potatoes australia

December 2011/January 2012

Ministerial pursuit

Senator the Hon Joe Ludwig

Scholarly times

A new industry on the horizon

The Tomato-potato psyllid: where to now?

Future management & research

2012 AUSVEG National Convention

The makings of an iconic event

Visit www.ausveg.com.au

NATIONAL CONVENTION

TRADE SHOW AND AWARDS FOR EXCELLENCE 2012

AUSVEG

10th - 12th MAY

WREST POINT HOTEL CASINO
HOBART, TASMANIA

For further information please contact AUSVEG on (03) 9822 0388 or email convention@ausveg.com.au

potatoes australia

Writer/Journalist
Caitlin Rodé
AUSVEG
Ph: (03) 9822 0388
Fax: (03) 9822 0688
caitlin.rode@ausveg.com.au

Communications Manager
William Churchill
AUSVEG
Ph: (03) 9822 0388
Fax: (03) 9822 0688
william.churchill@ausveg.com.au

Advertising
Max Hyde
Ph: (03) 9870 4161
Fax: (03) 9870 4163
M: 0408 558 938
max@hydemedia.com.au

Graphic Design
Marguerite Hickey
AUSVEG
Ph: (03) 9822 0388
Fax: (03) 9822 0688
www.ausveg.com.au

Print
Southern Colour Pty Ltd

Distribution Queries
AUSVEG
Ph: (03) 9822 0388
Fax: (03) 9822 0688
admin@ausveg.com.au

Contributors
Dr Tonya Wiechel
Dr Greg Walker
Anne Ramsay

AUSVEG

HAL
Horticulture Australia

All research and development projects are facilitated by HAL in partnership with AUSVEG, and in relation to processed potatoes also the PPAA, and are funded by the National Potato Levy and/or voluntary contributions from the industry. The Australian Government provides matching funding for all HAL's R&D activities.
For further information visit **www.ausveg.com.au**

Potatoes Australia is produced by AUSVEG and is free for all National Potato Levy payers.

PO Box 2042, Camberwell West, Vic, 3124
ISSN 1834-2493

FRONT COVER:

Photo supplied by Ian Wilson

John Brent
AUSVEG Chairman

As the National Peak Industry Body representing the interests of Australian potato growers, AUSVEG is committed to securing the future of the sector through communicating outcomes to meet the needs of the industry and representing grower's interests.

As of January 1, HAL has funded a potato extension program which will be run by AUSVEG to assist in translating the outcomes of potato R&D projects into a form that growers and processors can practically use on-farm or in processing facilities. The project will ensure a dedicated resource is made available to better facilitate the flow of communication; this will take the form of a potato industry extension manager.

The appointee will visit farms on a regular basis, to foster an open dialogue between growers, processors and agronomists and convey the latest R&D information to levy payers – both fresh growers and the processing sector as a whole.

Through a greater utilisation of the established agronomy networks, the project will ensure Australian potato growers and the processing sector have access to new information. The initiative will ensure growers are not excluded due to any inabilities to access technologies such as email or internet portals with reliable channels of communication maintained between the industry manager and growers, agronomists and processors using a combination of traditional and emerging communication methods.

Australian potato growers have been hit hard in this the most recent growing season. With prices having plummeted due to an oversupply of fresh market potatoes and supermarket crisps brands becoming increasingly supplied by imported product, local suppliers are fighting a tough battle to remain competitive. Australian vegetables are among the best in the world and AUSVEG will continue to support both the fresh and processed potato industries and rally behind Australian grown produce.

2012 has been named the Australian Year of the Farmer, with the official launch held in Sydney recently. Presenting the opportunity to thank the industry on a national scale and show appreciation for the contributions that growers make to the community, the Australian Year of the Farmer will recognise the importance of those who work in the rural industries which provide Australia's food. AUSVEG is continually working towards ensuring the future of Australian vegetable and potato growers and it is heartening to know the rest of the country will also take a moment to really appreciate their invaluable contributions.

John Brent
Chairman
AUSVEG

Richard Mulcahy
AUSVEG Chief Executive Officer

As the year draws to an end, AUSVEG is looking forward to an eventful and progressive time ahead in 2012. With several developments already underway, including a review for the investment of the National Potato Levy, there are no signs of slowing down. AUSVEG will facilitate the establishment of the plan which will ensure the future investment of the potato levy is best suited to the needs of the fresh and processed sectors, and the industry in its entirety. The development of the plan will ensure a sharp focus is placed on the priorities of the industry and address the issues and opportunities facing the sector.

Principal of Stride Consulting, Dr Denis White, will assist in the development of the plan, having extensive and relevant experience in the areas of government, horticulture, research and training. Outcomes from the new plan will aim to increase confidence in industry markets and ensure the ongoing investment of the potato levy supports future advancements in R&D. I am confident the plan will provide a basis for industry to achieve significant outcomes by offering confidence and support for the future of the sector.

In another initiative to safeguard the future of the industry, I recently appeared before the House of Representatives Petitions Committee that took evidence in Melbourne to see through the development of the 'Don't take the risk' campaign in opposition to the proposed importation of fresh potatoes from New Zealand for processing. Through this avenue, AUSVEG seeks to protect Australian growers from the potential incursion of the Tomato-potato psyllid, which in 2008/09 caused approximately $60 million in damages to the New Zealand potato industry. The psyllid, which can cause yield losses of up to 50 percent, is also believed to transmit the bacterial pathogen which causes Zebra chip disease, which can compromise the quality of entire crops. A domestic incursion of the pest would be absolutely devastating for the Australian potato industry, and it is a priority for AUSVEG to safeguard the livelihoods of Australian potato growers.

With only five months until the 2012 National Convention, Trade Show and Awards for Excellence, spaces at the trade show are selling quickly, with strong demand from leading members of the Australian horticulture industry. The critical success of previous AUSVEG National Conventions has provided huge momentum which will likely see the third such event become the biggest so far, both in the number of delegates in attendance and the number of exhibitors. The 2012 Convention, which will be held from 10-12 May at Wrest Point Hotel Casino, Hobart, is the most important and largest of its kind in the industry and I strongly encourage those involved with our sector to save the date. Delegate registrations can now be purchased on the AUSVEG website www.ausveg.com.au, and I encourage members of the industry to take advantage of the early bird rates currently available.

Richard J Mulcahy
Chief Executive Officer
AUSVEG

Power yield

GET WITH THE PROGRAM.

Unlock your crop's full yield potential.

When planning a fungicide program for potatoes, take the Power Yield approach.

Power Yield is a spray program for potatoes based upon selected chemistry applied in a specific manner.

- Highly effective control of early blight (target spot) and late blight.
- The crop protection benefits of pyraclostrobin.
- A new fungicide group (Group 7) for use in potatoes in Nufarm Filan fungicide.
- A unique spray program designed to optimise fungicide performance.

nufarm.com.au

Power Yield: Optimising growth potential in potatoes.

Nufarm

Editorial

AUSVEG National Convention, Hobart - Pg 15

2011 has been a busy and progressive year for AUSVEG, with a myriad of industry events and projects including the 2011 AUSVEG National Convention, Trade Show and Awards for Excellence, the Potato Summit and comprehensive round of Potato cyst nematode (PCN) consultations seeking feedback on the draft National Management Plan. Influencing change in the industry on behalf of Australian potato growers, AUSVEG is looking forward to the year ahead with several major industry events already filling the calendar.

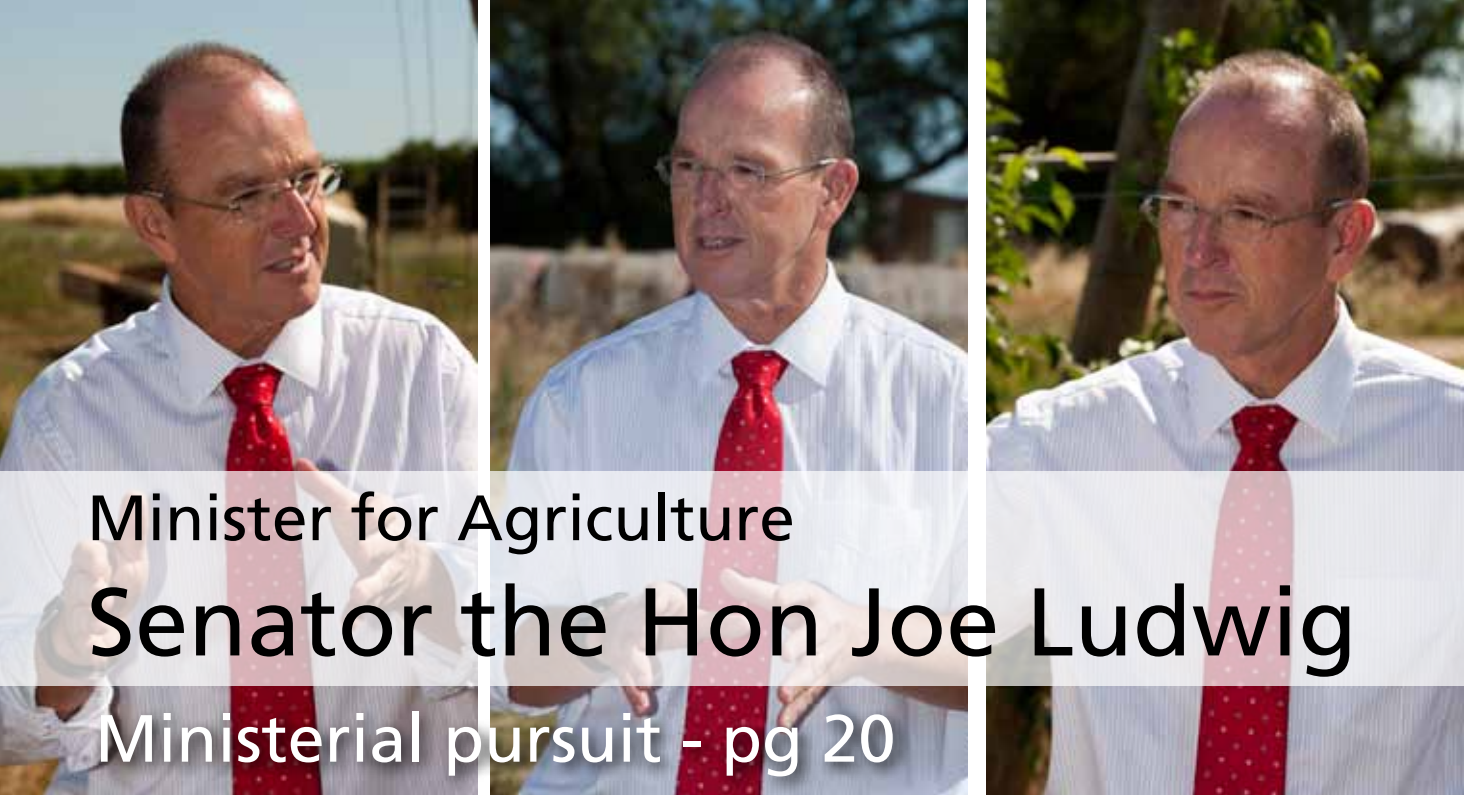
In this special edition of the magazine, Minister for Agriculture, Fisheries and Forestry, Senator the Hon Joe Ludwig spoke with *Potatoes Australia*. In an enlightening Q&A, the Minister outlined his views on foreign imports, sustainability of the Australian horticulture industry and what the government hopes to achieve in the next three years (pg 20).

In exciting news for the year to come, 2012 was officially launched as the Australian Year of the Farmer. Celebrating and recognising the tremendous contributions made to the nation from members of the agriculture industry, the official launch was held in Sydney with AUSVEG Chairman, John Brent, and CEO, Richard Mulcahy, showing their support (pg 24).

One of several grower tours which will take place in 2012 is a trip to Edinburgh incorporating the World Potato Congress (WPC). The tour, which will run from 22-31 May, will include visits to potato growing operations, auction houses and research stations across Scotland. With the Congress described as a must attend event for anybody involved in the potato industry, Australian growers are encouraged to apply for the upcoming tour. *Potatoes Australia* will continue to bring you new and updated information on the event (pg 30).

Another must see event for anyone involved in the horticulture industry is the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence. With brand new events and tours, entertaining festivities and celebrity guest appearances, the Convention is not to be missed. Now the biggest event of its kind in the horticulture industry, delegates will be offered an experience they won't soon forget (pg 15). This edition's featured R&D articles include an update on a project targeting the Tomato-potato psyllid and Zebra chip disease, led by Dr Kevin-Clayton Greene (pg 10), information on a project investigating the intricacies of Powdery scab in potatoes (pg 12), and we also investigated a collaborative international project which is analysing natural soil processes as a way of improving plant and soil health (pg 13). Finally, we take a look at the Horizon Scholarship initiative that is addressing the shortage of young people entering the industry (pg 18).

As well as a selection of industry news, *Potatoes Australia*'s regular features include Ask the industry (pg 26), Soil solutions (pg 27), the Potato profile (pg 28) as well as the International R&D update (pg 31) and the Young grower profile (pg 32).



Minister for Agriculture

Senator the Hon Joe Ludwig

Ministerial pursuit - pg 20

Contents

December 2011/January 2012

Features

R&D

Regular Items

News

NEWS IN BRIEF

A mobile horticulture industry

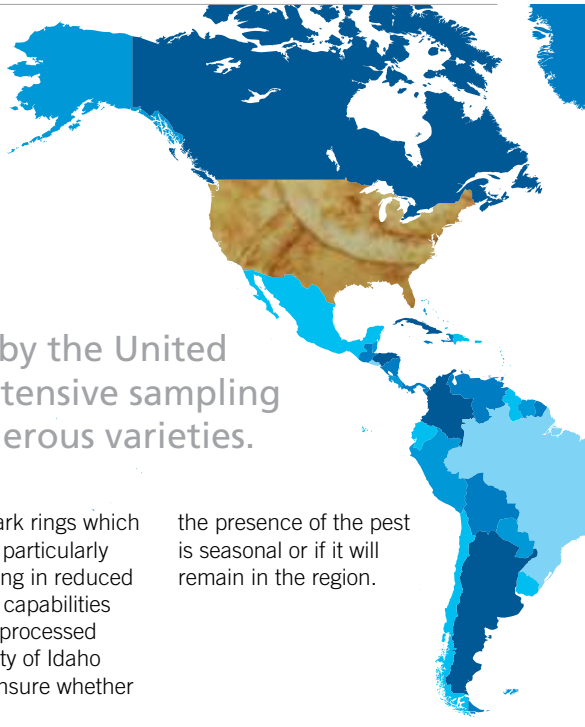
Members of the horticulture industry attended the Mobile Ready Horticulture conference in October to investigate new technologies that may assist the industry.

Held at the Australian Centre of the Moving Image in Melbourne, the Mobile Ready Horticulture Conference saw guest speakers offer presentations on the future of communication in the industry, horticulture smart phone applications and the need for comprehensive online resources. The conference aimed to develop an understanding of the systems and technology that is becoming increasingly available and to investigate some collaborative opportunities for those in the sector.

Speakers included an award-winning Australian application company, an internationally-recognised economist and Government Web 2.0 advisor, an agricultural company developing farmer-friendly mobile applications and an international communications company.

Presentations by those in the industry highlighted the modernisation of handheld technology (i.e. smart phones) and the subsequent opportunities in using mobile applications for record keeping and agronomy services. The conference also focused on the benefits of comprehensive networking and resource websites for vegetable and potato growers.

Zebra chip spreads in USA



The presence of Zebra chip was confirmed in Idaho by the United States Department of Agriculture recently, where intensive sampling proved the Tomato-potato psyllid had infected numerous varieties.

As reported by Capital Press, agricultural experts have made efforts to identify Zebra chip disease since it was first seen earlier in the year in areas in Washington and Oregon. Causing damage to potato industries in several states in the US including Texas, Arizona and New Mexico, damage has increased on an international scale. Grower's potato plants are devastated from the known vector, the Tomato-potato psyllid, and the dark rings which surface in tubers, particularly when fried, resulting in reduced selling and export capabilities of both fresh and processed potatoes. University of Idaho researchers are unsure whether the presence of the pest is seasonal or if it will remain in the region.

A unanimous reappointment

AUSVEG Chairman, John Brent, and Deputy Chairman, Geoff Moar, were unanimously reappointed to their positions at a meeting held in Melbourne recently.

AUSVEG Chairman John Brent and Deputy Chairman Geoff Moar were unanimously reappointed as Chairman of the Board and Deputy Chairman, at an AUSVEG Board meeting which coincided with the company's Annual General Meeting (AGM) on 21 November. With AUSVEG's State Members from around Australia attending, the AGM provided an opportunity to discuss the progress that AUSVEG had made over the past 12 months and to outline to members the strong financial and advocacy position that AUSVEG had created over the past three years. Mr John Said, from Victoria, was succeeded on the AUSVEG Board by Luis Gazzola at the AGM. Mr Brent expressed his appreciation for Mr Said's contributions to the AUSVEG Board over the past three years and said that Mr Gazzola would be a welcome addition to the Board, with his experience sure to be an invaluable asset, not only the industry, but also to AUSVEG.

New initiative to support food security in Africa

The Australian Government is set to establish a new Australian International Centre for Food Security to provide agricultural research and advice to African regions in need.

Offering support to strengthen agricultural practices in Africa, Prime Minister Julia Gillard has announced the initiative to share Australia's innovative and pioneering expertise in food production with the African community. With proficiency in dry-land and tropical farming, commercialisation of agricultural research and water and soil management, Australia is in the position to assist in the establishment of stabilising the future of global food security. The Australian Government will provide more than $36 million to establish the new centre which will be led by the Australian Centre for International Agricultural Research (ACIAR). This package of assistance builds on the existing $100 million initiative that is allowing African and Australian partners, including ACIAR and the CSIRO, to improve crop yields, livestock health and rural livelihoods in Africa.

Saving waste

Bundles of food rejected by supermarkets, including warped potatoes and twisted carrots, were used to feed over 5,000 people in London's Trafalgar square recently.

As reported by the BBC, an event which was organised by farmers and charities, aimed to highlight the large amount of discarded food in the UK which was perfectly fine to eat. With preparations for the colossal feast beginning days in advance with over 100 volunteers washing, peeling and chopping tones of vegetables, the event was well-received by the 5,000 hungry patrons wafting towards the oversized dish. Presenting a somewhat traditional and 'folk' like event, complete with small huddles of pigs to scoff up any leftovers, the initiative demonstrated the value of cosmetically unfortunate vegetables.

The Tomato-potato psyllid: where to now?

With millions of dollars in damage caused to the potato industry in New Zealand, and a recent spread of the disease identified in several regions of the US, the Tomato-potato psyllid and Zebra chip disease have become a cause for concern for members of the Australian potato industry.

The Tomato-potato psyllid (TPP), although not yet present in Australia, has caused severe damage to potato industries internationally, including several locations in the US and New Zealand. The psyllid, when infected with the bacterial pathogen Liberibacter, can result in the discolouration of tuber flesh, consequential reduced selling capabilities and hinder potential exportation.

The greatest threat posed to growers and the industry by this pest is not only the loss in value due to the compromised appearance, where the bands of the tuber darken when fried, but the severe reduction in yields and in some cases the death of potato plants. International researchers, particularly those from New Zealand (NZ), have undertaken investigations to understand and manage the pest. Australian researchers attended workshops and industry and project meetings in New Zealand, where valuable and practical information was shared.

Collaborative investigations have assisted Australian researchers and the industry with identifying critical information to better understand TPP and develop defensive strategies should a domestic outbreak of the pest occur. Research efforts have resulted in several strategies to fight the psyllid, including work undertaken by Paul Horne of IPM Technologies, utilising Integrated Pest Management. Early monitoring, diagnostic systems and alternative insecticidal treatments have been developed.

What is being done?

Project PT10026 aims to address the issue of potential contamination in Australia through extensive research of the pest, its effects and the development of diagnostic capabilities. This work has generated a greater awareness of TPP among those in the industry, with earlier applications of controls found to be crucial in the reduction of disease severity.

Dr Kevin Clayton-Greene has been heavily involved in the project and said that the collaborative research has aided the Australian industry in terms of preparedness and control methods.

"After 18 months of participation I think we in Australia have gained an immense amount. This work has very important connotations for the future of management and research," said Dr Clayton-Greene.

"Australia is much better placed to deal with an incursion of the Tomato-potato psyllid through the development of diagnostic capabilities and also awareness of control strategies. A monitoring program has been initiated and I believe it needs to

The Tomato-potato psyllid (Images courtesy of Plant & Food Research NZ).

Dr Kevin Clayton-Greene.

The Zebra chip effect.

be ongoing; we must continue to monitor for this insect,"

"We have not yet identified an economically sustainable chemical control for the psyllid, though I do believe it is important that industry remain abreast of this issue due to the rapid advances in understanding the problem and its potential impact – it needs to be kept relevant to the industry," he said.

Through collaborative research efforts, the project has investigated the psyllid and its subsequent effects and (in some cases) infection of potato plants, several control techniques and also treatment methods. A large portion of the research was conducted in New Zealand, where the infestation and spread of the psyllid and Zebra chip disease has been recorded. Developing a diagnostic program, chemical control, spray applications and biological controls, Australia has utilised data from the New Zealand diagnostic program to develop domestic diagnostic capabilities, with the processing potato industry having now begun a domestic monitoring program. Dr Clayton-Greene said there has not been any evidence to show Liberibacter presence in over 200 samples of potatoes tested, and no evidence of the associated phytoplasma found in the New Zealand potato plants.

Psyllid monitoring

Dr Clayton-Greene said TPP trap monitoring is a practical tool for detection but there is little association between numbers of the pest caught on the traps and crop infestation levels. The majority of the trapped pests during the investigations were 'hot' psyllids (those infected with the bacterial pathogen Liberibacter). Upon the infection of the potato plant, loss of root function and severe wilting occurred due to the high numbers of psyllids feeding. The research discovered valuable information regarding treatment of the psyllid.

"The trapping work showed that large amounts of rainfall caused dramatic plunges in psyllid numbers, as did forms of overhead irrigation," said Dr Clayton-Greene.

"It was found that 100mm of rain in the northern region of Pukekohe, New Zealand, had a greater effect on psyllid populations than chemical sprays. It might be possible to develop a predictive model for populations and ascertain the best time for application of control options," he said.

Dr Clayton-Greene asserted the importance of the industry remaining collaborative and up-to-date with advances in understanding the insect and its potential impact.

Molecular biology

The development of targeted treatment will better assist in the application of accurate and precise control strategies, leading to better management of the pest in the future, according to Dr Clayton-Greene.

"It is important to see if we can find a sampling method that allows us to better target treatments at appropriate times, instead of the current blanket method of treating throughout the growing season," he said.

Dr Ian Scott, Molecular Entomologist from Plant & Food Research NZ, has undertaken samplings and has now developed a test sensitive enough to identify three Liberibacter cells per sample. It has become evident through this research that infected tubers can result in healthy potato plants, however, it is not known at what level infection symptoms can begin to appear.

With growing evidence pointing to a link between disease severity and the concentration of bacteria in potato plants, it appears it is not a simple binary relationship, with other factors possibly playing a role in the progression of the disease.

Dr Scott has also investigated tubers with various levels of infection to measure contamination rates whilst analysing the spatial and temporal patterns of distribution of the disease after infection is found in a healthy plant. An important area of research, it has been identified that the infection of tubers with Liberibacter does not always result in tuber death. Consequently, Zebra chip may be passed between generations of tubers.

"Research suggests that 7.5°C is the action threshold for TPP development where you need 450 days with degrees above this temperature for life cycle completion, and at the moment data and modelling suggests three to five life cycles in the Pukekohe region each year," said Dr Clayton Greene.

"These results are significant and expose biosecurity issues concerning the handling of seed and infected matter. Implications for the Australian industry should an incursion of the pest occur are clear." he said.

The future

With an increased knowledge of the Tomato-potato psyllid and Zebra chip disease, Australia is in a better state to defend against, manage and control an incursion of the destructive pest. Continued collaboration between international research institutions will see the flow of valuable communication and better guard domestic and international potato industries through knowledge of on-farm practices.

Dr Clayton-Greene has advised Australian research officials to keep in contact with their New Zealand counterparts in order to maintain preparedness and keep abreast of the current outcomes of control options. Marked as an important event for the future of Australian research, the intermittent Zebra chip conferences, held in New Zealand, should be kept as a priority for those in the industry to attend.

THE BOTTOM LINE

- Through intensive sampling and research, project PT10026 in its final stages has uncovered valuable information on the Tomato-potato psyllid.
- Psyllid trapping work showed that large amounts of rainfall or overhead irrigation caused dramatic plunges in psyllid numbers.
- Increased knowledge, collaborative research and an ongoing monitoring program will better guard domestic potato industries against the pest.

For more information please contact:
Dr Kevin Clayton-Greene
Project Leader
<kevin@harvestmoon.com.au>
Project Number: PT10026

This project has been funded by HAL using the National Potato Levy, voluntary contributions from industry and matched funds from the Australian Government.

Getting the right dirt on Powdery scab

Researchers at the Department of Primary Industries Victoria, working on APRP2, have found that the manipulation of some soil and foliar applied nutrients can reduce the incidence of Powdery scab.

Powdery scab pustules on the skin of potatoes.

What is Powdery scab?

Powdery scab, caused by the soil-borne organism *Spongospora subterranea*, is a common disease found in most potato growing areas of Australia. Typically associated with cool, wet seasons, tubers of many commercial potato varieties are relatively susceptible to the disease.

The most obvious symptoms of Powdery scab are the cauliflower-like growths on the roots, known as galls, and the scab pustules on the skin of the potato tuber. Structures called *zoosporangia* are found in the microscopic hairs on the potato plant's roots that are responsible for absorption of water and nutrients.

The galls and the scabs contain *sporosori*, otherwise known as spore balls or 'resting' spores which can remain dormant in the soil for as long as 20 years, in the absence of the potato host. Each individual spore in the sporeball can germinate in cool, wet conditions as to produce a zoospore that swims in free water between soil particles to infect roots, hence the preference of this pathogen for saturated soils. The *zoosporangia* in the root hairs are a primary multiplication stage that produces an abundance of zoospores that infect more roots, as well as tubers.

The economic impact of Powdery scab

The economic impact of Powdery scab is due to the unmarketability of scabby tubers as well as any potential reduction of yield from root infection. Very scabby tubers become waste and the extra grading required to remove scabby tubers increases labour costs. Potatoes grown for processing that have scab require extra peeling, resulting in reduced income to growers and less profit in the factory. Potato tubers are susceptible to infection by this pathogen during a period of three to four weeks at early tuber set.

Powdery scab is difficult to control, especially when soil temperature and moisture conditions are favourable for the disease. In areas where the pathogen is already well established, the best option is to use resistant varieties. Some soil-applied fungicides can reduce the incidence of Powdery scab on tubers but are not registered for this use at the moment.

International research

Current research, as a part of APRP2, is aimed at finding other options for the control of Powdery scab. Over the past two years, the team at the Department of Primary Industries Victoria, led by Drs Tonya Wiechel and Ian Porter, have been investigating the effects of soil and foliar applied nutrients on the development of Powdery scab on tubers of two processing varieties Shepody and Russet Burbank, which are moderately and slightly susceptible to the disease.

This research has focused on soil (pre-planting) and foliage (pre-tuber set) applications of elemental sulphur and various formulations of the micro-nutrients zinc (Zn) and iron (Fe). In a trial near Ballarat last season, both a soil and foliar application of elemental sulphur reduced the proportion of scabby tubers in Shepody (51% and 68% tubers with scab) compared with the untreated control (90% tubers with scab). A soil application of zinc EDTA and a foliar application of iron EDTA reduced the proportion of scabby tubers in Shepody (67% and 65% tubers with scab) compared with the control. The corresponding foliar and soil application of these two treatments, however, did not significantly reduce the incidence of scabby tubers.

Only 10% of tubers of the Russet Burbank variety in this trial developed Powdery scab and the impact of the nutrient treatments was relatively small. The levels of nutrients applied in this trial did not have a detrimental effect on plant growth and tuber yield.

This preliminary research suggests that nutrients may have an effect on the pathogen in the soil and possibly on the plant's response to infection by the pathogen. Measuring nutrient levels in the soil and plant petioles is an important part of this study. Further research is focused on optimising the rate and timing of the application of nutrients and on the consistency of response in different soil types and seasons. A better understanding of these interactions will provide growers with improved options for Powdery scab control.

This research is being done in collaboration with Associate Professor Dr Richard Falloon from Plant and Food Research New Zealand.

This component of the APRP2 has been funded by HAL using the processing potato industry levy and voluntary contributions from the New Zealand Institute of Plant and Food and matched funds from the Federal Government. The Department of Primary Industries Victoria have provided in-kind support.

THE BOTTOM LINE

- International collaborative research between Australia and New Zealand is delivering outcomes for the Australian potato industry through APRP2.
- Researchers are investigating the potential of micro-nutrients that can provide cost effective reduction of Powdery scab disease.
- This research has focused on soil (pre-planting) and foliage (pre-tuber set) applications of elemental sulphur and various formulations of the micro-nutrients zinc and iron.

For more information please contact:
Dr Tonya Wiechel
Plant Pathologist, DPI Vic
Email: Tonya.Wiechel@dpi.vic.gov.au
or
Dr Dolf de Boer
Senior Research Scientist, DPI Vic
Email: dolf.deboer@dpi.vic.gov.au
Project Number: PT09026

Soil Health: a natural process

A collaborative international project has taken the initiative towards microbial fingerprinting of potato roots in an effort to identify rapid indicators of soil health.

Research conducted by Canadian based A&L Biologicals, with funding from the Australian Potato Research Program Phase Two (APRP2), aims to assist growers in increasing crop yields, reducing fertiliser costs, improving production efficiencies and promoting practices that benefit the environment. Through microbial fingerprinting researchers are trying to understand if organisms identified as being the most common on the root of potato plants, can be isolated in order to identify common indicators of soil and plant health.

For over three decades A&L Canada Laboratories have provided comprehensive analytical soil testing and have recently expanded to include a state-of-the-art laboratory to detect and diagnose the tiny micro-organisms that can impact farm production. Research Director at A&L Biologicals, Dr George Lazarovits, said that understanding the factors which contribute to healthy soil and healthy roots is principal to sustainability for growers and the environment.

"Our main focus is to provide growers with molecular diagnostics to identify pathogens and pests that impact their crops. We want to help growers create soils and root systems that lower their cost of production and improve the environmental foot print of agro-ecosystems," said Dr Lazarovits.

"We want to rebuild the organic matter in soils, create rich topsoils that enhance nitrogen and phosphorus nutrition and protect the roots from plant pathogens."

> "As you increase the organic matter, you increase biodiversity of the microbes and enhance plant root health and plant yields."

"The aim of our research is to develop technologies that will build soil and root structure to reduce water and nutrient requirements and improve plant productivity – there are certain elements that increase the severity of disease like high salts for instance, and when a plant is weakened, the pathogens have a much easier time invading it," he said.

Nature's strength

Dr Lazarovits said that plants in their natural settings do not rely on interference by people with extraneous fertilisers, pesticides and chemicals. Through the selection of cultivars with specific traits such as chip colour, over time we have lost many of the wild qualities of vegetable plants, resulting in a loss of competitiveness against weeds and poorer rots that need more water and nutrients from soil.

"What we are trying to do is go back to the natural systems and bring back some of these traits into the crops that we now have because both water and fertilisers are becoming limiting and the use of pesticides is now considered to be negative by the consumer," said Dr Lazarovits.

"The best example of when this was done was with a scientist in Brazil with sugarcane, in order to make sugarcane a low cost stock material for the biofuel industry, the researcher set out to convert it into ethanol from selected plants from growers that were producing sugarcane for 250 years."

"The plants which were selected used little or no fertilisers or external pesticides and were able to produce their own nitrogen and pesticides through the bacteria that colonise the inside of the plants and this is something we need to do with other crops now, as conditions for agriculture have changed significantly from fifty years ago. A lot of the inputs that were used then have now become very expensive," he said.

Root systems: vital to productivity

Separating the differences of certain locations in the same crop is another objective for Dr Lazarovits and his team. The research aims to address why particular areas of a grower's crop do not produce the same yield as another area. Dr Lazarovits said that this will be investigated through the identification of microbes that are present on the roots and inside of potato plants.

"At the moment our concern

Potato plants being tested for interactions with growth promoting bacteria in soil and tissue culture.The treated plant area is to the right.

Matured potato plants being tested for interactions with growth promoting bacteria.

Potatoes infected with *Streptomyces Scabies*, Common scab.

is the biology, so the microbes that live on the root and inside the plants. In the long run it may be possible that the microbes and the soil organic matter are quite closely linked," said Dr Lazarovits.

"We identified that as growers lost organic matter in soils, they also lost the microbial population that they need for high productivity – as you increase organic matter, you increase biodiversity of the microbes and increase plant root health and plant yields," he said.

Enhancing root systems as a way of improving yields and reducing input costs, is at the core of Dr Lazarovits' work. Two methods for achieving this have been identified through the investigative research.

1-Working with plant breeders to ensure more attention is given to breeding better root systems

According to Dr Lazarovits, breeding plants that perform well under low fertility due to robust root systems is an avenue which could potentially reduce costs for growers.

"In today's world there are over two billion grafted plants. This is where they take a certain vegetable like a tomato and they are grafted onto the wild roots of other plants and this practice is taking over many industries," said Dr Lazarovits.

"Presently this cannot be done to current potato cultivars, but if we could go back to the old cultivars of potatoes from a primitive line it is possible. I know for sure that the wild varieties of potatoes have extremely deep root systems – this could then potentially produce enhanced plant and root health and subsequently larger and better quality yields with little to no inputs," he said.

> "In the long run it may be possible that the microbes and the soil organic matter are quite closely linked."

2- Bacteria isolated from soils can make the root systems enlarge just by their metabolic activities

The team of researchers at A&L Biologicals has been working to identify both beneficial and detrimental components associated with root and soil health using molecular markers.

"In our tissue culture systems, when we apply them into plantlets we can double and triple root systems easily by these plant growth promoting bacteria. These are called bio-fertiliser; the question is how can we transfer that to a field," said Dr Lazarovits.

With over 43 per cent of the most common organisms on a potato root having never been identified or named, associate researcher, Dr Amy Turnbull, has assisted in identifying the most common bacteria found on potato roots.

Through this research, the team has been heavily involved in determining rapid indicators that identify levels of soil health and/or degradation in the hope that the findings will assist growers in the future with on-farm soil tests and accompanying practices.

Dr Lazarovits said influencing the on-farm practices of growers in regards to the treatment and understanding of soils and plants, will be a step towards a more ecologically sustainable future.

"Once we can find ten factors in the soil we could say 'well things are not going to go so well for you' or ten factors that will produce high yields then we could say 'things look good for you' – I think the rapid tests may really help growers in the long run," he said.

The research success is part of a multi-pronged research drive through the Australian Potato Research Program Phase 2 funded by Horticulture Australia Limited using the processing potato levy and voluntary contributions from the A&L Canada Laboratories.

THE BOTTOM LINE

- A collaborative research project has taken the first initiative towards microbial fingerprinting of potato roots in an effort to identify rapid indicators of soil health.
- Only healthy roots can take advantage of water, soil, nutrients and allow the plant to be competitive with weed species, researchers want to understand whether root associated micro-organisms play a role in plant health and productivity.
- It is hoped that the identified markers will be developed into an on-farm test which will alert growers to indicators of good or bad soil health.

For more information please contact: Dr. George Lazarovits
A&L Biologicals
Agroecology Research Services Centre
Email: Lazarovitsg@alcanada.com
Project number: PT09026

The makings of an iconic event

With sponsors renewing and innovative new events to entertain delegates, the 2012 Convention is set to excite and make an impression on the industry.

Leading national agribusinesses are lining up to attend the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence and trade show spaces will not last long.

Now the biggest event of its kind in the horticulture industry, the 2012 AUSVEG National Convention, from 10-12 May, is a must see event for anyone involved with the industry.

Hosted at Wrest Point Hotel Casino in Hobart, Tasmania, the event will showcase speaker sessions from influential members of the industry, exhilarating entertainment and an impressive trade show. The Convention represents an invaluable networking opportunity for growers and members from all areas of the industry's supply chain.

Key sponsors Steritech, Dow AgroSciences, Kalfresh, Peracto and Transplant Systems are once again on board and cementing their support of the industry through their involvement in key events on the Convention program.

AUSVEG National Marketing Manager, Simon Coburn, said there has been an overwhelming response received from exhibitors, providing just a taste of what the 2012 AUSVEG Convention will offer.

"The trade show is a fundamental part of the AUSVEG Convention and promises to be packed with significant industry leaders from the supply and service sectors, as well as key figures involved in research and development."

Mr Coburn said the trade show is a fantastic spectacle for Convention delegates to behold with a variety of trade booths and impressive machinery on display.

> "The AUSVEG Trade Show is a fantastic spectacle for Convention delegates to behold with a myriad of trade booths and impressive machinery on display."

"The trade show is much bigger than in previous years. With new companies not seen before, as well as returning ones, some of Australia's most innovative technology will be on display," said Mr Coburn.

"Presenting a fantastic opportunity for both exhibitors and delegates, the event is already 60 per cent sold," he said.

Initiating the three day event, the Welcome Reception for the Convention, held on Thursday 10 May, will offer exhilarating Carnival festivities for delegates, featuring circus entertainers and plenty of celebrations to kick off the occasion.

Friday, 11 May, will see Callum Hann of Masterchef fame return for the Celebrity Chef event, plating up a feast for delegate's eyes. Presenting an exciting new setup, the Celebrity Chef event is one of the favourite components of

The glittering coastline of Hobart.

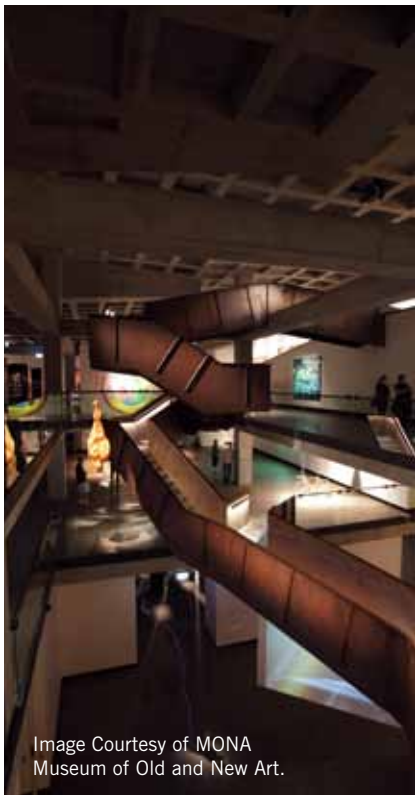


Image Courtesy of MONA Museum of Old and New Art.

The Tasman room at Wrest Point which will host the AUSVEG Gala Dinner and National Awards for Excellence.

the trade show and offers a taste of the potential culinary masterpieces made possible from local produce.

Demonstrating appreciation for women within the industry, the Women in Horticulture event and Women in Horticulture Award will be sponsored by Steritech to again show support for the contributions made by women in the sector. Delegates will be taken on an amazing trip to the Museum of Old and New Art (MONA). A multi-million dollar establishment, the building exhibits thought-provoking local and international art from around the world.

Two highly anticipated elements of the Convention which recognise the young bloods within the industry will return in 2012 - the Young Growers Event and the Young Growers Award. Sponsored by Dow AgroSciences, the event and award reinforce support of the younger generation of growers.

The evening of Saturday 12 May will see the AUSVEG Gala Dinner and National Awards for Excellence return to once again culminate the event in a glittering ceremony. The celebration will honour members of the industry with the coveted awards to recognise outstanding achievements with exceptional entertainment and prominent speakers to mark the occasion.

Nominations for the AUSVEG National Awards for Excellence are now open and members of the industry are strongly encouraged to nominate, with categories listed on page 17.

i For more information please contact:
AUSVEG
Phone: (03) 9822 0388
Email: <convention@ausveg.com.au>

Nomination Categories:
AUSVEG National Awards for Excellence

Grower of the Year	Proudly Sponsored by:	syngenta
Young Grower of the Year	Proudly Sponsored by:	Dow AgroSciences Science for growth
Industry Impact Award		
Industry Recognition Award	Proudly Sponsored by:	DUPONT The miracles of science
Productivity Partner Award	Proudly Sponsored by:	Elders
Innovative Marketing Award	Proudly Sponsored by:	cmaa central markets association of australia
Women in Horticulture Award	Proudly Sponsored by:	Steritech ACN 007 308 027 ABN 30 451 935 502
Researcher of the Year	Proudly Sponsored by:	Bayer CropScience
Environmental Award	Proudly Sponsored by:	NETAFIM GROW MORE WITH LESS
Rising Star of the Year Award	Proudly Sponsored by:	LANDMARK look to us

For full award nominee criteria contact AUSVEG,
Ph: (03) 9822 0388, or email: convention@ausveg.com.au

A new industry on the horizon

Research has identified a substantial gap of 35 per cent between the supply of agricultural graduates and the demand for their skills in the industry in coming years.

Often described as the backbone of the nation, the Australian agriculture industry is set to face a shortage in supply of agricultural university graduates within the next five years. Members of the industry have stressed that training the next generation of researchers, growers and service providers is critical to the future of the sector. With efforts towards research, production and sustainability a primary focus for the industry today, it appears support for the next generation of horticulture needs to be supplied from the industry itself.

Taking initiative

The *Horizon Scholarship* (formerly Investing in Youth) is an initiative lead by the Rural Industries Research and Development Corporation (RIRDC) to address the shortage of agricultural scientists and rural industry professionals in the Australian agriculture industry. The scholarship aims to promote career opportunities in the sector and subsequently increase the number of students pursuing undergraduate studies in agriculture.

The program has four key strategies: a financial scholarship, industry and faculty mentoring, professional development and industry placement. The scholarship has been designed to offer support and foster a sense of community among students, thus benefiting their chosen discipline and commitment to the course. The program, through relationships forged between student, sponsors and those in the industry, is also designed to provide graduates with strong and relevant rural connections and a sense of belonging within the sector. The scholarship exposes students to the dynamic and diversified career opportunities that await.

Horizon Scholars at CSIRO Black Mountain during the July workshop in Canberra

Program co-ordinator from RIRDC, Victoria Taylor, said the initiative shows the industry's support for the future of the sector through a tailored scholarship program, addressing the shortage of agricultural graduates.

"We want to increase the number of students undertaking agricultural science and related degrees as there is a shortage of suitably qualified people in our sector," said Ms Taylor.

"While there are good programs at a high school level and good post graduate research grants, there are a lack of programs supporting undergraduate students in Australian universities in agricultural science and related degrees, this is one way that industry has stepped up to the plate to support students of high potential through their degrees," she said.

> "This is one way that industry has stepped up to the plate to support students of high potential through their degrees."

The students are selected for the program based on skills in leadership, attitudes and commitment to the agriculture industry. The program provides each student with a $5000 bursary per annum for the three to four years of their degree. Providing a mentor in the first year of study, students work with a faculty mentor and in subsequent years an industry mentor who is appointed in consultation with their sponsor. Students also receive an industry placement each year, where over summer they spend two weeks in a business, nominated by their sponsor.

Early success

With ten students having participated in the pilot of the scholarship in 2010, another nine have been selected for the 2011 program. Out of the nine students in the 2011 scholarship, five are undertaking agricultural science degrees.

them find a place in our sector. We're hoping that we'll increase the number of graduates over time and their commitment to a career," she said.

Industry support

Portfolio Manager in Industry Development at HAL, Richard Stephens, said investing in people who will have an input into the industry in the future will support the long-term development of the horticulture industry.

"These programs allow that investment to take place and for individuals to be recognised by others and for themselves to become excited about a career in horticulture," Mr Stephens said.

"Without good people we are not going to survive. The industry needs to invest in programs like this," he said.

HAL's Horizon Scholarship student this year is Sam Adams who is studying a Bachelor of Agricultural Science at the University of Queensland and will be undertaking industry placement this summer.

Mr Stephens said that it is not just the individuals involved with the program who are seeing the benefits, with other students exposed to the variety of opportunities that exist in horticulture.

"This project aims to show that horticulture is an exciting and dynamic place to work. Not enough people know that but it is through programs like this that we can change that," he said.

> "We're asking for industry sponsors to come together and participate by sponsoring a student through their degree."

Some 70 students applied for the opportunity, an encouraging sign for the future of the program and the industry.

"They come together for professional development workshops each July. Every student comes to Canberra and we bring in guest speakers who talk about careers in agriculture, take them on tours and meet members of parliament," said Ms Taylor.

"We understand that we are working in a supply chain of providing skilled labour so the students get opportunities to increase their networks and learn new skills, like volunteering at industry conferences including involvement in the Year of the Farmer activities for 2012," she said.

Guidance and support seem to have been an integral component of the scholarships success, with a majority of the students having left rural locations to attend university, industry and academic mentoring is seen to be an invaluable element of the scholarship to students.

Ms Taylor said that transfers away from agricultural science degrees could be due to a lack of support networks. Little to no communication of the career paths available can hinder students' commitment to a degree.

"Industry really needs to take on these students and help

The project has been funded by HAL as part of the across industry program. The Australian Government provides matched funds for all HAL's R&D activities.

The program was also supported by the Primary Industry Centre for Science Education and the Primary Industries Education Foundation.

THE BOTTOM LINE

- Research has identified a substantial gap between the supply of agricultural graduates and the demand for their skills in the industry.
- The Horizon Scholarship program aims to promote career opportunities in the agriculture industry and subsequently increase the number of students pursuing undergraduate studies in the sector.
- Now in its second year, the scholarship has attracted attention, with some 70 applicants in this year alone.
- Corporate sponsors are being sought to maximise the number of agricultural students set to enter the industry in coming years.

For more information please contact:
Program Co-ordinator
Victoria Taylor
Phone: 0417 466 234
Email: <victoria@flourishcommunication.com.au>
Project Number: AH09027

Tiffany Hunt on industry placement with the Grain & Graze program in 2010.

Ministerial pursuit

Appointed by Prime Minister the Hon Julia Gillard MP as the Minister for Agriculture, Fisheries and Forestry in September 2010, Senator the Hon Joe Ludwig has now held the position for over 15 months. In this interview the Minister outlines his views on several issues affecting the horticulture industry.

What do you see as the largest threat to the Australian horticulture industry?

There are a number of challenges facing the horticultural industry. These include climate variability, as well as global competition from imported frozen and canned product trade uncertainties.

However, horticulture is a strong sector that is facing these challenges and working to become more productive and focusing on the development of products which consumers will pay a premium for.

The value of Australian vegetable exports, both fresh and processed, increased between 2005-06 and 2009-10 and this is a trend the government wants to see continue.

The government supports this industry and will continue to offer support in a range of ways, including through a strong biosecurity system, support for research and development, and strong efforts to open new markets.

What are two goals the Government would like to achieve in the horticulture industry within the next 3 years?

The Gillard Government is working to develop Australia's first National Food Plan to provide a framework for food security in the short, medium and long term. My goal is to see the horticulture industry contribute strongly to the food plan. Many of the issues affecting horticulture, such as processing capability, regulatory burden and the high Australian dollar will be considered as part of this plan. I am also very interested in the operation of the supply chain and interaction between growers, wholesalers and retailers. We all need to make sure this market works in a transparent and fair way. I will be looking at specific proposals which seek to address these things.

The Government is working to deliver export certification reform for the horticulture industry, which will strengthen our world-class inspection and verification systems and reinforce our international reputation.

There is a need to keep processing factories in Australia viable and these are all important issues for the industry.

Supporting research and development is vital to the future of agriculture. Last financial year the matching payments for rural research and development totalled $40.46 million for horticulture. I have made sure the Government will not cut these contributions.

With the world population expected to rise by an estimated two billion people within the next 40 years, do you think the general public is aware of how important the Australian vegetable and potato sector is in terms of food sustainability?

Producers need to continue the conversations with consumers and reduce the gap between paddock and plate. It is the role of Australian growers to explain to people where their food comes from and how it is produced. Of course, the Government also plays a role, but together, we need to ensure that people understand how productive our growers are and how capable they are of meeting Australia's food needs.

There is no doubt that Australian agriculture and horticulture are well placed to provide fresh and processed food into Asia. The Prime Minister recently identified this and announced a White Paper on Australia in the Asian Century, which along with our National Food Plan, will help outline the role of Australian producers in Asian food security.

Is it concerning to the Government that the average age of vegetable growers is 53 years old? Is anything being done or could anything be done by government or industry to entice younger people into the industry?

The Gillard Government has a skills focus. One example of this is the Productivity Places Program which provides support for existing workers wanting to gain or upgrade their skills and for job seekers wishing to enter the workforce. Equipping people with the skills they need supports a strong future for the agriculture industry, but also for our nation.

Engaging with youth is also important for the industry and the Government supports a range of programs that encourage youth participation. The Community Networks and Capacity Building program has

continued over page ▶

provided $3.6 million under the Next Gen Farmers grants to increase the leadership and representative capacity of young people to enhance their ability to contribute to our agriculture, fisheries and forestry sectors. The Government is working with the Primary Industries Education Foundation and Australian Council of Deans of Agriculture to increase awareness of agricultural careers and educational opportunities.

Co-operation between industry and government is important to ensure that skills and youth participation programs are successful. As well, work needs to be done to build clear pathways for people who want to become involved in this industry. We need to make it clear how people can get involved and appealing for them to do so.

With the cost of domestic vegetable production increasing and imports on the rise, what actions are the Government taking to support the local industry?

The Gillard Government is committed to Australian agriculture and is working with industry to build a strong and sustainable future.

Current work being done to support the local industry includes maintaining and supporting a strong science-based biosecurity system, reforming our export certification system and improving agvet chemical regulation.

These, along with a commitment to research and development, all help boost the productivity of the sector, which is essential in remaining globally competitive.

Global competitiveness is important and the government is also working to liberalise trade to open up new markets and new opportunities for Australian producers and exporters.

Do you think the Australian horticulture industry can remain competitive against foreign produce? How?

There are some things the industry can't help, such as a strong Australian dollar, but in other areas, the industry can take the lead, such as engagement with consumers.

The gap between producers and consumers is the largest it has ever been and industry has a role to play in reconnecting the two.

People always say the world is shrinking, often because of increased trade and improved accessibly to out-of-season produce. The fact is, the disconnect between producers and consumers is growing.

Knowing where their food is produced, how it is produced and who it is produced by will make this gap shrink and make people more loyal to domestically grown produce.

Australia is also a strong exporter and examining new markets will also provide more opportunities for growers. The Government is working to liberalise trade which will assist in this.

Our strong biosecurity system, our regulation of agvet chemical and research and development commitments also provide Australian producers with a competitive edge.

Australia produces high quality food and our farmers are among the world's most productive.

In 2010-11 Australian food exports were valued at $27.9 billion, with food imports valued at $10.9 billion.

Australia is in continual pursuit of international trade liberalisation. Free trade allows Australian farmers and food processors to export to international markets and, on the flipside, to import goods, services and technology that would otherwise be unavailable or more expensive.

By continuing to innovate and improve productivity, our producers will also maintain a competitive edge that will provide a strong future for the industry.

Nearly all the fresh fruit, vegetables, meat and dairy consumed in Australia are produced by Australian farmers. Fresh produce accounts for only 1.8 per cent of total food and grocery imports into Australia. This is a strength and should be celebrated by fruit and vegetable producers.

Australia continues to export far more food than we import.

Last year Australia exported $17 billion more in food than we imported which is testament to the high quality of global competitiveness of our produce and producers.

What do you find most challenging about your position as Minister for Agriculture, Fisheries and Forestry?

Australian producers are some of the most productive in the world, but the challenge is ensuring we remain so into the future. This requires industry and government to work together to tackle a range of areas and invest in research and development. This includes looking at improving water efficiency and developing new technology.

What do you find most rewarding about your position?

The people. The people who work within the agricultural sector are passionate about what they do, their produce and their communities. This makes the job a pleasure.

There are people facing challenges, and there are people doing it tough, but the great thing about this sector is people's resilience and their ability to bounce back.

People are committed to facing these challenges and generally have great ideas about how to do it.

What horticulture growing areas have you managed to visit as Minister?

Since taking on the portfolio a little more than a year ago, I have travelled extensively, including more than 70 visits to rural and regional Australia. These visits are in addition to thousands of face to face meetings, telephone conversations, letters and emails between myself and the many people speaking up for the interests of regional and rural Australians.

Australia produces quality fruit and vegetables and in a wide variety of different climatic zones and operations. As Minister I have travelled to many areas across this country and been able to visit a range of horticulture operations.

In just the past few weeks I have been lucky enough to see the unique mushroom operation in an old railway tunnel in Mittagong, NSW, to see hydroponically produced tomatoes in Virginia, SA, and attend the Citrus Australia conference at Nurioopta, SA.

I also recently had the opportunity to visit apple and pear orchards in Shepparton, and see the innovative steps taken by local producers to increase their productivity.

Throughout the year I have had the opportunity to meet with many from the industry in food bowl areas across Australia and elsewhere. I am looking forward to visiting more regions and operations in coming months.

Already, I'm making plans for 2012, and look forward to continuing to meet with producers and stakeholders.

Root-knot and other nematodes

An ongoing joint research project has identified the prevalence of specific species of Root-knot nematode and options for control through rotation crops. Dr Greg Walker from the Plant Research Centre of the South Australian Research and Development Institute explains.

Two species of Root-knot nematode (RKN) commonly occur in cooler, southern cropping areas: northern RKN *(Meloidogyne hapla)* and the false Columbia RKN *(M. fallax)*. Surveys conducted in south-east regions of South Australian potato fields in 2010/11, have improved the knowledge of the distribution of these important pests. Both species were commonly, but not always, present in the same field, with 82 per cent of surveyed potato fields found to be infected at harvest, exhibiting an overall higher population level for *M. fallax*. These results indicate that a serious problem exists with the current cropping regime.

Rotation crops

It was apparent that both *M. fallax* and *M. hapla* were adequately maintained by rotation crops, as significant populations of these nematodes could be found in fields that had not had a potato crop for extended periods of time (up to twelve years). It is predicted that screenings of rotation crops for resistance to these nematodes will enable the identification of resistant cultivars.

Associations between the population of Meloidogyne species and previous rotation crops indicated that mixed pastures (legumes/grass) are important for the maintenance and multiplication of the *M. Hapla species,* with lucerne being less important. Mixed pastures were also strongly associated with the presence of *M. fallax*, and there was a possible association with cereals, but field numbers were insufficient to confirm this association.

Both *M. fallax* and *M. hapla* displayed the highest pre-plant levels of nematodes in sandy to sandy loam soils, confirming that lighter soils are most suited to these nematodes. However, high levels were also present in light, organic soils, indicating that these are also at risk.

Detection rates (per cent of fields positive) for RKN in these soils were similar for DNA and manual tests, however, estimated average multiplication rates for these nematodes over the cropping season were higher with DNA tests indicating a potential advantage in nematode quantification using this method. Some potato fields showed little if any increase in population of these nematodes over the cropping season, while other fields showed large increases.

Recommendations

It is recommended to test soils before planting to estimate the risk that crops may face from these nematodes. Testing of the ground before and after the final cultivation indicated that light cultivation reduced the RKN population level but that this effect was not marked. Soil is best sampled after cultivation, but these results suggested that sampling before the final cultivation might also be acceptable.

The heavy rains and flooding that were common after planting in the 2010/11 season did not appear to favour nematodes, nor did the growing conditions, especially abundant soil moisture.

Lesion nematodes *(Pratylenchus* sp.) were very common in these fields, and in some fields their multiplication rates were very high, indicating that they were multiplying on potatoes. Very high populations were present in some fields at planting, high enough to pose a risk of the development of early dying if the soil pathogen *Verticillium dahliae* is also present. However, in other fields, no increase was observed and in these cases it is presumed that the species present were primarily associated with rotation crops and did not multiply on potatoes. Stubby-root nematodes *(Paratrichodorus* sp.) were also common and had high populations in some fields that would be expected to cause damage to potato crops, especially during early growth.

This project is funded by the National Vegetable Levy and the Australian Potato Research Program Phase Two, with matched funding from the Australian Government.

THE BOTTOM LINE

- An ongoing joint research project has identified that two species of nematode – *M. fallax* and *M. hapla* can be adequately maintained by rotation crops.
- The northern and the false Columbia species of nematode, were detected in 82 per cent of surveyed potato fields in south-east South Australia, where lesion and stubby-root nematodes were also commonly found in the same areas.
- These damaging nematodes are likely to be an important pest to monitor across southern cropping regions with similar rotation crops.

For more information please contact:
Dr Gregory E. Walker
SARDI Plant Research Centre
Phone: (08) 8303 9355
Email: <Greg.Walker3@sa.gov.au>
Project Number: MT09067

Year of the Farmer: celebrating our unsung heroes

As a way of showing appreciation for the contributions that growers and farmers make to the community, the Australian Year of the Farmer will recognise those who work in the rural industries which provide food for Australian consumers.

2012 will celebrate the Australian Year of the Farmer, with the Governor-General Ms Quentin Bryce AC having officially launched the campaign in Sydney on 12 October. The year will celebrate the contributions made to the Australian economy and community from farmers and growers involved with the agriculture sector.

Aiming to recognise Australian farmers from all types of businesses ranging from small scale operations to large national companies, the initiative will bring important issues to the surface such as the significance of food security and ensuring the sustainability of the food sector.

The Royal Botanic Gardens hosted the launch, which saw AUSVEG Chairman, John Brent, and Chief Executive Officer, Richard Mulcahy, in attendance to shine the spotlight on growers and celebrate the services and goods they provide to the country.

Mr Brent said the initiative would acknowledge the often overlooked heroes of Australia and present much needed recognition for deserving vegetable and potato growers.

> "It will showcase the role our farmers play as environmental managers, creating and delivering sustainability through best practice management"

"The often unsung heroes of Australia are finally being given the acknowledgement and accolades they deserve, by 2012 being marked as Australian Year of the Farmer," said Mr Brent.

"Australian agriculture industry is the lifeblood of this country and is made up of some of the hardest working people I have ever met, so this opportunity to thank the industry on a national scale is a privilege."

"AUSVEG is continually working towards ensuring the future of Australian vegetable and potato growers and it is heartening to know the rest of the country will also take a moment to really appreciate their invaluable contributions," said Mr Brent.

The Minister for Agriculture, Fisheries and Forestry the Hon Joe Ludwig MP said the celebration would highlight the essential role which Australian agriculture plays in the maintenance of national and global food security.

"It will showcase the role our farmers play as environmental managers, creating and delivering sustainability through best practice management," said Minister Ludwig.

The Australian Year of the Farmer 2012 will be a year-long program of activities that will celebrate the contribution farmers, growers and rural communities make to the country, offering recognition for feeding the nation, leading the world in farming techniques and innovation and for sustaining the agribusinesses that underpin the Australian economy.

As part of the program, a range of events, initiatives and educational programs will be rolled out across the nation throughout 2012.

Royal Botanic Gardens images appear courtesy of Jaime Plaza.

AUSVEG CEO, Richard Mulcahy, and Chairman, John Brent, at the official launch of Year of the Farmer in Sydney.

Ask the industry with Scott Mathew

Scott Mathew, Technical Services Lead from Syngenta

Managing crop nutrition and optimising yield potential can be a tedious task faced by many growers. With the development of disease greatly influenced by levels of soil fertility and plant nutrition, it is important to get the balance right. Scott Mathew answers your questions in this edition of Ask the industry.

Question: What is the significance of nitrogen nutrition in relation to the development of Target spot *(Alternaria Solani)* in a potato crop?

It would be fair to state that there are often significant interactions between crop nutrition and the level of development of certain diseases in plants. Target spot development is greatly influenced by levels of soil fertility and plant nutrition (along with many other factors such as environmental conditions, farm hygiene etc). It is often more severe when the potato crop has been subjected to poor nutrition, injury or other types of stress.

Overseas studies, predominantly from the United States, have shown that applications of high rates of nitrogen can suppress the development of Target spot. It could then be stated that Target spot may be more common in crops and particular leaves that have lower or deficient levels of nitrogen. Deficient levels of nitrogen in the potato crop can make the control of Target spot far more difficult.

However, before you apply a big drop of nitrogen to your crop to control this disease, it must be stated that these rates of nitrogen applied for control of Target spot are often higher than that required for optimising yield and maintaining tuber quality. High rates of nitrogen at the wrong timing can have negative effects on yield and tuber quality.

Effective and economical control of Target spot can be achieved by managing crop nutrition (with particular focus on nitrogen applications, timing and soil PH levels) for optimising yield potential in combined use with well timed fungicides.

Question: Why does this make fungicide application, prior to row closure, so critical?

Potato plants (pre row closure) still provide good access of fungicide, with a properly calibrated and operated sprayer, to lower leaves where Target spot is more inclined to infect early. Therefore good coverage and spray penetration into the lower canopy can be achieved.

Fungicide applications at this particular time can greatly assist in slowing the development of disease by keeping inoculum levels low and reducing the likelihood of infection, however as discussed, good soil and plant nutrition are also critical.

Once rows close over, accessing lower leaves with fungicide becomes far more difficult. From my perspective and from trial work conducted in the field, one of the best fungicides to use at this important time interval is AMISTAR TOP (Group 3 and Group 11) due to its protective and early curative properties. It really is the last opportunity to get good coverage of high calibre fungicides onto the lower leaves to restrict the development of the disease.

Question: How do growers evaluate the different nozzle technologies available or if your current nozzles are achieving adequate coverage?

Water sensitive paper can be placed in various sections of the canopy (upper and lower leaves as well as the inner and outer canopy) and is a quick and effective way to measure coverage and critically spray penetration into the canopy particularly to lower leaves where diseases such as Target spot can initiate. Water sensitive paper has been developed by Syngenta as a part of an application technology package. Results are easily observed and necessary changes can be made instantaneously to ensure results.

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*: ***info@ausveg.com.au.***
Please note that your questions may be published.

Soil solutions
with Rohan Davies

Balanced nutrition

Rohan Davies, Technical Agronomist at Incitec Pivot Fertilisers, discusses the importance of balanced nutrition in producing healthy potato crops.

Question: Can plants have too much of a nutrient?

Nutrient balance is an important concept in soil fertility, just as it is for human health. We all know the benefits of eating a balanced diet and the pitfalls of eating too much of a good thing; plants are no different and without a balanced diet they will be unable to reach their full productive potential. Nutrient imbalances can also cause crops to become more susceptible to disease pressures.

The solution is to understand the nutrition program and soil nutrient reserves through regular soil testing and analysis. With this information, we can assess whether the crop is getting a balanced diet for healthy growth and production, or make corrections to address any imbalances.

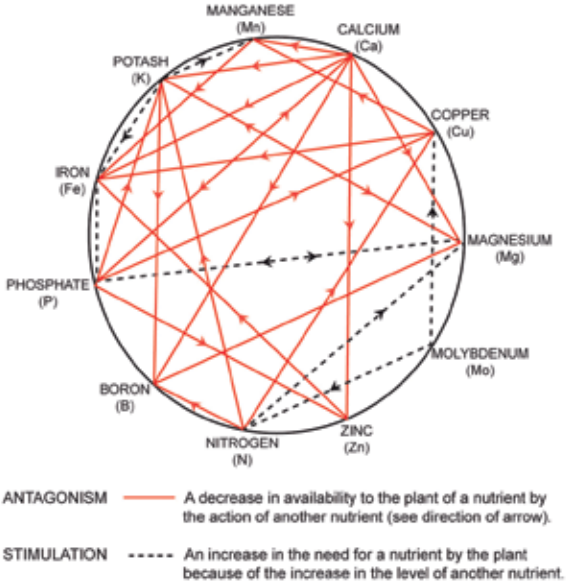
Nutrient imbalances can occur for a range of reasons, including fertiliser and ameliorant use and environmental factors. High levels of particular nutrients can interfere with the availability of other nutrients to plants i.e. they can be antagonistic. For example, a heavy application of nitrogen fertiliser may decrease the availability of potassium, boron and copper to the plant, to the point that deficiency symptoms occur. Increased nutrient levels can also drive the demand for other nutrients. For example, if more nitrogen is used, this may stimulate a demand for more magnesium.

The following diagram is a good representation of the interactions between nutrients in the soil.

Keeping nutrition in balance may also reduce disease pressure in your potato crops.

Mulder's chart

This diagram is a generalisation to illustrate the interaction between nutrients. Some plants require different levels of nutrients. This diagram does not indicate the specific responses for every plant species.



Disease and nutrition interactions

Disease	Pathogen	Effect of nutrient form
Stem canker	*Rhizoctonia solani*	Decrease when nitrate nitrogen applied
Potato virus X	Potato virus X	Decrease when ammonium nitrogen applied
Scab	*Streptomyces scabies*	Decrease when ammonium nitrogen applied
Wilt	*Verticillium dahliae*	Decrease when ammonium nitrogen applied

Source: *Adapted from Huber and Graham, The role of nutrition in crop resistance and tolerance to diseases, 1999.*

Even different forms of nutrients, for example, ammonium nitrogen rather than nitrate nitrogen or vice versa, can affect the crop's ability to withstand disease pressures.

The table shows some interactions to consider.

To help optimise crop production, a highly available and balanced supply of all of the essential nutrients is required. Arrange soil testing today for a complete picture of nutrients available to your crop and the balance of these nutrients.

Soil nutrition questions

Please send your soil nutrition questions to *Potatoes Australia*.
Email: info@ausveg.com.au
Phone: (03) 9822 0388

An innovating spud

National Manager for Potatoes at Elders Rural Services, Rene de Jong, takes a closer look at the Innovator potato variety.

Breeding programs around the world spend millions annually on trying to develop a better potato. The complicated genetics of the potato plant make breeding a new cultivar, which carries with it the right combination of characteristics for a particular end use, always problematic. Despite this, every now and then a new variety which offers a significant improvement over an industry standard comes along and the Innovator may fall into this category.

Bred in the Netherlands by HZPC (HZPC is one of the world's largest private seed potato companies) and imported into Australia by Harvest Moon in the late nineties, the variety is now a major player for processed potatoes for McCain Australia used exclusively for French fry production.

A cross between Shepody and a breeding line, Innovator has a pale cream flesh and a russetted skin. Although attracting criticism for a lower dry matter than Russett Burbank and other related types, it has a major processing strength in that the distribution of starch throughout the tuber is considerably more uniform than other varieties used for French fry production – this produces a fry of uniform texture.

> "Innovator is now one of the top 20 varieties in the UK having jumped 22 places in the past twelve months alone."

It is a potato which boasts a long growing period and does not set a large amount of tubers but those that are set are uniform in shape. It also does not display internal disorders such as hollow heart and sugar ends. A further advantage for growers is that its time to maturity is approximately three to four weeks less than most other French fry varieties. Innovator is also a good potato for the fresh market offering a superior texture than many other drier matter types with excellent baking and roasting characteristics.

As an offspring from Shepody, it shares the same intolerance of Metribuzin. There is also some doubt about its ability to perform in extreme summer heat although the evidence here is unclear.

It is not only doing well in Australia but in many other countries around the world and plantings are increasing rapidly; Innovator is now one of the top 20 varieties in the UK having jumped 22 places in the past twelve months alone.

For more information, please contact: Rene de Jong
Email: rene.dejong@elders.com.au
Website: www.elders.com.au
Or your local Elders representative.

APRP2 review reveals research preliminaries to industry

Members of the Australian Potato Research Program Phase Two met recently to share preliminary research results with members of the potato industry, collaborative international researchers and the supply chain, writes Anne Ramsay

Early October saw the first review of outcomes from the Australian Potato Research Program Phase Two (APRP2) with very positive feedback. Research and industry members met to share their results and to seek input from peers and industry to ensure future outcomes are relevant and valuable.

The review focused on the soil and plant health emphasis of the APRP2 program but also involved three other active potato research projects that fell outside the program addressing breeding of cultivars, development of controlled traffic techniques and managing the Potato cyst nematode (PCN) threat.

The APRP2 program has been operating for two years and results are preliminary but encouraging. Research findings were presented from all five core research projects, with most projects able to provide positive outcomes. Project discussions were enhanced by input from the grower, processing and research communities, as well as representatives from agchem companies and international contributors to the program, who were able to bring their own experience and perspective when reviewing results to-date and suggesting steps for the future.

Several opportunities for collaboration were identified within the program but also for the external potato projects, with steps put in place to share results and also activities - for example, by projects providing testing services for each other. This will lead to better outcomes for industry and greater efficiencies in the program.

Researchers and members of the industry at the Australian Potato Research Program Phase 2 (APRP2) meeting.

Peter Hardman, Chairman of the Potato Processing Association of Australia (PPAA), was impressed with the quality of the research and gave support to the notion of an annual APRP2 review.

"The R&D work that was presented at the review was of extremely high value to the industry," said Mr Hardman.

Particularly impressed with the new talent emerging in the research community, Mr Hardman said the university students involved in the research program were contributing valuable work to the projects.

"The PhD students that are involved in the R&D should also be proud of their achievements and the standard of work they are performing," he said.

The APRP2 program is looking forward to sharing its outcomes with industry in a series of events organised for next year when it has another year of results under its belt.

Grower Rod Fraser, from Fraser Farms, was also in attendance at the APRP2 review and said the work that has been achieved is encouraging.

"We are reaping the reward from the research and funding that is directed at the potato industry," said Mr Fraser.

"For example, the Tomato-potato psyllid/Zebra chip Integrated Pest Management project certainly gives me a sigh of relief knowing that Australia is preparing for this disease should it ever come here," he said.

> "The R&D work that was presented at the review was of extremely high value to the industry"

Other projects in the program include:

- Showing that DNA testing of soils and tubers will be a valuable aid to managing certain diseases in potatoes
- Increasing understanding of the nature and influence of Verticillium on the Australian potato industry
- Developing possible disease management strategies through the use of micro-elements and other soil and foliar amendments and treatments.

The APRP2 program is committed to fostering the development of pioneering research outcomes for the industry and looks forward to engaging more closely with the industry through the future extension initiatives of HAL and AUSVEG.

This component of the APRP2 has been funded by HAL using the processing potato industry levy and voluntary contributions from the New Zealand Institute of Plant and Food and matched funds from the Federal Government. The Department of Primary Industries Victoria have provided in-kind support.

An international industry event

The future of food security, potato genome research and cultivar breeding programs will all be on the agenda for the esteemed speakers appearing at the World Potato Congress in Edinburgh, Scotland, in 2012.

Held from 27-30 May, the World Potato Congress will see leading researchers and key members of the industry present innovative findings on multiple projects which affect the sector. The scientific community attending the World Potato Congress will exchange important knowledge with peers and the commercial sector, with the significant issue of collaboratively establishing a sustainable industry that utilises energy, land, water and chemicals. Lead speaker on the first day, UK government chief scientific adviser, Professor Sir John Beddington, will examine the approaching global challenges of food security and how policymakers can influence more sustainable intensification of agriculture with crops like the potato. Professor Beddington will discuss the recommendations of the UK Government Office for Science Global Food and Farming Futures report and how, one year on, this has been taken forward globally. Chair of the Potato Association of China (PAC) and vice governor of the Ningxia Hui Autonomous Region of the People's Republic of China, Dr Qu Dongyu, will address the Congress on the future of China's supply of produce. An influential potato industry spokesman and specialist in food security, Dr Qu will discuss how China's potato industry will develop to maintain supply for the expected 1.5 billion-strong population by 2030. Unravelling the potato genome and investigating how new found knowledge will ultimately impact production, nutritional qualities and consumer needs will be the focus for Dr Glenn Bryan of The James Hutton Institute, Dundee, Scotland. Dr Bryan, who led the UK component of the research team that sequenced the potato genome, is set to discuss the integration of scientific approaches in the industry to further develop the effectiveness of breeding programs. Dr Bryan said the use of genetics-based selection methods is very promising and technology to utilise the genome sequence is already underway.

As part of the industry's sustainability agenda to decrease the carbon footprint from potato production, Professor Anton Haverkort of Plant Research International Wageningen University and Research Centre, Holland, is also set to discuss and recommend sustainable actions for growers.

i For more information visit: www.wpc2012.net

International R&D Update

Linking growers with markets and the benefit of farmer business schools

Producing for a market and viewing farms as business enterprises, is a pivotal ingredient running through a project that aims to better connect potato growers with markets.

The introduction of innovative strategies for improving on-farm productivity, post-harvest value addition and market development, is at the forefront of the project which aims to integrate small holder growers into profitable supply chains and enhance the capacity to adopt new technology and innovative practices that are market driven.

Partners central to the project include the International Potato Centre (CIP), the Australian Centre for International Agricultural Research, the Department of Agriculture and Food Western Australia (DAFWA) and the University of Adelaide - School of Agriculture.

Experiences both in Australia and the developing world show that successful farm business requires the capacity not only for technological change but also for nurturing relationships among the market chain. The Participatory Market Chain Approach, an R&D method which assists growers to intervene in market chains and improve knowledge, outcomes and profits, utilised in previous projects in Asia, identified that a requirement had arisen to establish Farmer Business Schools that could train and empower small-scale farmers to become increasingly active partners in new market chains.

The Farmer Business School approach being piloted in Indonesia, combines methodological elements of participatory chain-wide learning and farmer field schooling. With support through the Australian Centre for International Agricultural Research (ACIAR), CIP furthered development efforts for the wider application of Farmer Business Schools in south-east Asia and the Pacific. The Farmer Business School's key elements consist of a structured learning process, learning content on marketing, market chain partnership, farmers' group building, and targeting market opportunities.

A spokesperson from ACIAR said the approach to food security includes understanding post-farm gate processes and their implications on price.

"Helping smallholders understand and negotiate the move into new markets is an important part of managing surpluses to achieve the benefits of additional income; the Farmer Field Schools help growers to engage with markets by making research into these issues available to them," said the spokesperson.

Dr Dindo Campilan leads CIP's research program on root and tuber crops in Asia, dealing with innovations for improving on-farm productivity and market development. At a conference at Parliament House, Canberra, Dr Campilan gave a presentation on the current work being conducted.

"Everyday decisions by farmers involve a constant balancing act between preserving and growing their limited assets, between immediate benefits and longer term returns, and between concrete economic rewards and less tangible values for building social capital," said Dr Campilan.

"Like Australian farmers having success in Australia's bush-tucker industries, we have had success in supporting farming communities to utilise local resources, such as crop genetic diversity and traditional know-how, for selling products to elite urban consumers and supermarkets," he said.

Post monitoring studies were conducted for both the Participatory Market Chain Approach and the Farmer Business Schools. These indicated that only five months after having completed the program, at least 30 individuals had initiated or expanded potato businesses by utilising the marketing innovations introduced through the Participatory Market Chain Approach, and upon completion of the Farmer Business Schools, growers had successfully negotiated with and had started to supply fresh potato to a local supermarket in Central Java, Indonesia.

Participants who have successfully started/expanded their businesses.

Ida Rosida developed Cumelly jacket potato chips to increase her rural household income.

Photos appear courtesy of The International Potato Centre (CIP)

For more information visit:
www.aciar.gov.au
or www.cipotato.org

Q&A Young grower profile

Trent Wells

Name: Trent Wells
Age: 35
Location of farm: Rocky Cape, TAS
Potatoes farmed: Processing potatoes for French fry production.
Role in company: I am the Manager. I oversee the day to day running of the farm including crop management and I also work full-time with the diversified cropping and beef farm next to our property.

How did you get involved in the industry?

I've always been involved in the industry really, from the time I was a kid. I grew up on a rural property so I've always worked on farms. I guess it's in my veins, but you have to really want to pursue it.

What is your average day like?

It is extremely varied, and depends on what time of the year it is. I could be spraying, spreading, planting, irrigating, cartage or harvesting some of the crops.

What do you like most about your job?

The freedom in the rural industries is the best part; you can organise your own day and come and go around that. Another element would definately be reaping the rewards of all the hard work and effort you've put into a crop. I also have a young family and I wanted them to grow up in the country; it's a great environment to work in.

How do you think young people could be encouraged into the industry?

That's definately a hard issue. It has been a battle for us to get to where we have got and it is bloody hard work; potato growing can be expensive to start off in. But something really needs to happen where we can encourage young people into our industry – they're just not making farmers anymore. Unless you're on a family farm, it can be quite hard to get growing, and even then if you are on a family farm, you will need to buy it eventually so it can be quite costly. Maybe if the government could help young farmers with some of the expenses with buying and

running a farm, then I think it would make a difference.

What do you think could help ease the stress on growers?

The cost of land has skyrocketed in the last decade, especially in the north west of Tasmania where I am. It is just very hard to try and make an income with the price of land opposed to what you can make off it. Maybe some assistance in buying farms for production would help, as we are providing for the nation.

What do you think is the biggest threat to the potato industry?

We need to be sustainable – we cannot afford to have (processing) factories closing down in the near future. If potato plants close down in Tasmania, it would be absolutely devastating for us; we don't want buyers sourcing potatoes from foreign markets because there are not enough processing plants to get our potatoes through to consumers. Australia grows the best produce in the world in my opinion and we need to make sure we are able to keep growing it into the future.

Do you see your future in the industry?

Yes, I hope to stay in the industry. I love growing spuds; there is no better feeling than digging them up and seeing what you have grown.

I bought some of my own land about 18 months ago and we still lease some ground as well. For me it was really the next step, as I had been growing for quite some time and I really enjoy what I do.

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

I think I would have done a trade. That is probably one of my biggest regrets, not doing a trade to have something to fall back on but also because I quite enjoy construction.

Calendar of events

4-6 January 2012

The Potato Expo

Where: Orlando, Florida

What: The largest conference and trade show for the North American Potato Industry, The Potato Expo offers interesting and informative programming, which will cover important issues affecting the industry. The event will provide numerous networking opportunities with key decision-makers and showcase the latest products and services for the potato industry.

Further information: www.potato-expo.com

25-26 January 2012

Washington Oregon Potato Conference

Where: Washington

What: The Washington Oregon Potato Conference presents delegates with an opportunity to network with fellow members of the potato industry, attend the exciting trade show featuring the latest in modern machinery and the Leadership Recognition Banquet which acknowledges efforts by those in the industry. With important and relevant topics on the agenda, the Conference will cover seed certification, the Potato psyllid and Zebra chip disease, Powdery scab, Root-knot nematode and Potato cyst nematode.

Further information: www.potatoconference.com

10-12 May 2012

AUSVEG National Convention, Trade Show and Awards for Excellence 2012

Where: Hobart, Australia

What: Now the biggest event of its kind in the Australian horticulture industry, the AUSVEG National Convention showcases speaker sessions, exhilarating entertainment and the impressive trade show. Set at the Wrest Point Hotel-Casino in Hobart, the event will provide delegates with an opportunity to forge relationships with key members of the industry, supply chain, researchers and vegetable and potato growers.

Further information: www.ausveg.com.au or email convention@ausveg.com.au

AUSVEG

HAL
Horticulture Australia

World Potato Congress

Grower Tour 2012

22-31 May

Register your interest today!

- Expressions of interest welcomed

For further information or for expressions of interest, please contact Hugh Gurney on (03) 9822 0388 or email hugh.gurney@ausveg.com.au.

The tour to Belgium and the United Kingdom will incorporate Scotland for the World Potato Congress.

The project has been funded by HAL using the fresh and processed potato levies, voluntary contributions from industry and matched funds from the Australian Government.

Cleaning, handling and storage systems.

Think of Grimme and you think of potato harvesters.

Complete the potato process from field to store with the Grimme range of advanced crop handling and storage equipment.

At every stage during and after harvest, every transfer and drop is critical.

Protect your investment with Grimme.

Call Craig Hopkins on 0418 501 647.

LANDPOWER
www.landpower.com.au

POTATOWORLD
The Used Potato Harvester Specialists

GRIMME

IMC LPA 1095 PT