

potatoes

australia

April/May 2011

Dr Robert Clayton

UK Potato industry leader
outlines the challenges

APRP2 Update

Heading in the right direction

Garry Kadwell

Fighting for the spud

Soil secrets unravelled

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potatoes australia

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▶ FRONT COVER:

Dr Rob Clayton

Photo supplied by UK Potato Council



John Brent AUSVEG Chairman

On the eve of what is one of the industry's largest events, it is becoming clear that an enormous amount of hard work will bear some significant fruit.

The AUSVEG National Convention, Trade Show and Awards for Excellence is set to take place in Brisbane from 14-16 April at the Sebel-Citigate Hotel.

It is expected there will be 600-800 delegates attend over the course of the weekend that includes a Trade Show that has been sold out since early February.

When reflecting on the work put in to make this event a success, it is imperative to take some time to thank everyone who has made it possible.

Over the past year, AUSVEG has gained significant support from our leading

strategic partners: Elders, DuPont, Syngenta, and Bayer CropScience, as well as other strategic partners listed on our website and in our publications. Without their ongoing support and contributions, staging an event of this magnitude would be nigh on impossible.

The support has also helped us co-ordinate the inaugural Potato Summit that will bring together some of the brightest minds in the potato industry from both Australia and abroad.

The Summit will take place on Sunday 17 April and is being co-hosted by our trans-Tasman friends at Potatoes New Zealand, who have been instrumental in helping set up the event and promoting it in New Zealand.

It is our hope that a healthy, ongoing relationship with

Potatoes New Zealand will help our industry and theirs moving into the future.

Included in the program of speakers at the Potato Summit will be Chief Executive Officer of AUSVEG, Mr Richard Mulcahy; Chairman of Potatoes New Zealand, Tony Olsen; CEO of Potatoes South Africa, Mark du Plessis; Business Manager of Potatoes New Zealand, Ron Gall; and Director of the UK Potato Council, Dr Rob Clayton.

They will be joined by key researchers in the industry to discuss ongoing developments including such topics as soil health, soil diagnostics, seed diagnostics, Verticillium, and Tomato-potato psyllid.

These presentations will offer an insight into the industry that will no doubt be invaluable to all in attendance.

I would like to wish everyone who comes along to this year's Convention a very enjoyable weekend. This is a not-to-be-missed event.



John Brent
Chairman
AUSVEG

Richard Mulcahy AUSVEG Chief Executive Officer

Earlier last month, AUSVEG facilitated meetings around Australia looking for input from industry members on the draft of the PCN National Management Plan.

The meetings saw growers, government representatives, processors and various other members from New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia involved in the consultations led by Dr Doris Blaesing and Dr David Beardsell.

The meetings provided growers with a crucial avenue to have input and help contribute to the plan.

The main point of discussion for growers in these meetings was the effect that it would have on their livelihoods on the farm. With almost 200 people attending the ten meetings

over two weeks, the response from industry was a positive indication of the need for a plan such as this to be introduced.

The issues raised in each of the meetings have been taken on board and are now in a review process that will aim to ensure that comments and recommendations are taken into account in the final development of the plan.

While the report is still being finalised and a number of issues need to be addressed by the Commonwealth in settling the plan, our objective is to ensure a positive and sensible outcome for growers around the country.

The importance of implementing the plan for the potato industry is imperative to protect the industry's interests moving forward.

In order to keep the disease under control in Australia, and

ensure that the international export of potatoes is able to continue, a plan that clearly sets out the requirements of growers and clarifies how and when testing will take place is of the utmost importance.

I would like to take the time to thank Dr Blaesing and Dr Beardsell for their work in the ongoing consultation process. In order to ensure that national consultations like this are successful, a strong commitment is required of those leading them.

I would also like to thank growers and industry members alike for their input into these meetings. The time taken to attend and provide feedback on this important issue is crucial and will go a long way to shaping how the plan affects the potato industry.

For anyone looking for a copy

of the current draft plan, it is available at www.ausveg.com.au, or alternatively, feel free to contact AUSVEG on (03) 9822 0388 or info@ausveg.com.au.



Richard J Mulcahy
Chief Executive Officer
AUSVEG



Editorial

As this edition of *Potatoes Australia* goes to print we are on the eve of the biggest potato industry event this year.

The 2011 AUSVEG National Convention in Brisbane brings together potato growers from around the nation. As growers converge on the Sebel-Citigate Hotel from 14-16 April they will have the opportunity to speak with leaders in the supply chain, hear about the latest research and development—including specific presentations on plant nutrition—and network with

their fellow growers at a range of informative events.

It's not too late to register! On page 12 we provide further details and registrations are being accepted right up to and throughout the Convention.

You can even just turn up and register on the day.

The 2011 Potato Summit will be a highlight event of the Convention, taking place on Sunday, 17 April, and includes speakers on topics specific to potato growers. As a special offer to AUSVEG Convention

delegates, those who register for the 2011 Convention receive a 50 per cent discount off the price of a Potato Summit pass, bringing the price of admission down to just \$60.

The 2011 Summit is sponsored by McCain.

In this edition of *Potatoes Australia*, as well as previewing the 2011 AUSVEG Convention, we feature Dr Rob Clayton, Director of the UK Potato Council. The UK Potato Council has demonstrated a cutting-edge approach in putting

potatoes in the spotlight and they've launched a number of programs to capture the attention of consumers, which are profiled on page 14.

On page 28 we provide a three-page update on phase two of the Australia Potato Research Program, while our grower feature this edition is with Garry Kadwell from Crookwell in NSW (page 18). We hope you enjoy this edition of the magazine and look forward to seeing you in Brisbane on 14 April.

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Western Potatoes "Mashing Myths"

Often seen as a vegetable high on the GI scale, the potato has recently been put through its paces to determine just how true this is.

Grower funded organisation, Western Potatoes Pty Ltd (WPPL) released CSIRO results in a major campaign during February and March 2011 showing that the Nadine potato has a far lower GI (Glycemic Index) reading than expected.

Following on from the release of Coles' Carisma potato (GI of 55 when sliced and boiled), this new research and campaign shows that there are options for consumers to keep up their healthy diets and still enjoy the great taste and versatility of potatoes.

Served best in salad, the Nadine variety (white skin and flesh) showed a reading of 45, after it was cooked in a WPPL

microwaver, and then served cool after being stored in a refrigerator overnight. Further testing of boiling and baking cooking methods are now underway and results will be available in the coming months.

Following on from the release of these studies, WPPL developed a promotional campaign which ran for six weeks starting on 30 January 2011 in the Perth metro area.

The campaign integrated TV advertising (targeted to grocery buyers) with the Feel Good Food magazine (200,000 copies per season), online and in-store promotion with retail partner, IGA. The campaign has also been supported through relevant

ongoing media and all WPPL activities, such as expos, school visits and other community events that see the organisation reach over 600,000 consumers a year.

The campaign titled "Mashing Myths" focused on potatoes and highlighted their healthy attributes, particularly the great GI results achieved for the Nadine variety. There are two TV advertisements with health messages that attempt to put an end to the common myths about potatoes:

Advert 1. Highlights that potatoes can be low GI;

Advert 2. Highlights that potatoes have less carbs than rice or pasta and are not

fattening.

The advertisements direct consumers to metro IGA stores to purchase their potatoes and to find more information about the campaign. As such, Western Potatoes produced **Mashing Myths** point-of-sale materials that are available in-store (go to www.feelgoodfood.com.au for the information and recipes).

In-store demonstrations were also held throughout February at 10 IGA locations.



Floods affect Australian French fry manufacturers

A summer of flooding around the country will have a serious effect on the supply of potatoes for the French fry market, the Weekly Times reports.

Crops from Gippsland and Ballarat in Victoria, Penola in South Australia, northern Tasmania and the Riverina in New South Wales have all been affected by the increased rain over the summer, resulting in a reduced supply of potatoes for French fry production.

It is estimated that approximately 30 per cent of potatoes from these markets have been lost.

The flooding saw up to 77,000 tonnes of potatoes spoiled, adding up to an estimated \$19 million.

The losses were felt particularly in the Gippsland region with reports of crop losses of up to 80 per cent.



The Hon Tony Abbott MP confirmed as keynote speaker at AUSVEG National Convention

AUSVEG is pleased to announce that The Hon Tony Abbott MP will attend the 2011 AUSVEG National Convention as a keynote speaker.

Mr Abbott was elected Member for Warringah at a by-election in 1995 and became Leader of the Opposition on 1 December 2009.

Mr Abbott's attendance is a monumental opportunity for horticulture to emphasise its importance in agriculture and the contribution it makes to the Australian economy.

Mr Abbott will be speaking at the AUSVEG National Convention on Friday 15 April in Brisbane at the Sebel-Citigate Hotel.



PCN National Management Plan meetings take place

In the hope of managing Potato cyst nematode on a national scale, AUSVEG facilitated meetings around the country to obtain input from industry members on the draft plan.

The month of March saw around 200 of Australia's potato industry members gather for meetings around the country to discuss the proposed PCN National Management Plan.

The intention of the plan is to demonstrate that PCN is under control in Australia.

As one of the world's most deadly potato diseases, it is crucial that it cannot be allowed to spread as it has in the past.

The meetings were held in six states around Australia, including: Wagga Wagga and

Dorrigo, New South Wales; Bundaberg and Atherton, Queensland; Murray Bridge and Mt Gambier, South Australia; Bunbury, Western Australia; Warragul and Ballarat, Victoria and Deloraine, Tasmania.

According to meeting facilitators Dr Doris Blaesing and Dr David Beardsell, the overall response from the industry was a positive one, with constructive points on how to improve the plan.

"The plan was generally well received at meetings in

key potato regions around Australia, with a significant level of support from industry," Dr Beardsell said.

"The major issue raised at all meetings was that testing had to be done and how much it would cost."

"Another major issue was the question of how the plan would be implemented and whether it would be compulsory or an industry code of practice."

Dr Blaesing said that trade was another important issue raised by those in attendance.

"Industry was keen to understand how the plan would affect trade, both between states and with international markets," she said.

"(The plan) will prevent uncontrolled spread of the pest and associated economic losses to the industry."

"The plan will ensure that the occurrence of new strains of *G. rostochiensis* (golden cyst nematode) or *G. pallida* (pale cyst nematode) will be detected and controlled before having a chance to spread."



Dr Doris Blaesing and Dr David Beardsell address attendees at the Warragul meeting.



AUSVEG CEO Richard Mulcahy addresses the meeting.

i To access the draft plan, please visit www.ausveg.com.au or call (03) 9822 0388.

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Potato history highlights *Crookwell festival*



The annual Crookwell Potato Festival took place last month, with people from surrounding areas flocking to enjoy entertainment that included Spudlympics, music, and of course, lots of cooking potatoes.

Taking over from the previously named “Crookwell Country Festival”, the people of Crookwell drew on the area’s agricultural history to enjoy everything the tuber had to offer at the Crookwell Potato Festival.

The event saw hundreds of people weaving through the stalls and onto the main oval for the Spudlympics, as well as testing the many different types of potato-based foods on offer.

Upper Lachlan Shire Tourism Manager, and part-time emcee of the Spudlympics, Andrew Warren, was happy with the turnout.

Mr Warren said the festival gave people from out of town the opportunity to learn about Crookwell’s history in the industry.

“People are keen to know what we do here, and because we’ve had a lot of people

coming to the town that didn’t grow up with the potato industry, they don’t understand the history of potatoes in Crookwell,” Mr Warren said.

Potato growing in Crookwell dates back about 150 years, with potatoes initially grown to break-up the soil for other crops.

“They started doing it seriously at the turn of the last century and a lot of people jumped in

back in the 1950s.”

“At one point we had two thirds of the state’s growers (approximately 180) in Crookwell.”

With paddock tours running all throughout the day, visitors got a ‘hands on’ look at the process potatoes undergo from planting to harvesting, including the role that growers such as Garry Kadwell (featured on page 18) play in the industry.



The Fire Brigade Band get set to perform



Garry Kadwell and David Montgomery with Crookwell Potato Association award winners



People gather to watch the potato pie-eating contest.

Weeds research leader rewarded

The Weed Science Society of America (WSSA) awarded Professor Roger Cousens honorary membership for his research contribution in weeds.

Professor Roger Cousens of the Department of Resource Management and Geography at the University of Melbourne has been awarded honorary membership of the WSSA for his extensive work on weed solutions over nearly three decades.

Professor Cousens was presented the award at the 51st annual meeting of WSSA last month.

His research has uncovered important information on competition between weeds and

crops and population dynamics of weeds.

Weeds Advisory Committee Chair of the Rural Industries Research and Development Corporation (RIRDC), the Honourable John Kerin AM said that Professor Cousens’ research had played an important role in working through the damage caused by weeds on Australia’s food industries.

“Solutions to weeds in Australia require a long-term, integrated and multi-disciplinary

approach,” Mr Kerin said.

“Weeds cost Australia’s agricultural sector alone more than \$4 billion a year in management imposts and lost production, as well as doing immense damage to our environmental assets.”

Professor Cousens currently holds a position on the RIRDC Weeds Advisory Committee as well as working at the University of Melbourne and has spent 27 years researching the ecology and biology of weeds.



Potato Summit Program



Sunday 17 April

10:30am-10:35am	Open and Welcome - Terry Olsen - Chairman of Potatoes New Zealand
	Morning session to be chaired by Terry Olsen - Chairman of Potatoes New Zealand
10:35am-10:50am	Ron Gall - Business Manager of Potatoes New Zealand
10:50am-11:05am	Richard Mulcahy - AUSVEG CEO
11:05am-11:35am	Dr Robert Clayton - Director of UK Potato Council - <i>"Getting the message across - ups and downs of knowledge transfer in GB"</i>
11:35am-12:05am	Dr Ian Porter - Principal Research Scientist in Plant Pathology, DPI Victoria - (including Q&A)
12:05pm-12:35pm	Dr Kathy Ophel Keller - Chief Scientist, Sustainable Systems at SARDI - (Including Q&A)
12:35pm-1:35pm	Calum Wilson - Associate Professor in Plant Pathology, University of Tasmania - (Including Q&A)
1:35pm-1:50pm	Lunch
	Afternoon session to be chaired by John Rich - Fresh and Processed IAC Chair
1:50pm-2:25pm	Dr Kevin Clayton-Greene - Chairman of the Technical Advisory Group, Potato IACs - <i>"Potato Psyllid Update. An Australian Perspective"</i>
2:25pm-3:00pm	Mark Du Plessis - CEO of Potatoes South Africa
3:00pm-3:35pm	Monty Spencer - Research & Innovation Manager, A S Wilcox & Sons Ltd
3:35pm-3:50pm	Stuart Burgess - Industry Services Manager
3:50pm-4:00pm	Closing and thankyou - John Rich - Fresh and Processed IAC Chair

Special offer to AUSVEG Convention Delegates!

Your AUSVEG Convention registration will entitle you to **50% off the 2011 Potato Summit!**

Potato Summit normally AUD \$120 now being offered for **AUD \$60** to AUSVEG Convention Delegate Pass holders

Those with full AUSVEG Convention Delegate passes, will have access to the potato speaker sessions for just AUD \$60. For those wanting to only attend the potato speaker sessions, the cost to enter will be AUD \$120 for the day, including food and beverages.

Register today!

To register call AUSVEG on (03) 9822 0388

Passes to the Potato Speaker Program will also provide access to the AUSVEG National Convention Trade Show.

The background of the page is a photograph of a marina. Numerous sailboats with tall masts are docked in the water. In the background, several modern high-rise apartment buildings are visible under a blue sky with light clouds. The water is a deep blue, and the overall scene is bright and clear.

Potato Summit to exceed expectations

With an impressive line-up of local and international speakers, the inaugural Potato Summit is set to impress, writes Stephanie Bellasai.

“It’s very rare that you get renowned experts from all over the world speaking in the one room, all sharing the same passion.”

This year’s highly anticipated AUSVEG National Convention will be followed by the inaugural Potato Summit on Sunday 17 April, in Brisbane at the Sebel-Citigate Hotel.

The McCain-sponsored event is being co-hosted with Potatoes New Zealand and will see a host of leading researchers and industry members from around the world discuss key issues in the industry today.

The Summit will provide a great opportunity to hear about cutting-edge industry research from Australian and New Zealand scientists, as well as hear internationally-renowned experts talk about potato diseases and viruses.

The morning session of the Potato Summit will be chaired by Terry Olsen, Chairman of Potatoes New Zealand, and the afternoon session will be chaired by John Rich, Chair of the Fresh and Processed Potato IACs.

Mr Olsen farms potatoes and dairy with his two nephews at his farms in Opiki near Parlmerton North and Kahutuaara in South Wairarapa.

Mr Olsen was elected Chairman in 2005 and since then has helped establish the Chip Group that comprises the potato industry and health advocates to reduce the fat content in hot chips.

Business Manager of Potatoes New Zealand, Ron Gall, will be speaking on the morning of the Potato Summit.

Mr Gall has filled his position for the past 15 years and was instrumental in securing and organising the 2009 World Potato Congress, hosted in Christchurch. He also played a key role in the organisation’s

efforts to raise the profile of potatoes during the United Nations, International Year of the Potato.

AUSVEG Marketing Manager, William Churchill, said this year’s Potato Summit would play an integral role in the National Convention and is an event not to be missed.

“The amount of international reception and involvement the Potato Summit has received already reflects the importance of the event on a global scale,” he said.

“I encourage anyone involved in the Australian and New Zealand potato industries to attend—it’s very rare that you get renowned experts from all over the world speaking in the one room, all sharing the same passion.”

High on the day’s agenda, will be discussions about phase two of the Australian Potato Research Program (APRP2).

APRP2 is a set of projects that are taking place around the country, involving international collaboration.

The program consists of five separate projects that focus on different areas that include; Verticillium, soil diagnostics, soil health, seed diagnostics and psyllids.

Researchers leading projects in APRP2 program are Dr Kathy Ophel Keller and Dr Calum Wilson, both of whom are speaking at the Summit, presenting their findings and what they hope will result from the remainder of the program.

Dr Ophel Keller leads the soil diagnostics program in APRP2 and has been working on the development of DNA diagnostics for over 15 years.



Dr Kevin Clayton-Greene



Mark du Plessis

Dr Ophel Keller is also head of Sustainable Systems Research Division, South Australian Research Development Institute (SARDI), where she oversees research programs in plant health, entomology, climate change and water resources programs.

Associate Professor in Plant Pathology at the University of Tasmania, Dr Calum Wilson, is responsible for Plant Pathology units in Agricultural Science. Dr Wilson plays an important role in APRP2, with a lead role in the soil health study.

Director of the UK Potato Council, Dr Robert Clayton, will speak on potato marketing and knowledge transfer challenges in getting the right messages to British consumers.

Dr Clayton has been in the potato industry for 20 years and is trained as a plant pathologist working on blight resistance.

AUSVEG CEO, Richard Mulcahy, will also present, discussing a range of threats to the viability of the Australian potato industry.

Mr Mulcahy is former CEO of many major industry organisations and is a former Director with the Wrigley Company based in Chicago, USA.

Mr Mulcahy became the CEO of AUSVEG in 2009 and since then has continued to enhance the voice of over 9,000 vegetable and potato growers around Australia.

Tomato-potato psyllid (TPP) will be up for discussion throughout the day with Dr Kevin Clayton-Greene and Monty Spencer to give a summary of the virus that spreads Zebra Chip disease

among potatoes.

Dr Kevin-Clayton Greene is the Chair of the Technical Advisory Group set up to advise the Fresh and Potato Industry Advisory Committees (IACs) and is also the Operations Manager at Harvest Moon, a fresh vegetable company based in Tasmania.

In addition, Dr Clayton-Greene works with his colleagues in New Zealand and has worked extensively on preventing the incursion of Zebra Chip into Australia, as well as ways to deal with the disease if it is to hit our shores.

Mr Monty Spencer has been working for A S Wilcox and Sons Ltd for the past 12 years as an agronomist, potato crop manager and currently as a research and innovation manager.

Mr Spencer has had a diverse range of roles in the horticulture industry, including growing, consulting, business development and technical support in the kiwifruit, avocados, persimmons, potatoes, onions and carrots industries.

Over 650 delegates attended last year’s Convention, and this year’s event is set to be much larger and more refined in order to cater for all members of the industry.

Over 70 exhibitors and up to 800 delegates are expected to attend in 2011, which means the AUSVEG National Convention will again be the biggest industry event of the year.

i To register for this event or to find out more, please contact AUSVEG on 03 9822 0388 or email convention@ausveg.com.au.

UK potato industry leader outlines the challenges

When Dr Robert Clayton was appointed Director of the UK Potato Council, he was charged with growing the organisation's output. For Dr Clayton, this meant doing things differently, embracing changes and expanding horizons to give the potato industry the prominence it deserved. One year on, he speaks to *Potatoes Australia* about the continuing journey, writes Lisa Higginson.

“Right from being a teenager, I always wanted an outdoor life,” Dr Clayton recalled.

“I started off in my later school days working weekends and summers as a tractor driver for plant breeders and that's where I decided it had to be something agricultural.”

After making that decision, Dr Clayton never looked back. He went on to study an agricultural degree, followed by a PhD in Potato blight using resistant varieties and reduced fungicide rates-which was to be his first introduction to key industry players such as McCain and Syngenta.

During his 20 years in the industry, Dr Clayton has worked as a research scientist focusing on storage issues and has also completed a spell working on potato pathology at the Scottish Agricultural College.

He joined the UK Potato Council in 2000, and enthused that “every day has been different since.”

“Communications has been the interesting part rather than research,” he said.

“That's where I was very keen to move to, and that's still a big challenge for our industry.”

Formed in 1997, the Council has a membership of around 2,500 potato growers and 400 distributors/purchasers, with

33 potato specialists employed across three sites.

Dr Clayton explained that at one time, British farmers and growers were very well-supported by government advisory schemes, but most had been wound up more than 10 years ago.

“When I joined the UK Potato Council, the mentality was very much around reports based on academic calendars and summary reports that growers were left to interpret and just get on with,” he said.

“We decided that we needed to do things differently. We needed bigger campaign approaches to technical messages. It's all about return on investment; we've got to create behavioural change and it just wasn't happening.”

“Now, it's a concerted program that very much ties in with the R&D pipeline and it delivers those changes in packages, rather than as individual reports.”

As well as inheriting a strong team, Dr Clayton said he took on a very ambitious plan aimed at growing the Council's output when he embarked upon the role of director 12 months ago.

“A year in, and I think we've taken our targets on pretty well,” he said.

“The turnstiles for farm meetings are up, the marketing activity is up and we've got to a

stage now where we've got a lot of peer-reviewed literature on the nutritional value of the potato, that's going to be vital in some of our stakeholder engagement work.”

Raising the profile

The UK Potato Council has been forward-thinking in its approach to putting potatoes in the spotlight, launching a number of programs to capture the attention of consumers.

The organisation's National Chip Week, now in its 20th year, provides a boost to sales every time, while the more recent Potato Ambassador's Program-which Dr Clayton dubbed a “suit to boot exercise”-is already proving successful.

“We can say what we like, but we have all got suits on and it sounds so much better coming from the guys and girls in the boots,” he said.

“We have regionally recruited 10 farmers, who each share the vision that potatoes are exciting, they're nutritious, they're a big contributor to diet and they're fun. We've been through quite an intensive program with them, but we've got to a stage now where they are increasing our opportunity to be seen on TV and within the national press.”

“These guys are now doing a fantastic job; they are working with celebrity chefs and telling

continued over page ►





Profile Information

Profile: Dr Robert Clayton
Role: Director, UK Potato Council
Based: Stoneleigh, Warwickshire, UK

their story to camera. It brings a sense of realism to the messages we've got."

The Council is also targeting the next generation of consumers with the Grow Your Own Potato initiative, which has been rolled out to 15,000 primary schools across the UK, aimed at educating youngsters about the nutritional value of potatoes, where they come from and how they can be eaten.

"We will have more than half a million kids going through this program; that's a million parents we can deliver this message to as well," Dr Clayton said.

"It's all part of the combined strategy we've got around the nutritional value, which is why we went for the peer-reviewed stuff to sit alongside this. As well as the initiative with school kids, we can get some of the policy messages into government, and into the big central procurement programs, about the value potatoes have to the diet."

Sharing challenges

While they may be some 16,000 kilometres away, potato growers in the UK still face many of the same tough challenges as their Australian counterparts, with diseases and water usage being common concerns.

Dr Clayton explained: "We are threatened here in terms of plant health and we have recently gone through bacterial issues with Dickeya. That was

a big warning shot that the industry needed to look very carefully at plant health."

"More recently, we have had an issue with the Epirix flea beetle that is now present in Spain and Portugal and we have very recently been talking to the government about the proportion of control measures around this. We also know things like Zebra chip are set in mainland Europe and we've got to prepare for all these things."

Dr Clayton added: "We have other technical challenges around water. When we draw water for irrigation, it's usually peak demand times, so we have a lot of constraints around Europe and around water."

Potato Cyst Nematode (PCN) is also a major issue for the UK industry, with 63 per cent of potato land found to be infested with the disease in 2003. While it remains an endemic problem, Dr Clayton said the Council was dedicated to educating growers on how to manage the situation robustly and working with scientific bodies on this.

Changing times

Being part of Europe, Dr Clayton explained, meant a certain level of compliance with European regulations that affected both water and the way pesticides were going to be available in the future. However, he said it was also beneficial in increasing

knowledge when it came to R&D.

"We have to maximise knowledge potential across Europe and the world," he said.

"We push out to the research institutes that are looking for funding, so they have to come up with proposals that tie in to the research that's going on in the Netherlands, for example, on things like Dickeya. We've got similar programs with the French and we also do a lot of work with the Baltic states."

"The idea is to use the combined knowledge base to deliver things more rapidly into our great British levy payer base."

During the past 10 years, the UK Potato Council has seen the number of levy payers drop from 17,000 to 2,500, with more people moving into contract arrangements.

"As long as the contracts are reasonable, it takes a lot of volatility out of the market and that was a big historic problem for us," Dr Clayton said.

"We've gone through a period of volatility, but now by consolidating and having very dedicated, highly capitalised potato growers, we've lost a lot of that volatility."

Dr Clayton explained that the cost of production was below contract price in the processing sector, but not the fresh sector, where there were four or five different costing models that contracts were based upon.

Although the UK potato industry produces enough volume to serve the domestic market each year, it is not always available at the right time, so imports from North Africa are relied upon to fill the production gaps.

United front

Looking to the future, Dr Clayton cited working with other countries on issues of plant health and sustainable production and sharing best practice through initiatives like the International Potato Group meetings as paramount.

"There is evidence we are really starting to reap rewards on setting up these collaborations. For example, we already have a program with Australia and New Zealand that speeds up the research process. We are turning around field results very quickly, having those analysed and interpreted and getting them over to Australia, then having another field season. So it's halving the time over which research can take place."

"We've got a crop where there is still potential to improve; to improve yield, to improve uniformity and to improve the quality of product that consumers get."

"There is a lot to play for and I think we've got to start playing collectively as a team."

Dr Clayton will be speaking at the AUSVEG 2011 Potato Summit, which takes place on Sunday, 17 April at the Sebel-Citigate Hotel in Brisbane, as part of the AUSVEG National Convention, Trade Show and Awards for Excellence.





Workers for all seasons

Australian growers looking for reliable and enthusiastic workers need to look no further than the Pacific Seasonal Worker Pilot Scheme, which is giving workers from Pacific nations the opportunity to live and work in Australia while being involved in our food production industry, writes Cynthia Halloran.

You know you are part of the family when you are expected to help out with the household chores. So it was with Pacific seasonal workers who found themselves caught up in Australia's recent floods. In Mundubberra, in the pre-Christmas flooding, seven Tongan Pacific seasonal workers joined in the community effort to salvage their neighbours' household effects from rising floodwaters.

According to the Central and North Burnett Times, "When told that one family's fridge needed to be moved, one of the Tongan men just threw it on his shoulder and carried it down the stairs." Needless to say, the community was very grateful for their assistance.

In early January, following almost a month of flooding, Craig Pressler, Owner of 2PH Farms outside of Emerald, surveyed his farm and its prospects and concluded: "We were a shot duck."

"You know what a shot duck is? Not very good."

The orchards had been under water for some weeks, and as the flood receded, the trees were left full of grass and debris.

More grass and debris was left

at the base of the trees where the soggy mess threatened to cause root rot to the citrus trees. Mr Pressler estimated it would take ten minutes to clear each tree, so with close to 40,000 trees it was going to be a Herculean task and beyond the capacity of his regular staff of eighteen to manage. Nor was there help available locally. Neighbours had their own flooding problems and any

source enough local workers to meet 2PH's picking and pruning needs. Of course, Mr Pressler's shortage of labour was then compounded by the flooding that commenced in December 2010, and the massive clean-up that would follow. As it happened there had been a second flood and yet more clean-up by the time the workers arrived, so their presence was even more

or doubled over on their knees scraping grass and mud from under the trees. Because the rivers flow from east to west, most of the debris was on the western side of the trees, so the workers toiled in the relentless heat of the Queensland summer sun without the benefit of tree shade. Hot, hard yakka.

It took a month for the men to complete the clean up, but the farm is almost back to normal, with just a few pockets remaining which the regular staff are attending to. Mr Pressler is very happy with his Tongan workers, who he says worked very hard in trying conditions.

His orchard has been saved and production schedules have returned to normal. If he is unable to source sufficient local labour when that harvest is ready in May, he will look to recruit more Pacific seasonal workers.

“ Mr Pressler had a secret weapon—a small army of Tongan workers, courtesy of the Pacific Seasonal Worker Pilot Scheme heading his way. ”

available workers had already been recruited elsewhere.

But Mr Pressler had a secret weapon—a small army of Tongan workers, courtesy of the Pacific Seasonal Worker Pilot Scheme heading his way. Mr Pressler hadn't specifically recruited the workers for this purpose; in fact, he had sought approval to recruit the workers after he was consistently unable to

welcome.

In early January the most urgent task was to save the trees and get the annual farm cycle back on schedule. The Tongan workers were put to work removing the debris from the trees. It was hard, wet, muddy work. The workers were either scabbling high into the trees to retrieve the debris caught among the branches,

i For further information about the Pacific Seasonal Worker Scheme, contact the Department of Education, Employment & Workplace Relations (DEEWR).
Phone: (02) 6240 5234
Email: <seasonalworker@deewr.gov.au>
Website: <<http://www.deewr.gov.au/pswps>>

A photograph of a man with grey hair, wearing a blue short-sleeved button-down shirt, working in a lush green potato field. He is leaning forward, using a wooden-handled tool to tend to the plants. The background shows rolling green hills under a bright sky.

Fighting for the spud

The Kadwell name has long been synonymous with the humble spud. Standing tall in the face of unprecedented pressure on the industry, fourth generation seed potato farmer Garry Kadwell is well aware of the issues facing growers across the country. Armed with the latest technology, he is ready for a fight, writes David Hastie.

Mother Nature has long been a worthy adversary for farmers the world over.

The unpredictability of weather patterns has, and still to this day, continues to break the hearts of growers.

With summer's recent drenching rains wreaking havoc along the eastern seaboard of Australia, farmers such as Garry Kadwell know the importance of surrounding themselves with the latest technologies that deliver long-term, accurate forecasts.

Mr Kadwell's picturesque property of sweeping paddocks can be found at Crookwell, a historic country town nestled among expansive farmland on the Southern Tablelands of NSW where farmers have been in the potato game for more than 150 years.

His property of 750 acres sits 1,000 metres above sea level, providing the perfect cool climate needed for certified seed production.

But it wasn't immune from the

heavy rains.

In his words, the paddocks were hit by "several inches" in December, right in the heart of his planting period.

But thanks to his reliance on long-range forecasts courtesy of the internet, he chanced his arm and held off planting.

In doing so he also dodged the possibility of his crop contracting diseases like *Ralstonia*.

More to the point, he would have lost at least 20 per cent of his crop and risked a crossover



Grower Information

Producer: Garry Kadwell
Region: Crookwell, NSW
Growing: Various local and international varieties including Dutch Maranca
Other activities: Vice President, Crookwell Potato Association

of the different varieties of potatoes planted.

"We had been watching the weather closely. The ground was still very cold at that stage, so I thought we would hold off for a bit and see what happens," Mr Kadwell said.

"We were well-warned that it was coming so we didn't plant. We held off and thankfully it was a good decision."

"Anyone who planted early had a lot of potatoes washed. Their paddocks became a real mess."

"It was 18 December when we finally got started planting. We would have liked to have had two thirds of them in by then."

The extra effort involved with having to rework the paddocks and replace topsoil after the rain was well worth it, according to Mr Kadwell.

With 81 acres of certified seed potato now in the ground, he is predicting a bumper season.

"Once we did plant, the conditions were ideal," he said.

"We got a very soft start and the plants weren't that much further behind than normal."

"I'd never seen rain like that at that time of year before."

"But in the last five years with the access to the internet and all the forecasts available to us, it's one of the most valuable tools a farmer like myself can have."

"You see the guys in the paddock now with their iPhone looking up the weather there and then. It's amazing technology."

Mr Kadwell, the Vice-President of the Crookwell Potato Association, is a champion

of his region and a life-long ambassador of the potato.

The spritely 63-year-old has had more than 50 years experience on the land, and as a fourth-generation grower, he hopes his two sons will follow in his footsteps.

His great grandfather originally came to Crookwell in 1901.

Starting with a market garden, he branched out and ran a successful orchid.

But it was Mr Kadwell's grandfather who began planting potatoes and his father, Albert, took the next step and moved into seed production.

His oldest son Daniel, 17, recently finished school and has started an apprenticeship with the local council as a plant mechanic before it is anticipated he will begin work on the farm.

His youngest son, 15-year-old Jarrod, is still at school but according to Mr Kadwell, he hasn't yet shown a willingness to continue on the family business.

Time will tell if a fifth generation of Kadwell will take the reigns at Crookwell.

One thing that is certain is the popularity and the wealth of history the potato brings to the town.

Earlier this year Crookwell held its inaugural Potato Festival with more than 4,000 turning out to take part in the festivities.

But despite the potato's assumed hero status in the region, Mr Kadwell is concerned for its future.

When the potato industry began to flourish in the area in the early 19th century, Mr

Kadwell said everyone seemed to have a patch of spuds.

With hundreds of growers thought to be in the region back then, the contrast today is a sobering one.

"25 years ago when we formed the Crookwell Potato Association, we had 26 grower members," Mr Kadwell said.

"Now we have five. It's sad, really."

It's a story that unfortunately reflects the growing trend that has seen growers leaving the land for a myriad of reasons.

Mr Kadwell has his own theories on the issue, as do most veteran Aussie growers.

He said if the grower shortage isn't addressed soon, the future looks grim.

"It's no secret, it's hard work out here," he said.

"Young people are driven away because there are a lot of other opportunities out there for them, whether it's in the mines or in the city. They are chasing the dollar elsewhere."

"The financial returns just haven't been there for them on the farms."

"And in some cases when the growers retire in their 70s and 80s, they haven't had any family to continue it on."

Like in the case of the trade shortages around Australia, Mr Kadwell called on the State and Federal Governments to support aspiring growers, to help give them a kick start into the industry.

While most industries frown on the creation of competition, Mr Kadwell said it was crucial for the potato's survival in Australia.

"Farming is a lifetime apprenticeship," he reflected.

"But for many young people wanting to buy land and start from scratch, it's unrealistic."

"On a government level, they need to give out low-interest loans for long periods."

"Coming into a farming operation now, the capital outlay is enormous. It would be beyond anyone who wants to come in cold. They would never pay their way until they were on their feet."

In an attempt to inject excitement and enthusiasm back into the potato, Mr Kadwell is currently trialling 10 Dutch varieties alongside his four main varieties of potatoes.

Armed with an array of yellow-fleshed spuds including his favourite crop of Dutch Maranca, which will be headed for the South Australian market, the veteran farmer was coy when quizzed about the identities of his trial crop.

While reluctant to reveal details, Mr Kadwell said he anticipated some of the lines of yellow-fleshed potatoes would be warmly embraced by Australian consumers.

He said new lines could hit the shelves as soon as 2012.

"Yield-wise they are superior and they have superior eating qualities," he said.

"I can't say too much more at this stage, though. But a few are showing a lot of promise."

"I'm sure we will see commercial trials in the next year or two."

Watch this space.



Study reveals key to profitability

A recent study commissioned by McCain Foods has found that, although increasing scale can be critical to achieving cost reductions, a focus on optimising equipment utilisation can go a long way to developing a successful small business potato operation, writes Andrew Mahony.

A comprehensive global benchmarking study undertaken by McKINNA et al for McCain Foods Australia has found that adaptability and a focus on optimising equipment utilisation are key factors in maintaining a successful small scale potato operation.

With environmental conditions being vastly different in all of the growing areas around Australia, the study found that there is no single approach to cost reduction which works for all farms here. While processing potato farms in New Zealand, USA and Canada can reduce their costs by increasing scale and employing highly efficient equipment, growing conditions in Australia do not always allow for the same economies of scale to be achieved (for example small, fenced paddocks, undulating terrain).

The study revealed that input and operational costs differed greatly from region to region around the world, and that Australian costs were generally higher on most measures. Overall, the cost of processing potato production in Australia was higher than New Zealand, USA and Canada, where large scale farms operate, as well as the Netherlands and Belgium where small scale farms prevail.

There are a number of factors underpinning these cost differences including economies of scale, growing conditions and input costs. However, the issue of scale needs to be put into some perspective.

According to Catherine Wall of McKINNA et al, the study showed that there is no such thing as an optimum farm size in Australia to ensure profitability. Rather, there is a need for growers to balance a number of variables, taking into account the growing conditions, terrain and soil types.

"I think the optimum farm size really comes back to the acreage you need to maximise

local conditions."

"For example, smaller equipment is necessary in Tasmania and Victoria where the land is hilly and soil can be boggy. If your equipment is not being fully utilised, then it makes sense to look at a business model where you share equipment with neighbours or use contract harvesting and planting. This will require a new way of

the cost of capital invested in equipment. The size of the farming operation in Australia is neither 'too large' nor 'too small' but dependant on how well equipment is utilised.

"Scale certainly does have an impact on cost reduction, but it is not always achievable in Australia."

"The cost of harvesting and planting potatoes is expensive, compared to most alternative mixed farming enterprises; therefore, profitability comes down to getting the best possible return on equipment investment. If you want to buy another planter/harvester set, then you really need to double the size of your potato operations to make that investment cost effective."

The consultants believe that Australia's smaller scale potato farmers need to be more open to new business models.

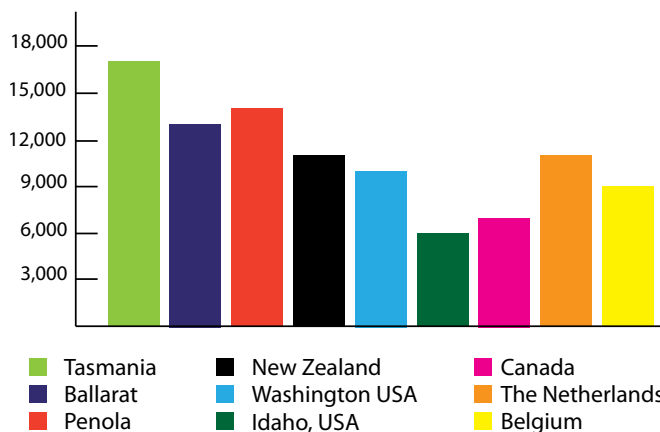
"If they cannot invest in large scale farms, they must adapt their operations to suit a smaller scale business model—this means careful analysis of the return on capital invested," Ms Wall said.

"The world of farming is changing and it's become a lot more complicated to run a mixed farming enterprise."

"Not only do you have to have good growing skills, you also need to have good business skills and know how to manage water trading, comply with regulation on taxation, food safety and OH&S, keep up to date with the latest agronomic developments and manage labour."

"Farming today requires a far broader skill set."

The study found that at a 99c exchange rate, the cost per tonne (in \$AUD) to produce raw processing potatoes in each area is approximately:



your return on the capital," Ms Wall said.

"If you have one set of harvesting and planting equipment, your optimum size is the size where you can work that equipment as long as possible across the season to leverage that investment. This 'optimum' acreage may be quite different in all of the growing areas in Australia, according to

thinking for a lot of Australian growers who have traditionally owned all their own equipment."

"Smaller European growers have developed some very successful business models with shared equipment where the harvest is pooled across a number of families."

Effectively, the study suggests that if scale cannot be achieved, then the focus needs to be on managing every cost, including



Ask the industry

with Scott Mathew

Due to some unusual growing conditions this cropping season, there have been many people inquiring about the best way to manage potato desiccation. Scott Mathew answers your questions in this edition of Ask the industry.

Question: With all the summer rain we have had, our potato crop canopies are quite large and there are a lot of weeds throughout the crop as well. What is the best way to approach desiccation with REGLONE this season?

For the best results with REGLONE, an even and complete coverage and good penetration of the spray into the target foliage is necessary, when the potato canopy is quite dense and there are large numbers of weeds present this can sometimes be quite difficult to achieve. One way to improve the desiccation result with REGLONE is to split the application of REGLONE. The first application is to commence crop desiccation and open up the canopy to give better access to the plant stem bases for the main desiccation application.

Question: If splitting the REGLONE application, how long should I wait until I apply the second dose?

Depending on the environmental conditions after the initial application, apply the second dose after the canopy has opened up (within 5-7 days). Five days if the weather conditions are quite warm and light intensity is high. Seven days if weather conditions become quite overcast and cool.

Question: What is the recommended procedure of applying split applications?

The initial application should be made using 1-2L/ha of REGLONE (always add AGRAL at 200ml/100L of water). Follow up in 5-7 days with a further 2-3L/ha of REGLONE. You can use up to, but do not exceed, 4L/ha of REGLONE per crop

Question: Why do I have to use REGLONE? Can I use Paraquat + Diquat based products (SPRAY.SEED, Revolver, Spraykill, Spray-out 250, Eos)

No. Paraquat based products are not registered in Australia for this purpose. The SPRAY.SEED label carries a specific warning: "DO NOT use SPRAY.SEED 250 for potato haulm desiccation."

The only chemical registered for this purpose in Australia is diquat 200g/L (e.g. REGLONE®). The off-label use of crop protection products is against the law (in the absence of an approved APVMA Permit). In addition, off-label uses, particularly in the late stages of crop development and around harvest, can pose a real risk of resulting in residues in the harvested potato crop.

Question: I have heard of growers having issues with REGLONE causing stem end rot. Is this possible?

Very rapid vine desiccation can, on occasion, cause a discoloration or browning of the tuber vascular ring, regardless of the method used. It is a myth that this problem is specifically related to use of REGLONE. Stem End Browning (SEB) can be a feature of ANY rapid crop destruction in dry conditions when temperatures are high. SEB has a greater risk of developing in immature crops that have a higher water demand, situations where there is a high soil moisture deficit and when application is made during high temperatures when tuber dehydration is likely to be at the highest point.

Ask the industry

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*:

andrew.mahony@ausveg.com.au

Please note that your questions may be published.



Scott Mathew, Technical Services Lead from Syngenta

Soil secrets unravelled

Cutting-edge medical technology has successfully been applied to Canada's soils, enabling scientists to bio-prospect for micro-organisms that can suppress diseases and enhance potato growth, writes Gretel Sneath.

The use of gene technology is long established in the medical field, but it is fast becoming a powerful new tool in crop science.

A pioneering study recently completed in Canada has enabled scientists to pinpoint useful bacteria in the soils and roots of potato crops using chaperonin gene technology normally reserved for humans.

The bacteria identified not only have the potential to enhance disease suppression, but also promote plant growth, with tests uncovering certain organisms that consistently appear in soils devoid of particular diseases.

The findings are expected to enhance the future development of biocontrol agents and biofertilisers, and

provide growers with low cost, non-chemical soil-borne disease management strategies.

The project's co-ordinator is Agriculture and Agri-Food Canada's Dr George Lazarovits.

He says it's the first time that anyone has investigated soil ecosystems using this complex technique developed by research collaborator Dr Sean Hemmingsen at the Plant Biotechnology Institute in Saskatoon.

"We are trying to understand what constitutes a healthy soil ecosystem for a specific crop such as potatoes," Dr Lazarovits said.

"Many growers know that they have sites in their field where they get excellent yields and sites where they do not. We do not know the reasons for this

but if we did, we could find a technology to repair the poor sites."

Plant microbial interactions can be both detrimental and beneficial to plant growth. Until recently, most research focused on the negative impacts, with scientists paying little attention to investigating the beneficial ones.

"The beneficial ones, however, may greatly assist growers as these include things like nitrogen fixation, phosphorous release, production of plant growth stimulating hormones, biological control and many others. If we can harness the micro-organisms we can reduce growers' costs and also greatly improve the environment," he said.

Dr Lazarovits likens this latest

project to "studying the forest rather than individual trees."

"Many people have studied the impact of single micro-organisms on plant growth; we are trying to understand how the community works," he said.

Soil samples were taken from two different potato cultivars (Shepody and Yukon Gold) growing on Prince Edward Island and Ontario, Canada.

Chaperonin gene (cpn60) technology helped to characterise the consortia of soil microbes present within the samples, and determine where best to look for micro-organisms of importance to plants.

The level of variation in the soil microbial profiles was investigated at the bulk soil, root and tuber level using DNA sequencing technology.



"The results confirmed that the *cpn60* technology can generate a 'fingerprint' of the soil micro-organism community that may be used to characterise soils in the future, leading to identification of signature microbial groups involved in disease suppression and evaluation of the impact of agricultural practices on the soil," Dr Lazarovits said.

"The advantage of this is that it would allow scientists to grow these micro-organisms in cultures and then apply them to soils to help prevent diseases in potato crops."

This particular study revealed that microbes directly associated with roots, which also encompass the endophytic community in the roots, harbour unique concentrations of potentially useful bacteria for enhancing disease suppression and promoting plant growth.

The organisms on the roots were significantly different than those in bulk soil, but they were similar to each other even when grown in two different soils.

The soil from Prince Edward Island yielded greater numbers of useful isolates than the Ontario soil, and Yukon Gold provided many more antibiotic-

producing isolates than Shepody.

The promising isolates were further screened for inhibitory activity against known potato pathogens or growth promotion effects on potatoes.

10 of the 81 antibiotic producers were active against all six pathogens tested, and 30 inhibited at least one of

“ If we can harness the micro-organisms we can reduce growers' costs and also greatly improve the environment. ”

the pathogens. Molecular identification showed that 18 of the antagonists were closely related to known bacteria with antagonistic activity towards plant pathogens.

10 promising nitrogen-fixing isolates were identified as species of the nitrogen-fixing genera *Bradyrhizobium*, *Azospirillum* and *Xanthobacter*,

four of which promoted the growth and yield of potatoes in glasshouse pot trials.

Dr Lazarovits has worked extensively with Australian researchers as part of the Australian Potato Research Program (APRP2).

Dr Jacky Edwards, who is the Research Leader-Plant Pathology at the Victorian

Department of Primary Industries, said the opportunity to access such a blend of cutting-edge research with an applied outcome in mind is very exciting.

Department of Primary Industries, said the opportunity to access such a blend of cutting-edge research with an applied outcome in mind is very exciting. "Dr Lazarovits has a long history of tailoring his research to help potato producers. The microbes that he has discovered could have tremendous potential as useful products in the future, and in the short-term, it helps to inform our current research," she said. The future challenge will be to determine methods of introducing or stimulating microbial communities to achieve disease suppression and growth promotion in the field.

Dr Lazarovits believes that in addition to discovering what 'works', the project also highlighted the shortcomings of the technique. "Having the ability to unravel what organisms live in a soil is an extremely positive result, however, we still do not know what they do," he said.

"That will be a big job but the very good news is that the DNA technology to achieve this continues to decline in price and will likely reach a point in the very near future where it can be done on a routine basis."

THE BOTTOM LINE

- Medical gene technology has been applied to soil ecosystems for the first time.
- Scientists have successfully identified useful micro-organisms in soils growing potato crops.
- The bacteria identified have the potential to enhance disease suppression and promote plant growth.

For more information contact:
 Dr Jacky Edwards
 Research Leader – Plant Pathology
 Department of Primary Industries
 Phone: (03) 9210 9222
 Email: jacky.edwards@dpi.vic.gov.au
 Project number: PT07038



Screening for growth promotion in natural and pasteurised soils using minitubers. Images courtesy of DPI Vic.



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Pre-planting survey major nematode problem in

The South Australian component of an Australia-wide study has uncovered a

A new national project headed by Dr Frank Hay at the University of Tasmania is enabling surveys of vegetables including potatoes to be conducted in several states around Australia.

The focus of this component of the project is pre-planting samples from South Australia, particularly for processing potatoes from the south east region.

Root-knot nematode was detected in 67 per cent of potato fields sampled, indicating a major problem with this highly damaging nematode.

As one aim of the project was to validate DNA-based tests for root-knot species, the samples were independently tested manually and by DNA in a 'blind' trial. These tests showed a very similar result.

The DNA tests detected two species adapted to cooler temperatures, *M. hapla* and *M. fallax*.

Of these two species, *M. hapla* was slightly more commonly found, but both could be found in the one field.

The presence of 'warm-adapted' root-knot species (including *Meloidogyne javanica*, a species common in more northerly areas of the state, and *M. incognita* and *M. arenaria*) was not detected in the tests.

As global warming proceeds, it can be predicted that conditions will become more favourable for spread of 'warm-adapted' species in this region and climatically similar regions in southern Australia.

It is possible that these species may be even more damaging than *M. hapla*.

Pre-planting Root-knot nematodes above damage threshold

Pre-planting populations of root-knot nematode were above the damage threshold

“Root-knot nematode was detected in 67 per cent of potato fields sampled, indicating a major problem with this highly damaging nematode.”

(developed for *M. hapla* on potatoes in the US) in 39 per cent of infected fields, and the highest population found consisted of 1,061 juveniles per 100g of soil. This was at a level reported in the US with the ability to reduce marketable yield by a staggering 40 per cent or more.

This nematode not only reduces plant growth but causes unsightly blemishes or galls on tubers.

Damage thresholds for the less studied *M. fallax* are not known, but it is possible that they could be lower, meaning an even higher proportion of infected fields would suffer economic loss.

Stubby-root nematode

Root-knot nematode was not the only nematode detected that is likely to cause economic damage to potatoes in this region (Table 1).

Stubby-root nematodes were commonly found, and at population levels that would be expected to cause damage to



Dr Greg Walker inspects potato plants in the shadehouse

reveals south east South Australia

prevalence of Root knot nematode in parts of that state, writes Greg Walker.

both potatoes and to susceptible pasture species.

Some Stubby-root nematode species are known overseas to transmit viruses such as Tobacco rattle virus, the cause of Corky ringspot disease.

Lesion nematodes were found in almost all fields, often at high population levels. Their damage potential will depend on what species are actually present and whether they are primarily associated with potatoes or with pasture species.

However, some lesion nematode species are definitely damaging to potatoes, and some interact with the *Verticillium* wilt fungus to cause early dying.

Unknown damage

Some other nematodes found are strongly suspected to be causing damage, but there is very little known about their effects on potatoes or pastures in Australia.

Dagger nematodes are not only damaging in their own right, but some can transmit certain viruses (such as Tobacco ringspot virus in some countries) to cause plant diseases.

Very little is known about the Sting nematode that was found, but a related nematode in the United States causes economic damage to potatoes at very low levels of one to two nematodes per 100g of soil.

This could mean that the actual levels (up to 55 per 100g of soil) found in south eastern fields are highly damaging to potatoes.

Sheath nematode is also known to be damaging to some vegetable crops overseas.

Ring nematode and Spiral nematode are potentially damaging but were rarely found.

Others found

Some nematodes were very common but their effects are

restricted to pasture species, such as Clover cyst nematode.

Pin nematode was very common and could be primarily associated with some pasture species, but the high levels found in some fields could be damaging to potatoes.

Stunt nematode may also be associated more with pasture species.

The cropping systems in this region are quite complex, and many important nematodes including root-knot nematode will be able to multiply on potatoes, some pasture species and lucerne.

Testing highly recommended

Plant parasitic nematodes such as Root-knot nematode can greatly reduce marketable yields, and it is recommended that fields be regularly monitored for these pests by taking soil samples for testing.

One of the most important

times that this can be done is before planting because this is the last chance growers get to decide on management options, including costly chemical treatments such as nematicides or soil fumigation.

Research internationally has aimed to improve yield predictions based on pre-planting nematode counts, but information under local Australian conditions for vegetables is very limited.

This study is funded by Horticulture Australia Limited using funds from the potato and vegetable levies with matched funds from the Australian Government.

Thanks to Rob Harding who collected soil samples from south east potato fields and SARDI Root Disease Testing Service who conducted the DNA tests.

Table 1. Results of pre-planting soil survey of 54 potato fields in the south east region of South Australia, 2010.

Nematode	% of S.E. potato fields infected	Highest population detected/100g soil (manual test)	Damage potential by rotation phase*	
			Potato	Pasture
Root-knot nematode	67	1,061	H	H
Lesion nematode	97	3,851	H	H
Stubby-root nematode	65	607	H	H
Sting nematode	12	55	M-H	M-H
Sheath nematode	12	24	M	M
Dagger nematode	8	24	M	M
Ring nematode	4	346	L	L-M
Spiral nematode	2	12	L-M	L-M
Clover cyst nematode	76	1,452	-	H
Pin nematode	67	2,868	L-M	M
Stunt nematode	11	110	L	L

*H=high; M=moderate; L=low; estimate based on potential susceptibility of crop and unadjusted population counts by manual test. For many of these nematodes, actual damage thresholds have not yet been determined.

THE BOTTOM LINE

- Plant parasitic nematodes are most likely having a major impact on the cropping systems in this region.
- The importance of developing improved methods of management to reduce losses caused by the nematodes is stressed.
- Monitoring by regularly testing soil samples is recommended: advice on testing can be sought from your local department of primary industries.

i For more information contact Greg Walker, SARDI Plant Research Centre, GPO BOX 397 Adelaide SA 5001
Email: <greg.walker3@sa.gov.au>
Project number: MT09067

Virus speed detection improvements

Free trade agreements have put Australia's potato seed exporters under increasing pressure to carry out more rigid testing of their certified product. With expectations that the trend will filter down to domestic markets, the push to improve virus diagnostics is well and truly underway, writes Gretel Sneath.

Victoria produces 34,000 tonnes of seed potatoes annually, which equates to just over 50 per cent of Australia's seed production.

While surveys conducted by seed scheme inspectors have indicated low levels of *Potato leaf roll virus* (PLRV), *Potato virus Y* (PVY), *Tomato spotted wilt virus* (TSWV) and *Potato virus S* (PVS), these pathogens still managed to wipe out an estimated \$2 million worth of

Victorian seed crops in 2006/07.

The detection of viruses is an integral part of certified seed programs worldwide, and virus incidence in seed potatoes is currently primarily based on visual inspections made by seed scheme inspectors.

Latent or symptomless field infections are almost impossible to detect by even the most experienced inspector.

The global adoption of a post-harvest grow-on enzyme-linked

“The possibility to use a single multiplex RT-PCR assay that can detect PVY strain type and detect mixed infections should also be investigated”

immunosorbent assay (ELISA) test gives a reliable measure of the virus presence in potato seed tubers, but the six to eight week wait for results can cause seed producers in Australia to miss markets for their stocks.

A three-year project currently being undertaken by the Department of Primary Industries Victoria, jointly funded by VICSPA and HAL, is aiming to reduce this turnaround time by developing a new form of reliable diagnostic



Potato crop planted with certified tubers – no PVY symptoms.



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testing.

Project Co-ordinator, Dr Brendan Rodoni, said it aims to improve the effectiveness of the current 300-leaf test, determine the strains of PVS associated with selected certified seed potato crops in south east Australia, and investigate direct tuber testing for viruses.

"There is anecdotal evidence that climatic conditions can reduce levels of some potato viruses in a potato plant to below the levels of detection when using ELISA, (and) the implications for potato seed certification are significant," he said.

"Our goal is to develop a diagnostic method to enable the reliable detection of potato viruses directly from tubers."

"It is critical that we determine the best tuber sampling and RNA extraction techniques and maximise the chances of detecting viruses in tubers."

As part of the project, potato plants infected with PVY, PLRV, PVS and TSWV in ware crops were identified, tagged and tested using ELISA.

Although a range of symptoms were observed on the various varieties, the viruses were not always detected when plants

with the symptoms were sampled and tested using ELISA during the growing season.

"Results obtained during the first year of the study (2008) found that fluctuations in PVY in field grown potato plants occur during the growing season.

These findings highlighted the difficulties in detecting these viruses in field-grown potato

a single infected tuber within a bulk of 20, 50 or 100 potato tubers and a resulting probability of the level of virus in the crop is currently being investigated.

"The different PVY strains or their recombinants may vary in the degree of disease severity that they cause as well as in their distribution within a tuber."

“ Our goal is to develop a diagnostic method to enable the reliable detection of potato viruses directly from tubers. ”

leaves by ELISA, particularly after certain weather events," Dr Rodoni said.

More recent field testing results have shown that PVY is currently a significant virus problem in potato production.

"To overcome this problem, seed stocks should be tested for the presence of virus before they are planted in the following season," Dr Rodoni said.

The probability of detecting

"The possibility to use a single multiplex RT-PCR assay that can detect PVY strain type and detect mixed infections should also be investigated," he said.

"The improved diagnostic capability may result in increased biosecurity for seed certification schemes, with the benefits likely to be demonstrated on an annual basis with a decrease in the percentage rejection of seed

potato crops due to viruses."

It is expected that the research outcomes will be adopted by diagnostic labs that test seed potato material for plant viruses.

The work described here has been funded by Horticulture Australia Limited through the potato levies with matched funding from the Australian Government.

THE BOTTOM LINE

- Current virus level estimates in seed potatoes in Australia are based largely on visual inspections made by seed certification inspectors.
- Latent or symptomless virus infections are difficult to detect.
- New technologies involving direct tuber testing have the potential to reduce the time it takes to test potato tubers from six weeks to less than a week.



Dr Brendan Rodoni
Senior Research Scientist
DPI Victoria
Phone: (03) 9210 9264
Email: Brendan.Rodoni@dpi.vic.gov.au
Project number: PT08008



Brendan Rodoni presenting data from the HAL funded project (PT08088) on Improved diagnostics to support seed potato production.

Research program making steady progress

The Australian Potato Research Program phase 2 (APRP2) is into the second of its five years of operation. Scott Williams of SED Consulting gives *Potatoes Australia* a run-down of the progress that has been made to date.

The portfolio of projects in the APRP2 was developed following a detailed process of industry consultation and a review of the first phase of the program. APRP2 focuses on the significant diseases of potatoes in Australia: Common scab, Powdery scab, *Rhizoctonia* and *Verticillium*, as well as the feared Tomato-potato psyllid ('Zebra chip') which has devastated crops in the US and New Zealand.

The program represents a total investment of \$13.74 million by 13 partners from across the world, including potato producers and processors through HAL, plus the Australian Government, which

provides matching funding for research.

The project '**Control of potato psyllid within an IPM strategy**' is managed by Dr Paul Horne of IPM Technologies and also involves Horticulture New Zealand and Plant and Food Research. The project aims to develop integrated pest management strategies to tackle the psyllid should it reach Australia.

The work is being done in New Zealand both in laboratories and on the farms of collaborating producers.

The project has identified that all stages of three species of beneficial insects—Damsel bugs,

Brown lacewings and Common spotted ladybirds—will prey upon all life stages of the psyllid, when given no other choice of food.

These species are also found in Australia. Colonies of the three insects have been established in Auckland. Trial work is now seeking to establish whether they will prey upon psyllid when alternative food sources are available.

Meanwhile, over the most recent potato season, IPM Technologies and an independent agronomist in New Zealand worked with several of the agronomist's clients to pilot

an IPM approach to psyllid. Instead of the usual heavy application of chemicals, spraying was confined to strategic applications of 'softer' chemicals and greater emphasis was placed on biological control using beneficial insects.

"The results are very encouraging," Dr Horne said.

"We could only find psyllids in low numbers and only at the edge of the crop and there were always predators present. Moreover, there appears to have been little if any damage to the plants. It proves to us that an IPM approach can



Workers sort harvested potatoes as part of project PT09026. Image courtesy of DPI Victoria.



work.”

IPM strategies for psyllid will be further tested in the field next season.

In Tasmania, the project **‘Importance of tuber-borne inocula on seed potato health’** is investigating the relationship between the quantity of a disease agent on a line of seed potatoes, as measured through visual and DNA diagnostics, and the incidence of that disease in the subsequent crop.

The focus is on Common and Powdery scab, *Verticillium* and *Rhizoctonia*.

Dr Calum Wilson, who recently took over as Project Leader from Dr Iain Kirkwood, said that the research to date mostly concerned the relationship between DNA test results and the visual appearance of disease on tubers.

“The results demonstrate a relationship between the visual assessment and a series of proposed risk categories based on DNA results,” he said.

“This relationship between visual assessment and DNA results tends to be quite poor under low disease pressure/inoculum but much stronger under higher disease load.”

“Additionally, we have been able to show that collection of samples at the beginning and end of a seed lot for DNA testing gives a result that is

representative of the entire load. This allows us to design accurate testing protocols.”

In collaboration with the soil-borne inoculum program led by SARDI, a draft protocol for tuber sampling has been proposed and will be trialled in coming months to test seed lines which will be planted in the trial paddocks in Tasmania, Victoria and South Australia. This will be the initial trial to establish the relationship between soil-borne

on the relationship between disease agents in the soil and the incidence of disease in the crop—the ‘flip side’ to the Tasmanian project.

Much of the research seeks to understand the environmental risk factors for disease development. For example, soil moisture has been identified as a clear driver of disease due

increase the risk for a particular disease—for example, nutrient levels, soil temperature or measured level of pathogen. If the checklist suggests that the risk of disease is high, growers can make informed pre-planting decisions to better manage the disease.”

The checklists, which cover eight diseases, are being trialled by producer groups in South Australia, Victoria and Tasmania. Members of the groups are taking soil samples for pathogen testing at various times in the growing cycle. The results are allowing the checklists to be progressively refined. It is hoped that, by the end of the project, disease risk checklists incorporating soil test results will be shown to be a highly valuable management tool.

The **‘Soil health / disease mitigation project’** is the largest and most complex of the APRP2 projects and is managed by Dr Ian Porter at DPI Victoria, with collaborating teams in Tasmania, South Australia, New Zealand and Canada. The project has several distinct components.

One is investigating the value of nutrient amendments in disease control and involves trial sites near Ballarat and Cora Lynn,

“ The trials run during the 2009/10 season threw up some interesting results...We have designed our 2010/11 trials to build on the results from last year. ”

and seed-borne inoculum. Dr Kathy Ophel Keller and her team at the South Australian R&D Institute are conducting the **‘Diagnostic tests for soilborne pathogens – international collaboration’** project. As the name suggests, this project involves teams in Australia, New Zealand and the United Kingdom working

to *Rhizoctonia*. The effects of soil temperature and pH on *Rhizoctonia* are also much better understood as a result of the work so far.

Dr Ophel Keller said that her team has developed checklists for disease risk in crops.

“These checklists allow producers to work through a range of factors that could

Victoria, and draws upon the expertise of A&L Laboratories in Canada.

"We are examining the effects of a range of soil parameters on Common and Powdery scab," Dr Porter said.

"The trials run during the 2009/10 season threw up some interesting results. For example, increasing the soil K:Mg ratio to 0.6 reduced the incidence of Common scab on Simcoe, which is a susceptible variety."

"Elemental sulphur also reduced Common scab on Simcoe, but it also reduced yield. Micronutrients zinc and iron showed promising results in reducing the level of powdery scab on Russet Burbank."

"We have designed our 2010/11 trials to build on the results from last year."

In other aspects of the project, trial work in Tasmania showed that 2,4-D applied at very low rates was highly effective in

suppressing Common scab, with single treatments as effective as multiple treatments (please note that these are experimental results and 2,4-D is not currently approved for this use in Australia).

Meanwhile a team at Flinders University has isolated over 250 endophyte actinomycetes–bacteria which live synergistically with plants and can be used to fight disease –from potato plants. A large number have been screened for activity against Rhizoctonia and Streptomyces, with many 'hits'. These and several cereal endophytes are being assessed in field and glasshouse testing.

The final APRP2 project is '**Enhancing the understanding of *Verticillium* spp. in Australian potato production**', led by Professor Paul Taylor.

PhD student Prakash Vijayamma Ramakrishnan Nair has assembled a collection

of *Verticillium* isolates for validating taxonomy (the naming conventions) of the pathogen that is present in the Australian potato growing regions and for assessing the pathogen's genetic diversity.

"It is important for us to understand the Australian situation, in regard to the species of *Verticillium* present, relative to that of other countries, where *Verticillium* wilt and Potato early dying (PED) disease are more extensively described," Professor Taylor said.

"This work will also be the foundation for later studies to identify the roles of various species in disease development."

Preliminary molecular studies have validated the taxonomy of the *Verticillium* species isolated from infected plant tissue involved in PED disease and have shown the

close relationship of the major described species *V. dahliae* to *V. albo-atrum*.

A second set of isolates is currently being established from infected potato tubers which will enable a comparison of the causal pathogenic species of *Verticillium* wilt in tubers and in plant tissue.

Many of the results arising from APRP2 to date are preliminary, with effectively only one season's data available to researchers until 2010/11 trials are completed. Further results will be reported in *Potatoes Australia* as the various research teams continue their important work.

i For more information, about the research contact:
Scott Williams
SED Consulting,
Phone: (03) 5324 2081
Mobile: 0413 059 190
Email: <scottw@sedconsulting.com.au>

APRP2 leaders at the Potato Summit

Dr Calum Wilson, Dr Kathy Ophel Keller and Dr Ian Porter will speak about their projects at the upcoming Potato Summit in Brisbane on 17 April. The Summit is your opportunity to hear these three leading scientists speak about their projects and to ask them what the results mean for you. Call (03) 9822 0388 to register.



Dr Kathy Ophel Keller



Dr Ian Porter



Dr Calum Wilson

Opportunity to exclusively manage potato varieties

Elders Rural Services Australia Limited is seeking expressions of interest by growers, packers or others involved in the production and marketing of potatoes in Australia, who wish to exclusively manage the listed potato varieties.

- ▶ **Redgem** – high yielding, red skinned variety with white flesh. Low-medium dry matter, oblong, shallow eyes. Suited to washing sector.
- ▶ **Inova** – medium to high yielding, light yellow skinned variety with light yellow flesh. Low-medium dry matter, oblong, shallow eyes. Suited to washing and brushing sectors.
- ▶ **Eva** – high yielding, white skinned variety with white flesh. Low-medium dry matter, round to oval, shallow eyes. Highly suited to washing sector.
- ▶ **Eos** – medium to high yielding, cream skinned variety with white-cream flesh. Low dry matter, oblong, shallow eyes. Suited to washing and brushing sectors.

- ▶ **Ultra** – high yielding, light yellow skinned with light yellow flesh. Low-medium dry matter, oblong, shallow eyes. Modest tuber set results in large tubers. Suited to brushing sector.

A tender form must be filled in and submitted by the due time and date to complete the expression of interest.

Information and the tender form can be obtained from René de Jong, National Potato Manager, Elders Rural Services Australia Limited, Corner Carngham Road and Learmonth Street, Ballarat, Victoria, 3350. Phone 0418 523710 or e-mail rene.dejong@elders.com.au.

The due date for the expression of interest is 29 April 2011, (5.00pm CST).



International collaboration increasing R&D knowledge

Into its second year, the UK component of an APRP2 project looking at soil diagnostics has already achieved a significant amount. With the joint knowledge base between Australia, New Zealand and Europe, it promises to achieve much more, writes Andrew Mahony.

Powdery scab and Rhizoctonia are two diseases that have played havoc with potato growers for many years.

The UK component of APRP2 project PT09023, run by the UK Potato Council, aims improve management of key soil-borne diseases to the processing potato industry by improving interpretation of DNA tests to quantify soil-borne inoculum.

It is hoped the project will give growers the ability to assess disease risk of soils before planting a crop.

As well as achieving positive results in the laboratory, the project has been a shining light in showing how international collaboration can work on major research and development projects.

Dr Mike Storey is the Director of R&D at the UK Potato Council and speaks very highly of the way the international setup has worked.

"As international potato industries, one of the main challenges is that funding limits the scale of programs we can confront," Dr Storey said.

"It only makes sense that

these collaborations take place."

"We've got to use the best people internationally for our own respective businesses."

"This is a great example of international collaboration. There are great synergies in the work, and levy payers in the northern and southern hemisphere are benefiting from the collaboration."

Advantages of the international setup include the ability to test a range of different soils found in more than just one country.

Testing the diseases in multiple soil types allows for greater knowledge and assists in coming up with ways of fighting them, with the potential to benefit many different areas in the industry.

"There are a number of businesses—processing companies—that are operating internationally that will benefit from these studies because they're getting the learnings from the international collaboration," Dr Storey said.

The study involves three different bodies in the UK—the Scottish Crops Research Institute (SCRI), the Scottish Agricultural College (SAC) and

the Food and Environment Research Agency (FERA).

Between the laboratories in the UK and those in Australia and New Zealand, data is shared and interpreted against internal diagnoses.

The first year of the project involved discovering the environmental parameters that impact on the relationship between inoculums and Powdery scab disease, as well as inoculums and Rhizoctonia; understanding the relationship between seed and soil inoculums causing Black scurf and Stem canker (Rhizoctonia); and inter-laboratory comparisons of various soil test results.

Into the second year, the project is now focussing on field and controlled environment trials

on both Powdery scab and Rhizoctonia.

The Powdery scab trials involved real-time PCR tests to monitor rate of infections and assess disease prevalence, with a focus on the relationship between inoculum and disease development.

It is hoped that with the continued relationship between the UK, Australia and New Zealand, this project will find answers to some very important questions that have the potential to greatly help all areas of the international potato industry.

The UK Potato Council's voluntary contribution to the international diagnostics project is AUD\$820,000 with co-investment from Australia through voluntary contributions which are matched by the Australian Government.

THE BOTTOM LINE

- International collaboration is allowing scientists from across the globe to interact with one another and increase understanding of Powdery scab and Rhizoctonia.
- In its second year, the project is focussed on monitoring the diseases in field and controlled environment trials.
- A part of the APRP2 program, the study is being run in numerous centres around the United Kingdom and reports findings back to SARDI who are managing the project.



For more information contact:

Dr Mike Storey
Director of R&D, UK Potato Council

Email: <mstorey@potato.org.uk>

Website: <www.potato.org.uk>

Project number: PT09023



Value from Valor: a potato for the times

René de Jong, National Manager, Potatoes at Elders Rural Services takes a close look at Valor, in this inaugural edition of Potato Varieties.

The headlines are full of news about rising costs occurring all over the country with fuel, household energy bills and food prices all squeezing household budgets.

'Reduce your energy use', 'use less water', 'be green' are catchcries in the current media.

When it comes to what is one of the most economical and "green" potatoes, the Valor potato variety is worth considering.

So why is Valor such a great value potato?

It is simply because the plant

is very strong, deep rooted and highly resistant to diseases.

Because of these attributes, the yield of tubers is higher and more reliable, particularly when the going gets tough (excess heat, low soil moisture etc).

Under mild growing conditions Valor plants produce a bumper crop.

The value comes in the form of higher yield from standard management or reasonable yield when things don't quite work out. Either way, there will be a crop at the other end.

What's more, the amount of yield per unit of input

is higher than just about any other potato.

The relative "green-ness" of the variety is once again due to its strong growth habits and ability to produce high yields under similar management regimes as other crops. This makes the input of energy and water across the tonnage produced in the paddock lower.

Interestingly, Valor is unique in its ability to produce uniform sized tubers. It sets around 10-14 tubers per plant that size up evenly. Now this can be a blessing or may not quite suit growers. It is a blessing because the handling and packout is at a highly efficient level

but it can be a minor problem if you want to keep seed because there may not be much seed to

keep, as the larger tubers all end up going to market.

In the handling part of the market chain, the Valor variety proves to be very efficient and hence of high value because there is very little waste and efficiency is at a high level. Valor gets plenty of green ticks here as well due to handling efficiency and low levels of waste.

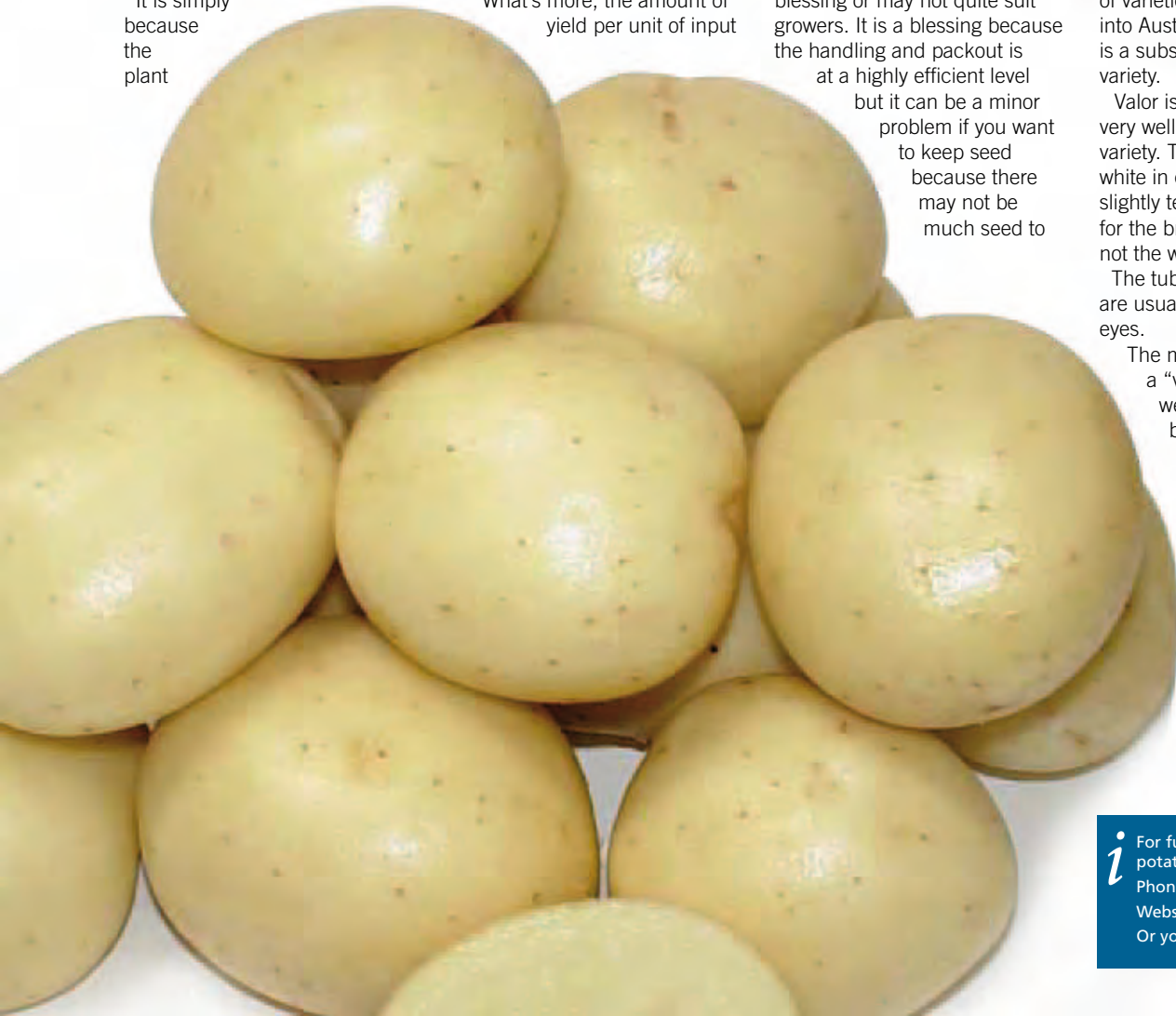
So what is Valor?

Valor was bred by Dr. Jack Dunnett, is managed by Elders in Australia and is from the Caithness Potato Breeders stable of varieties. Valor was brought into Australia about 1995 and is a substitute for the Sebago variety.

Valor is a potato which grows very well and is a great "growers" variety. The tubers are cream to white in colour and the skin is slightly textured so it is suitable for the brushed potato market, not the washed potato market.

The tubers can be round but are usually oblong with shallow eyes.

The market accepts Valor as a "value" potato that boils well and is suited to dry baking.



i For further information on the Valor potato variety, contact René de Jong
Phone: (03) 5337 9999
Website: <www.elders.com.au>
Or your local Elders representative.

Name: Wesley Costa

Age: 28

Location of farm: Tolga/Kairi, Atherton Region, QLD

Potatoes farmed: Fresh, processed and chipping varieties. These include Snowdon Atlantics, Woolwash, Lady Janes, Sebago, Kipfler and Charlotte.

Role in company: I lease the farm from my father and do all the different aspects of farming.

How did you get involved in the industry?

Dad has been farming since he left school, so I just sort of followed. This is what I wanted to do. I have three sisters, but I'm the only one that's got anything to do with the farm. Mum owns a bridal shop, which she runs from these premises and she also has other shops. Dad got himself a large bailer and does contract bailing, so he decided to give me a try and room to move at the farm.

How do you find having the responsibility of running the farm by yourself?

I love it, it's great. I took over in October 2005 and I plan to continue.

How do you think younger people could be encouraged back into farming?

Probably by making it more profitable. We've had a few bad years. I took over in 2005, so my first crops were 2006 and I lost all of my corn and all my

grass seed because of Cyclone Larry. That was a real kick in the teeth right from the get go and it's not easy to crawl back out.

Describe your average day in season:

I take care of everything from irrigation, checking crops, pest monitoring, spraying, hilling-up, and side dressing.

What is the best thing about your job?

Probably the freedom to make the decisions myself, whether they be good or bad. The mistakes are mine, but I learn from them.

If you weren't farming, what would you be doing?

I would probably be operating machinery somewhere.

Do you read *Potatoes Australia*? If yes, what do you like about it most?

I do read *Potatoes Australia*, yes. It's very informative with all the up-to-date events and things that are going on with diseases and everything that's of interest to us as potato farmers.

Q&A Young Grower Wesley Costa

Tolga/Kairi,
Queensland

Controlling disease in potatoes

In this edition of *Potatoes Australia's* Pests & Diseases Profile, Dow AgroSciences focuses on the topical diseases of Early and Late blight.

Potatoes are susceptible to a wide range of diseases—both bacterial and fungal—and their effective control is part and parcel of the husbandry of a healthy crop.

The ability of diseases to affect a crop depends on many factors including (but not limited to) climate, soil type, paddock history, water management and potato variety.

The approaches a grower takes to mitigate disease will vary depending on a number of criteria which may include intended end-use of the crop, previous growing experience, crop production costs as well as his own attitude to risk.

The list of diseases to which potatoes can fall victim is a long one. It includes Rhizoctonia scurf (*Rhizoctonia solani*), Powdery scab (*Spongospora*

subterranea), Common scab (*Actinomyces* spp.), Verticillium wilt (*Verticillium dahliae*), Fusarium dry rot (*Fusarium* spp.), Pink rot (*Phytophthora erythroseptica*), Leak (*Pythium* spp.), Grey mould (*Botrytis cinerea*) White mould (*Scierotinia sclerotiorum*) and Gangrene (*Phoma exigua*).

There are also skin blemishes caused by *Helminthosporium solani* and *Colletotrichum* spp.

It's a long list already and yet it doesn't include the two most important diseases in Australian potatoes—Early blight and Late blight.

Early blight (*Alternaria solani*)

Early blight is the most common fungal disease of potatoes.

Symptoms are seen on the leaves as circular brown spots

which rapidly enlarge becoming zonate or target-like and lead to defoliation and reduced yields.

Late blight (*Phytophthora infestans*)

Late blight, also known as Irish blight, is the world's most serious potato disease.

It is most noticeable when irregular green spots on leaves become purplish-black with a yellowish halo. Tubers develop with brownish dry rot which promotes secondary fungal and bacterial infections, leading to a complete collapse of the plant.

Despite the long list of diseases which affect potatoes, and the bewildering array of fungicides that growers can call on to control them, there are some things which potato growers can rely on year after year to make life easier.

Early and late blight are still

reliably controlled by a product which has been on the market for 40 years. Generations of potato growers have learnt to rely on Dithane™—first as Dithane M45 and then through incremental formulation improvements to become Dithane Rainshield™ Neo Tec™ fungicide.

Dithane Rainshield Neo Tec is a multi-site activity fungicide with superior spreading and sticking ability setting it apart from competitors. Its enhanced rainfastness ensures that growers can get the best protection available even under trying conditions when other formulations fail. And unlike other formulations of mancozeb that can leave a tank residue and block jets, Dithane has excellent mixing and re-suspension properties that further set it above the rest.



Potato foliage showing signs of infection with late blight (*Phytophthora infestans*). Background courtesy of William M. Brown Jr., Bugwood.org. Foreground courtesy of Howard F. Schwartz, Colorado State University, Bugwood.org.

What's on

▶ 14-16 April 2011

AUSVEG National Convention 2011

Where: Sebel-Citigate Hotel, Brisbane, Queensland

What: The largest single gathering of vegetable and potato growers of the year, once again featuring the annual trade show that promises to be bigger and better than last year.

Further information: Phone (03) 9822 0388 or email convention@ausveg.com.au. Registration is possible throughout the Convention

▶ 17 April 2011

Potato Summit 2011

Where: Sebel-Citigate Hotel, Brisbane, Queensland

What: Following the AUSVEG National Convention, the Potato Summit will feature presentations by international and local leaders and researchers about varying issues of relevance to the industry.

Further information: Phone (03) 9822 0388 or email convention@ausveg.com.au

20-22 April 2011

China Potato Expo 2011

Where: National Agriculture Exhibition Center, Beijing, China

What: The only international exhibition for potato products in China, showcasing the latest products and techniques in the whole industry supply chain.

Further information: www.chinapotatoexpo.com

29-30 July 2011

East Gippsland Field Days

Where: Bairnsdale Aerodrome, Bairnsdale, Victoria.

What: Into its 25th year, the East Gippsland Field Days hopes to see up to 10,000 visitors attend with over 300 stalls exhibiting all areas of the agriculture industry.

Further information: www.egfielddays.com

5-7 May 2011

Agro-Trend 2011

Where: Agro-Trend Grounds, Bundaberg, Queensland

What: Bundaberg's largest trade show running over the first full weekend in May, providing attendees with information on products relating to agriculture and horticulture.

Further information: www.agrotrend.com.au

13-14 May 2011

Riverina Field Days

Where: Griffith Showgrounds, NSW.

What: The fifth annual event will see an ever-expanding list of local exhibitors on hand to provide attendees with information on agricultural products.

Further information: www.riverinafielddays.com



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