Inglis Premier Yearling Sale. Pam says that the trainers had agreed "probably to spend \$100,000 but spent considerably more."

Once a yearling had been acquired, it was Pam who came up with the name, Black Caviar, which was inspired by her love of geography.

"I'm a geography fan who, for fun - I must sound boring - reads maps," she says. "Anyway, I noticed that when we were looking for a name, you go back in the horse's pedigree and

her grandmother was called Scandinavia and her mother was called Helsing, which is a small town in Denmark. I knew that black caviar was the milk taken from the sturgeon that live in that region, and we love black caviar. We wanted a good time from the horse, and black caviar goes with champagne when you celebrate. It all made sense to me, and the others liked the name, and that was the name that was chosen."

It is no secret that their filly grew into a champion mare and one of the greatest horses in the history of racing. She has provided her trainer, owners, and jockeys with much cause for celebration and a collection of happy memories. Pam says her biggest highlight was the Diamond Jubilee Stakes at the famous Ascot Racecourse in the United Kingdom. She says that she thoroughly enjoyed "the pomp and ceremony and the fact that there were so many of [her friends and family] all over there, having a marvellous time."

"But the best thing," she says, "has been the camaraderie between the families and

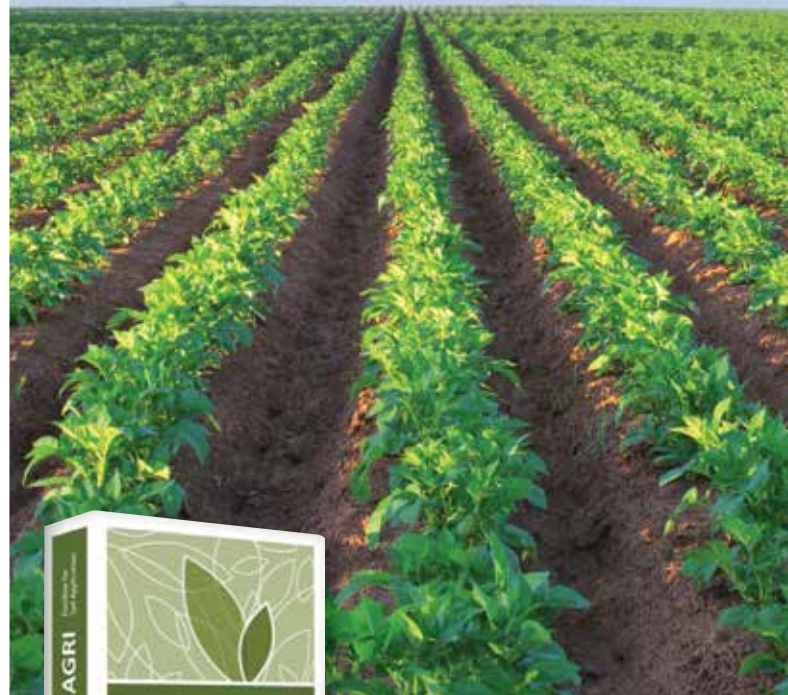
between our friends, and the excitement and the joy that the horse has brought everybody, from my friends who live in Rutherglen to people who live in Ireland. They follow the horse as closely as we do, so it's been a central pivot point for our families."

With her potato growing days behind her, Pam says that she would like to continue racing horses and being part of the group that has become close through sharing such a special, rewarding experience. She says that she has plans for the next foal that the group acquires: "To win more, yes, now that we've gotten used to it!"

"I still enjoy the local country meetings," she says. "We went up to Scone recently, I still go to races at Mornington, but always the anticipation - you get a new foal and you go out and you look at it and you dream that this one might be special as well. We were right with one, but lightening rarely strikes in the same place twice."



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Pioneering the Future



Visy's vision for the future of packaging technology

AT THE 2013 EMERGING TECHNOLOGIES IN HORTICULTURE SEMINAR, VISY GENERAL MANAGER OF INSIGHTS AND INNOVATIONS, MR RICHARD MACCHIESI, PRESENTED ON SOME OF THE WORLD'S MOST INNOVATIVE PACKAGING SOLUTIONS CURRENTLY BEING DEVELOPED. *POTATOES AUSTRALIA* TAKES A CLOSER LOOK AT HIS EXCITING PRESENTATION.

Growers like to see their product delivered to consumers in its best condition. Cultivating a healthy, sustainably produced, aesthetically uniform product demands work and time, so it provides great disappointment when transport, handling and other supply chain issues cause the product to be

less than perfect.

Good packaging plays a vital role in ensuring the distribution of an undamaged product. Packaging technology is a rapidly evolving area of the food industry, which is pioneered by a few key innovators.

At the 2013 Emerging Technologies in Horticulture

Seminar, Richard Macchiesi, General Manager of Insights and Innovations at Visy, spoke to attendees about some of the most exciting developments taking place in packaging around the world. The seminar was held on Thursday 30 May at Jupiters Gold Coast, and provided members of the

Australian horticulture industry with the opportunity to hear from local and international experts about innovative projects that have the potential to improve the efficiency of industry practices.

"When I was studying my Masters, a lecturer said... 'What is Visy all about?' and we all said, 'Well, it's about packaging,'"

Mr Macchiesi told attendees of the seminar. "And [the lecturer] said, 'It's not. It's about mitigating risk of getting the product from, say, the farm to the retailer, and the amount of risk that we can reduce... in getting the product in its best condition'."

Mr Macchiesi also told attendees that packaging plays an important role in facilitating the optimal performance and presentation of the product when received by the consumer.

Mr Macchiesi used the case study of 'Cuties USA' to demonstrate the impact that the strategic packaging of fruit and vegetables can have on sales. The campaign involved mandarins being packaged in boxes which displayed illustrations of smiling fruit, and thereby creating an association of that character with the actual fruit contained inside.

"It's about creating an identity around a particular piece of produce, and then giving it

something that you can talk to the consumers with," he said. "It gave the mandarin an identity."

"In this case, consumption of mandarins in the US accelerated phenomenally, just purely based on the branding exercise they did with that product," he said.

Mr Macchiesi said that vegetables need to be branded and marketed strategically like any other product sold in a supermarket.

"What's the difference between a piece of fruit or vegetable that sits in the... green-grocer... and a product that sits on a retail shelf? For me, really, nothing," he said. "Being able to give it an identity might be just a different way of thinking about what you actually produce... It might be an industry approach, it might be a sector approach, or it might be something you take on individually... but [it's] definitely a trend that we've seen locally."

Mr Macchiesi demonstrated how innovative packaging has been cleverly applied to other products. He used the example of introducing new, sophisticated "doggy bags" to restaurants.

"This is basically a fibre tray, but the idea here is taking a doggy bag to a whole new level," he explained. "It's about having the chef put his signature on the product."

He also demonstrated medicine packaging that appeared to rot by having brown patches appear in the same way as an aging banana, as it approached its date of expiration.

"The idea here was... that you would not have to go and look at the dates, because I'm sure we've all got medicine cabinets full of different products [on which]... we go and look at the expiration date when we've got a headache," he said. "This is a ready, visual identification that translates."

Mr Macchiesi discussed some of the recent investments that Visy have been making, such as in the development of the Visy R Flute box, as well as the construction of a recycling plant, which has recently been completed.

"It was the first of its type in Australia," said Mr Macchiesi in his presentation. "It's a food-grade, FDA-approved

recycling plant for HDPE (high-density polyethylene) and PET (polyethylene terephthalate)... As a high-volume producer of PET and also HDPE, we found a way to be able to collect that product... and be able to incorporate [it] back into your packaging."

"I'm guessing that if you drank out of your regular soft drink bottle... that you may not have realised that there's 15 per cent also of recycled content in there today," he said. "We've been recycling fibre for a long period of time and turning that into boxes [and] this is something that we've now done in our plastics piece."

Visy is clearly proud of its achievements, and, according to its website, is "aiming for a future where everything that touches us can be recycled, and where waste is a thing of the past. And [they're] not stopping until [they] get there." As a key stakeholder in the Australian vegetable industry, Visy's vision is a positive indication of the exciting developments that are taking place across the sector.



To watch presentations from the 2013 Emerging Technologies Seminar, go to ausveg.com.au/events/Convention%202013/emergingtech.htm

Project Number: VG12050

“It's about creating an identity around a particular piece of produce, and then giving it something that you can talk to the consumers with.”

- Richard Macchiesi.



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Potato Extension Program



Future focus: Tasmanian growers talk emerging R&D

THE POTATO INDUSTRY EXTENSION PROGRAM CONTINUES TO ENGAGE IN NEW INITIATIVES THAT WILL HELP TO RAISE THE LEVEL OF AWARENESS OF R&D OUTCOMES WITHIN THE INDUSTRY AND ENSURE THAT MORE POTATO LEVY PAYERS ARE ABLE TO REALISE THEIR PRACTICAL BENEFITS. *POTATOES AUSTRALIA* OUTLINES SOME OF THE RECENT ACTIVITIES THE PROGRAM HAS BEEN INVOLVED IN.

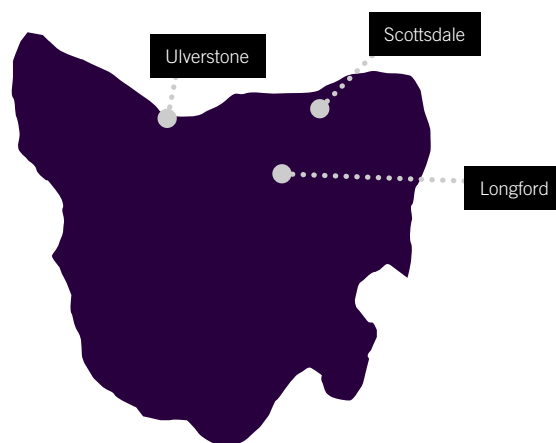
Simplot Potato Futures 2013 events – Tasmania

'Potato Futures' was the theme for a series of R&D workshops held across Tasmania last month, which featured insightful presentations on the latest research conducted on behalf of the Australian potato industry. Organised by Simplot, the events were held in Ulverstone, Longford and Scottsdale, and provided Tasmanian growers with a valuable opportunity to hear about some exciting developments happening within the sector.

Presenting on the theme, 'Extension in the big world', the Potato Industry Extension Program participated in the three events, to present on the role of R&D in the industry and to outline new initiatives that are being undertaken by the Program to effectively communicate R&D findings to potato levy payers. The presentation highlighted the

various ways in which key R&D information is being disseminated to growers, processors, agronomists and other industry stakeholders, including through digital platforms.

AUSVEG Special Projects Coordinator, Luke Raggatt, explained that potato levy payers now have free access to an extensive online database of industry-funded R&D projects, known as the Knowledge Management System (KMS), which can be found on the AUSVEG website (www.ausveg.com.au). Mr Raggatt informed attendees that users of the KMS can easily search for hundreds of reports on completed R&D projects, which cover a broad range of issues relevant to the sector, including irrigation; virus, pest and disease management; nutrient application; exports and more.



New technologies and potato production practices were also outlined by speakers at the Potato Futures events, with Simplot representatives discussing recent field trials conducted in various growing regions of Tasmania. Precision agriculture has been a key focus in many of Simplot's field trials, which have investigated the effectiveness of rapidly evolving technologies relating to water and fertiliser application. Attendees were shown aerial (thermal) images of several

potato crops, which revealed crop stresses that resulted from either too much, or too little, irrigation in specific areas of a field. It was said that the technologies presented could assist growers to identify and address specific problem areas within their fields in an effort to maximise their yields, as well as to "get an early start on controlling disease[s]". Other land, crop and harvest modelling technologies were also outlined in the presentations, including

continued over page ►

the Potato Calculator, which was developed several years ago to help growers predict the yields and profitability of their crops.

Tasmanian agronomists also participated in the Simplot Potato Futures 2013 events to discuss a new 'cloud-based' crop and farm management tool (called 'Agworld'), which aims to facilitate better record keeping and farm planning practices.

Grower visits – Tasmania

While in Tasmania for the Simplot Potato Futures events in September, the Potato Extension Program hit the road to speak one-on-one with potato growers in key growing areas about the challenges they face in their businesses. Central to the discussions were how implementing the findings of R&D projects and on-farm trials could help to increase productivity, as well as some of the issues associated with R&D adoption.

In Sassafras, in Tasmania's north-west, AUSVEG met with a number of growers who together run a successful operation supplying potatoes and carrots to the processing sector. The growers spoke about some

of the crop trials they have conducted on their property in recent years, in collaboration with their local agronomists. Of particular interest was the bio-fumigation trials they are currently conducting on a number of their paddocks. At harvest, the growers plan to compare the yield results from these trials, with that of their remaining crops grown under 'normal conditions'. The discussions with the growers based in Sassafras provided a valuable insight into the kinds of issues that growers may experience when conducting trials on their crops.

Heading east, the Potato Extension Program also visited several potato growers operating in Longford and Cressy (in Tasmania's Midlands), as well as Scottsdale, in the north-east corner of the state. During these farm visits, discussions focused on new technologies and farming practices that are being utilised by large-scale potato growers in the United States; business development and expansion strategies; precision agriculture tools; and the challenge of

high production costs for potato growers in Australia.

All of these farm visits proved an invaluable opportunity to discuss a range of emerging R&D issues with growers directly, and to gain a first-hand understanding of some of the unique challenges that growers are facing in their own operations.



L-R: Colin and Tom Lindsay, with AUSVEG Special Projects Coordinator, Luke Raggatt.

APRP2 Symposium

The Potato Extension Program took part in the Australian Potato Research Program Phase 2 (APRP2) Symposium, held over two days in Melbourne in September. The event brought together all of the researchers currently engaged in APRP2, as well as representatives from Horticulture Australia Limited (HAL), AUSVEG, the Potato Processors Association of Australia (PPAA), the Processed Potato Industry Advisory Committee (PPIAC), and the Potato Technical Advisory Committee (TAG). Growers, agronomists and a range of other industry stakeholders also participated in the Symposium.

During the 'science' component of the event, project leaders provided technical updates on their research to-date, and discussed what benefits their work is likely to deliver to the industry at its completion. The 'industry'

component of the event aimed to provide growers, processors and agronomists with practical information on how the findings from the research projects could be implemented on-farm.

The Potato Extension Program also delivered a presentation at the APRP2 Symposium, stressing the need for a strong level of engagement between the research community and potato levy payers, whom have invested considerable funds (via the National Potato Levies) into the R&D program. In his presentation, AUSVEG Special Projects Coordinator, Luke Raggatt, urged all members of the industry to play an active role in ensuring that R&D projects are utilised practically, and are providing clear benefits to growers and the broader industry.

For a full-wrap of the APRP2 Symposium, please refer to the article contained on page 16 of this issue of *Potatoes Australia*.

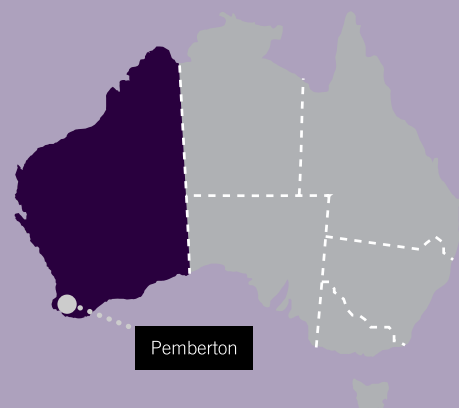
Potato R&D Workshop in Pemberton, Western Australia

The Potato Extension Program held an R&D workshop in Pemberton, Western Australia (WA), on 24 September 2013. The workshop featured a keynote presentation from international researcher, Professor Richard Falloon, from Plant and Food Research New Zealand. Prof. Falloon is widely considered a leading expert on Powdery scab and other soil-borne diseases of potatoes.

Chaired by Pemberton grower and President of the Potato Growers Association WA, Mr Dean Ryan, the workshop also included a presentation from Ms Brenda Coutts, from the Department of Agriculture and Food WA (DAFWA), who spoke

about new research findings on Potato virus Y (PVY); and Mr Matthew Wetherall, from Yara Australia, who discussed methods to address potato skin and tuber quality issues.

A full wrap-up of the Potato Extension Program's recent activities in Western Australia will feature in the next edition of *Potatoes Australia* (December 2013/January 2014).





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Genetically characterising the Powdery scab pathogen on a global scale

A RECENTLY COMPLETED INTERNATIONAL STUDY HAS INVESTIGATED THE EVOLUTION AND HISTORIC SPREAD OF THE POWDERY SCAB PATHOGEN, AND THE IMPLICATIONS FOR POTATO BREEDING AND PLANT QUARANTINE INITIATIVES, WRITES DR REBECCA GAU, DR UELI MERZ, PROFESSOR RICHARD FALLOON AND DR PATRICK BRUNNER.

Powdery scab is one of the most serious diseases of potatoes wherever intensive potato cropping is carried out. This disease is well-recognised for the harmful effects it causes to potato tuber quality, and because seed tuber lines with the disease are considered unacceptable for crop establishment.

Working in Switzerland at the Swiss Federal Institute

of Technology in Zurich, Dr Rebecca Gau examined genetic variation in the Powdery scab pathogen, and how the pathogen has dispersed around the world. The knowledge gained in the study will be valuable for the development and maintenance of international plant quarantine standards, and could assist strategies for managing Powdery scab, particularly

the development of disease-resistant potato cultivars.

Global study

This collaborative study - part of which connects with the Australian Potato Research Program Phase 2 (APRP2) - is the first to characterise the Powdery scab pathogen on a global scale. Collections of the pathogen were obtained from 19 countries, across all continents. Close to 700 samples (from tuber lesions or root galls) were analysed using molecular techniques. Collections from South America were variable (six 'strains' were differentiated), while collections from almost all other areas of the world were found to be genetically identical to each other. This indicates that the pathogen probably originated in the highlands of northern South America, where greatest diversity occurs, and the same

area where potatoes were first developed as food crops.

The Powdery scab pathogen is unlikely to move long distances by aerial spread. Wide dispersal has probably resulted from human activity transporting diseased potatoes or contaminated soil. Computer analysis procedures were used to test different scenarios of pathogen evolution and spread around the world. The pathogen was probably transported out of South America during the 1500s, when the conquistadors introduced potatoes to Europe. Only a very few original introductions from South America to Europe were likely, which accounts for the very low diversity in all countries other than in South America.

Further spread of the Powdery scab pathogen probably occurred when European colonialists took potatoes from Europe to other areas. More recently, the high export



The Swiss Federal Institute of Technology in Zurich.

volume of seed potatoes from Europe to developing countries has probably caused further dissemination of the pathogen.

Implications for potato breeding and plant quarantine

The low diversity of the pathogen in all areas except South America has important implications. Potato breeders working to develop Powdery scab resistant cultivars in areas outside of South America can do so knowing that the pathogen they are selecting



Potatoes with Powdery scab.

against is genetically very uniform. Cultivars selected for resistance to Powdery scab in one area are likely to be resistant in most other areas of the world.

Another important outcome of this research is that the spread of different strains of the Powdery scab pathogen from South America to other countries should be prevented. Plant quarantine regulations should be robust and rigidly applied; particularly to prevent the import of potentially infested soil or plant material from South America.

Finally, the study also found that South America is likely to be a good area to find potato varieties that are resistant to Powdery scab. Plant types from that area are likely to

have been exposed to different strains of the pathogen and may possess usefully broad resistant characteristics.

Dr Gau's project was supervised by Dr Ueli Merz, Dr Patrick Brunner and Prof. Richard Falloon, and was funded by the Swiss Federal Institute of Technology, Horticulture Australia Limited (HAL), the United Kingdom Potato Council, the New Zealand Ministry for Science and Innovation, Potatoes New Zealand (Horticulture New Zealand) and the Swiss Ministry for Agriculture.

Part of the work conducted by Dr Rebecca Gau discussed in this article is related to APRP2.

THE BOTTOM LINE

- A new study has investigated the genetic variations in the Powdery scab pathogen, and how the pathogen has dispersed around the world.
- The study found that the Powdery scab pathogen probably originated in the highlands of northern South America, where six 'strains' of the pathogen were located.
- This means potato breeders developing Powdery scab resistant cultivars in areas outside of South America can do so with the knowledge that the pathogen they are selecting against is genetically very uniform.
- Plant quarantine should be rigidly applied to prevent the import of potentially infested soil or plant material from South America.
- South America is likely to be a good area to find potato varieties that are resistant to Powdery scab.



Further information:
Project PT08032
Contact Dr Dolf de Boer
Email: dolf.deboer@dpi.vic.gov.au



World map showing sources of collections of the Powdery scab pathogen.



with Andrew Olley

Potassium fertiliser options

IMPACT FERTILISER'S NATIONAL AGRONOMY SERVICES MANAGER, ANDREW OLLEY, DISCUSSES POTASSIUM AND ITS RELATIONSHIP TO WATER REGULATION.

When constructing nutrient programs for potato crops after the Phosphorus and Nitrogen components have been calculated, the next critical nutrient is often Potassium.

Growers and advisors are well aware of Potassium's role in the filling of potato tuber. Potassium also serves in the key process of water regulation in the crop. Many nutrient programs focus on large potassium applications late in the crop, however, it is important a small consistent Potassium supply is available after planting and through early growth stages to allow uptake of water to ensure key nutrients such as Calcium, Boron and Nitrogen can be absorbed and translocated in the potato plant.

When applied in "slug" doses via fertigation or granular products, Potassium can often induce Magnesium deficiencies,

reducing the crops ability to convert sunlight into sugars for crop maturity. In soils where Magnesium supply may be marginal and when large Potassium levels are applied, it is beneficial to apply Magnesium to ensure induced deficiencies do not occur.

There are three common groups of Potassium fertilisers used in horticulture:

- Potassium Chloride (Muriate Potash - MOP)
- Potassium Sulphate (Sulphate Potash - SOP)
- Potassium Nitrate

All three of these groups, whether fertigated or granular-applied, supply Potassium in a water-soluble form, which than can be taken up by the crop. The choice of group to use is dependant on soil and irrigation chemical properties.

Where soil and/or irrigation water conductivity levels are high or contain chloride, Potassium Sulphate or Potassium Nitrate is the preferred group, as it does not add to existing conductivity and chloride levels. In situations where soil conductivity is low and irrigation water is of good quality, Potassium Chloride is often used as it is the cheapest form of Potassium available.

Depending on soil type, all three of the Potassium groups have the potential to

leach very readily below the crops root zone and hence can have low efficiency in uptake to the crop over time. Strategies to alleviate this problem include split applications at regular intervals to hold Potassium in the root zone.

New technologies in controlled release fertilisers, such as Agrocote®, negate the need for multiple split applications. The Agrocote® technology allows the release of Potassium over a period of up to four months. This controlled release allows a large portion of the total Potassium requirement to be applied at planting with a relatively consistent release throughout the crops growth. Not only is the Potassium released on a daily basis, but so too is the Chloride, thus issues with soil high conductivity levels, and chloride in irrigation water, are significantly reduced. A secondary benefit of Agrocote® technology is that the coating protects transplants and seed pieces from root burn that is common with conventional Potassium fertilisers.



Please send your soil nutrition questions to *Potatoes Australia*.
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Phone: (03) 9822 0388

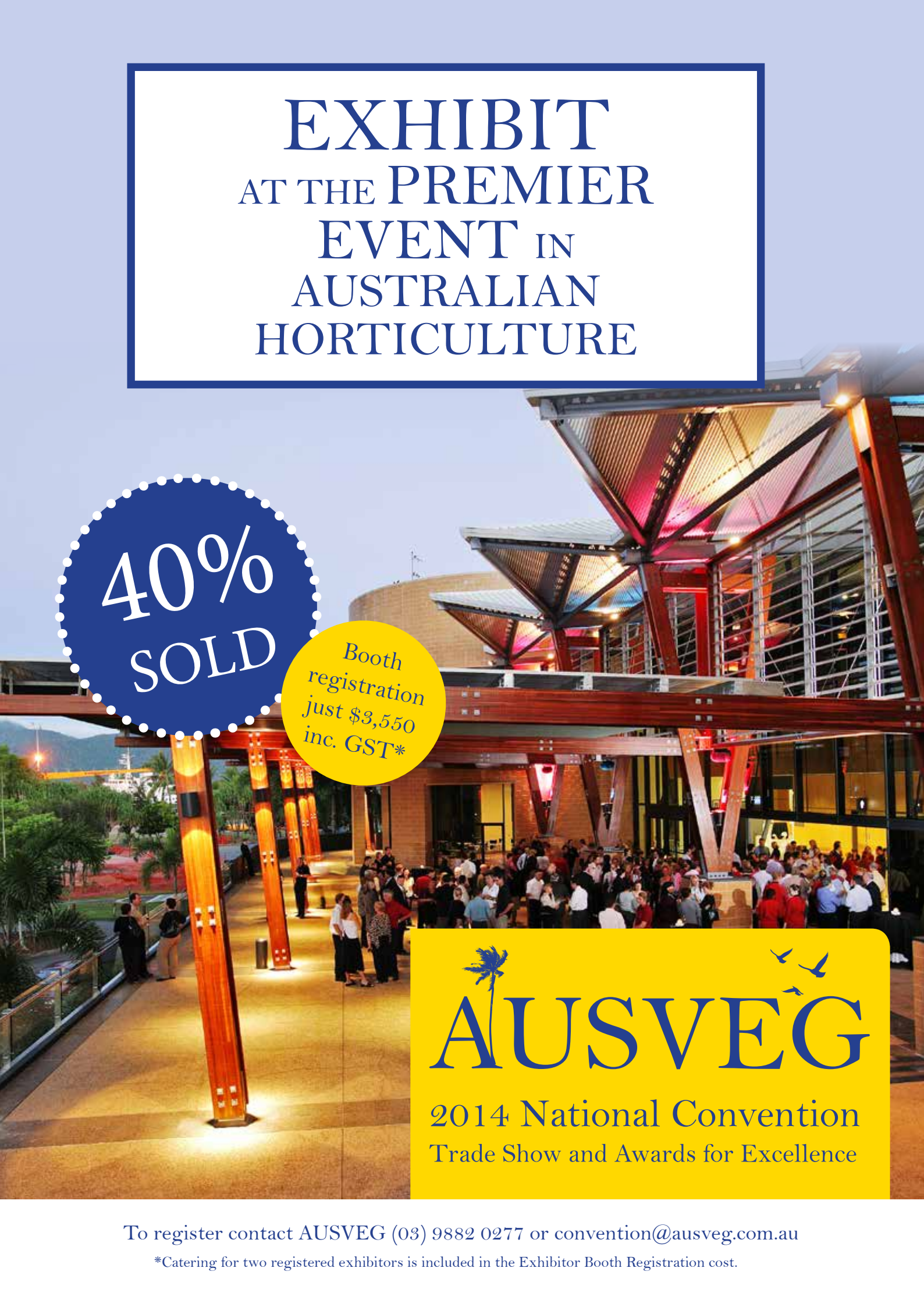


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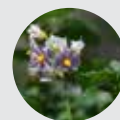
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Where: Cairns Convention Centre, QLD

What: The AUSVEG National Convention showcases speaker sessions, entertainment and an impressive trade show. The event will provide delegates with an opportunity to forge relationships with members of the industry, supply chain, researchers and growers.

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READER SURVEY

1. What sector of the industry do you represent?

- ☐ Grower (seed) ☐ Grower (fresh) ☐ Grower (processed)
☐ Processor ☐ Supply chain ☐ Researcher
☐ Government ☐ Industry official
☐ Other _____

2. Age group?

- ☐ 18-24 ☐ 25-34 ☐ 35-44
☐ 45-54 ☐ 55+

3. Which sections of *Potatoes Australia* are of most interest to you?

- ☐ News ☐ R&D Articles
☐ International R&D ☐ Young Grower Profiles
☐ Grower Profiles ☐ Feature articles
☐ Industry Columns ☐ Potato Extension
☐ New products/Advertisements

4. On a scale of 1-5, how useful do you find the R&D articles included in *Potatoes Australia*, with 1 being "Not useful at all" and 5 being "Extremely useful"?

- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. Does R&D content in the magazine influence the way you run your business?

- ☐ Yes ☐ No

6. How many people read your copy of *Potatoes Australia*?

7. Where do you get your information from?

- ☐ Industry publications ☐ Consultants
☐ Processing company ☐ Independent agronomists
☐ Resellers ☐ Government organisations
☐ Grower groups ☐ Other _____

8. What crops do you grow apart from potatoes, if any?

9. Do you have any comments/suggestions regarding the magazine?

10. Are you interested in receiving further information regarding the 2014 AUSVEG National Convention in Cairns from June 19-21 2014?

- ☐ Yes ☐ No

Thank you for your time

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