

potatoes

SEED SPECIAL

australia

February/March 2012



Gary Crick

**Sprouting a career
in seed potatoes**

Reaching the audience
the Potato Extension Program

**2012 AUSVEG
National Convention**

Serving up a feast for the industry

Potato profile

Are you managing
seed potatoes correctly?

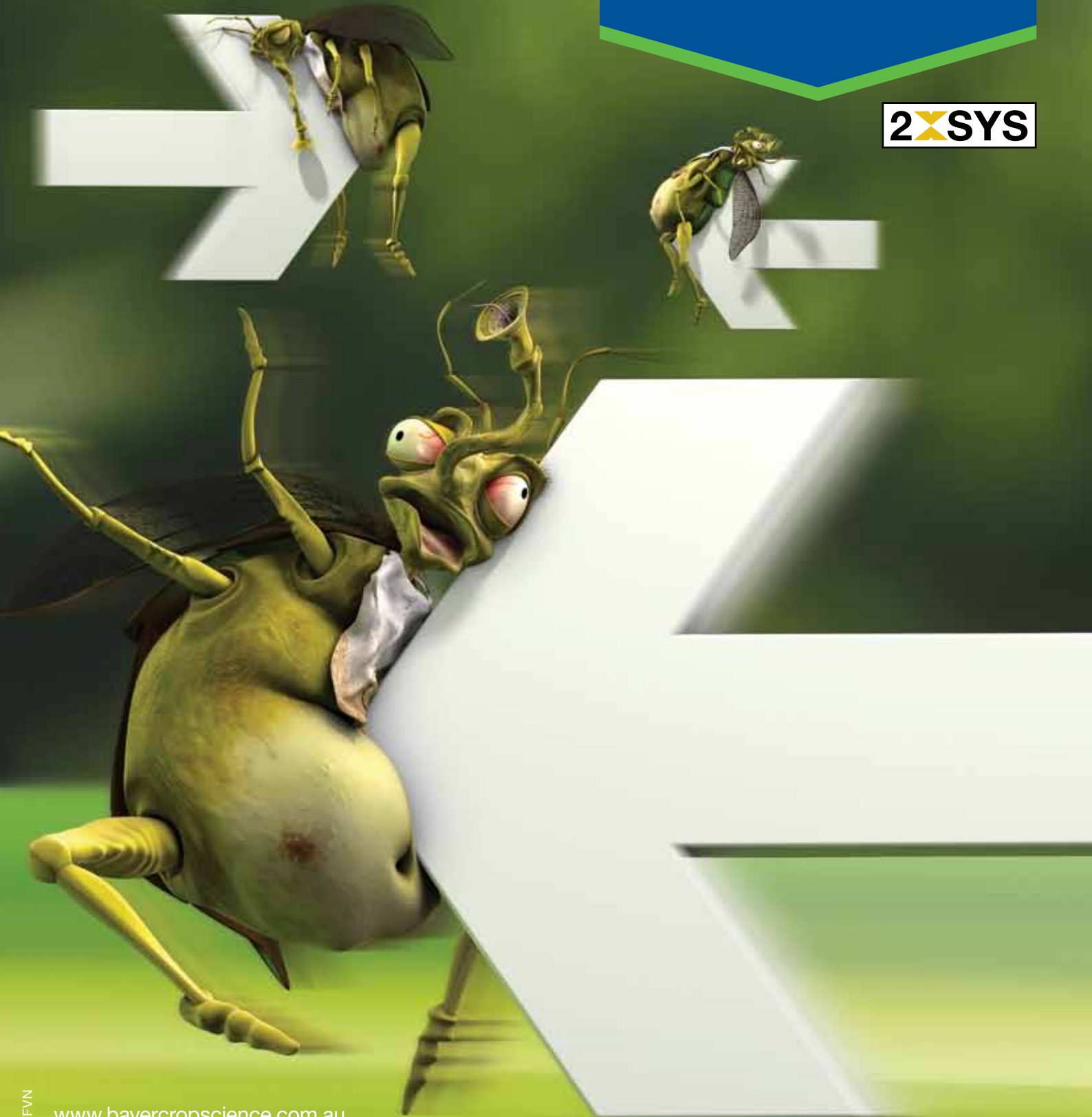
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FRONT COVER:

Gary Crick

Photograph courtesy of Ian Wilson Photography

John Brent AUSVEG Chairman

It is no secret that Australian growers have been doing it tough lately, and with the closure of the Heinz Victorian-based tomato sauce factory, it seems the trend of relocating processing companies to offshore locations is continuing. The repositioning of local manufacturing businesses is indicative of the broader picture that has seen growers across the country gripped by higher costs, increasing competition from imported produce and poor recognition of Australian products in supermarkets due to a confusing labelling system.

With 2012 having recently been crowned as Australian Year of the Farmer, policy makers in Canberra need to keep the plight of the food sector in mind if the vegetable industry

and the broader farming sector are to be sustainable. In order to avoid potential future food supply issues we must pay greater attention to ensuring our long-term food security through strategic investment in areas of need and through stronger political support for the sector and its issues. The only way we can safeguard the vegetable and potato industries of Australia is to ensure decision-makers in Canberra and in our State Parliaments not only understand the issues facing our farmers but also act to create policies which will secure their future in Australia.

With only several months until the biggest event in horticulture arrives - the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence

- another exciting event is also fast approaching. The World Potato Congress potato grower study tour takes place from 22-31 May this year and anticipation is mounting for this experience of a lifetime, which will cover territory throughout Belgium, the United Kingdom and Scotland. Bringing together over 600 international delegates including growers, producers, traders, processors and manufacturers, the Congress will enable a global exchange of information. We have had an overwhelming response to the tour and AUSVEG is extremely enthusiastic and excited to be offering this opportunity to growers. I am sure it will prove to be an important educational experience.




John Brent
Chairman
AUSVEG

Richard Mulcahy AUSVEG Chief Executive Officer

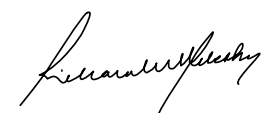
With the future of the Australian industry at the forefront of our minds, ensuring that the voices of Australian growers are heard is imperative. In an effort to promote avenues of better communication between vegetable growers and politicians, along with senior staff from AUSVEG, I recently attended the Victorian launch of the Australian Manufacturing & Farming Program (AMFP) in Ballarat. The initiative, launched by Senator John Madigan, aims to close the gap between decision-makers of the country and the manufacturing and farming community. AUSVEG has put its support behind the venture and hopes that it will assist with our efforts to ensure Australian growers are heard. I look forward to the national

launch of the initiative in Canberra at Parliament House in March.

I am also pleased to welcome a new addition to the vibrant AUSVEG team in 2012. Christopher Ritchie has come on board to fill the role of the Manager – Special Projects, and will be heading up the Potato Industry Extension Project. Mr Ritchie is already taking strides towards creating better lines of communication in the Australian potato industry and has visited growers and researchers alike over the past few weeks. Mr Ritchie will essentially be acting as an intermediary between growers and the wider industry and will work to ensure a higher uptake of potato industry R&D. The program, which is funded by HAL and coordinated

by AUSVEG, will assist in translating the outcomes of potato R&D projects into a form that growers and processors can practically use on-farm and in processing facilities.

It is essential that growers are supplied with lucid and intelligible information on R&D projects which can be put into practice. Through this program, AUSVEG will facilitate multi-level and multi-directional information exchange between growers, processors and the research sector which will enhance understanding for the benefit of the wider industry. I am confident that Mr Ritchie's experience across several areas of the government sector will only add to his determination and success in the role.

Richard J Mulcahy
Chief Executive Officer
AUSVEG



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Editorial

SEED SPECIAL

A healthy and productive crop begins with good quality seed and this edition of *Potatoes Australia* presents readers with an abundance of information and tips from experts within the industry. Detailing the facts and identifying the intricacies involved with several aspects of growing and managing seed potatoes, this edition of the magazine covers seed selection, soil diagnostics, seed handling, pests, viruses and diseases, and traceable packaging.

Communicating R&D outcomes to Australian growers and the wider industry is an imperative component for the future and sustainability of the industry. However, the dense information presented in some scientific articles and reports can be lost in translation or seen as difficult for growers to apply in a practical on-farm setting. The Potato Extension Program will see better communication and translation of R&D outcomes, delivered to growers in a comprehensible way. Christopher Ritchie speaks with *Potatoes Australia* about the new initiative and what he hopes it will mean for the sector (pg 16).

With less than four months to go until the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence, members of the industry are being urged to show their support for the



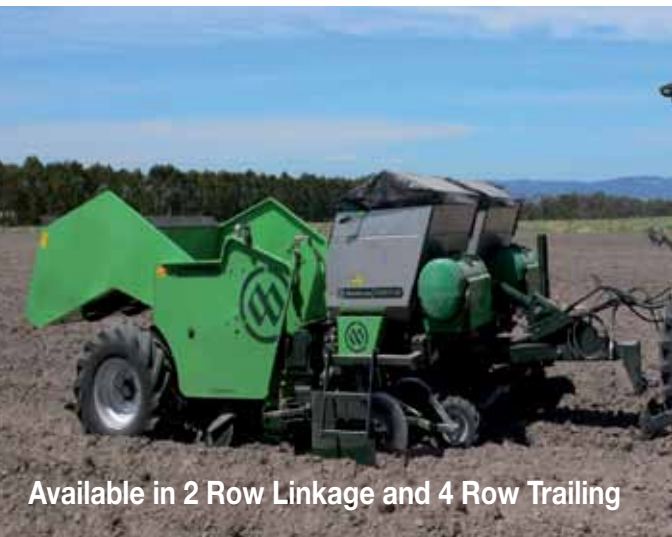
sector by attending the biggest event in Australian horticulture. With a special guest appearance from Callum Hann, of *MasterChef* fame, delegates are set to enjoy the culinary delights of the Tasmanian region (pg 10).

A number of research projects are also featured in this edition detailing the challenges and achievements encountered when dealing with potato seed. Projects include methods to

accurately detect pathogen and disease levels in seed and soils (pg 12), improving the performance of Australian potato seed internationally (pg 18) and new Potato cyst nematode resistant potato cultivars approaching the Australian market (pg 20).

As well as a selection of industry news, *Potatoes Australia's* regular columns - Ask the industry (pg 26), Soil solutions (pg 27) and the Potato

profile (pg 28) - are in the mix, as well as the International R&D update (pg 31) and the Young grower profile. For this edition of the Young grower profile, *Potatoes Australia* spoke with Jane Nix. Based in the tablelands in Queensland's far north region, 27-year-old Miss Nix works alongside her father David in the packing shed and on the family farm growing gourmet potatoes (pg 32).



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Gary Crick

Sprouting a career in seed potatoes - pg 22

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News in brief

Aussie growers' voice to be heard in Canberra

Communication channels between Australian vegetable growers and politicians are set to expand through a new initiative.

Giving an insight into the daily working lives and hardships faced by Australian growers, the Victorian launch of the Australian Manufacturing & Farming Program (AMFP) took place in Ballarat recently with the aim to create greater dialogue between the decision-makers of the country and those that provide produce for its people. The farming initiative, proposed by Senator John Madigan, was intended to narrow the divide between politicians and working Australians. With the event having attracted several political

figures, including Senator Nick Xenophon and the Hon Bob Katter, it is anticipated that the information communicated through the program will benefit politicians, particularly when debating legislation related to the horticulture industry. Showing support at the event, AUSVEG actively took part in proceedings and was represented by AUSVEG CEO, Richard Mulcahy, and AUSVEG Director, Luis Gazzola. The national launch of the initiative will be held in Canberra on 16 March, 2012.

Senator Madigan exhibiting his blacksmith skills, alongside Senator Nick Xenophon.



Above left: Attendees at the Victorian launch of the AMFP. **Above right:** Senator Nick Xenophon, AUSVEG CEO, Richard Mulcahy, AUSVEG Director, Luis Gazzola and AUSVEG Communications and Public Affairs Manager, William Churchill.



Healthy root systems: Key to adaptable plants

New research has moved the international industry closer to environmentally adaptable and pest resistant vegetable crops.

An international joint research project has shown root growth in a plant can be adjusted by simply managing an essential protein. Key researcher, Dr Ivo De Smet from the University of Nottingham, UK, said with the world's population growing it is becoming increasingly important to ensure global food security is possible.

"Optimising the root system of plants is essential and these recent results will contribute significantly to our goal of improving crop growth and yield under varying environmental

conditions," Dr de Smet told Science Daily.

The protein had been previously identified to influence the way in which plants interact with different species of nematode. It is hoped the research will lead to further investigations of how to prevent infestations of the pests in the early periods of plant development. The results of the research can now be used to produce new plant lines which have an improved root system to resist environmental changes.

Source: Science Daily

Blue seed

A new seed certification level with a tolerance of below 4% for Potato Virus Y has been developed.

Potato Virus Y (PVY) has severely affected the yield and quality of potato crops in the Eastern parts of Australia in recent years. Spread by aphids and infected seed, the incidence of the virus and the damage it can cause could be reduced by utilising quality potato seed. As a foundation it is critical to have low levels of PVY in seed stocks, which reduces the source for aphids to acquire the virus and spread the disease. To increase productivity and reduce spread of potato disease, the industry must aim to reduce the incidence of PVY in all crops.

With a tolerance of below 1% PVY for red tagged

stocks, certified seed offers more security for growers when planting, where alternatively, un-certified seed is an unknown quantity. To counter this, a new certification level with a tolerance of below 4% PVY, labelled with distinctive blue certification tags has been developed. This allows seed buyers to make a more informed choice when selecting appropriate stocks. Ensure not to plant a problem, where seed is one of the highest input costs and it is worth getting it right.



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Serving up a feast for the industry

With less than four months until the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence, exhibitor booths are already 70 per cent sold with delegate numbers increasing quickly.

Excitement is growing amongst those in the industry with the biggest event in Australian horticulture fast approaching. Following from the success seen in previous years, the 2012 National Convention, Trade Show and Awards for Excellence is set to once again raise the bar and surpass expectations. Bringing together members from across the industry, the event will not only provide an invaluable networking opportunity for delegates, but also give growers the chance to learn about the latest developments in the horticulture industry. The event will showcase Tasmania's beautiful capital city of Hobart, which will play host to the highly anticipated event, where delegates will be taken on tours across the city to its most renowned landmarks and attractions. One of the major components of the event will be the enormous Trade Show, which has already sold over 70 per cent of its exhibitor space. The Trade Show will see some of the biggest brands in the industry on display and give delegates an inside look at the major players from the supply and services sectors of the industry. Innovative



“ I had a fantastic time meeting people, cooking and exploring the stalls at last year's AUSVEG Convention - Callum Hann. ”



technology, R&D initiatives and information about the future of the sector will take a prominent place within the program also.

Plating up a feast for delegate's eyes, the program will not only include the spectacular Trade Show spanning across several show rooms with additional machinery on display outside, but also many newly developed events. The Flavours of Tasmania section is a segment of the trade show which will showcase some of Hobart's most renowned



Callum Hann is set to showcase his cooking mastery at the 2012 AUSVEG National Convention.

food and wine for delegates to experience. With delicious culinary mastery in mind, celebrity cook Callum Hann will again return to host the popular *Celebrity Chef Lunch* at Wrest Point. Most will remember Mr Hann as the youngest contestant and runner up from the second series of ratings giant *MasterChef Australia*. With a string of opportunities across the nation, Mr Hann has also worked closely with 'Jamie's Home Cooking Skills' launched in Australia, is the spokesperson for the Adelaide Produce Market retail development program, and co-founder of Sprout, a joint cooking school initiative alongside accredited practicing Dietitian, Themis Chrissydis. The *Celebrity Chef* event will see two of Hobart's most prominent young cooks battle it out to create the most delectable dish sourced from local produce with

Mr Hann as a guest judge. "I had a fantastic time meeting people, cooking and exploring the stalls at last year's AUSVEG Convention," said

“The young growers who have recently entered or are about to enter the industry are the lifeblood of the vegetable growing industry in Australia.”

Mr Hann. "I can't wait to be involved in the next event in Hobart!" An entertaining experience from previous years at the Convention, the Young Growers event is set to return in May with a splash. The event, sponsored by Dow AgroSciences, will see

the young bloods of the industry taken on a jet-boating adventure which is sure to offer an exciting adventure. Shooting passengers across Hobart's

River Derwent, Wild Thing Adventures jet boating will be sure to rank amongst the most memorable of experiences for young members of the industry. Supporting the younger growers, Dow AgroSciences proudly sponsors the Young Growers Event and Young

Growers Award at the AUSVEG National Convention each year. A spokesperson from Dow AgroSciences said the future of the vegetable growing industry is very bright.

"In this country, as part of our own future, the young growers who have recently entered or are about to enter the industry are the lifeblood of the vegetable growing industry in Australia.

"Dow AgroSciences is proud to work alongside current and future growers in the vegetable industry to ensure that vegetable growing continues to be an integral part of Australia's efforts to ensure continued self-sufficiency in the provision of top quality vegetables for the growing Australian population."

The three-day Convention will conclude with one of the most highly anticipated and recognised events in the industry, the AUSVEG National Awards for Excellence and Gala Dinner. The prestigious occasion, held on Saturday 12 May, will honour some of the most exceptional members of the industry with a glittering ceremony and gala dinner which will showcase special entertainment and esteemed guest speakers.



For more information:

Nominations for the National Awards for Excellence are open and members of the industry are strongly encouraged to nominate now.

REGISTER NOW!

If you have not already secured your place at the 2012 AUSVEG National Convention, Trade Show and Awards for Excellence, be quick to contact AUSVEG on
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Understanding seed health

Research is currently being undertaken to better understand the importance of tuber borne fungal, bacterial and nematode inoculum on disease in subsequent crops, and methods to accurately detect levels on seed, writes Dr Robert Tegg.

Researchers at the University of Tasmania within the Tasmanian Institute of Agriculture (TIA), are evaluating the importance of seed-borne inoculum on disease outcomes as part of the Australian Potato Research Program Phase 2 (APRP2). The work utilises some of the molecular DNA testing tools generated by the South Australian Research and Development Institute (SARDI) in the initial APRP1. The team, led by Associate Professor Calum Wilson,

includes researchers from both TIA and SARDI. Key pathogens and diseases targeted in this seed-health project include: *Rhizoctonia solani* AG2.1 & AG3 (Black scurf), *Meloidogyne fallax* & hapla (Root-knot nematode), *Spongospora subterranea* (Powdery scab), *Streptomyces scabiei* (Common scab) and *Verticillium dahliae* (Verticillium wilt).

One of the key objectives is to compare DNA testing versus visual assessment for accuracy in determining disease risk.

DNA testing, although more time consuming and expensive than visual assessment, has the advantage of detecting pathogens (inoculum) not visible to the naked eye, it may also aid in distinguishing diseases with similar symptoms e.g. Common vs Powdery scab.

This project will determine the relative importance of seed borne inoculum, for various potato pathogens in the development of disease, and the subsequent impact on commercial production. This

information may ultimately lead to improved and targeted disease management for these important potato pathogens.

Point vs continuous sampling for certification

Standard seed certification practices have utilised point sampling, whereby tuber samples are taken from the beginning and end of a seed lot and assessed for disease. There is some conjecture as to whether this sampling strategy



Sample of peeled tubers; the peel is sent to SARDI for DNA analysis.



TIA staff visually assessing tuber samples for disease.

accurately reflects the overall disease loading of a given seedlot. Studies over the first two years of the project tested the differences between two different sampling strategies: 1) the traditional point sampling (two samples in total from beginning and end of seed lot) vs 2) the more labour-intensive continuous sampling where random samples are collected continuously from the whole seed lot (ten randomly collected samples). The results show that current certification practices (point sampling) accurately predict relative disease loading of a given seed lot in greater than 95 per cent of cases, so the current sampling practices used for seed certification are a valid sampling technique. Year three will be used to confirm these findings.

Washing tubers - impact on disease load

From a research perspective one question that is often asked is 'Does washing/brushing tubers reduce the disease loading in a seed lot?' One initial study conducted in the last six months showed that for a crop that was carrying reasonable quantity of two key pathogens: *S. subterranea* (Powdery scab) and *R. solani* AG3 (Black scurf) that the effects of washing were pathogen specific.

Washing had no impact on *S. subterranea* (Powdery scab) inoculum whereas washing significantly reduced *R. solani* AG3 (Black scurf) inoculum by approximately 4-fold; changing a seedlot with a moderate disease risk to a low disease risk indicating potential benefits of washing. This trial will be repeated in the near future, however, washing seed is currently not a recommended practice.

Importance of seed versus soil inoculum

Multiple trials which are currently underway are assessing the joint role of both soil and seed disease inoculum. Field sites that have had their soil assayed for inoculum level using DNA testing will be planted with seed that has also had its inoculum level measured via DNA tests. Disease outcomes will enable a determination of whether soil inoculum is a more important indicator of disease risk, than seed based inoculum, or whether both sources of inoculum (seed and soil) are significant. Initial results in clean soil indicate that seed containing significant tuber borne inoculum (particularly *R. solani* AG3 - Black scurf and *S. scabiei* - Common scab) can give rise to disease.

Final word

In summing up the project Dr Wilson states that "It is good to have an independent assessment of these DNA testing technologies, such that the true value of this newer DNA testing assessment can be compared with traditional visual assessments,"

"multiple trial work will identify which particular technology is the most suitable for a given disease and therefore which tests are most suitable for commercial usage by growers. This will increase the available tools to industry and allow better prediction of disease risk attributable to seed quality."

It is important to note that the research presented in this article is preliminary in nature, and the strategies discussed are part of a novel research program. Key recommendations and findings making use of these tools will be made available to growers during the last year of the five year project where industry and grower workshops are planned.

This project has been funded by HAL using the processed potato industry levy and matched funds from the Australian Government. The University of Tasmania/Tasmania Institute of Agriculture has provided in-kind support.

processed potato industry levy and matched funds from

the Australian Government. The University of Tasmania/Tasmania Institute of Agriculture has provided in-kind support.

THE BOTTOM LINE

- New DNA testing tools are being assessed for their applicability in assessing tuber (seed) borne inoculum and disease potential.
- These newer DNA technologies are being compared to standard visual assessments in terms of practicality and accuracy in assessing disease.
- This APRP2-funded research project may lead to additional disease detection tools being made available to growers.



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Project number: PT09019

Controlling viruses in potato seed

One of the biggest issues potato seed growers can face is the presence of viruses in a crop. There are a range of management solutions, however to help growers win the battle against these viruses.

Australian vegetable growers select seed varieties according to their changing conditions and markets. With varying seed products with different characteristics or traits, choosing the appropriate seed and treatment is of the utmost importance when ensuring a healthy and productive crop. Insects, nematodes and seed or soil-borne diseases pose a serious threat to crop production. As a result, growers are continually looking for better and more effective tools for protecting their valuable crops



Solutions development - Technical Lead, Syngenta, Scott Mathew.

“Viruses cannot survive outside living host plants or insects.”

and yield. In recent years, modern seed treatments have emerged as one of the best options for growers to combat pests transmitting viruses and diseases, which attack early in the season when seeds are most vulnerable.

Immobile and reliant upon other organisms for dispersal (called a vector or carrier) most viruses that infect vegetable

crops are transmitted by the various sap-sucking insects that feed on the plants (thrips, aphids, mealy bugs etc). With an effort to maximise yields and minimise loss, preparing for the worst can often be the best defence against an unexpected incursion of pests, a virus or the spread of disease.

Technical Lead of Solutions Development at Syngenta, Scott Mathew, detailed the intricacies of pests affecting potato seed crops, contracted viruses and the best defence against an incursion.

the contents of the plant cell, meaning that the insect can acquire the virus. Therefore, if an insect has acquired virus particles from one plant, it can then deposit them in the next plant it feeds on, which leads to subsequent infection.”

Viruses are often described as either persistent or non-persistent. These terms relate to the length of time an insect takes to acquire and to transmit a virus and the length of time the insect remains capable of transmitting the virus.

- Persistent transmission: the insect needs to feed for several hours, often in food conducting tissues of plants, to obtain the virus. These can persist within the vector for up to several weeks.

- Non-persistent transmission: the insect needs only very short feeding times, usually from tissues near the surface of leaves, to obtain the virus. The virus is effective immediately but is not persistent within the vector.

“Viruses cannot survive outside living host plants or insects, with very few exceptions to this rule. Viruses can survive adverse conditions and for varying intervals between crop cycles in alternative weed hosts, volunteer plants, abandoned crops and infected seeds, and persistent viruses can also survive in the insect vector,” said Mr Mathew.

“Once a plant is infected with a virus it cannot be cured, but rather disease control should be aimed at preventing or delaying the infection of plants.”

A combination of the following management options can be successfully implemented:

Exclusion/avoidance

- Plant virus-free seed and seedling transplants.

- Grow crops in regions where the disease seldom occurs or during periods when the virus or its vector are at a low level.

- Quarantine, prevent infected plants from coming on to your property.

Keep the level of virus inoculum as low as possible

- Control weeds and other virus hosts.
- Use appropriate crop protection techniques to keep insect vector numbers as low as possible.
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- Offering growers a unique mode of action with no cross resistance with existing products CHESS works fast and permanently stops feeding aphids, leading to starvation. Once ingested CHESS offers protection against virus transmission by aphids.
- Remove crop residues as soon as harvest is completed.
- Separate new crops from maturing crops and avoid overlapping crops, especially continuous year-round cropping, where this is possible.

Protection of the host

- Plant virus-resistant or virus-tolerant varieties.
- Use highly reflective mulches and oil sprays to deter insects.
- Use barrier crops and bare land to reduce vector activity.
- Use insecticides strategically to protect plants from insects.



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Reaching the audience: the Potato Extension Program

Communicating the efforts and outcomes of scientific research and development projects can sometimes get lost in translation. The Manager of the new Potato Extension Program has been appointed to ensure that important potato R&D findings result in practical changes on farms.

A potato industry report compiled by Pyksis in 2010, which evaluated the communication of R&D outcomes to growers and industry from the Australian Potato Research Program (phase one), identified that there was an element missing between the results of projects and information provided to growers for application on-farm. Almost two years later, the Potato Industry Extension Program was conceived to

address the issue. With a relatively low amount of growers using the internet to obtain industry information and research results, Christopher Ritchie was appointed by AUSVEG in January 2012 to communicate R&D outcomes in an accessible and understandable manner.

As Mr Ritchie explained, the role will be a challenging one.

“The industry can be quite compartmentalised. Researchers are occupied

with their R&D projects, while growers and processors are busy managing their businesses. The Extension Program will help bridge communication gaps between potato industry parties and enable growers and processors to receive R&D information in a succinct and comprehensible manner,” he said.

Mr Ritchie’s role will be to act as an intermediary between growers, processors and the wider industry and he will work

to combat the gaps present within the sector today.

Already hitting the ground running having completed a number of visits to farms and meetings with researchers, Mr Ritchie said the initiative would provide a much needed boost to the amount of R&D information growers are receiving and consequently implementing.

“The Extension Program is aimed at communicating both ongoing and recently completed research to growers and

processors in a farmer friendly manner. It is vitally important that growers and processors understand the practical benefits of research activities, and are able to implement changes in the short and long term," he said.

Having worked for the Australian Federal Government in Canberra in a range of different roles and showing a keen interest in the horticulture sector, Mr Ritchie made the move to Melbourne to join the team at AUSVEG over Christmas.

Born and raised in Canberra, Mr Ritchie has always harboured an avid interest in the sport of rowing. Having taken

through lengthy research papers or decipher scientific processes. It is important that researchers recognise that their work needs to be translated into something which is clear, concise and comprehensible for growers and processors."

The project will use a range of forms of communication, leaning towards a more traditional approach, for the distribution of R&D information to ensure that growers are not excluded due to an inability to access email or the internet.

The program is funded by HAL using the National Potato Levy and matched funds from the Australian Government.

One of Mr Ritchie's main

questions among members of the industry and supply chain are 'will the research provide practical outcomes, and will it be financially beneficial to the industry?'

"For the potato industry to be innovative and competitive, growers and processors need to be able to implement R&D in a practical manner. A number of R&D programs have the potential to help growers and processors reduce their production costs and better protect their crops against pests and diseases,"

"Inevitably some of the complexities and intricacies may be lost in translation, but ultimately, a simple message

"AUSVEG will convene workshops in Australia's key potato growing regions. This is a further opportunity for R&D to be disseminated in an intelligible manner. Furthermore, it is hugely beneficial when growers, processors and researchers can come together in one room and discuss industry issues face to face. In a struggling industry - one in which production costs are increasing, labour costs are high, and foreign imports are growing - it is crucial that Australians from all walks of the potato industry work together, otherwise we will be condemning ourselves to the pages of history," Mr Ritchie said.

“ The Extension Program is aimed at communicating both ongoing and recently completed research to growers and processors in a farmer friendly manner. ”

up the sport in his secondary school years, and continuing to pursue it at an elite level at the Australian National University, Mr Ritchie was awarded a scholarship with the Australian Institute of Sport and competed for Australia at two World Championships.

He will use that drive and ambition to navigate his way through the challenging but progressive role, and said that he was eager to get to work on the new program.

"Growers and processors do not have the time to read

tasks will be to better facilitate information exchange to develop an open dialogue between growers, processors, agronomists and researchers.

Visiting farms to promote an open dialogue between growers, processors, agronomists and the research community and conveying the latest R&D information to both the fresh and processing sector, Mr Ritchie will work to enhance growers and processors understanding of R&D and industry issues.

Mr Ritchie said the main



Mr Ritchie on farm with Processed Potato IAC member, Rod Fraser.

that reaches and teaches a broad audience, or at least wets an individual's appetite, is much better than a complex message that reaches no one at all."

Mr Ritchie said that one of the main parts of the program will be a series of workshops which will aim to get growers and researchers around the table and help to foster a strong rapport between the groups.

"At the end of this three year period, we would like to see a higher uptake of R&D outcomes and in so doing, witness improved industry profitability. One of the major changes that would be great to come about is that researchers and growers are talking to each other in a more open manner with the industry becoming less compartmentalised."



Improving the performance of Australian seed

An Australian based, joint research project has sought to improve the international performance of Australian seed and increase the profitability of potato production in Indonesia.

In association with a linked Australian Centre for International Agricultural Research project set in Indonesia, an Australian based joint research project aimed to increase the production and profitability of the potato system in varying areas across Indonesia using participatory technology transfer of market focused crop management techniques. The project's main objectives were to adapt and apply dynamic integrated crop management (ICM) systems for potato and cabbage, develop and implement low-cost schemes that improved the access of smallholder vegetable producers to quality potato seed, and assess the potential to develop a potato seed producing area in eastern Indonesia. Other Australian collaborating organisations involved were the Department of Agriculture and Food Western Australia (DAFWA), the University of Queensland and the Department of Primary Industries Victoria.

Researcher Ian McPharlin from DAFWA formed part of the large team that worked on the joint project. Mr McPharlin said that Indonesia exhibited a substantial potato industry with a large capacity for growth, particularly with processed potato products such as snack foods like crisps and fries. With



Sembalun, Indonesia. An isolated PCN free potato growing area that is ideally suited for a partial seed scheme using Australian seed.

the average yield comparatively low (16 tonnes per hectare) compared with Australia (40 tonnes per hectare), there was considerable room to improve yields, local productivity and production he said.

“Availability of good seed quality, in both disease and pest levels as well as physiological condition, has consistently been identified as a major limit to yield in Indonesia. Indonesia produces good quality or

‘certified’ seed, but the issue is it is difficult to produce large quantities using the current seed systems, which were devised in temperate regions in a tropical environment like Indonesia,” said Mr McPharlin.

“Consequently, the quantities of high quality seed available locally, only meet a small per cent of total demand and are therefore expensive. So next door to Indonesia is Australia, which grows potatoes in a temperate environment in the southern areas, and can produce large quantities of

“ Australian seed potatoes can be offered with a package of knowledge to ensure the seed will perform to its potential. ”

certified or high quality seed and wants to expand its seed export markets. Indonesia needs high quality seed to expand its domestic production and has difficulty in producing the quantities of good quality seed it requires."

The project intended to facilitate Australian and Indonesian scientists to work together on developing potato industries in both countries for mutual benefit. Mr McPharlin noted that Scotland grew high quality seed in the cool temperate regions compared to the warmer areas of southern Europe, which allowed a comparative advantage as a seed supplier compared to the rest of the UK and some areas of Europe. Researchers reported that southern Australia boasted a similar advantage and offered a great environment to play this role in South-East Asia.

Challenges

Mr McPharlin said that working with diseases and pests which were either absent in Australia

or of low consequence, and trying to apply management in tropical environments, were also significant hurdles for the project. Language barriers and import regulations also posed a challenge, as did handling a small scale/high labour environment compared with the highly mechanised/low labour potato production found in Australian growing regions.

Potato cyst nematode (PCN) was also identified to be widespread and a severe problem in Java but appeared to be absent in other regions.

"The project was able to identify the strain of PCN causing most of the problems in Java, which was RO2, and helped to explain why varieties thought to be tolerant to PCN, such as Granola and Atlantic, were badly affected," said Mr McPharlin.

What can Australian growers learn from this research?

The potato industries of both

countries have a future with mutual benefit according to Mr McPharlin, with Australian seed growers having the opportunity to develop strong business in the Indonesian market.

"Good quality Australian seed will perform well in Indonesia if it is managed, including storage, properly after arrival in Indonesia and grown with good agronomic practices. It can be a profitable business for both the Australian seed growers and the Indonesia farmers,"

"The research could be a model for the development of other markets for Australian seed potatoes. Australian seed potatoes will benefit the potato industries of southern Asia, and research to determine how to overcome production constraints in these markets will mean that Australian seed potatoes can be offered with a package of knowledge to ensure the seed will perform to its potential. This is a relatively untapped market which offers growth potential for the Australian potato industry," he said.

THE BOTTOM LINE

- A joint research project aims to improve the performance of Australian seed and increase the profitability of potato production in regions of Indonesia.
- The project aimed to improve the access of smallholder vegetable producers to quality potato seed.
- A series of Farmer Field Schools were run in different regions as a platform for participatory field learning about potato management.



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The importance of PCN resistance in cultivars

Ensuring the industry has ready access to Potato cyst nematode resistant cultivars which meet market trends is essential. A joint research project has identified potato cultivars which show strength against this destructive pest, writes Nigel Crump.

Potato cyst nematode (PCN) is a destructive pathogen of potatoes found internationally and can be attributed to significant yield losses if populations build up in the soil. In Australia, PCN is a restricted pest and where there are small pockets of infested land, these infestations occur with populations of PCN that are well below thresholds that cause yield loss. Management of PCN in Australia is largely concerned with the containment of the spread of the pathogen through stringent hygiene trade protocols. In addition, the management of PCN involves monitoring populations (soil testing), crop rotations (non-host crops), PCN resistant cultivars and chemical pesticides (nematicides and fumigants).

To make certain the industry had access to PCN resistant cultivars that met market trends, the voluntary project funded by Seed Potatoes

Victoria, Gippsland Potatoes, the Victorian Crisping Research Group and the Warragul Conference fund, together with funding by HAL, was initiated.

The consortium has been successful in securing potato

that do not have this pathogen. The use of resistance together with other management strategies, particularly crop rotation, can suppress the build up and/or detection of PCN in soil. It is important to

Some information is already known about such cultivars including their performance attributes and agronomy needs, however, evaluation is still required to adapt their suitability to Australian production conditions. Importantly, access to overseas material can provide other benefits. For example, two cultivars imported in this project (*AC Sunbury* and *Exploits*) have PCN Ro1 resistance and in addition have resistance to PVY (strain O), which is an added benefit given the increasing concerns associated with this condition. Furthermore, the cultivars have five or more years of agronomic data available. For example, it is known from years of trials that the cultivar *Boulder* produces a large number or oversize tubers and therefore a row spacing of less than 25.4cm is recommended. Of course this will still require validation under Australian conditions, however, it does provide a valuable

“two cultivars imported in this project have PCN Ro1 resistance and in addition have resistance to PVY (strain O).”

cultivars that have potential in Australian production and also boast PCN resistance. Importantly, cultivars released through this project can be openly traded similar to that of conventional public cultivars.

PCN resistant cultivars are not just for areas that exhibit PCN infestations but are also important for production areas

emphasise that PCN resistance does not replace the need for other management strategies including hygiene and rotations of non-host crops.

The selection of overseas cultivars provides Australia with ready access to new cultivars that have desirable production characteristics including PCN resistance.

Summary of disease reactions for AC Sunbury compared with Russet Burbank and Shepody

Disease	AC Sunbury	Russet Burbank	Shepody
Common Scab	MS ¹	R	S
Early Blight	S	R	MS
Fusarium dry rot	S	R	R
Late Blight	VS	S	S
Verticillium wilt ²	S	MS	MS
Cyst Nematode (Ro1)	R	S	S
PLRV	S	S	MS
PVY	R	S	VS
Wart	S	S	S

Table 1. Adapted from Murphy A., Tarn, R., de Jong H., Arsenault, W., Tai, G. American Journal of Potato Research (2002) 79:397-402

S = susceptible, MS = moderately susceptible, VS = very susceptible, R = resistant.

¹ Moderate scab has been observed on occasion but it appears to be the exception ² *Verticillium wilt* caused by *Verticillium dahliae*



resource for collating specific information on each of the imported cultivars.

What resistance to PCN?

There are two different species of PCN, *Globodera rostochiensis* (Golden cyst nematode) and *Globodera pallida* (Pale cyst nematode). Only *Globodera rostochiensis* has been found in infested areas of Australia. Worldwide there are five different types (known as pathotypes) of *Globodera rostochiensis* but in Australia we only have found pathotype 1. This is an important finding as it specifically affects the type of resistance needed in potato cultivars to suppress the PCN. Therefore, the primary interest is in cultivar with resistance to *G. rostochiensis* pathotype 1 (Ro1).

Firstly, the project team reviewed existing material already present in Australia. Through this process the project team identified *Maris Piper* as a general all rounder cultivar with some suitability for storage. *Maris piper* is PCN Ro1 resistant and is the most common cultivar grown in the UK with stock already in tissue culture and minitubers available from ViCSPA accredited laboratories.

Capturing cultivars

Secondly, the project team searched the world looking for PCN resistant cultivars that would have suitability here in Australia and that could also be openly traded similar to that of conventional public

cultivars. The search for such potato cultivars is ongoing, however, so far there have been five identified which are suitable. These cultivars have been working their way through quarantine requirements and are currently in post-entry quarantine. The cultivars are in tissue culture and will be rapidly multiplied and evaluation field trials established over the coming season. Found below are descriptions of each new cultivars approaching the market, and also of the *Maris Piper* variety which is currently available.

Exploits

- Moderate to high yields of uniform round tubers, medium dormancy period, moderate to high specific gravity.
- Suitable for the fresh market (boiling/baking).
- Resistant to potato wart (races 2 and 8), and *Globodera rostochiensis* (Ro1). Highly resistant to PVY. Moderately



resistant to Common scab and Fusarium dry rot.

Cupids

- High yielding cultivar, tubers are uniform in size, relative resistance to damage during harvest. Suitable for storage, moderately resistant to greening, high dry matter.
- Suitable for the fresh market - good for boiling.
- Resistant to potato wart (races 2 and 8) [not present in Australia] and *Globodera rostochiensis* (Ro1), moderately resistant to late blight, *Rhizoctonia* and storage diseases. Susceptible to Common scab.

AC Sunbury

- An attractive, round/oval, medium early table potato with light yellow flesh and very good culinary quality, especially when baked (American Potato Journal 2002).
- Shallow eyes, high specific gravity under high temperature growing conditions.
- Resistant to Potato cyst nematode Ro1, resistance to PVY strain O.

Missaukee

- Missaukee is a round white chip-processing variety with an attractive round shape and bright skin. The primary strength of this variety is its strong foliar resistance to late blight (*Phytophthora infestans*) combined with chip-processing quality. MSJ461-1 can also be marketed as tablestock because of its good culinary quality. The tubers will chip process out-of-the-field and from 10 C (50 F) storage. Short to med term storage.
- Susceptible to Common

scab (similar to Atlantic)

- Full season cultivar similar to Snowden.
- Resistance to *Verticillium* greater than that of Atlantic
- Carries H1 resistance gene that relates to PCN resistance - confirmed by glasshouse tests (resistance to PCN Ro1).

Boulder

- A full season cultivar that produces round tubers with low incidence of internal defects. High yielding in irrigated or dry land growing conditions (greater or equivalent to Atlantic). Resistance to Common scab better than Atlantic, storability - medium dormancy similar to Atlantic.
- Potential for crisp and or fresh market. Boulder scored above average in blind taste test for baked, steamed and micro waved.

Maris Piper (currently available)

- Seed material already available.
- Main crop maturity with high yields and many tubers per plant.
- Resistant to Potato cyst nematode Ro1, good resistance to gangrene, damage and bruising. Suitable for storage. Moderately susceptible to Common scab, Powdery scab and Potato Virus Y.
- Medium dry matter with good cooking and frying qualities.

THE BOTTOM LINE

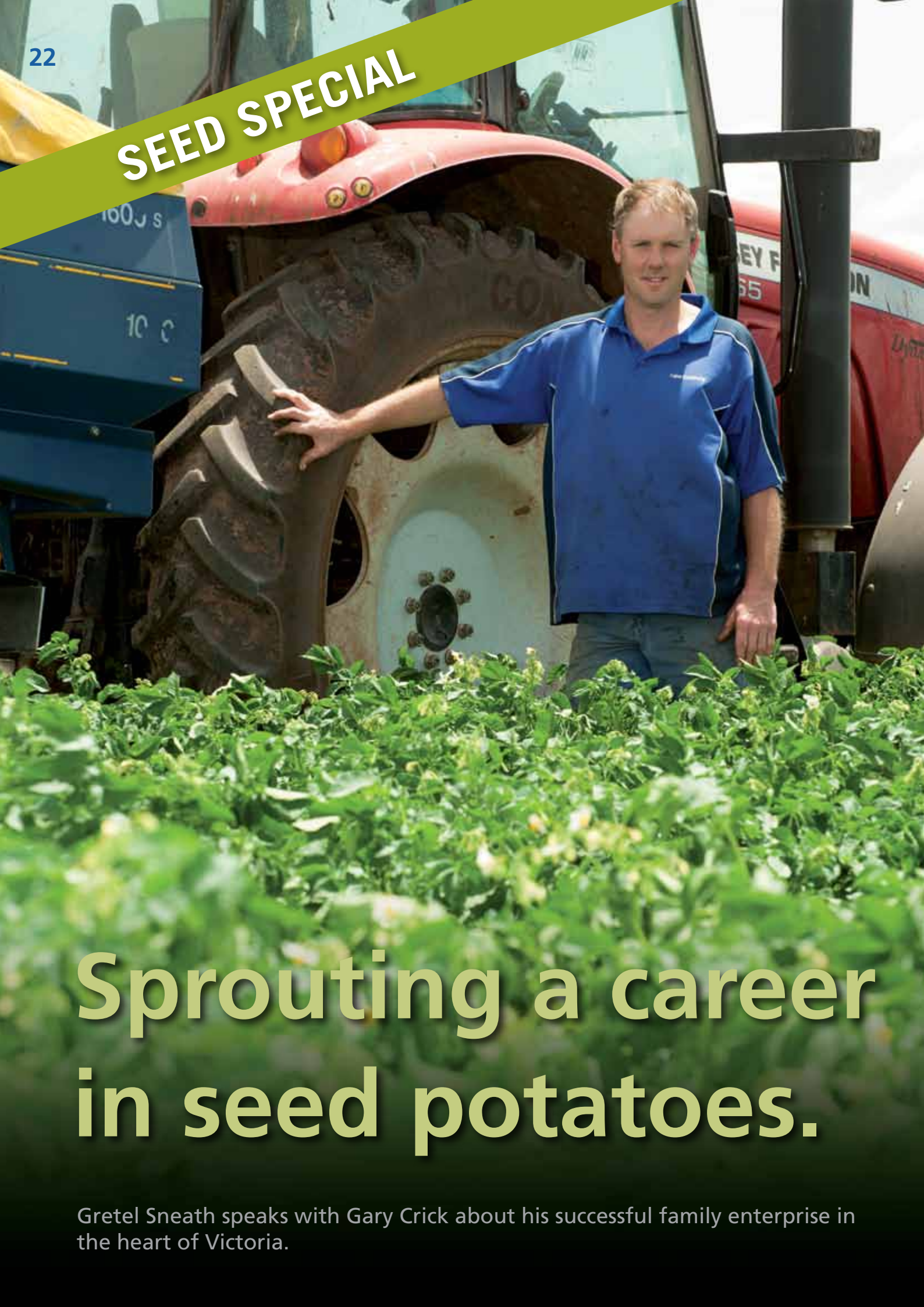
- Research has identified international cultivars with Potato cyst nematode resistance that can be utilised in the Australian potato industry.
- The project aims to improve the availability of potato cultivars that have PCN resistance in Australia.
- PCN resistance does not replace the need for other strategies e.g. hygiene, rotation of non-host crops.



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Project number: PT09034

SEED SPECIAL



Sprouting a career in seed potatoes.

Gretel Sneath speaks with Gary Crick about his successful family enterprise in the heart of Victoria.



Grower | Information

Producer:	Gary Crick
Region:	N.W Ballarat, Victoria
Growing:	Seed Potatoes
Farm size:	700 hectares

Many hands make light work, but when you're milking cows, it seems that there are never enough to go around. When Geoff Crick and his sons Darron and Gary decided to shift away from dairy farming in the early eighties, it meant they were able to diversify into Angus beef production and free range eggs. They could also focus more on their potato seed crops, and a 450 hectare enterprise has now grown to nearly 700 hectares.

Gary Crick runs the potato side of the business, and his 15-year-old son Kirby is already expressing an interest in becoming a fifth generation farmer.

"It's an enjoyable career if you can get everything to click in terms of growing, harvesting, packing and delivering," he said.

Located around 20 kilometres north-west of Ballarat, G.A. Crick & Company is a one crop per year operation, and the potatoes tend to be grown in rotation with cereal crops, grass seed, peas, corn, and wheat.

“ it's so rewarding to be able to implement strategies and then pull up some plants from the crops and find that they're spot on. ”

"When we first started off, we had enough land to have a good rotation of seed potatoes, and the addition of more ground as well as the transition from

conventional planting and harvesting systems to bed forming and de-stoning has lead to easier harvests and substantial improvements in quality and productivity," Mr Crick explained.

In the past few seasons, all of the seed varieties grown have been privately owned. Apart from unseasonal wet weather, buffeting winds are the biggest

challenge for production - it's no coincidence that the district is called Blowhard, and the nation's largest wind farm is next door.

"We have changed our irrigation systems to try and combat this, but in the main, the climate is fairly suited to our job; we have good cold winters and a good altitude for growing seed potatoes (440m above sea level), generally pretty reliable spring rainfall, and fairly warm but not ridiculously warm summers for our growing season," Mr Crick said.

The property's relative isolation from other potato growers is another big plus due to the ongoing threat of virus.

"Keeping on top of all potato viruses is a challenge for all growers within our industry and we're trying to get seed buyers to focus on growing



good quality crops and keeping virus levels to a minimum - it's crucial that good certified and low generation seed is used," he said.

Mr Crick believes the industry itself is evolving very quickly.

"It is moving from public varieties to private varieties where organisations are doing their own thing and they are trying to have their seed set up so that they can minimise potato viruses and other issues - especially Potato Virus Y (PVY) which is the biggest challenge the industry is facing at the moment. It is a worldwide issue, and we are trying to adopt world's best practice to

manage it as best as we can," he explained.

Mr Crick is working with early generational material which is supplied to commercial growers in all states except Western Australia and the Northern Territory.

"We are breeding up and growing on varieties for McCains Commercial Growers, and washing lines for Elders Limited. Being able to grow a good looking sample that's fit for its purpose is a really good feeling - it's so rewarding to be able to implement strategies and then pull up some plants from the crops and find that they're spot on."

means minimum virus levels," he explained.

"Seed growing is a lot of trial and error; we don't really know how different varieties are going to perform until they hit the market and get turned into a chip or crisps. It's just an ongoing R&D process really, and I love that challenge."

Clearly passionate about this aspect of the job, Mr Crick and his commitment to excellence has taken him to breeding stations across Europe and the United Kingdom.

"It is good to see new up and coming varieties coming through from breeders in Europe and the UK - it is interesting to follow what these guys are doing and see what's going on and coming through," he said.



The company is also in its second year of multiplication with AgTek crop varieties.

"We're still in the research and development phase, and what we are trying to do from a seed perspective is grow all round seed that doesn't have to be put through a seed cutter with early generation which

"I think there's a positive outlook for the future, so long as we keep our finger on the pulse. Things change, and if there's an opportunity to alter your operation, it's something that all farmers need to do to survive; you must be able to adapt to industry and market demand."

Pioneering technology for the modern industry

SEED SPECIAL

It is well known amongst those in the industry that growing a good crop starts with superior seed. Authenticating the quality and origins of seed can prove difficult in some areas of the sector, but a new technology which enables label and packaging authenticity could see the industry welcome a new sense of security.

Authenticity and traceability are two significant components when it comes to the quality and sustainability of local produce. IntelliSeed™ is a new technology which enables label and packaging authenticity for the absolute identification of a products origin and manufacturer.

ID Technology

Agricultural identification technology has taken considerable steps towards developing pioneering technologies and one such venture from Australian based

self-destructing stock to ensure packaging integrity is guaranteed.

Managing Director, Neil Mulcahy explains: "What we find, particularly in the broader global market, is that products that are perceived to be quality products and which have a hologram or logo on a packet may very easily be a replicated or counterfeited product. What AgTechnix is able to do is take covert and overt portions of our IntelliSeed™ technology and apply it to a particular package, label, product or logo to state that it is an authentic product from a particular grower or a

can be authenticated at any stage in the supply chain. It is a technology that can be used in real-time as opposed to having to do a genetic test to verify that a particular product is what it pertains to be.

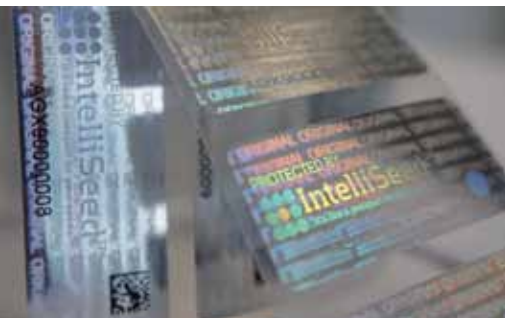
Security for the industry

With the rate of counterfeit products having increased significantly in the European market in recent times, the prospect of validating the origins of vegetable and potato seed seems to be a well timed, pre-emptive action to safeguard domestic markets.

levels of security technology which allows us to link labels and coding to a database and also the ability to include a 2D barcode which are smart phone enabled."

"There are additional levels of hidden security in our labels. These additional levels of security allow only authorised parties to authenticate via a specialised authenticator device, so if someone attempted to replicate a pre-designated serial number, we simply scan for the covert security system which enables us to re-authenticate that label," he said.

With Australian consumers



AgTechnix, presents a new layer of security for members of the Australian and international horticulture community.

Formed as a joint project in 2009 by DataDot Technology Ltd and IPECO Pty Ltd, AgTechnix endeavoured to increase global food production through the authenticity of products sold into agricultural markets, case in point – IntelliSeed™ labelling. IntelliLabels provide tamper evident, hologram,

service provider."

"We can actually put the tracer into material of the packaging or we can put it into an ink or a portion of a label so that the coding can be retrofitted to food packaging whether it is plastic, card board or a particular label requirement," he said.

The technology can be applied on packaging immediately beside the tubers in a box, so that a package

"Looking at two ends of the supply chain, where inputs coming in from one end that the farmer expects to be authentic and of good quality, to then look at what he has got coming out of his farm and needing to show proof of origin. The farmer can then show authentication to his consumers that the products are exactly what they say they are, that they're his product," said Mr Mulcahy.

"In addition we have multiple

arguably preferring quality produce sourced from domestic manufacturers, vegetables which can be traced all the way back to the seed manufacturer may prove an interesting development for future markets and for the sustainability of the local horticulture industry.



For more information, please contact:
Phone: (03) 9646 2047
www.agtechnix.com

Ask the industry

with
Scott Mathew



Scott Mathew, Technical Services Lead from Syngenta

With the potato growing season in most regions either a fair way through the season or nearing completion, many queries can arise around this time of year. Scott Mathew answers your questions in this edition of Ask the industry.

What should I do during the harvesting and handling process?

At every stage of harvest and handling, physical damage to the potatoes should be avoided. Some practices that can prevent damage include:

- Minimising the height that the potatoes drop when harvesting and handling.
- Smoothing any sharp edges on trailers or conveyors.
- Where possible filling any bins or trucks from the bottom to the top rather than staying at a constant height.
- Ensuring that the height of the stack in the bin is not too high or too steep.

It is important that physical damage to the potato is avoided at this stage as often the impact of bruising and cutting potatoes during harvest and handling does not become evident until several weeks after the event.

What are some of the key diseases to keep an eye out for?

There are two main postharvest rots of potatoes in Australia that you need to keep an eye on, these being bacterial soft rot and Fusarium rot.

Bacterial soft rot (*Erwinia sp.*) - The soft rotted tissue is characterised by the creamy appearance at first which later develops into a blackened area. Under favourable conditions rotting can be very rapid and can be detected by the foul odour from the rotting potato.

Fusarium rot (*Fusarium spp.*) - Fusarium rot is also commonly referred to as dry rot. And the symptoms of this rot are that the rot forms cavities in the flesh, which are lined with a pale covered mould with the skin tending to wrinkle as it loses water. As time progresses the surface dries out over the infection and becomes a brown or black colour.

What are the ideal conditions for potato storage?

Potato tubers are living organisms that produce heat through respiration and lose moisture (shrinkage) through respiration and

evaporation. The aim of potato storage is to maintain a consistent, ideal environment for the duration of the storage period. Potato tubers go through four different storage phases (curing, cooling, long term storage and marketing), each requiring a different environment. To meet all of these requirements the potato storage must be designed to:

- Maintain tubers at a desired temperature by exhausting the heat of respiration and circulating cool fresh air through the pile.
- Maintain a high relative humidity to promote wound healing at harvest and to prevent tuber desiccation (shrink).
- Provide oxygen for tuber respiration.
- Remove carbon dioxide, the by-product of respiration and other deleterious gasses that affect tuber quality.
- Deal with adverse storage conditions where the tubers are wet, rotting, chilled, frozen or too warm.

Long term storage demands more critical control than short term storage. The recommended storage temperature is dependent on crop condition, variety and intended end use (see table below).

Potato Use	Temperature
Seed Potatoes	2-4°C
Fresh market	3-5°C
Processing	
French Fries	7-9°C
Chips	7-10°C

Table 1. Storage temperatures for potato

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

Potassium in potatoes

Rohan Davies, Technical Agronomist at Incitec Pivot Fertilisers, discusses the importance of maintaining adequate levels of potassium in potato crops.



When should I apply potassium?

Potatoes require large amounts of potassium to facilitate movement of sugars from the leaves to the tubers and to transform sugar into potato starch.

Potassium is primarily supplied to potato roots through diffusion and is generally considered to be a relatively immobile nutrient in most soils.

However, in light soils with a

low cation exchange capacity, or CEC, potassium can leach.

On sandy soils, even when soil tests show adequate levels the daily rate of supply may not be adequate to meet peak plant uptake demand. See Figure 1 for graph of total nutrient uptake over time.

Potassium deficiencies reduce crop yield, size and quality. Low potassium levels may also make

it difficult for potato crops to resist disease or tolerate stress, such as frost or drought.

While relatively immobile in most soils, potassium is a mobile nutrient within the plant, so the lower leaves are usually the first to display symptoms of potassium deficiency.

Plants will respond to in-season potassium applications

The potassium status of your potato crop should be monitored by tissue testing, as plants will respond to in-season potassium applications if deficiency levels are seen and addressed.

However, there is a two- to three-week lag period between potassium application and a change in the petiole level. Applying potassium will stop levels further decreasing, but may result in only maintaining levels, rather than increasing

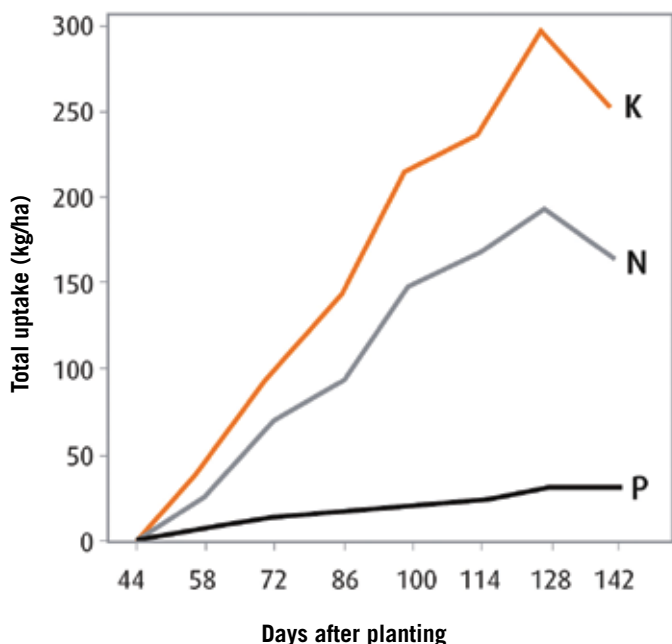
them.

Therefore, applications should be made two- to three-weeks before petiole levels are estimated to drop below the adequate level.

Potassium application strategies

There are three different ways to apply potassium in-season to your potato crops, depending on your soil type and irrigation method:

- Applying a major portion of your whole season's potassium fertiliser prior to planting has been found to be effective in helping obtain higher yields;
- On sandy soils, where holding capacity is low, use of split applications may be advantageous; or
- Potassium fertigation is potentially an effective means of helping match the 3-7 kg K/ha daily potassium uptake rate which takes place during tuber bulking.



Source: Gunasena, H.P.M. (1969). Studies on the growth of the potato with particular reference to the efficient use of nitrogen and potassium. PH. D. Thesis, Univ. Reading

Soil nutrition questions

Please send your soil nutrition questions to *Potatoes Australia*.
Email: info@ausveg.com.au
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Potato profile

with René de Jong



Are you managing seed potatoes correctly?

Seed breaking down? Crops with spindly shoots? Lots of tubers formed? Early maturing crops? We can all relate to crop performances like these and they are ongoing problems that we see from time to time, probably less now than in years gone by, but they still happen. They still cost dearly when the above symptoms show up. So what's going on?

Most issues relate to decisions by the seed manager (seed growers included) around heat, time and communication and of course, a little understanding of the technical aspects of seed performance. So what are some of the technicalities behind

these issues?

Running out of puff

Physiological aging (the time seed potatoes are exposed to warm conditions) has a strong influence on seed performance where seed left in warmer conditions for longer

tend to "run out of puff" and the plants produced from the seed are weakened, mature quicker and have higher numbers of stems and tubers which result in smaller sized potatoes for market. These sorts of plants tend to have lower immunity and tend to become

diseased or attract insects as the plants feed less efficiently and are weakened. The seed manager(s) have made poorly timed decisions that allowed such seed to be exposed to warmer conditions than they needed to be and much of this can be traced back to lack of



time or urgency to handle seed correctly. Often communication (with information about the seed) between the last person that influenced the seed and the next person who needs to make decisions based on the resulting crop is not maintained at the level needed.

Too vigorous

Seed that has been kept cool and then planted soon after, will do the opposite of seed described above. Seed that is too vigorous (physiologically very young) will take a long time to emerge, emerge unevenly, have few stems and tubers and will take a long time to mature which will result in the production of large tubers. An understanding of this and good communication between the seed grower and seed managers/users would result in the seed crop being grown earlier so the seed is at an appropriate physiological condition to get the best result.

Solution - plan seed production with your seed buyer and communicate frequently.

Viruses

Another issue is the recent high levels of (mainly) Potato Virus Y (PVY) which has become more common due to the ease in which seed potatoes and potatoes generally can be transported around the country and placed in most districts.

The ViCSPA seed scheme is introducing the mandatory testing of all seed crops which is a huge step in the right direction to having reliable information on the virus status in seed crops

and allowing seed managers to make better informed choices in the use and management of seed. There are several important technical things seed managers must know to manage PVY and the 5 key ones are:

- Know the virus status of the seed.
- If PVY is present, do not cut seed.
- Manage the main insect vector that spreads PVY - green peach aphid (monitor and control as necessary).
- Don't contaminate certified seed potato growing areas with PVY infected seed.
- Be aware that handling sprouted seed can result in sharing sap between tubers and this may increase PVY incidence in seed, even before planting the seed.

As bad as PVY is for seed growers, it is not the end of the world and low levels in commercial production are tolerable, particularly if the variety can tolerate it and still produce saleable potatoes.

Solution - use only certified seed potatoes.

Poor seed performance (no obvious reason)

One last experience on seed I would like to mention. I am aware of significant amounts of poor performing seed with no obvious reason and relate this to a situation where good seed that went into a cool store, but performed poorly. After some discussion trying to work out a reason, seed manager told me that the seed was stored



with apples. As apples produce ethylene (an aging hormone that is spread in the air in a cool store), the good seed came out of the cool store as if it was aged because the ethylene affected the good potatoes. Never store seed potatoes with apples or bananas etc.

Along these lines, highly aged or stressed seed will also produce ethylene and whilst I have no scientific evidence that this is also a problem for otherwise good seed stored in the same cool store, particularly in a poorly ventilated cool store, I have seen problematic crops from large cool stores grown from otherwise good seed. I suspect the good seed was

affected by some highly aged, stressed seed in the same cool store and/or poor ventilation including the build up of CO₂ (carbon dioxide). I'll leave that one for you to think about.

Solution - separate older seed from good seed and ensure adequate ventilation in cool storage.



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Bringing diagnostics closer to growers

Utilising diagnostics to test for soil-borne pathogens has been widely used by researchers and scientists in laboratories for quite some time. But it is only recently that several research institutions across Europe have commercialised diagnostic testing for potato growers.



One of the biggest research centres in the UK, and the first of its type in Europe, the James Hutton Institute (JHI) (formerly the Macaulay Land Use Research Institute and Scottish Crop Research Institute) have developed diagnostic tests for many pathogens affecting potatoes. Tests for specific soil-borne pathogens were developed at JHI in two Potato Council projects which targeted three soil-borne diseases: Powdery scab, Black dot and *Rhizoctonia solani* (AG3). With potato diseases causing severe financial losses throughout the industry, the commercialisation of DNA diagnostics has been a welcomed aid for growers and the wider industry according to Dr Stuart Wale of the Potato Consultancy and Research division of the Scottish Agricultural College.

"The tests that were developed commercially were those that we felt the industry required most – Black dot and Powdery scab. The other factor was to offer validated tests and in the Potato Council projects we were able to validate the tests competently. The fact that the Potato Council funded research into the diagnostics, epidemiology and control of the soil-borne pathogens reflects their prominence towards problems in the industry."

The tests which were commercialised for Black dot, and particularly Powdery scab, were received well due to the affliction of these pathogens in

the region said Dr Wale.

"Powdery scab remains perhaps the most intractable problem facing the seed industry. By knowing the level of soil contamination, choices on field selection and variety placement in specific fields will reduce risk."

"Black dot is a problem for pre-pack ware growers and its uptake was poorer than anticipated. Those growers (mostly in England) who had a

“ By knowing the level of soil contamination, choices on field selection and variety placement in specific fields will reduce risk. ”

consistent problem with black dot felt they didn't need a test to tell them they had a problem. In Scotland, Black dot was not perceived as such a major problem," said Dr Wale.

Ensuring that the tests could be utilised in a practical, on-farm setting, Dr Wale said the validation of the diagnostics was crucial to assure that testing was cost effective and timely. Some modification of the original testing was also required to commercialise.

"The important parts of the PCL projects were a) Carrying out epidemiological and control

studies alongside the diagnostic test development and b) Monitoring surveys of a large number of commercial crops and c) Strong relationships confirmed between test results and disease risk in the field. This unified approach to R&D meant that advice could be offered on the back of a test result," he said.

With no changes suggested to the tests over the three years in which they had been

benefits were potentially substantial. Where numbers of samples have risen steadily it is important to still continually show the benefits to encourage further uptake he said.

"We suggest that samples should be taken from a 4ha (10ac) block of land, thus an 8ha field should have two samples. In practice growers often sample from a single 4ha block within a bigger field to save money and apply the result to a larger field. Luckily we found that soil-borne diseases such as Powdery scab and Black dot are more uniformly distributed than other soil-borne problems such as *Rhizoctonia* and Potato cyst nematode," said Dr Wale.

When asked if he thought the commercialisation of diagnostic testing could be successful in Australia in the near future, Dr Wale affirmed 'yes' that the principles would be the same in Australia as seen in the UK.

"SAC is lucky in that we provide a strong consultancy service so not only can we explain the benefits of the tests to growers but can provide back up after the results are issued. We strongly believe that advice on interpreting the results should accompany the test results," he said.

commercialised, Dr Wale said an improvement over time to reduce the cost of the test would be welcomed.

"There is still a substantial use of staff to prepare samples prior to DNA extraction and we would like to improve this step. It would be ideal if we could carry out multiple tests at the same time but this will take a fair bit of development."

With a significant uptake of growers utilising the diagnostic tests, Dr Wale did note that growers were restrained to spend on relatively expensive soil tests, even though the

i For more information, please visit:
www.sac.ac.uk
www.hutton.ac.uk
www.potato.org.uk



Atherton, QLD

Q&A Young grower profile

Jane Nix

Name: Jane Nix

Age: 27

Location of farm: Atherton, QLD

Potatoes farmed: Gourmet potatoes such as Nicola and Kipfler.

Role in company: I am the Packing Set Manager. As well as physically working in the sheds I organise the staff to grade, pack and handle the produce. I also liaise with my Dad on a regular basis as to what our requirements are, as they change all the time, especially in a season like what we've just had.

How did you get involved in the industry?

A few years ago my Dad had come to me and said that he was interested in building a packing plant. He had been growing potatoes for over 40 years but hadn't had a packing plant on the farm previously and he wanted me to be involved, so I moved back to the tablelands and we started building the packing plant on the farm. I grew up on the farm here so it was always in my blood I guess. I'd been packing or grading on the harvester from as far back as I can remember, so it felt natural to come home.

What is your average day like?

I don't live on the farm so I try to get in early. When we are packing the sheds I will come and make sure the equipment is ready to go and I'll try and

corner my Dad to find out exactly what the priority things are to be packed, so we can get the most efficient way of packing it for the day. My job is also bookwork and accounting for the business too.

What do you like most about your job?

I like the flexibility. It's hands on and it can be outside or inside, but I think the biggest thing is that your hard work isn't just to make your boss rich, -you work hard to benefit the family and the health of the entire business that your family depends on.

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

With our resources boom I think it's very difficult to attract young

people into the agriculture industry when they can go and get a mining job and exceed any earnings they are going to make in the first few years in agriculture quite quickly. It's difficult because agriculture can be seen as a gamble, whether it's on the seasonal changes, the market or government regulations making things harder. I really think that we need to concentrate on keeping the kids that are coming off farms, back onto farms. I'm not really sure how we would attract new bloods into the industry but I think its definitely important not to let the people of my generation run off to the mines or something. Who will be left to farm into the future?

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

I think that our government's regulations are in favour of some of the larger retailers. Support really needs to come from the government for growers. There needs to be a change in some of the political perspectives towards agriculture and that would definitely ease the stress on growers. Right now we just feel like it is pushing a rock uphill. A lot of food is coming from overseas and I think the government needs to support us more in the way that they write legislation so that we can be viable, because if the farmers aren't viable then they're just

not going to do it anymore.

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

I have a degree in tourism management and if I wasn't working in agriculture I'd probably be using that.

Do you see your future in the industry?

Yes definitely. It is very doom and gloom at the moment because we have just come out of a terrible season but I think we just have to adapt and change with the changing markets and if you can do that you will be relevant into the future.

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

The industry is very broad so there are a lot of threats, be it biological or increasing imports. Imports are a major factor though, where other countries that grow potatoes might be subsidised, they are then a lot more competitive in international markets than what we could be. It's an unfair platform, so I think we need to have more support from government, Federal and State, to instill more confidence in Australian farmers.



CALENDAR of events

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 an 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 from the industry supply chain, researchers and vegetable and potato growers.

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

22-31 May 2012

World Potato Congress

Where: Edinburgh, Scotland

What: Hosted by the Potato Council, the event will span from May 27th to May 30th, bringing together over six hundred delegates from international locations including growers, producers, traders, processors and manufacturers. The Congress will enable a global exchange of information between the world's potato specialists on all aspects relating to the potato industry. Attendees will have the opportunity to take part in a number of tours to see developments in the potato industry in Scotland and visit local growing and production facilities.

Further information: www.potatocongress.org



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