

# potatoes australia

Informing and connecting  
Australia's Potato Industry  
August 2009

A photograph of a person from behind, wearing a dark jacket and carrying a long-handled tool over their shoulder. They are standing in a vast field of purple potato flowers under a clear sky. The foreground is filled with the vibrant purple blossoms and green leaves of the potato plants.

**Branston Ltd: recipe for success**  
**The East Coast Cultivars**  
**Keith Blackmore: 40 years strong**

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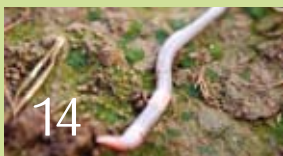


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# Contents



## News & Views

- 10 Cultivating a new approach

---

- 14 Get set for green trade

---

- 16 Australia's positive year of potatoes

---

- 18 Keeper of the seed

---

- 20 Taking the lead

---

- 22 Fertiliser strategies for today

---

- 26 Introducing a new face

---

- 28 The pest defence

---

- 30 Spudscape

---

- 34 Sowing the seed of success

---

## Regular Items

- 2 Contacts & credits

---

- 4 Chairman's message

---

- 4 Editor's message

---

- 6 News

---

- 9 CEO's message

---

- 27 Ask the industry

---

- 38 Chips: a look at what's new  
in potato information & technology

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# AUSVEG

## Chairman's message

The Award Modernisation process and its implications, and country of origin concerns are on the lips of many growers and other industry stake holders at the moment. Over the last month AUSVEG has taken a number of steps to ensure that our levy-payers concerns and interests are amplified in this respect.

AUSVEG approached the Office of the Deputy Prime Minister to consider a review of the Horticulture Award situation. We also held our June Board meeting at Parliament House where Board directors were able to meet with principal policy-makers including the Honourable Tony Burke MP, Minister for Agriculture, Fisheries and Forestry.

With biosecurity playing a central role in the well-being of our potato and vegetable industries, AUSVEG has also made representations to Plant Health Australia in relation to Zebra Chip disease.

Beyond Australia's borders the effects of expanding international markets continue to remain a major issue for the local industry. These days it seems that there is always news of how producers from the potato industries of China, India or Latin America are influencing world trade, and are perfecting their agricultural and food production processes.

Be that as it may, potato production remains one of the things we do very well here in Australia but we can't afford to stagnate, faced especially with the added pressure of the challenges being presented by the climate change debate. To this end, AUSVEG is determined to continue to not just represent your voice to decision-makers, but also keep you abreast of what is happening at a national and global level.

This marries with the story on UK potato giant, Branston (see pages 20-21), a company that has achieved world-wide recognition for its innovative approach to sustainability and its supply chain relationships.

As always, we will continue to update you on what it takes to remain productive and competitive in the face of all the trends impacting on potato production here and around the world.



**John Brent**  
AUSVEG Chairman

## Editor's message

Is the scramble for climate change solutions the new space race?

Whether or not you subscribe to this kind of speculation, there seems to be an increasing number of organisations who are prepared to reshape their operational models because of pressure from forces, including consumers and governments, who are concerned about the possibilities of a future destabilised by current climate change theories. So, we've made it our business to bring you news of what potato-producing organisations in Australia and around the world are doing to secure their places in the future.

We interviewed the people at Branston, the UK's first food production company to win that country's Carbon Trust Standard award for innovative practices.

We also look at a group of Australian producers who have banded together to form the forward thinking East Coast Cultivars.

Ian James gives us the economic forecast, but also brings us his Economist's view of the proposed Carbon Trading Scheme and how it affects growers.

We spoke to Keith Blackmore on the eve of his retirement from a 40-year career in the Australian potato industry about what makes the industry tick, while the new Manager of ViCSPA, Dr Nigel Crump, also argues in detail for the importance of good quality seed.

For those who were unable to attend the recent Australian Vegetable Industry Conference, we continue our series of adaptations of some of the R&D Showcase presentations. In this issue we look Agronomist Tony Pitt's reasons growers should re-think their current fertiliser strategies.

Finally, our Spudscape pages give you a wide angle view of happenings here, there and everywhere in potatoes.

Enjoy the edition.



**Jenan Taylor**  
Editor  
*Potatoes Australia*





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## The future could be hybrid

The best possible way to tackle agricultural farming over the course of the next fifty years and beyond might be to consider bringing together the best of traditional and modern farming techniques, according to Tom Standage, the author of 'An Edible History of Humanity'.

Standage who is also editor of business affairs for the Economist believes that in order to survive the constant changes brought about as a result of climate change, and stave off the potential food crisis associated with unprecedented population growth, new food production approaches need to be considered. These could include embracing genetically engineered produce in order to be cost effective.

Some of the arguments in the debates about genetic modification could be compared to the history of potatoes, Standage writes in the Los Angeles Times, drawing references to the way in which potatoes were regarded superstitiously for centuries.

But in order to avoid the possibilities of war and famine, biotechnology was an option that should be considered, along with other farming alternatives. "It also will open the door to new approaches--from wider use of techniques developed since the 1970s that minimise the tilling of soil to reduce erosion and fuel use, to the cultivation of food using hydroponic techniques in "vertical farms" inside skyscrapers," he said.

However, Julie Newman from Australia's Network of Concerned Farmers re-iterated some of the concerns of anti-GM lobbyists. "The organisations who own the rights to GM organisms such as potatoes will dictate who to sell them to and there will be no new varieties because of the stranglehold of contracts, so farmers and alliance partners will have no choice," she said.

"This would lock up the entire food chain and result in anti-competitiveness. Fresh food and vegetables would become an unaffordable option for most people." [pa](#)

## Correction

In our June 2009 issue we ran a story entitled 'Resistance is essential', about the development of potato cyst nematode (PCN) resistant varieties for the Australian industry.

The accompanying table concerning the resistance status of the main commercial cultivars stated that the Plant Breeders Rights registered variety, Golden Delight, was susceptible to PCN.

Golden Delight is the trademark representing a range of potato cultivars. We have been advised that the majority variety of those making up Golden Delight, are resistant to PCN.

Further advice is available from Peter Neilson, Australian Business Manager of The New Zealand Institute for Plant and Food Research, on 02 6020 3221 or by emailing [neilsonp@cropandfood.com.au](mailto:neilsonp@cropandfood.com.au) [pa](#)

## Enter the titan

Hot on the heels of Woolworths' announcement of a massive end of year profit, comes Costco's announcement of the opening date of its Australian flagship store.

The massive American retailer is promising cuts in prices for most of its range and will open a 13,000 square metre store at the Docklands in Melbourne on 17 August.

Would-be customers need to purchase a membership for \$60 before they can join in with the other 58 million cardholders around the globe to reap the savings benefits promised by the organisation.

Whereas consumers and suppliers look set to welcome the new player into the largely monopolised Australian retailing market, retail strategists are advising suppliers to be prepared to consider carefully the implications of partnering with Costco.

According to Phil Bonnano a sales strategist from The Leading Edge, the physical size of the merchandise areas, limited staff, limited advertising opportunities, and how to keep pace with the "sales velocity" of Costco are just some of the criteria that some suppliers might find harder to realise.

Costco is modelled on a warehouse style of retailing similar to Bunnings, with, reportedly, a very American feel, that may or may not appeal to Australians. The Melbourne store will have a variety of convenient specialty departments, including fresh bakery, fresh meat, fresh produce sections as well as sections that carry clothing, jewellery, and furniture. [pa](#)

## Free Intellectual Property workshop and symposium

The Australian Centre for Intellectual Property in Agriculture (ACIPA) in conjunction with Horticulture Australia Limited (HAL), and with support from the Tasmanian Institute of Agricultural Research (TIAR), is holding a free Workshop on Wednesday, 2 September and a free Symposium on Thursday, 3 September. The Workshop and Symposium is designed for growers, researchers, industry associations and others involved in horticulture industries who need to understand the role of intellectual property (plant breeder's rights, patents, trade marks, copyright) for plants.

The Workshop will cover recent developments in intellectual property, particularly in the area of plant breeder's rights, patents and trade marks, which are having more and more impact on the horticulture industry. It will also discuss how trade marks, copyright and patents are being used to protect new innovations in the horticulture sector and will overview Intellectual Property: patents, plant breeder's rights, trade marks, copyright and




confidential information/trade secrets; as well as contracts and Intellectual Property.

This coverage will background the information needed to gain full benefit from the Symposium *'Capturing the Value from Innovation in Horticulture: Commercial Use of Intellectual Property'* being held the following day at the same venue.

The Symposium will examine the ways of capturing the commercial value of intellectual property in horticulture and other agricultural sectors.

Some of the case studies that will be covered at the Symposium include the role of patents for protecting plant innovations both in Australia and overseas; plant breeder's rights and ways to maximise the benefits; branding and labelling to protect your business; and the role of R&D investment for commercial outcomes.

Speakers and topics include **Prof Brad Sherman**, Director, ACIPA, The University of Queensland on IP and Horticulture and **Kathryn Adams**, Senior Research Fellow, ACIPA, Griffith University covering *Plant Breeder's Rights*.

For further information and to register, please contact Carol Ballard, Australian Centre for Intellectual Property in Agriculture phone: 07 3346 7506 Email: [c.ballard@law.uq.edu.au](mailto:c.ballard@law.uq.edu.au) 

## Potato peelings may aid human health

THEY SAY one man's trash is another man's treasure. But what sort of bounty could possibly lie in piles of discarded potato peelings or in heaps of spent grain left over from brewing beer?

A biochemical kind of treasure, according to two groups of researchers who are gearing up to mine such waste for bioactive molecules with the potential to control agricultural pests, improve human health and even combat cancer.

"We have been interested in by-products for quite a while now," says Dr Nigel Brunton, a senior research officer with Teagasc who works with phytochemicals derived from plants. "They are mostly defence compounds the plants produce themselves that may have a beneficial effect for human health."

Brunton and colleagues are currently looking for valuable chemicals in potato peelings, which crisp manufacturers Largo Foods are only too happy to donate for the research.

The company produces around 30 to 40 tonnes of wet peel each week, and has to pay for its disposal, says Brunton. "So if we can do anything useful at all with the waste, that's a good thing."

Funded under the Department of Agriculture and Food's Firm scheme, the scientists at Ashtown are starting to examine the peels for glycoalkaloid compounds, which can be toxic at high levels but have already proven their mettle when used as a topical treatment for skin cancer.

The project, which involves collaborators at University College Cork, will isolate glycoalkaloids from the potato waste and hopefully find some novel compounds in the process, explains Brunton.

Glycoalkaloids could also help farmers to ward off nematode (roundworm) pests, he says, noting that collaborator Peter Jones at UCC is working on this. "Nematodes are present as eggs in the soil and the glycoalkaloids basically cause the nematodes to hatch out," explains Brunton. "So at a time when there are no potatoes growing there you apply the potato peel waste or the glycoalkaloid to the soil, causing the nematodes to hatch out, and they have no food source so they die."

And as the potato peels give up their biochemical secrets, another group of scientists will look to a different source of potentially useful chemicals – brewers' spent grain (BSG), a solid leftover from the brewing process.

"There are significant volumes of this material produced annually," says Prof Dick FitzGerald, from the University of Limerick, who estimates that about 150,000 tonnes of BSG are produced in Ireland each year. "But if you consider how much beer is consumed internationally that can be bumped up by several orders of magnitude worldwide."

At present, the leftover material is usually diverted to animal feed, but the UL team and their collaborators at UCC are eyeing up other uses.

"We know BSG contains some potentially useful components of food interest, so it has an important application in human nutrition," says FitzGerald.

The first step is to isolate the carbohydrates, fibre and protein from the cereal by-product, explains researcher Dr Charlie Piggott, with a particular eye to finding bioactive compounds such as anti-oxidants.

"There are known antioxidants found in cereals that have protective functions in the intestine," he says, adding that the project hopes to find new beneficial compounds too.

The Firm-funded work will also mine the leftover grain for bioactive peptides (protein fragments) that could be added to functional foods to help manage health conditions in humans.

FitzGerald believes that isolating particular compounds or enriched fractions from the spent grain will add value.

"We may need targeted strategies to release these peptides so



From page 7 ►

that they can then be available to interact with organs to bring about or mediate particular beneficial health effects,” he says.

The project, which has links with Diageo and Kerry Foods, will run for four years.

Published in *The Irish Times*, July 2009 pa

## 2009 PMA Fresh Summit to include key note speaker Condoleezza Rice



Former U.S. Secretary of State Condoleezza Rice will offer advice on leading during tumultuous times when she opens Produce Marketing Association's (PMA) 2009 Fresh Summit International Convention & Exposition. Focused on driving change and seizing opportunity in today's economy, this year's convention will be held Oct. 2-5 in Anaheim, California, USA at the Anaheim Convention Centre.

Fresh Summit is the most widely-attended produce industry conference in the United States, attracting attendees from the entire produce supply chain. Business leaders from every segment of the produce industry come from all over the globe to convene at this event. With current economic tough times, it is now more important than ever to attend Fresh Summit to learn insightful information, proven tactics and strategies, inspiring new products and services, effective business solutions and make important new connections.

Other highlights at Fresh Summit include speaker David Plouffe, campaign manager for Barack Obama's 2008 presidential campaign who is credited not only with creating the campaign's renowned grassroots online outreach program but the campaign's successful overall strategy.

Last year's Fresh Summit in Orlando, drew a record 17,502 attendees from 61 countries.

For more information, visit [www.pma.com](http://www.pma.com) pa

## Deputy Prime Minister considering allowances on Awards Modernisation

*A potential 30 per cent rise in wages under the Horticulture Industry Award 2010 could spell the end for many businesses already struggling with high input costs.*

Following discussions between AUSVEG and the office of the Deputy Prime Minister, the Hon Julia Gillard, AUSVEG has been informed that a review is currently underway on the proposed Horticulture Industry Award Modernisation.

AUSVEG CEO Richard Mulcahy has written to the Deputy Prime Minister requesting that she intervene as has already occurred for the restaurant and pharmacy sectors.

The Horticulture Industry Award is due to be introduced on 1 January, 2010. The Deputy Prime Minister's Office has indicated that if the Minister is not satisfied that the government's framework for award modernisation has been followed, she may intervene.

“The Minister for Workplace Relations instructed the Australian Industrial Relations Commission to set up a process that would benefit neither employers, nor employees,” said Mr Mulcahy.

“The proposed awards changes will have significant impacts on the Australian vegetable industry, ranging from increased costs for producers to a rise in unemployment in regional areas,” he said.

Intervention would represent good news for vegetable growers who are concerned that the proposed changes will put them out of business.

Under the new award, vegetable growers will be particularly impacted by the hours of work provisions, piece rates, and casual loadings proposed. Growers face rises in piecework loadings from 12.5 per cent to 15 per cent and casual loadings from 15 per cent to 25 per cent.

Submissions made to the Industrial Relations Commission regarding the transition process to the new award, have requested a suspension of the contentious clauses until the review of the new awards in 2012.

Failing that, an extended transition phase of five years has been requested, which will assist growers by allowing the significant cost increases to be brought in gradually.

Award Modernisation is the process currently being undertaken by the Industrial Relations Commission to create Modern Awards covering employers in the Federal workplace relations system.

The Horticulture Industry Award 2010 will replace all Notional Agreements Preserving State Awards (NAPSAs) and Pre-Reform Federal Awards, with the exception of those industrial instruments—such as enterprise agreements—confined to a single business. pa



## CEO's message

The last month has brought several opportunities for AUSVEG to consolidate its plans to provide bigger and better advocacy for the interests of our potato levy-payers and other industry stakeholders at the levels of government, media and the public.

The AUSVEG Board meeting in June was held for the first time at Parliament House in Canberra. Board Directors met with The Hon Tony Burke MP, Minister for Agriculture, Fisheries and Forestry and The Hon John Cobb MP, Shadow Minister for the same portfolio.

In July I also had the opportunity to attend the Horticulture New Zealand Conference for 2009 in Christchurch and meet with key figures in the New Zealand potato and vegetable industries. At the conference, I caught up with the participants of an Australian Young Growers' Tour led by AUSVEG Board Member, Paul Bogdanich, and we also met the New Zealand Prime Minister John Key and the New Zealand Minister for Agriculture David Carter.

Recently I was fortunate to be able to meet with the Victorian Potato Growers Council. Several matters were raised. These included the status of the PCN Harmonisation Plan which aims to be completed by the end of this year; increasing dialogue between the industry and the supply chain; minor use chemicals concerns and the modernisation of the Horticulture Award.

Since meeting the group, AUSVEG has held discussions with the Office of the Deputy Prime Minister in relation to the Award Modernisation and we expect a decision within weeks as to whether or not she will intervene in the provision of industry concessions about this issue.

In relation to minor use chemicals, I have met with the Principal of AgAware, Peter Dal Santo, and in the next few weeks we look forward to working even more closely with him to enhance communications between AUSVEG and the industry on Peter's important work in this area.



*Richard Mulcahy, David Carter and Paul Bogdanich*

At AUSVEG we are continuing to actively pursue the best possible outcomes for all of the above-mentioned matters, and we look forward to keeping you fully informed of those and other industry happenings. In the meantime I look forward to hearing your views and these can be emailed to me at [info@ausveg.com.au](mailto:info@ausveg.com.au), or call us on 03 9544 8098. [pa](#)



**Richard Mulcahy**  
Chief Executive Officer  
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PROFILE

# Cultivating a new approach





**“Necessity is the mother of invention,” the old saying goes. For a group representing a broad spectrum of the potato industry along Australia’s east coast, necessity not only drove members to develop their alternative organisational model, it is what keeps them at the forefront of research into better potato cultivars in a tough and competitive market.**

“We felt it was a matter of survival,” says Peter Britt from JC Cutbush & Co. near Ballarat, one of the founding members of the East Coast Cultivars (ECC).

“We’re all just trying to be in there and survive as growers, packers, agents... whatever our role in the industry.”

Indeed, this is the distinctive feature of ECC. While there are many groups for growers, others for packers and still more for producers – and alliances may connect some of these – ECC represents a cross-section of the industry in locations far apart working co-operatively towards the same goal: new cultivars that can make it into the lucrative produce aisles of the supermarket giants.

“It’s almost like a consortium of representatives from across the industry,” says Dene Griffin from Alan Steggles Produce in Newcastle, another ECC member. “The impression I get is that other groups are specific to particular parts of the industry. We cover the whole range, but we’re still a like-minded group. We all had either dealt with each other—trading seed or finished product—or knew of each other.”

JC Cutbush, a business with more than half a century of history, is an agent and grower buying and selling both seed and table potatoes Australia wide. Alan Steggles Produce has been trading in Newcastle Markets even longer, since 1919. It wholesales, pre-packs and processes, supplying major chain stores and the hospitality industry.

Other ECC members are: Riverina potato grower Geoff Moar; Alan Westbury’s Westbury Produce Thorpdale in Victoria’s

Gippsland region; Geoff Martens’ Fresh Produce Group (formerly Baird Produce) in Brisbane; Manuel Stamatis’ wholesaling, pre-packing and processing business, Manuel’s Potatoes, in Canberra; and Luigi Garozzo’s Australian Produce Management Solutions in Cairns, which markets produce predominately from the Atherton Tablelands and pre-packs for the major chain stores and independents throughout the east coast of Australia. All have significant operations and have brought to the table decades of experience and credibility.

Mr Westbury, a grower for more than 30 years, says mutual respect was key to the diverse group’s ability to work together.

“I’ve dealt with other ECC members for a long time and know them quite well,” he said. “The main thing is that there’s trust in it.”

“We can help each other through our individual knowledge and contacts—they’re the key now.”

The group was formed after funding was withdrawn for the National Breeding Program at the Department of Primary Industry’s Toolangi Potato Research Centre.

Mr Moar explains: “The Department was very concerned that a lot of the breeding programs had produced cultivars that hadn’t been taken up in the field. Tony Slater (from the Toolangi Research Centre) felt that if people committed their own finances to a joint venture, they would have more ownership of the breeding schemes.”

Mr Slater encouraged industry people to form syndicates or partnerships to maintain the program at Toolangi. The groups would provide half the funding while Horticulture Australia (HAL) provided the other half. Each would need enough members to cover individual contributions to a level that could be maintained over five years. Groups would also need to be big enough to conduct trials and promote successful varieties across the east coast.

Through word of mouth in 2007, ECC members made contact and decided to form the group as a company. Members have equal shares within the company and equal voting rights.

The vast distances involved mean the group meets as a whole only once or twice a year, although individual members often meet through business. Most communication is by phone or email.

“The guys in Victoria keep us informed,” says Mr Griffin. “When we do eventually meet it’s good but very matter-of-fact and business-like. It’s just ‘let’s sort it out and get back to work’. Then we give Tony Slater a bit of a grilling.”

Mr Slater continues as the hands-on manager for the breeding work at Toolangi while trials are conducted at Cutbush’s Ballarat site. Seven varieties have been planted there, says Mr Britt. “They are growing nicely but it’s too early for evaluations.”

The goal is to develop— or find among existing overseas

**“We can help each other through our individual knowledge and contacts—they’re the key now.”**

*continued over page* ►



From page 11 ►

Cultivars at the trial dig at Dean and cultivars bred at Toolangi, Victoria

varieties— a few good all-round cultivars that balance the needs of growers, processors and consumers.

“If we do get a variety like that we’re in a position to market it,” Mr Britt says.

Mr Griffin says the advantage of a diverse group like ECC is that it provides perspective from every level, not just one segment of the industry.

“Some potatoes developed by growers crop like a bomb but are rubbish,” he says. “Growers are concerned with yield and disease, packers with presentation and timing, processors need them to be easy to peel. We need a potato that does all that.”

ECC members think this would be something like a Sebago, but with resistance to Potato Cyst Nematode (PCN) and powdery scab, according to Mr Westbury.

“Woolworths have refused Sebagos since January last year,” he says. “Growers are stuck with the situation where supermarkets are making it increasingly hard for us.”

Yet ECC members know they cannot seize a reasonable market share without a product the supermarkets will accept.

“We’ve got to get it into the major chains to be successful,” Mr Britt says.

**“We see this as a long-term project with obvious benefits to not just our members but the industry in general.”**

Mr Moar says that if they do come up with a cultivar that ticks all the boxes, it will not be withheld from other growers outside the group through a restrictive enforcement of Plant Breeders’ Rights.

“What we’re trying to do is come up with a line that may carry a royalty but would be available to everyone,” he says. “The royalty would refund the investment we have put into developing it. It will be user-friendly for growers, who need that little bit more profit.”

Mr Griffin comments: “We’re not from the top end of town.”

The group wishes that sort of co-operation and concern for smaller players was more widespread. Mr Britt says members were

disappointed their recent tender for three new DPI cultivars was rejected.

Nevertheless, the East Coast Cultivars are determined to persevere.

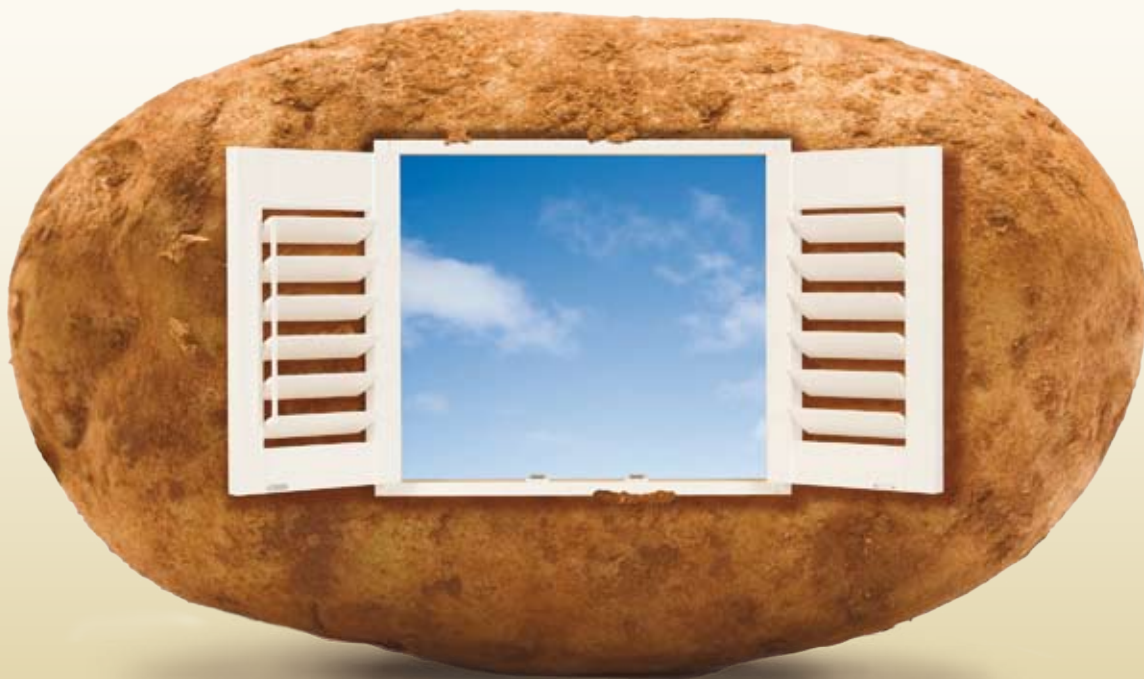
“So far it’s just made a fair bit of work for us but we don’t mind as long as there’s light at the end of the tunnel,” Mr Britt says.”

“We see this as a long-term project with obvious benefits to not just our members but the industry in general.”

“None of us sees it as a big money-making exercise. We want, basically, to survive.” **pa**



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# Get set for green trade

The Australian Government's proposed Carbon Pollution Reduction Scheme (CPRS) has been passed by the House of Representatives and is before the Senate for consideration. From an economic perspective, the CPRS will raise costs (more so for heavily polluting industries), lead to changes in methods of production, and shift resources between industries across the economy. However these developments will not occur overnight and industries which are major contributors to carbon emissions will be provided with arrangements that give them some time to adjust.



Rather than place a tax on carbon emissions the Government has opted for a market based solution. The CPRS uses a 'carrot and stick' approach to encourage businesses to reduce their emissions. Businesses will either have to reduce their carbon pollution (the carrot) or pay for permits to cover their carbon emissions (the stick). A 'cap and trade' system is being proposed. Permits will be issued up to a set limit and will gradually reduce in number over the years to enable Australia to meet its international commitment to reduce emissions (the cap). The centre piece of the CPRS is the use of the market mechanism for the transfer of permits (the trade) between industries. As the number of permits decline their price will rise, raising costs to industries emitting carbon.

### The CPRS and spuds

Nobody knows how the CPRS will affect the Australian potato industry, but we can outline some scenarios that suggest what the impact might be. The reason for the ambivalence over the impact on the potato industry is that amendments to the CPRS are possible and at this stage, agriculture is not included in the CPRS. Most other countries appear reluctant to include agriculture in their proposed schemes. The Australian government's preference is to have agriculture in, mainly because it is a major contributor to Australia's emissions (accounting for 16% of the national total) and hence could play an important role in helping meet the pollution reduction targets that are required. The Government hopes to make some decision on whether to include agriculture in the CPRS by 2013 but if agriculture is included it will not be before 2015.

### Costs

The CPRS in its existing form will raise the cost structure of potato growers because the suppliers of farm inputs such as electricity and fertiliser, will have to buy permits to cover their carbon polluting activities and they are most likely to pass these increased costs on in the form of higher prices. So, regardless of whether the potato industry as part of agriculture is included or excluded from the CPRS, potato growers will be impacted. How much the price of inputs will rise is uncertain because input suppliers may take the carrot approach and change their methods of production to reduce their carbon emissions.

If agriculture is included in the CPRS and carbon emissions are determined at the farm gate regardless of size of farm operations, then costs will increase further through the need of potato growers to buy permits corresponding to emissions.

The good news for potato growers is that unlike other agriculture industries, gas emissions attached to potato growing are low and may fall below an agreed threshold. To a large degree it won't matter too much to potato growers whether agriculture is in or out of the CPRS.

The cost of the CPRS for the potato industry will be in the higher prices for inputs used.

Economic modelling suggests that on the basis of no change in the existing production techniques for input suppliers, the cost of inputs for potato growers will rise between two per cent and four per cent. However, potato growers producing for the processing sector may face higher costs if processors decide to pass the increased costs attached to their activities down to growers through lower prices rather than up to consumers through higher prices.

### Global agreement

At present, world rules on carbon emissions do not allow account to be taken of the contribution that plants make to carbon emission reduction through the sequestering of carbon in the soil as part of the natural plant cycle. A best case scenario for potato growers would be agreement coming out of the meeting of major world economies on climate change held recently in Copenhagen, for a change to accounting rules to measure and recognise the sequestering of carbon in soil so that credits could be earned to offset against higher costs associated with carbon emission.

If this was combined with the idea which is incorporated in legislation before the USA Senate for agriculture to be 'in' on the credit side and 'out' on the debit side then potato growers may actually be able to make money out of generating and selling carbon credits. But then I might be dreaming. <sup>pa</sup>



### The Bottom Line

- Australian agriculture is not expected to enter into the proposed CPRS until at least 2015.
- An accounting mechanism attached to the sequestration of soil carbon might be financially rewarding for those potato growers actively engaged in emissions mitigating efforts.

# Australia's positive year of potatoes

The Australian Bureau of Statistics recently released data on the potato industry from its Agricultural Survey covering the financial year 2007/08.

The survey is taken from a sample of agriculture businesses registered for GST, and with annual turnovers in excess of \$5,000. Agricultural businesses are classified according to their principal source of revenue, so grower numbers are likely to be understated. The ABS estimates that the statistical error associated with sampling in the survey for potato growing is low—at 2.5% at the national level, and between 4.5% and 10% for state estimates depending on the state.

## National statistics

Following a fall in numbers, area planted and production in 2006/07, the national figures for 2007/08 showed that from an output perspective 2007/08 was a much better year for potato growers. All key data estimated increased. Although the number of potato growers rose only slightly, production rose almost 16% to the highest level in 10 years. Production was boosted by the largest area planted since 2000/01 (up 12%) and the highest yields in the past decade.

	2005/06	2006/07	2007/08
Number of Growers	1342	1270	1280
Area Planted (hectares)	35,268	34,096	38,190
Production (tonnes)	1,249,605	1,211,988	1,400,206
Yield (tonnes/ha)	35.4	35.5	36.7

## Segment statistics

The data break down between fresh and processing was a surprise given the pressure on returns experienced in the latter. The number of fresh potato growers fell, while grower numbers in the processing sector rose. The area planted and production rose in both sectors. Plantings were up 15% for the fresh market and 10% for processing. Fresh potato production rose 21% and potato production for processing, 12%. The respective shares of the total market were 40% and 60%.

	Number of Growers	Area Planted (hectares)	Production (tonnes)	Yield (tonnes/ha)
Fresh market	735	17,809	563,589	31.6
Processing	667	20,381	836,617	41.0
Total	1,280*	38,190	1,400,206	36.7

\* Some growers active in both sectors

## State statistics

Almost 60% of potato growers in 2007/08 were located in Victoria or Tasmania. Grower numbers fell in Victoria and Western Australia compared to the previous year but rose slightly

**“From an output perspective 2007/08 was a much better year for potato growers”**

in the other States.

South Australia accounted for 32% of area planted in Australia in 2007/08 and Victoria for 28%.

Tasmania's share of total area planted declined to below 16%, New South Wales below 11% and Western Australia to just above 5%. Queensland's share of 8.8% in 2007/08 was its lowest in the past decade and down sharply from 14% in 1999/00. There were strong increases in area planted in Victoria and South Australia but the area planted fell by 4% in Queensland, and by 10-11% in Tasmania and New South Wales. There is a contrast between South Australia and the other states with potato farms in that South Australian farms are much larger than the national average.

South Australia, Victoria and Tasmania dominated potato production in 2007/08 accounting for almost 80% of total production. South Australia's 34% share of Australia's potato production in 2007/08 was a record over the past decade and up strongly from 22% in 1998/99. In line with the increase in area planted South Australia and Victoria recorded the biggest increases in production with gains of 31% and 26% respectively. Despite the fall in area planted, production in Queensland was up by almost 13% due to much higher yields. There were smaller increases in production in Western Australia and Tasmania. In contrast, New South Wales' 7.5% share of total production in 2007/08, represented its lowest in the past decade.

Yields ranged over a wide spectrum but in Queensland they rose by 18% on the previous year, to reach 29.6 tonnes/ha, which is still below the national average of almost 37 tonnes/ha. [pa](#)

	Number of Growers	Area Planted (hectares)	Production (tonnes)	Yield (tonnes/ha)
New South Wales	135	4,070	104,448	25.7
Victoria	275	10,720	322,446	30.1
Queensland	172	3,354	99,241	29.6
South Australia	151	12,124	477,062	39.3
Western Australia	67	1,949	85,761	44.0
Tasmania	480	5,969	311,218	52.1

## The Bottom Line

- Production and yields in 2007/08 were the highest they have been since 2000/01.
- South Australia, Victoria and Tasmania dominated Australian production.
- Fresh potato production was up by 21% and processing potatoes rose by 12%.



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Words Jenan Taylor

# Keeper of the seed

The Victorian Certified Seed Potato Authority or ViCSPA as it is commonly known in Australia and around the world, has been the custodian of the 70 year-old certified seed scheme since 1994. ViCSPA Manager Keith Blackmore who retired in July after being involved in seed certification since 1969, gives us his perspective on the organisation and the national potato industry.

## Why was ViCSPA established and how has it attained the heights of international recognition?

Following attempts to prevent the degeneration of the potato industry to diseases and pests through the introduction of a seed certification program, an eminent pathologist David Harrison who worked for the Victorian Department of Agriculture went on some overseas study tours in the late 1960s to see what the rest of the world was doing to preserve their industries. The knowledge he brought back reshaped the way that Australia did things and in due course led to the formation of a committee who were dedicated to revitalising the existing certification program.

ViCSPA was established in 1994 as an organisation whose aim was to continue keeping the potato industry profitable and sustainable through the provision of clean, good quality certified seed potatoes. In many ways ViCSPA is a service organisation and there is outstanding effort provided by the board, staff and industry. It is highly respected because of its innovative and revolutionary approach to seed certification, which includes Pathogen Testing (PT), its G4 Foundation scheme and the tissue culture system.

## How has seed certification changed in 40 years?

The PT process has evolved considerably and there has been the development of the G4 Foundation scheme as well as the tissue culture system. There is more certification training and the industry is more aware of the importance of the system. In many ways certified seed schemes underscore the robustness of the Australian industry and increase the scope for increasing the export of fresh and seed potatoes.

Some of the things covered under seed certification by ViCSPA includes field inspections for certified seed growers; soil sampling for PCN-impacted areas; quality assurance; the maintenance

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of the In Vitro collection; Laboratory accreditation audits; the National Certification Officers Course; Australian Quarantine Inspection Service (AQIS) compliance inspections; Interstate Plant Health certification; and Fruit fly monitoring, and virus monitoring of ViCSPA growers' plots. This year so far, we have inspected more than 18,000 ha of potatoes. These days we're also in charge of eight ViCSPA-accredited facilities in Victoria, South Australia, Tasmania and NSW.

### What has been the most satisfying aspect for you?

The inspection and validation of healthy seed crops, and the national seed certification course. I am particularly proud of this scheme which is going quite strong. We train clients from seed inspection departments nationally and internationally. This involves giving Certification Officers the knowledge and skills to be able to identify varieties, diseases and also implement the national criteria for seed potatoes. The next course will be in 2010 and from time to time we accept applications for training from people outside of the usual sphere of industry stakeholders.

### How has the Australian potato industry fared in the last few years?

The last year has been one of the hardest for the industry in terms of diseases and weather extremities. In Victoria it has certainly been the toughest, driest year. It's not all gloom, though. Yes, there have been smaller size crops, but there have been some good ones among those. But it has been very difficult for growers impacted by the discovery of PCN.

### How would you like to see this resolved, ideally?

It's going to be good to get the PCN management plan passed in. There have been some unethical practices which have placed the entire industry in jeopardy. This has been about short-term gain for long term pain. Growers need to take on the PCN management measures, which might include growing PCN resistant varieties, observing better and sensible crop rotations, and regular soil monitoring. The final draft of the management plan is just awaiting risk assessment procedures.

### Recently, there has been some discussion about whether or not the industry shows enough cohesion in terms of knowledge transfer. What has been your experience?

There are lots of people who have gone to great lengths for the sake of furthering the industry, and we should be grateful for them. Some of these people have involved themselves tirelessly in the various committees and groups that help to keep ideas moving and extend knowledge. At the Victorian level, these include Brian Dennehy, Ken Labbett, Des Jennings, some of whom were recognised at last year's awards at the Biannual Seed Potato Conference, and a host of others who made some major contributions to the good of potatoes. One of the most positive things you can do is be a part of the potato industry. There's always room for partnerships and very positive thinking,, and potato people are a great group of people to work with.'

### What are some of your thoughts on the World Potato Congress in Christchurch which you attended earlier this year?

The meeting was very, very good, and there were excellent outcomes for Australia because of it. For the first time we were able to have an international seed committee meeting and keep the company of some leading international seed organisations such as the South African seed certification scheme. We received very positive feedback on the quality of our certification program and training from the international groups. [pa](#)

Keith Blackmore is quiet-spoken and calm; he is reluctant to pose for photographs, shys away from attention, and is unlikely to want to read this snippet. He speaks briefly about hailing from a market gardening background in Dandenong, Victoria, and shares his hopes to be present for the imminent arrival of his next grandchild, but the rest of is all about potatoes.

While he guides visitors around the Toolangi research facilities and surrounding country, he talks about people in the industry and the grower communities—locally, nationally, internationally, and past and present—and how they've made the industry what it is. For Keith, being the Manager of ViCSPA was no one-man show, and that is part of the legacy of success he has left the company. After 40 years, though, there is still no separating the man from his work—or rather, his passion. When he gets back from a short break, he'll fill in the gap left by his friend and colleague, the late Bruce Fry, and then, he says, there is a possibility he will return to market gardening.



# Taking the lead

As “the home of great British potatoes”, Branston has been working with some of the United Kingdom’s most progressive growers since 1968. But the company itself has also been progressive, particularly when it comes to implementing environmental initiatives to minimise use of non-renewable resources, reduce waste and develop long-term sustainability.

With sites in Lincolnshire, Somerset and Scotland, Branston is one of the United Kingdom’s leading potato buyers, packers, distributors and marketers. The company has three formal Producer Groups who work 16,000 acres of land surrounding the production sites, and has a total handling capacity in excess of 400,000 tonnes per year.

As a business which relies on nature for its product, Branston is also well aware that a company’s environmental credentials can sway consumer opinion. As a result, the organisation has made a commitment to reducing environmental impacts and lowering carbon emissions wherever practically possible.

Late last year, it became the first food producer in the country to be awarded the Carbon Trust Standard in recognition of its success in reducing carbon emissions over the previous three years. The environmental certification scheme was launched in June 2008 in response to demands from businesses and consumers for a program which focused on actual results and achievements rather than just good intentions. It provides an objective benchmark against which to assess an organisation’s commitment and success in addressing its climate change impact.

Branston had already received an ISO 14001 standard across all three sites for best practice in environmental management following rigorous inspections of all areas of operation. The company regards the Carbon Trust Standard as the next phase of its environmental strategy, as it looks to continue to reduce its carbon emissions by using less energy and embracing new technologies and processes wherever possible.

“Receiving the standard is a great honour for us and the whole team at Branston has worked incredibly hard to secure it,” said Branston’s managing director, Graeme Beattie.

“Each step of our process is considered, from ethical sourcing of premium quality potatoes to efficient packing and storage of

*Vidyanath Gururajan, Group Head - Development and Projects, Branston Ltd*





the finished product. Once we establish each impact, we aim to monitor and reduce the negatives.”

As part of achieving the Carbon Trust Standard and ISO 14001 accreditation, Branston devised and implemented an environmental policy across all of its sites, which commands systematic reviews and continual improvement particularly in areas of significant environmental impact by minimising the use of water, energy and other natural resources wherever possible.

“Each step of our process is considered, from ethical sourcing of premium quality potatoes to efficient packing and storage of the finished product. Once we establish each impact, we aim to monitor and reduce the negatives through our management focus and environmental management system,” Mr Beattie explained.

Vidyanath Gururajan chairs the company’s group environmental forum, ensuring the continued monitoring of carbon measurement resulting from Branston’s activities, identifying carbon-producing hot-spots and developing and implementing carbon reduction plans.

“Environmental best practice is important for all business, but especially so in the food industry,” he says. “It’s not just about securing a more stable environment for our future, but also reducing costs and increasing efficiency.”

The environmental management system balances the financial needs of the business with the need to reduce the environmental impacts of operations. Measures such as building a state-of-the-art coldstore, which uses less power than traditional coldstores, introducing high-speed doors in areas of the factory where heat loss is above average and upgrading water treatment facilities have all contributed to the reduction in carbon emissions.

The company has also explored energy reduction opportunities in potato packing and transportation, and has also looked beyond its own operation by working to ensure that its suppliers and contractors are aware of their environmental responsibilities.

Following the success of the company’s decision to diversify into the prepared vegetables market in 2005, Branston has also recently invested £3.5m in its own purpose-built high-care facility at its Lincolnshire site to accommodate increased production. The new Branston Prepared factory has been designed to be as environmentally-friendly as possible: drawing its water from a borehole, recycling hot air from chiller units

to warm water, using light tubes to maximise natural light, and utilising a biomass heating system.

The company has also explored energy reduction opportunities in potato packing and transportation, and has also looked beyond its own operation by working to ensure that its suppliers and contractors are aware of their environmental responsibilities.

Branston is the biggest fresh produce supplier for Tesco, and has worked closely with the international retail giant to reduce its packaging weights, measure the carbon footprint of potato production and introduce clear carbon footprint labelling on its potato product packaging. Branston growers also work to Tesco’s Nurture scheme which sets environmental standards in key areas of safety, traceability, quality and environmental responsibility. Each grower is audited on an annual basis to ensure they meet the required high standards Tesco has set, which include a demonstrated commitment to wildlife protection and landscape conservation and limited use of artificial pesticides, fertilisers and manures.

Growers are also required to encourage sustainable farming practices, such as use of energy, natural resources and recycling. The Nurture Standard is set out in such a way to encourage continuous improvement, with three levels of achievement: bronze, silver and gold. Tesco says growers are continually motivated to work towards and join the group of worldwide elite ‘gold standard’ growers as they reap the benefits of building sustainable businesses, commercially and environmentally.

As the first company in the food and agriculture sector to receive the Carbon Trust Standard, Branston has been described as a “beacon for other food production companies”.

“Branston’s innovation and foresight in recognising that reducing carbon emissions also reduces costs is to be celebrated. It demonstrates real action on climate change as well as commercial acumen. We hope that many other food producers follow Branston’s lead,” said the Carbon Trust Standard Company’s general manager Harry Morrison.

In order to maintain the Standard, Branston will have to continue its efforts and reduce its carbon emissions every year. The company will be audited every two years to ensure it has met its targets.

*The Carbon Trust was set up by the UK Government in 2001 as*



*an independent company. Its mission is to accelerate the move to a low carbon economy by working with organisations to reduce carbon emissions and develop commercial low carbon technologies.*

*The Carbon Trust Standard was introduced in June 2008 to put an end to the practice of ‘greenwashing’ whereby the public mistrusts organisational claims of environmental best practice. The Standard has since been awarded to more than 90 organisations who are taking real action to reduce their direct impact on climate change by measuring, managing and reducing their carbon footprint.*

Read more about Branston at [www.branston.com](http://www.branston.com) 

Words **Tony Pitt**

# Fertiliser strategies for today

Over the last two to three decades much has changed in respect to fertiliser management, but this may be influenced by the fact that there has been very little agronomic research over the past 10 years, and very little new available information on fertiliser management.

There were plenty of agronomic trials in the 1970s and 1980s. Every district had its own trials undertaken either by the Department of Agriculture or by the fertiliser field representatives. And there was a healthy level of scepticism to be associated with fertiliser trials, because the trial results were showing responses (or lack of) in crops that were yielding 45 and 50 tonnes/ha in the plots, whereas the surrounding un-trialled crops were only producing 30 tonnes/ha.

These days I am a little reluctant to embark on agronomic work on a grower's property where the grower's expectations are for yields of 65 tonnes/ha (Russet Burbank) or at least 50 tonnes/ha. If these yields or better aren't achievable in trial plots, what am I able to demonstrate for the industry?

The advent of tissue testing services, whether it be sap testing or dry petiole analysis, has changed the growers access to their crop nutrition information, and given them the ability to fine tune fertiliser practices above and beyond that available through conventional trial programs.

Now, every commercial potato farm has the potential to become a trial site with weekly print outs of tissue test results, and as with a lot of services, the farming community responded by lifting productivity to new levels. For instance, the average farm gate yield of Russet Burbank potatoes for 2008 in the Ballarat district was 53 tonnes/ha, whereas 10 years ago it was around 42 tonnes/ha.

The changed situation is related to how the potato industry in Australia has recognised the limitations in conventional approaches to soil testing and fertiliser recipes, and embraced the concept of tissue testing through the active growth of the crop. Many growers have used tissue testing at some stage in the past 10 or 15 years. They have learnt from the data it produces as to how to achieve higher levels of productivity for their own farm.

However, growers should remain critically aware of the impacts of fertiliser levels on their crops *and* soil nutrients. It pays to revisit how nutrients are removed from the soil by potato crops.

## Back to some basics

Nutrient Removed from typical contract (French Fry) and fresh market crops

	Russet Burbank 21% dry matter 65 tonnes /ha	Coliban 18 % dry matter 45 tonnes/ha
<b>Nitrogen</b>	<b>260 kg</b>	<b>155 kg</b>
<b>Phosphorus</b>	<b>35 kg</b>	<b>20 kg</b>
<b>Potassium</b>	<b>285 kg</b>	<b>170 kg</b>
Calcium	5 kg	3 kg
Magnesium	15 kg	8 kg

In 2009, the above data gives rise to a number of issues that need to be explored:

Over the last two years fertiliser prices have doubled, so is the fertiliser strategy that we used two years ago still appropriate?

Is it still cost effective to side dress with nitrogen?

Potato production is located in traditional soils and districts. Are there any other nutrients besides nitrogen, phosphorus and potassium with which we should be concerned?

Are our current fertiliser strategies sustainable?

## Planting fertiliser strategies versus cost

How do some typical fertiliser strategies compare with the likely crop removal of nutrient?



	Russet Burbank 21% dry matter 65 tonnes /ha	Pivot 800 (8-10-10) @ 1750 kg/ha, 20-0-16 @ 400 kg/ha	Coliban 18 % dry matter 45 tonnes/ha	Pivot 800 (8-10-10) @ 1500 kg/ha
<b>Nitrogen</b>	<b>260 kg</b>	<b>220 kg</b>	<b>155 kg</b>	<b>120 kg</b>
<b>Phosphorus</b>	<b>35 kg</b>	<b>175 kg</b>	<b>20 kg</b>	<b>150 kg</b>
<b>Potassium</b>	<b>285 kg</b>	<b>239 kg</b>	<b>170 kg</b>	<b>150 kg</b>

The above table shows that there is likely to be a deficit in nitrogen and potassium, and an excess in phosphorus based on this comparison. The deficit in nitrogen is likely to be made up from mineralisation of nitrogen from organic matter if the paddock is reasonably fresh from pasture. The deficit in potassium may be made up of soil reserves of potassium. The excess of phosphorus is necessary on clay soils as an offset against the phosphate fixation of these soils.

There is some evidence that on heavily cropped soils we are starting to approach some saturation of phosphorus fixation, and an available phosphorus test (Olsen method) of 60 mg/kg would be an indicator that a lower level of phosphorus fertilizer is required.

Because of the higher levels of productivity being achieved, there is no case for a decline in fertiliser use with the possible exception of phosphorus. For potassium and nitrogen, any lower fertiliser rates will lead to long term decline in soil reserves.

Compare the fertiliser cost today with the relative cost 25 years ago in 1984. This was towards the end of the peak period for the fertiliser trial work that was done in the 70s and 80s. While fertiliser prices may well have doubled over the past two seasons, the ratio between planting fertiliser and contract price is largely unchanged compared with 1984. The planting fertiliser (and cost) that was appropriate 25 years ago in 1984 is a similar proportion of contract price in 2009. There is no argument here for a review of the strategy.

Product	1984			2009		
	\$/tonne	\$/planted hectare	Contract Price	\$/tonne	\$/planted hectare	Contract price
6-6-6 @2500 kg/ha	\$143	\$358	\$124 PER TONNE	\$574	\$1,435	\$335 PER TONNE
Pivot 800 @ 1500 kg/ha	\$248	\$372		\$883	\$1,545	
10-17-8 @1100 kg/ha	\$281	\$309		\$1,008	\$1,109	

### Is it cost effective to side dress with nitrogen

The following table lists some of the commonly used side dressing fertilisers together with the cost per unit of nitrogen. As would be expected, urea is the cheapest nitrogen, but is not necessarily the best value for money. The most expensive source of extra nitrogen in this group is Diammonium phosphate (DAP).

	Price per tonne <sup>1</sup>	Nitrogen content	Cost per unit of Nitrogen \$/kg
Urea	\$694	46%	\$1.50
Ammonium Sulphate	\$560	21%	\$2.50
DAP	\$947	18%	\$5.26
Calgran	\$862	24%	\$3.60
20-0-16	\$803	20%	\$4.00

1. These prices are quoted from a single supplier in April 2009. Lower prices may well be obtained by individual negotiation.

So at cost per unit of nitrogen ranging from \$1.50 up to \$5, is it cost effective to apply nitrogen side dressing? The fertiliser trials of the 70s and 80s don't provide the answer. They had yield responses to nitrogen in contract crops that were yielding 40 and up to 50 tonnes/ha. How applicable can this be to crops that now yield 65/ha and potentially higher?

The response to higher levels of fertiliser nitrogen follows a typical pattern of straight line response to a threshold whereby it quickly plateaux out to no further increase in yield. At the plateau value, other factors are restricting yield and at higher levels there may even be yield suppression. The transition from the straight line response to the plateau value is often very short. This transition zone may occur between 30 kg/ha and 40 kg/ha of total fertiliser nitrogen on soils that are supplying considerable quantities of nitrogen through mineralisation. On hungrier soils the transition zone may be over 300 kg/ha, and between 300 kg/ha and 350 kg/ha. The responses are very variable depending on paddock history.

Across a range of 1970s trials there was sometimes no response to nitrogen at all, but when responses did occur, they were linear responses for up to 100 kg/ha of fertiliser nitrogen, and with an additional 30 kg to 50 kg potatoes per kg unit of nitrogen. Fountain and Stackhouse (1972) obtained a series of straight line nitrogen responses of up to 157 kg/ha fertilizer nitrogen with an average of 33 kg potatoes per kg nitrogen. More recently, Dahlenburg (1990) obtained straight line responses to fertiliser at up to 320 kg/ha of fertiliser nitrogen and the average response was 78 kg potatoes per kg of fertiliser nitrogen. Thus responses to nitrogen, when they occur, are exceptional.

How do we relate this to the cost effectiveness of side dressing with nitrogen. Consider the table below which is based on a side dressing which delivers 40 units of nitrogen, or 40kg/ha of fertiliser nitrogen. The right hand column is the break even yield response.

	Cost for 40 kg/ha nitrogen \$/ha	Break even yield required (French Fry Contract Price)	Yield response for break even
Urea	\$60	160 kg	4 kg potatoes/ kg N
Ammonium sulphate	\$100	300 kg	8 kg potatoes/kg N
Calgran	\$140	400 kg	10 kg potatoes/kg N
20-0-16	\$160	450 kg	11 kg potatoes/kg N



The answer to the question fundamentally lies with whether or not the crop is in the region of linear response to nitrogen. Tissue testing has become the accepted means of determining the crop nitrogen status. If the nitrogen levels are below the key thresholds for tissue analysis, then it is likely that **all** of the nitrogen fertilizers above are likely to be cost effective. If however the crop is not responsive, then they are **all** potentially a waste of money.

#### Are there other nutrients with which we should be concerned?

Away from traditional production areas we do get problems with minor nutrients such as zinc and manganese. These are particularly related to alkaline sand soils in the drier production areas.

In traditional growing areas in southern Australia, on volcanic clay soils, the balance of minor and trace elements has up until recently been adequate for potato cropping. About 15 years ago we started to see the commencement of magnesium deficiency in some of the more heavily cropped areas of Thorpdale. We also commonly see very low tuber calcium for crops grown on these soils. The current season is the first in which I have seen magnesium deficiency in the Ballarat district, and going by the Thorpdale experience, this is likely to be more common in the future as we continue to return to the same paddocks in rotation without boosting the soil reserves of magnesium.

The low magnesium has quite distinctive and recognizable foliage symptoms. There is some cultivar variation as to how the symptoms are expressed, but minor symptoms show cupping and mild yellowing of the lower leaves which can be accompanied by some mild inter-veinal patterns on the leaves which may include some death of the leaf tissue (necrosis). As symptoms become more severe, the plants become stunted and the lower leaves become fully necrotic.

Low calcium is more complex. Foliage symptoms of low calcium are meaningless because they tend to reflect a calcium mobility problem in the plant, and often occur when the plant is growing too quickly for the calcium supply to be maintained to the youngest expanding leaves. This has no relationship, of which I am aware, to tuber calcium deficiency, which seems to culminate in storage and handling problems. Calcium deficient tubers are more prone to storage problems and possibly to seed piece decay if the tubers are used for seed.

One solution for the calcium deficiency, is calcium nitrate fertiliser at hilling. I would generally recommend the cal-nitrate with added boron, as there is an interaction between calcium and boron whereby it is best to add them both together.

The solution for the magnesium deficiency, is magnesium sulphate before planting if picked up in a soil analysis, or even using dolomitic lime if planting is not imminent. If magnesium problems are diagnosed in early crop growth, the crop can often be saved with timely application of magnesium nitrate. Other foliar magnesium compounds do not seem to be as effective and are probably less soluble than magnesium nitrate.

#### Is the strategy sustainable?

No. Our current fertiliser strategy is built around the mining and consumption of two natural resources products. Phosphate rock reserves in particular are running out and there are various estimates as to how long we can continue with the exploitation of this resource before we approach serious depletion. In 1984 the proven reserves of phosphate rock were estimated to be adequate for about the next 30 years. Now, 25 years later, there is no immediate end in sight, so that estimate has presumably been superseded by new developments of winnable reserves. But commercially winnable phosphate reserves must eventually run out. And there is also increasing demand in some areas of the world for phosphatic fertilizers. We need an alternative. It might benefit us to have a greater understanding of the role of endophytic soil microbes in the search for answers. This has to be the one of the new directions for research in potato crop nutrition. [pa](#)

**References:** Dahlenburg AP, Maier NA, and Williams CMJ (1990) Effect of nitrogen on the size, specific gravity, crisp colour and reducing sugar concentration of potato tubers (*Solanum tuberosum*) cv Kennebec. *Australian Journal of Experimental Agriculture* 30, 123:130.

Fountain PJ and Stackhouse KN (1972) The effect of fertilizer on tuber number. *Proceedings of the Australian Potato Agronomy Conference, Burnie Tasmania* 1972.

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#### The Bottom Line

- Growers need to be aware of the effects of fertiliser levels on their crops and soil nutrients.
  - The ratio between planting fertiliser and contract price has remained largely unchanged over the last 25 years.
  - Commercially winnable phosphate reserves must eventually deplete and an alternative is needed.
-





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# Introducing a new face



*Keith Blackmore guides Hugh Tobin around Toolangi research facility*

In my first few months at AUSVEG I've been astounded to encounter the resilience and determination of Australia's vegetable and potato growers. In March I finished working as Public Affairs Manager at a public policy think tank for four years after being offered a position as part of the AUSVEG communications team.

The vegetable industry has a great health story to tell and it is exciting to be able to be a part of such a positive and vital Australian industry.


Already I've managed to find time to visit a number of growers including a farmer in Boonah, Queensland, and witnessed the AUSVEG Enviroveg program in action on farms in Victoria. Recently Luis Gazzola and Tony Imeson of the Vegetable Growers Association, Victoria escorted us through the Melbourne Markets on a cold, wintery morning where we met many of the industry characters who have been selling vegetables for decades.

It was also fascinating to visit the Toolangi Research Centre with the Editor of Potatoes Australia where we met with Keith Blackmore, former Manager of VICSPA, and saw the science behind potato production in Australia.

In May I spoke to a group of future leaders at the Vegetable Industry Strategic Leadership Course about dealing with the media. VegVision 2020 and the Vegetable Industry Development Plan see the development of the next generation of industry leaders as a vital task in the coming years and I was impressed with the enthusiasm and conviction of the group that I met and wish them luck.

An eager group of young growers have also recently been on a study tour to New Zealand to study farming operations there and attend the Horticulture New Zealand Conference for 2009 in Christchurch. In October vegetable growers of all ages will have the opportunity to travel to the United States to attend the PMA Fresh Summit in Anaheim, California, with 17,000 other attendees from the entire supply chain. This tour is supported by the Australian vegetable levy through HAL. Anyone interested in being a part of the tour should contact me to express their interest.

In May I attended the Vegetable Industry Conference in Melbourne organised by AUSVEG which was a great opportunity to meet with many growers, suppliers and industry representatives for the first time. From my perspective these types of events are invaluable learning opportunities and I would welcome the opportunity to meet with as many of you as possible in the coming months.

If you have any questions or feedback you can call me any time at the AUSVEG office on 03 9544 8098 or email [hugh.tobin@ausveg.com.au](mailto:hugh.tobin@ausveg.com.au) 



**Hugh Tobin**  
Communications Manager  
AUSVEG

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If you have a question that you'd like addressed, please ring the advice line on 1800 067 108 or email *Potatoes Australia*: [jenan.taylor@ausveg.com.au](mailto:jenan.taylor@ausveg.com.au). Please note that some questions may be published.

# Ask the industry

A regular advice column covering issues from resistance management to occupational health and safety.

As spring approaches, many growers in Southern Australia will be assessing paddocks for suitability of potato production for the coming season. A common scenario that often arises is that of wanting to plant potatoes into soil that was previously treated with a residual herbicide or an herbicide that has a plant back interval recommendation on the label.

The issue here is that some herbicides, whether they are either pre or post emergent, can remain active in the soil for many weeks, months or even years after they have been applied and as such could be potentially damaging to the following crop that is planted into that soil.



Figure 1: Group B herbicide damage

## What effect can a herbicide residue in the soil have on potato plant growth?

In many instances, the overall effect can be economically devastating; ranging from mild damage to partial or even total crop loss. However, the likely crop effect is very difficult to determine and will depend primarily on the herbicide that was used previously and any number of environmental factors that contribute to the herbicide breaking down within the soil over time.

Herbicides within the soil are broken down or depleted to harmless levels via microbial, chemical, hydrolysis or photo degradation with chemical degradation being affected by factors such as soil type, moisture levels and soil temperature. The

critical note here is that not all herbicides are the same and as such the individual characteristics of each herbicide must be considered by growers.

## What does 'plant back interval' refer to regarding herbicides and where do growers find the information?

Herbicides that persist in the soil (such as a residual herbicide) generally have what is termed a plant back interval. This refers to the time period that must pass after the use of that herbicide before a sensitive crop is planted back into that soil. Such herbicides usually have detailed information contained on their label in relation to rotational crop restrictions that take into account the properties of the herbicide, the persistence of the herbicide in various soil conditions i.e. texture and pH, the effect of environmental factors such as rainfall or irrigation and the sensitivity of the intended rotational crop.

## What happens if potatoes are not mentioned on the herbicide plant back interval restrictions?

In the first instance, always consult the manufacturer of the herbicide, who will be able to advise growers of an appropriate course of action. It is important that prior to planting (especially where growers are intending to lease ground which they are unfamiliar with), that all information regarding previous cropping history and therefore previous herbicide use is fully investigated and understood. The risk of crop loss is extremely high if this is not taken into account.



**Phil Hout**  
Syngenta

# The pest defence

With much of Australia reeling from the recent disasters, emergency planning is on the mind of many growers. While the dangers of drought, fire, flood and storm damage are normally considered when developing emergency plans, biosecurity is often a forgotten part of the mix. AUSVEG and Plant Health Australia (PHA) are working to help fill this gap.

The significance of exotic pest incursions on Australia's rural sector should not be underestimated. An outbreak of the Asian papaya fruit fly near Cairns in 1995 resulted in trade restrictions of more than \$400 million and cost \$34 million to eradicate, and last year's Equine influenza outbreak reportedly cost businesses, communities and horse owners \$9.75 million per week. This devastation can also compound the emotional impact that such biosecurity emergencies can have on individuals and communities.

## What is 'Biosecurity'?

Biosecurity is everything we do to protect our crops from damage by exotic pests. Australia's geographic isolation has meant we have been relatively free of many pests that have wrought havoc on some industries overseas. This is a real trade benefit for us (both overseas and interstate) in terms of securing market access. And that's good for our image and growers pockets. So good biosecurity means we can keep it that way.

Minimising the biosecurity risks posed by insects, pathogens and diseases (collectively called pests) that are new to Australia is a key focus for governments, plant industries and PHA. Minimising the risks is achieved by:

- preventing establishment
- preparing the plant health system to respond, and
- contributing to emergency responses if an outbreak occurs

The farm hygiene practices implemented because of the PCN incursions in Victoria are the same practices that will help protect your crop and your industry from exotic pests such as Serpentine leaf miner (Vegetables) or Bacterial ring rot (potatoes).

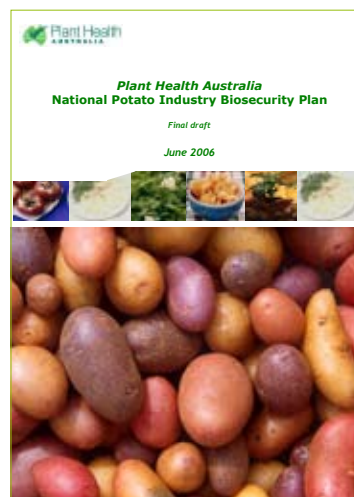
## Industry action plans

*Industry Biosecurity Plans* provide a blueprint for a number of Australian agricultural industries, ensuring the best possible protection for your crop against new plant pests. Developed by AUSVEG and other industry associations in conjunction with PHA and the Commonwealth and state and territory governments, *Industry Biosecurity Plans* cover:

- how we guard against exotic pests
- which are the exotic pests that pose the greatest threat to industry
- what we must do to detect these pests, and
- how we will deal with exotic pests if they are found.

AUSVEG CEO Richard Mulcahy says, "*Industry Biosecurity Plans* are absolutely critical to the future viability of our industry.

We are more and more at risk from exotic pests that could severely impact our growers' businesses. Working closely with government experts and PHA, we have developed world-class biosecurity plans for the potato and vegetable industries. These plans are not a guarantee, but if we all play our part, they ensure that we have the best possible protection. It is the first step towards being prepared to deal with such threats."





PHA and AUSVEG regularly review and update the relevant *Industry Biosecurity Plans*, ensuring they contain the latest possible information on pest risks and the most up-to-date strategies for industry protection. Both the *Potato Industry Biosecurity Plan* and *Vegetable Industry Biosecurity Plan* were originally released in 2007. The *Vegetable Industry Biosecurity Plan* is due to be reviewed next year, with the *Industry Biosecurity Plan* reviewed the following year.

### Which Pests?

Of course, it is critical that we are preventing (and prepared for) exotic pests which pose the greatest threat. There are 230 plant pests that have been identified through the development of *Industry Biosecurity Plans* across 20 industries. These “high priority” pests each present significant risk to Australian horticulture and agriculture. PHA examined:

- How easy it would be for each pest to get into Australia, spread and become established.
- If an exotic pest became established here, how bad would the impact be on productivity, profits, quarantine, trade and the community?
- And lastly, how difficult (and costly) it would be to control or eradicate.

Our target list is regularly reviewed and updated – and everyone involved kept informed.

### Supporting growers

Growers often ask, “What if my farm is affected; What if my crop has to be destroyed?” This too is covered in the *Industry Biosecurity Plan* and a separate legal agreement between AUSVEG and the Commonwealth and all state/territory governments, known as the Emergency Plant Pest Response Deed (EPPRD).

As described in that agreement, in the event of a declared incursion and formal response, growers are entitled to claim certain expenses and also the agreed value of the crop destroyed. For the first time, there is certainty, not only on how we react when an outbreak occurs, but also on how our growers will be reimbursed. Of course there are conditions and limits, but it is much better than the uncertainty that existed previously. Having signed the EPPRD, AUSVEG is part of the decision process at every step.


### Taking responsibility

Our industry must play its part, not only in responding to an incursion, but in actively trying to prevent one. “Governments have agreed to support industries with resources and expertise, but only if industries do their bit too,” said Richard Mulcahy. “Everyone has a responsibility, including our growers. They are in the best position to spot a pest early, and report it. Anything unusual or suspicious on your plants should be notified straight away. By working together we have the best chance of protecting our industry, the community, our farms and our livelihoods” he said.



PHA is also helping growers secure their farms, their futures and their industries against potentially devastating plant pests and diseases. Partnering with Animal Health Australia, PHA has developed a website with biosecurity planning information for both plant and livestock producers at [www.farmbiosecurity.com.au](http://www.farmbiosecurity.com.au)

Growers who notice something new or unusual on or around their crop should immediately call the **Emergency Plant Pest Hotline on 1800 084 881**.

More information about the 20 *Industry Biosecurity Plans* currently in place is available on the PHA website at [www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au) 



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## Taties top menu at the House of Potatoes

At the Glendower Kartoffelhouse and Restaurant, located approximately 50 kilometres south-east of Melbourne, in Beaconsfield Upper, there is a menu to suit all tastes, but it has one constant feature—the potato.

“All of our dishes start with potatoes, whether mashed, fried, baked... then we build from there”, says Executive Chef and co-owner Peter Hutten, who sources all the produce locally, with the majority of potatoes coming from the Gembrook and Thorpdale growing regions.

Together with Ulli Reichard, Peter opened the restaurant almost 10 years ago, armed with more than two decades worth of experience in running kartoffelhouses in Germany. When they came to Australia they were excited by the friendly, relaxed nature of the land down under, and saw an opportunity to share their passion for the kartoffel (German for potato) with Australian consumers by opening Glendower Kartoffelhouse in 1999.

“Competition from rice and pasta in Australia means there is not as much of an appreciation for the potato over here. Back when the restaurant opened, it was challenging to market a ‘potato house’. But by showing our customers the versatility of the potato they return time and time again. Nowadays 97 per cent of diners at our restaurant are Australian.”

Growing up in Germany, Ulli says you couldn’t help but love potatoes; they were a very important part of the German diet. “There are a number of kartoffelhouses in Germany, but you don’t find many over here,” he explains.

“Competition from rice and pasta in Australia means there is not as much of an appreciation for the potato over here. Back when



Words **Hannah Burns**

the restaurant opened, it was challenging to market a 'potato house'. But by showing our customers the versatility of the potato they return time and time again. Nowadays 97 per cent of diners at our restaurant are Australian."

Peter uses the Nicola variety in most dishes because of its rich, yellow flesh and "all-rounder" qualities. "I love the versatility of the Nicola, and enjoy working with the Desiree, Royal Blue and sometimes, Kipfler," he says.

The cuisine is Modern Australian with European, Mediterranean and even Asian influences. Peter and Sous Chef Megan White are always experimenting with new dishes. "It is fun to work with another chef who shares my passion for potatoes. You can do anything with potatoes!" says Peter.

The menu has some traditional German dishes such as potato dumplings with pot roast and Sauerkraut, and also potato desserts, including a potato chocolate mud cake. A favourite with customers is Glendower's homemade 'Potato Bread' which comes in four varieties, each with a very different flavour, and is also available to take home.

Glendower is situated in a 1920s bungalow-style house surrounded by sculptured gardens and native bushland, with a magnificent view towards the Blue Dandenongs and beyond. The building operated as a private hospital during the 1980s, then a private residence, before being purchased by Ulli and Peter and turned in to what it is today.

For more information, phone 03 5944 4710 or visit [www.glendower.com.au](http://www.glendower.com.au) 

## Australian creativity and science aid WPC think tank

A few years ago a sub group of like-minded delegates from the World Potato Congress (WPC) from seven participating countries formed what is known as the International Potato Network--an R&D and marketing-specific alliance that meets regularly in between Congresses to work collaboratively on all issues of research and marketing.


The group consists of some leading research scientists including Dr Iain Kirkwood from the Tasmanian Institute of Agricultural Research (TIAR), and marketing representatives such as David Wells, TIAR's marketing and business development officer who was recently invited to join this motivated and innovative network.

Some of the focus at this year's WPC International Potato Network meeting was on boosting the profile of potatoes from country to country, food security and the future of potatoes.

**"I was able to establish networks that will embrace not just the potatoes but all aspects of the vegetable industry."**

David's marketing representation was the first of its kind from the Australian delegation and would go a long way to ensuring Australians have access to the sharing of marketing intelligence and studies to broaden their knowledge scope.

He had recently been working on a new initiative for Tasmania - the *Taste Is In Our Nature* campaign - which he was able to present at the meeting, and was delighted by the accolades it received from the international group members.

"This was one of the most inspiring groups I have had the pleasure to become involved with in my 32 years of Marketing and business/product development," said David. "[Through the WPC and the international group] I was able to establish networks that will embrace not just the potatoes but all aspects of the vegetable industry." 



## Dishing up raunchy spuds

Sexy, sexy spuds will be the theme of a gala Co-producers Dinner hosted by Spudhunters in celebration of potatoes at the Royal Melbourne Show in September.

Chef Gary Thomas, who has been the driving force behind the Spudhunters concept, says the dinner will be an addition to the annual Spudhunters exhibit at the Royal Melbourne Show.

Spudhunters started off as an initiative aimed at educating children about the origins of potatoes, and what it takes

to bring them to the dinner plate. It was initially a display at Federation Square, but moved to the Royal Melbourne Show where it has become a favourite with show-goers of all ages.

Last year the exhibit demonstrated the significance of potatoes to more than 10,000 eager children and adults, with the help of Department of Primary Industry (DPI) staff. "We had ViCSPA officer, Bruce Fry, and DPI Veg Cheque Officer, Nic Gowan, come along to help out, and they were amazing. You could see people and children really start to get the significance of knowing where their food originates and how it gets to them," Gary says.

**"Rather than making potatoes merely a couple of side dishes, as most of these types of dinners tend to do, spuds will actually be the main event."**

This year Spudhunters will be bigger and better than ever with sponsorship from Seed Potatoes Victoria (SPV) and ViCSPA. There will be opportunities for visitors to speak to farmers about produce, take home bags of potatoes, even watch DVDs from a Couch Potato Lounge while eating bags of chips all for free, according to Gary.

Well-known for his restaurant concepts in the Daylesford area of Victoria, his promotion of the Slow Food Movement, and support of International Year of the Potato events in 2008, Gary is determined to make the planned dinner unforgettable.

"Rather than making potatoes merely a couple of side dishes, as most of these types of dinners tend to do, spuds will actually be the main event," he says. "At the moment, I'm experimenting and trying to decide on precisely what that main course will be."

The venue for the dinner is the Port Phillip room at the Melbourne Showgrounds on Thursday 17 September from 6:30pm, at a cost of \$90 per head and tickets are going fast.

"The dinner is open to people from across the potato industry and beyond," Gary says, 'but there will be a twist—they'll have to be prepared to watch some hot spuds get their jackets off!'"

For bookings, contact Simone on 0421 458 891. [pa](#)

## World Catalogue of Potato Varieties

The 2009/10 edition of the World Catalogue of Potato Varieties is now available and can be ordered online. The catalogue contains information on more than 4,500 cultivated varieties as well as 1,900 descriptions of wild potato varieties and species.

It is not only a reference manual for researchers and breeders but is a unique and practical publication for commercial potato farmers, retailers, processors, packers, private breeders of potato seed, and others in the industry.

The following essential information about every variety is included:

- Variety name: Including synonym(s)
- Breeder: Name and contact information
- Year: Year introduced to the industry
- Countries where cultivated: Includes the country of origin
- Maturity: Early to late
- Usage: Table, industry, french fries, chips (crisps)
- Disease resistance

A separate chapter is devoted to a listing of varieties in all countries, with a reference to the description of the variety. A further chapter provides contact details of breeders and breeding/research institutes in several countries around the world.

For further information visit [www.potatonews.com/knowledgecenter/books/wkk.asp](http://www.potatonews.com/knowledgecenter/books/wkk.asp) [pa](#)

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# What's On

## 18 - 20 August

### AgQuip Field Days

**Where:** AgQuip site, 134 Blackjack Road Gunnedah, NSW (North West Slopes and Plains)  
**What:** Australia's biggest agricultural industry field day event, showcasing over 3,000 companies  
**Further information:** [www.agquip.com.au](http://www.agquip.com.au)

## 26 - 27 August

### Dowerin GWN Machinery Field Days

**Where:** Dowerin, Western Australia  
**What:** the biggest showcase of agricultural machinery and associated equipment in Western Australia  
**Further information:** [www.dowerinfielddays.com](http://www.dowerinfielddays.com)

## 31 August - 9 September

### 2009 Vegetable Study Tour to Hong Kong and China

**What:** Includes visit to Asia Fruit Logistica  
**Further information:** [www.quadrantaaustralia.com](http://www.quadrantaaustralia.com) or email [qinfo@quadrantaaustralia.com](mailto:qinfo@quadrantaaustralia.com) or phone 1300 301 128

## 1 - 3 September

### The Heritage Agricultural Show

**Where:** Toowoomba Showgrounds, Darling Downs, Queensland  
**What:** The Heritage Ag Show provides an opportunity for businesses to source maximum exposure from a wide section of the primary industry marketplace  
**Further information:** [www.rasq.com.au/show.htm](http://www.rasq.com.au/show.htm)

## 17 - 27 September

### Spudhunters

**Where:** The Royal Melbourne Show, Flemington, Victoria  
**What:** The acclaimed exhibition for everyone interested in learning more about spuds, from field to fork.  
**Further information:** [www.royalshow.com.au](http://www.royalshow.com.au)

## 2 - 3 September

### Intellectual Property Workshop and the Australian Horticultural Industries Symposium

**Where:** Launceston, Tasmania  
**What:** Free workshop and symposium for growers, and other industry stakeholders on intellectual property, including what they need to know about plant breeders rights.  
**Further information:** Carol Ballard, [c.ballard@law.uq.edu.au](mailto:c.ballard@law.uq.edu.au) or phone 07 3346 7506

## 8 - 9 September

### Carbon footprinting for your product, your firm, your future

**Where:** The University of NSW Water Research Centre, Kensington Campus, NSW  
**Further information:** Kirra Dean, [k.dean@unsw.edu.au](mailto:k.dean@unsw.edu.au) or phone 02 9385 5017

## 8 - 10 September

### Potato Europe 2009



**Where:** Emmeloord, The Netherlands  
**What:** This event is set to attract prominent potato specialists from all over the globe and features an international exhibition, highly acclaimed field demonstrations and an international congress  
**Further information:** [www.Potatoeurope2009.com](http://www.Potatoeurope2009.com)

## 10 - 11 September

### 13th Symposium on Precision Agriculture in Australasia

**Where:** The University of New England, Armidale, NSW  
**Further information:** David Lamb, [parg@une.edu.au](mailto:parg@une.edu.au) or phone 02 6773 3565

## Early October

### 2009 Vegetable Growers Tour to the US

**What:** This study tour of the prime Californian growing regions, includes attendance at the Produce Marketing Association Fresh Summit Convention.  
**Further information:** Hugh Tobin at AUSVEG ph: 03 9544 8098 or [www.ausveg.com.au](http://www.ausveg.com.au)

## 2 - 5 October

### Produce Marketing Association (PMA) Fresh Summit Convention

**Where:** California, USA  
**What:** The widely attended produce convention in the USA attracts attendees from more than 50 countries around the world.  
**Further information:** [www.pma.com](http://www.pma.com)

## 6 - 8 October

### Elmore & District Machinery Field Days

**Where:** Rosaia Rd, Elmore Field Day Site, Elmore, Victoria  
**What:** the 46th consecutive annual staging of the event, featuring over 600 exhibitors showcasing the latest advances in technology and innovation within the agricultural industry  
**Further information:** [www.elmorefielddays.com.au](http://www.elmorefielddays.com.au)

## 14 - 16 October

### Eurofruit Congress Southern Hemisphere

**Where:** Cape Town, South Africa  
**What:** Billed as the preeminent event for all of the southern hemisphere's fresh produce traders and growers who want to optimise their business opportunities.  
**Further information:** [www.shcongress.com](http://www.shcongress.com)

## 16 - 17 October 2009

### Wandin - Silvan Field Days

**Where:** Wandin East Recreation Reserve, Upper Yarra Valley  
**What:** now in their 40th year, the Field Days continue to be a major focus for the Horticultural and Agricultural producers of the Yarra Valley and Dandenong Ranges region of Victoria, and beyond  
**Further information:** [www.wandinsilvanfielddays.com.au](http://www.wandinsilvanfielddays.com.au)

## 20 - 22 October 2009

### Australian National Field Days

**Where:** Australian National Field Days site, Borenore, Orange, NSW  
**What:** Australia's oldest annual agricultural exhibition, featuring an array of agricultural machinery, implements, services and ideas.  
**Further information:** [www.anfd.com.au](http://www.anfd.com.au) for more information.



Words **Dr Nigel Crump**

# Sowing the seed of success

Margins in the potato industry are becoming increasingly tighter putting more pressure on getting the inputs right to achieve the best yield and quality. The quality of potato seed has a major influence on the subsequent crop performance in terms of yield and quality. Nothing can be done during the growing season to compensate for yield if you are starting with poor quality seed.

## What seed should I plant?

The following factors contribute to the production of a complete stand of uniform plants with the potential for high yields of top quality tubers.

- Seed that is certified
- Seed that is free of rots and decay
- Seed from a grower with a good reputation
- Seed that has been stored properly
- Seed that is physiologically young (produced without major stresses)
- Seed that is uniform in size
- Seed that has been handled to avoid bruising

## Seed that is certified

Certified seed conforms to guidelines of varietal purity and disease tolerances according to the National seed certification rules and regulations. Using uncertified, one-off-seed, culls, oversize or seconds may lead to problems, such as seed infected with Potato Leaf Roll Virus, which can be costly due to loss of yield and quality. Certification ensures that diseases are not present at levels above that which will affect yield or marketability of the subsequent crop. For some diseases, such as bacterial wilt, complete exclusion





is required to prevent spread of diseases and significant yield losses. In Victoria, all fields that are used for certified seed crops are routinely soil tested for PCN (potato cyst nematode) thereby providing assurances of its PCN free status.

### Seed from a grower with a good reputation

A visit to prospective seed suppliers both during the growing season and once the crop is in storage will help to assess the grower and the quality of the seed crop.

### Seed that has been stored properly

Seed storage should be maintained at two to four degrees centigrade. Higher temperatures can enhance the physiological aging of the tubers which may affect the stem number, tuber set, tuber size, and yield of the subsequent crop (as discussed in the article on physiological aging in the April edition of this magazine). Ensuring that the temperature is evenly distributed in the store is important; the temperature may be four degrees in the bottom levels of boxes but may be higher in the top boxes

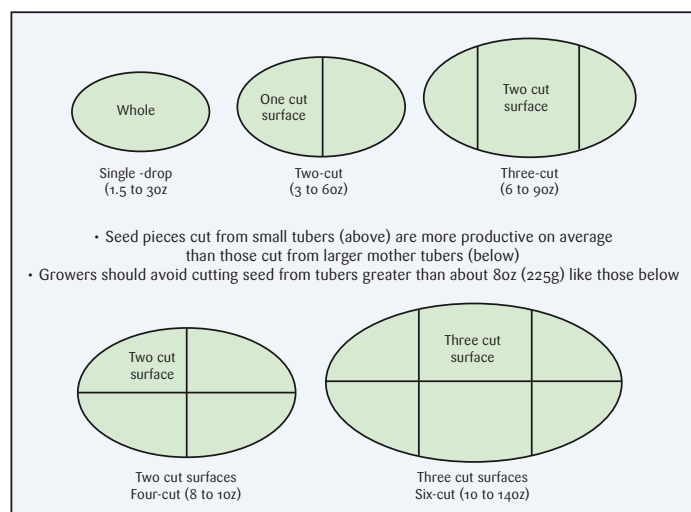


Figure 1 From L. Delanoy, C. Schaupmeyer, D. Ziprick, D. Kirkham

thereby creating different physiological ages within a seed lot. Refrigeration damage can also occur where there is a pocket of extremely low temperature.

Carbon dioxide ( $\text{CO}_2$ ) build up in store can adversely affect tuber quality. High levels of  $\text{CO}_2$  can promote rots and blackheart of tubers.  $\text{CO}_2$  in store is generated by tubers respiration; the respiration rate is dependent on the temperature and physiological state of the tubers. Respiration increases with increased temperatures.  $\text{CO}_2$  production is highest when tubers are curing (wounded tubers respire greater than suberised tubers) and lowest when tubers are dormant;  $\text{CO}_2$  production increases as tubers sprout. Frequent ventilation with outside air is required to prevent  $\text{CO}_2$  build up in store. Evenly distributed airflow is necessary to control temperature and provide oxygen and remove  $\text{CO}_2$  and excess moisture.

The storage area should be disinfested between seasons and clean from excessive potato debris and soil that may be harbouring disease.

### CIPC and Seed Potatoes

The sprout inhibitor, CIPC (chloroprotham) is routinely applied to commercial potatoes to inhibit sprouting of tubers. CIPC does not degrade quickly, and even a small amount of residue can retard sprouting of seed. Do not store seed potatoes in a structure that was recently treated with CIPC. Seed can only be safely stored after the fans, ducts, and plenums are thoroughly cleaned (using a high pressure washer and a detergent) of all CIPC residues.

### Seed that is physiologically young (produced without major stresses)

As discussed in the April edition, the physiological age of seed can have a tremendous impact on the productivity of a subsequent potato crop. Aged seed tubers produce more stems per seed piece which affects the number of tubers produced per set and the size of the tubers produced per set. It is important that seed, particularly seed that is not for immediate planting, be young seed as it is easier to maintain in store and potentially more productive. Seed crops produced with stress such as high temperature or drought stress tend to be physiologically older than unstressed crops. Young seed can be aged, if required to achieve the intended result (increased stem numbers). However, old seed cannot be made "young".

### Seed that is uniform in size

Assess the uniformity and size of the seed tubers. The performance of cut-seed pieces is affected by the size of the uncut mother tubers. Smaller, uniformly sized mother tubers result in:

- Uniform, blocky cut-seed pieces
- A higher proportion of the most productive seed piece sizes (43-85g)
- Better planter efficiency, which contributes to correct plant spacing which, in turn, provides a more uniform crop of potatoes and optimal yield.

Planting small seed pieces may result in weak unproductive plants,

while large pieces (greater than 85g) produce plants with excessive stems and may fall off planting cups.

The variation in seed piece sizes results in skips and/or doubles due to inconsistent feeding through the planter.

On average, seed pieces cut from large mother tubers (greater than 225g) are not as productive as pieces of the same weight cut from smaller tubers. Seed pieces cut from larger tubers have fewer eyes and may result in blind seed pieces (no eyes), causing a reduced plant stand and reduced yield.

Make sure that the seed cutter is adjusted to optimise the cutting of the seed lot. Sorting a 5.4 kg sample of cut seed into size categories; too small less than 42.5g, within preferred range 42.5g to 85g, more than 85g. Adjustments can then be made accordingly.

### Seed that has been handled to avoid bruising

Bruising reduces the vigour of the seed potato. Bruising significantly increases the risk of seed piece decay and can increase the physiological aging of seed. To minimise bruising, the internal pulp temperature of the tuber should be above 7.3 degrees before handling tubers. The drop of potato tubers from conveyers should be no more than six inches (15.24 cm). Use cushioning material (such as foam) to reduce impact of potatoes in drop areas e.g. loading bins. [pa](#)



### The Bottom Line

- The effects of poor quality seed are difficult to stop once growing is underway.
- Good quality seed includes certified stock from a reputable grower.
- The physiological age of the seed is one of a number important factors that should be considered before planting.

For more information contact Dr Nigel Crump on 03 5962 9043 or 0408592051 or email [nigelcrump@vicspa.org.au](mailto:nigelcrump@vicspa.org.au)

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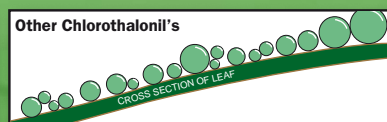
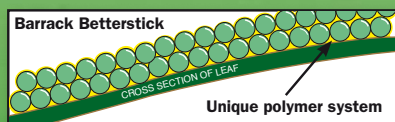
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## Studies

### Late blight

A review of four papers on late blight disease published over the last year.

In the first paper (Dowley et al. 2008) field experiments carried out over from 1983 to 2007 at Carlow, in Ireland investigated the loss in potato production caused by crop infection with *Phytophthora infestans*. In each year, untreated potato crops were compared with those under protectant and with systemic fungicide programmes. For over half of study period, blight was first recorded in crops in the time frame between 17 July and 13 August, reaching epidemic status in all but four of the 25 years. In every year, yield losses from not using fungicides were significant, with a mean yield loss of 10.1 tonnes/ha. There appeared to be no change in the aggressiveness of the pathogen throughout the trial period.

The trials described in Bouws & Finckh, 2008, were carried out in Germany and investigated an organic approach to control of late blight disease. This involved strip cropping of potatoes with cereals or a grass-clover mix, with some treatments being planted perpendicular to the main wind direction. In the first year (2000), plots were 3 metres x 10 metres and no disease reductions were observed, due to interplot interference. Plot sizes were increased in 2001 and 2002 (to 6 x 18 and 6 x 36 metres respectively), and reduction in disease ranged from four to 20%. Greatest reductions in disease were

seen in plots planted perpendicular to the wind and neighbored by grass-clover. The main reason for disease reduction was a loss of inoculum to the neighbouring non-potato crops. There were significant yield reductions in the potato rows bordering cereals, but this did not affect the disease-yield-loss relationship. Strip intercropping may be a useful strategy in integrated management of late blight disease of organic potatoes.

The third paper (Hospers-Brands et al. 2008) also studied disease management strategies for organic potato production, with experiments carried out in the UK and The Netherlands. The agronomic treatments included presprouting (chitting) and early planting of seed tubers, which should encourage early bulking and evasion of the disease. In addition, different plant populations and spacings were tested to see if they altered the microclimate of the crop, making it less favourable for infection. Early planting and presprouting strategies were most effective in years with a short growing season, while the population and spacing treatments affected canopy architecture, but not late blight infection.

The final paper (Mayton et al. 2008) focused on strategies for suppressing tuber late blight infections. In three field trials over two years, phosphonate biopesticides were

applied at weekly intervals to the foliage, and tuber disease was assessed at harvest and after two months in storage. In general, tubers from plots treated with phosphonates had less tuber blight than tubers from plots treated with a conventional fungicide. All phosphonate treatments suppressed foliar late blight disease.

**Yield losses caused by late blight (*Phytophthora infestans* (Mont.) de Bary) in potato crops in Ireland.** Dowley et al. (2008) *Irish Journal of Agricultural and Food Research* 47: 69-78.

**Effects of strip intercropping of potatoes with non-hosts on late blight severity and tuber yield in organic production.** Bouws & Finckh (2008) *Plant Pathology* 57: 916-927.

**Effects of presprouting, planting date, plant population and configuration on late blight and yield of organic potato crops grown with different cultivars.** Hospers-Brands et al. (2008) *Potato Research* 51: 131-150.

**Potato late blight in tubers – The role of foliar phosphonate applications in suppressing pre-harvest tuber infections.** Mayton et al. (2008) *Crop Protection* 27: 943-950.



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## Research Summaries

### Disease control

**Rhizoctonia disease.** The fungal pathogen *Rhizoctonia solani* causes stem canker and black scurf diseases on potatoes and can cause large reductions in yield. Disease inoculum found on seed tubers can be effectively controlled by seed treatment with fungicides, but soil-borne inoculum is much harder to control. The four papers below look at various aspects of the biology of the pathogen and strategies to manage the disease.

**Infection of potato by *Rhizoctonia solani*: effect of anastomosis group.** The species *Rhizoctonia solani* is actually made up of various anastomosis groups (AGs), and these differ in their pathogenicity and the type of disease they cause. In both glasshouse and field experiments AG3PT and AG5 have been shown to cause severe stem and stolon disease, while AG8, and to a lesser extent AG3PT, have been associated with severe root disease. Even within AGs there is large variation, with the AG2-1 isolate (X81) producing only small lesions while in a glasshouse trial another AG2-1 isolate caused more severe stem and stolon infection than AG3PT. In the field, tuber yields from seed potatoes inoculated with various isolates were all reduced compared with uninoculated (control) plants. The majority of tubers inoculated with AG3PT developed black scurf, while very few tubers inoculated with AG2-1 or AG5 showed these symptoms. Woodhall *et al.* (2008) *Plant Pathology* 57.

**Infection with *Rhizoctonia solani* induces defense genes and systemic resistance in potato sprouts grown without light.**

An interesting phenomenon observed

with *Rhizoctonia solani* is that, while initial shoots that are infected prior to emergence may die, subsequent compensatory new sprouts are not damaged and emerge successfully. The mechanism behind this recovery response is not known, and the research described in this paper was carried out to test the hypothesis that infection may induce pathogen defence in sprouts. Tubers were sprouted in cool, moist conditions in darkness and the basal part of the sprout was inoculated with a highly virulent *Rhizoctonia solani* strain. The genes activated in the apical part of the sprout were monitored and compared with uninoculated sprouts. Differential expression of a large number of genes was observed, indicating that infection with the pathogen at one site activated resistance at other sites in the sprout. This information can be used to develop control strategies. Lehtonen *et al.* (2008) *Phytopathology* 98.

**Biological and chemical control and their combined use to manage different stages of the *Rhizoctonia* disease complex on potatoes.** This study investigated the ability of commercially available biocontrol fungi and bacteria, along with the flutolanil seed dressing, to control soil-borne infection of *Rhizoctonia solani* in the field. Interestingly flutolanil did not affect the biocontrol agent *Trichoderma harzianum* but significantly inhibited the growth of *Rhizoctonia solani*. This combination treatment (flutolanil + *Trichoderma harzianum*) reduced sprout damage and severity of stem canker during early growth, increased the proportion of marketable-sized tubers and decreased the incidence of black scurf on progeny tubers. Wilson *et al.* (2008) *Annals of Applied Biology* 153.

## Processing

**Nitrogen management for potatoes by using rapid test methods.** Nitrogen concentrations in the sap and chlorophyll content were measured in leaves from a trial that had been given one of five nitrogen fertiliser treatments. Both sap nitrogen and chlorophyll content increased with increasing nitrogen fertiliser and decreased during the growing season. However, tuber yield was not correlated with either sap nitrogen or chlorophyll content. Poljak *et al.* (2008) *Cereal Research Communications* 36.

**Organic amendment history and crop rotation effects on soil nitrogen mineralization potential and soil nitrogen supply in a potato cropping system.** This field trial was carried out over two years in Maine, USA, and was based on three crop rotations with and without a history of organic amendment (cow manure). Soil samples were collected from the top 15 cm of soil before planting and the amount of potentially mineralisable nitrogen was measured. On average, historically amended soil had 35% greater levels of potentially mineralisable nitrogen than non-amended soil. There were higher levels of potentially mineralisable nitrogen in the potato-barley and potato-soybean-potato-barley rotations than in the potato-soybean-barley-alfalfa/timothy rotation. Other measurements of soil nitrogen availability were also made (e.g. mineralisable nitrogen pools) and these also detected management-induced changes. Sharifi *et al.* (2008) *Agronomy Journal* 100.

**Opportunities for improved fertiliser nitrogen management in production of arable crops in eastern Canada:**

**A review.** This paper reviews the tools and strategies that arable crop growers can use to minimise losses of nitrogen to air

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or water, yet still optimise crop yield and quality. These include measurements of crop nitrogen status during the growing season, soil nitrogen tests and new nitrogen fertiliser products. The advantages and limitations of these tests are discussed, and areas for future research are identified. Zebarth et al. (2009) Canadian Journal of Soil Science 89.

## Slow- release fertilisers. Slow-release nitrogen fertilisers in vegetable production: a review.

Slow-release nitrogen fertilisers that have a release pattern matching crop needs can improve the efficiency of nitrogen use and decrease application costs. There are two main groups of synthetic slow-release fertilisers. The first group releases the nitrogen as a byproduct of a chemical reaction (such as urea-formaldehyde), while the second group has a sulphur, wax or resin coating around the fertiliser prill. Most studies have shown that slow-release nitrogen fertilisers neither increase nor decrease crop yields relative to conventional fertiliser treatments, with the main advantages coming from reduced environmental risk and savings in production costs. Guertal (2009) Horttechnology 19.

New book release: **World Catalogue of Potato Varieties 2009/10**. The latest edition of this book, co-edited by Lukie Pieterse and Uwe Hils, describes more than 4500 different potato varieties from over 100 countries around the world. In addition, 1900 wild potato varieties and species from the International Potato Center Wild Potato collection, Lima, Peru, are described.

Essential information about every variety is provided, including name and synonym(s), contact details for the breeder, the year of release, countries where cultivated, tuber characteristics (shape, flesh and skin colour, depth of eyes) and agronomic information (maturity, usage, disease resistance). The catalogue contains detailed cross-references, and lists some of the major potato breeding/research institutes around the world.

This book will be of great practical value to commercial potato farmers, retailers, processors, packers, private breeders of potato seed and others in the industry, as well as being an excellent reference manual to researchers and breeders at universities, colleges and institutes.

The book can be purchased directly from Global Potato News website ([www.potatonews.com/knowledgecenter/books/wkk.asp](http://www.potatonews.com/knowledgecenter/books/wkk.asp)), for around US\$125.

## Snippets from [www.potatonews.com](http://www.potatonews.com)

Listed below is a small selection of the articles that are posted on the Global Potato News website.

*February 2009: News headlines*

**United Kingdom: Potato growers set sprayer booms too high.** At the Scottish Agricultural College/Association of Potato Growers conference, spray application specialist Paul Miller said that most potato growers set their sprayer booms too high. Although this is done to prevent damage to the boom, this practice may reduce spray coverage. Another factor affecting coverage is spray volume, and at least 150 to 200 L/ha was recommended for blight sprays.

**China turning to the humble potato to feed the poor.** The Chinese government is aiming to increase their annual potato production from 70 to 120 million tonnes over the next 5 years in an effort to feed their population.

*March 2009: News headline.*

**New tuber treatment developed for seed potatoes in the UK.** Based on the chemical fludioxonil, Syngenta is developing a seed potato treatment to control a range of tuber diseases, such as *Rhizoctonia solani* (responsible for stem canker and black scurf), silver scurf and black dot. In addition,

field trials in 2005 on 'Maris Piper' gave good reductions in common scab disease, for which there is currently no chemical control.

**Radiation cameras focus on crop pests, disease.** Radiation cameras, which detect electromagnetic radiation outside the visible spectrum and have been used in satellites for decades, are being developed for recognising infection of crops by pests and diseases. Although very costly, at about \$10,000 each, scientists from Australia's premier national technology incubator, NICTA, say that the cameras could give growers a competitive advantage by enabling more rapid detection than traditional techniques.

*March 2009: Feature article*

**Storage disease prediction system validated in commercial fields.** A system for measuring disease levels in soil using molecular techniques (real-time Polymerase Chain Reaction; RT-PCR) and assessing disease risk was developed by scientists at the University of Wisconsin-Madison, USA, and applied to 42 commercial potato fields by Pest Pros Inc. The diseases included in the assessment were soft rot, pink rot and *Pythium leak*, and the varieties being grown were 'Russet Burbank', 'Norkota', 'Gold Rush', 'FL 1879', 'FL 1867', 'White Pearl', 'Snowden' and 'Dakota Pearl'. Fields were given a disease risk of 1-5 (very low-high risk) and storage bins were monitored for disease and rated from 1 to 5 (very low rot-high rot). Results have shown that 74% of disease predications were either in complete agreement or very close to the final disease outcome. False positives occurred in 25% of fields because slightly less rot developed than was predicted, which is thought to be due to a seasonal effect. In future, other diseases that are thought to be a potential problem, such as late blight or *Fusarium*, can be included in the risk assessment.





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