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Informing and connecting
Australia's Potato Industry
October 2008



**Biotechnology: How much do
we want to change potatoes?
Nigel Crump cultivates connections**

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Front cover image:
Courtesy of Nelson Herbert



AUSVEG Ltd is proud to be an Australian Grown campaign partner



FreshTest – the residue and microbial testing program for Australia’s fresh produce industry

With food safety a major current concern at local and international levels, growers as well as wholesalers in central produce markets around the nation can now register their produce for maximum residual limit (MRL) and microbial evaluation via the FreshTest program. The system, which was established by the Australian Chamber of Fruit and Vegetable Industries, manages and stores the results of MRL and microbial examination of produce, and is more affordable because of the availability of bulk-testing and an increase in the number of service facilitators.

The wholesaling sector developed FreshTest to increase the program’s accessibility, and manage the testing procedures of thousands of wholesalers who wish to comply with national food safety & quality assurance standards. FreshTest enables the examination of produce for over 110 different substances and is the only system to also incorporate testing for microbial traces in produce, with results normally available within 14 days.

The database has 33,000 test results indicating a 97 per cent compliance rate with the MRL legislated by Food Standards, Australia New Zealand (FSANZ).

Features of the FreshTest program include:

- The availability of independent facilitators in each of the nation’s Central Markets to collect samples for testing.
- A corrective action and re-testing service for produce exceeding residual allowances and adverse microbial results.
- Elimination of test duplication, thus reducing costs.
- Confidential management of reports.
- Release of collective test results on a fee-paying basis only to organisations such as State and Federal Departments of Agriculture and Health, Peak Industry Bodies, FSANZ and Market Authorities. The fees are used to fund the program and offset the costs of testing.
- The storage of evidence that can be used to protect and maintain the viability of Australia’s fresh produce industries.

For further information on how FreshTest works, the management of results, registration and payment methods, and other details, please call your state Chamber of Fruit and Vegetable Wholesalers.

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New South Wales	Newcastle	02 4923 3700
	Sydney	02 9764 3244
South Australia	Adelaide	08 8349 4528
Western Australia	Perth	08 9455 2742

AUSVEG

Chairman's message

The release of the Potato Nutrition Report has ignited some debate about the marketing of fresh potatoes in the industry. The guide has people thinking about the real health benefits of potatoes and the debate concerns how we can re-position potatoes in consumers' perceptions. They need to see the full scope of potatoes for health, but also need to be made aware of the environmental advantages—that potatoes are more water efficient than rice and pasta in production. The marketing bottom line is that the more people start to change their thinking, the more value there will be for producers.

The Australian potato industry needs the trade harmonisation protocols for PCN. The highest level of bio-security with integrity needs to be applied. This will set the bench mark for international trade and also assist domestic trade. There is enough good will on the table to progress this.

The AUSVEG annual report will be less glossy this year. AUSVEG has had a trading loss for the 2007/2008 financial year. The annual report will be available shortly.

The Directors of AUSVEG have announced a special general meeting for 24 October, 2008. The company is hopeful that members and individual members will accept the new AUSVEG constitution with the amendments. The change will clear up some anomalies and open up the company to better represent you, the growers. I encourage all members to read the amendments and vote positive on the day.

One of the changes will be that only levy payers can sit on the board of AUSVEG (apart from the two skills-based Directors). This means that my position as Chairman and as a Director must come to an end at the AGM in November this year. The new Chairman will be elected by the new Board, which will in turn be chosen by a Director Selection Committee. I am hopeful of the changes going through, so that the new Board can be in place from the AGM onwards.

With plenty going on in the potato industry, there has never been a better time to tell the world to eat more spuds!



David Anderson
AUSVEG Potato Group Chairman

Editor's message

October already! In about six months, the Australian Vegetable Industry Conference (4-6 May, 2009) will be on us, and before that there's Christmas... With so much going on, we decided this edition would take a pause from the usual pace and allow you to gather your thoughts.

The biotechnology in food debate has sparked a considerable amount of heat in Australia recently, with NSW joining Queensland and Victoria in permitting Genetic Modification (GM) practises in canola crop production. One of the core issues is whether or not the potential competitive boost that biotechnology promises growers, weighs up sufficiently against the potential social and health costs to consumers, and the potential cost to ecosystem biodiversity.

We asked Dr Rick Roush from Melbourne University who presented at the recent Victorian Seed Potato Conference to tell us about the possible opportunities that GM opens for potatoes. In order to give the GM arguments the equal consideration they deserve within the scope of this publication, we also looked at the concerns of Dr Maarten Stapper, a campaigner for the natural approach to farming systems.

We also pursued another Doctor in this issue—Dr Nigel Crump: a mentor, a supervisor, and an inspiration to school children. He is also an expert who destroys the myth of the lab-confined scientist with his unswerving belief in cultivating connections. In the next few pages Nigel talks us through what the power of extension can do for the Australian potato industry.

The European Potato Conference held in "Dracula" country in July was attended by some of the Department of Primary Industries (DPI) researchers. They used the opportunity to swap ideas with other delegates and returned with the low down on some of the latest concepts and developments from the convention.

In addition to our regular columns, including Ian James' Economic update, this issue carries the Reader Survey. It gives you the chance to win some extra power for your farm appliances and tools in the form of a Garrison industrial generator worth \$829, courtesy of Vin Rowe.

Finally, but by no means last, our International Year of the Potato coverage looks at a South Australian potato seller who wanted to help make a difference to a young boy's world. For us, the story was nothing short of inspiring.

Hopefully, you'll feel the same.



Jenan Taylor
Editor
Potatoes Australia

KNOWN FAR AND WIDE FOR HIS EYES

Graham Ramsay, Carrington Farms
Bundaberg – QLD.



With fifteen years of supplying to the biggest names in crisping potatoes, Graham knows his spuds have to make the grade, or as he says, “no smaller than 35mm, no greater than 85mm, and they don’t like deep eyes.”

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Apart from the odd game of golf, Graham loves nothing more than harvesting a truly saleable item. And this shows, as he has won the National and Northern Grower for Smiths Snack Food Company two years running.

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Sounds like team spirit

Tonya Wiechel, Fran Richardson, Robbie Ates, Nigel Crump and Justin Verstraten. Missing are Dolf de Boer, Ian Porter and Lauren Perry.

Closer collaboration between growers and scientists and international knowledge exchange is reaping benefits for the local industry, and Dr Nigel Crump of the Victorian Department of Primary Industries (DPI) embraces it with gusto.

Trading local research internationally has saved local growers both time and money in developing new techniques for improving crop practices and disease control, while also highlighting what growers and scientists can achieve by working together, according to Dr Nigel Crump.

Nigel oversees and supports several scientists in ongoing research through the Australia Potato Research Program (APRP), which involves testing crops for diseases such as common scab, Rhizoctonia, powdery scab and nematodes, as well as developing methods to control the diseases and improving pastures before planting crops.

Armed with the results of his team's day-to-day research, Nigel has established an extensive information exchange network of industry contacts overseas, giving him access to a wide array of information, which he applies for the national industry's benefit.

"I rely on a lot of smart and innovative people around me, who are experts in their own right and undertake research on the potato industry's disease issues. I am part of a committed research team, which currently consists of Dr Tonya Wiechel, Dr Ian Porter, Dr Dolf de Boer, Cassie Scoble, Lauren Perry and Justin Verstraten. We work as a unit, bounce ideas off each other and all pitch in."

Nigel has found his personal links with overseas researchers, such as Dr George Lazarovits in Canada and Professor Richard Falloon in New Zealand, have been able to give growers several years' head start on local research as well as improve the way information is delivered to industry users.

“Other countries have similar issues to the Australian potato industry. Rather than identify a problem and then start from scratch, our links with researchers in Canada and the UK, for example, have given us access to research already done on a particular problem and let us focus on applying knowledge to the specific requirements of the Australian potato industry,” he said.

“My main focus is to make the information from good research practical and get it out there where it is needed,” Nigel said.

Field trial demonstrations, he believes, are an excellent way to demonstrate to local growers both the research methods and the ongoing results, giving them an opportunity to provide feedback and get a ‘hands on’ understanding of the work, while also providing an opportunity to make new contacts in the industry.

“The field days present excellent opportunities for the local industry to compare notes, so in addition to growers, we invite anyone with a message to come to the days, such as processing companies, chemical suppliers as well as irrigation and farm machinery people. We’re not experts in everything, we’re just facilitating knowledge transfer,” he said.

“There is a lot of stuff happening around the industry and these field days provide an opportunity for people to communicate new technology, products and know how.”

The success of the field day demonstrations, and an idea which Nigel developed after a trip to visit the Scottish Agricultural College’s Dr Stuart Wale in UK, has led to the creation of a regular discussion group for Ballarat seed potato growers. The group allows the growers to ask the questions they most need answers to, exchange ideas and provide advice to each other.

With Daniel Grayling at VICSPA, Nigel was able to gather a group of about 20 local seed growers together, with the aim of informally discussing current issues. Participation in the group, which has met three times within the last season, is voluntary and the group are making plans to continue in the coming season.

“We have talked about planter efficiency, yield estimations and bruise prevention/store hygiene. Importantly, we have done this in the field, not in the classroom, on actual crops not in trials. The real benefit of these groups is that everyone gets to see and hear what other growers are doing, so there is interactive learning. I am not up the front lecturing to growers, but we are working together to improve the way we do things. I am also learning, it is fantastic!”

Upon discovering there was a similar discussion group already operating in Tasmania with McCains, Nigel arranged for a group of Ballarat growers to spend a couple of days comparing notes with their Tasmanian counterparts and was impressed by the results.

“Some of the growers are already changing the way they do things, and have gone back to Tasmania to get more information on how to improve their work practices and technology. They’re really enthusiastic about the possibilities,” he said.

To make these contacts, you’ve got to be able to make a contribution. Just as international information can save us a lot of time, the work we have already done can be of enormous benefit overseas.

Nigel believes this type of grower interaction and collaboration with scientists is the future for local research in Australia, pointing to the success international collaboration is already having on the research front.

His links with the UK, for instance, saved the Victorian industry a great deal of time when confronted with a need to test exports to Mauritius for Bacterial Wilt (BW), a test that was not previously conducted in Australia.

“I contacted the Scottish Agricultural Science Agency’s Gary Sadler (who I had previously met in the UK) and asked how they did their tuber test for BW. He sent through his entire protocol on testing for BW and said ‘let me know how I can help’ which enabled Seed Potatoes Victoria to implement that test and secure the Victorian industry’s export market to Mauritius,” Nigel said.

“These sorts of collaborations can provide many different ways to save time on research locally. Even something as simple as attending an international conference and visiting scientists as a part of that

can result in suggestions on new ways to approach research, through process or even the type of equipment used,” he said.

This has proven particularly true when dealing with developing a strategy to combat PCN in local crops. International experts have already visited Australia to offer their expertise, saving industry time and expense on research while providing valuable information, which can be used to enhance the management of PCN in Australia.


“To make these contacts, you’ve got to be able to make a contribution. Just as international information can save us a lot of time, the work we have already done can be of enormous benefit overseas,” he said.

UK, South Africa and New Zealand scientists have already expressed strong interest in the Australian Potato Research Program’s DNA diagnostic research, run by the South Australian Research and Development Institute’s (SARDI) Kathy Ophel-Keller, which has encouraged international researchers to establish a global program that will prevent the duplication of research and make information more readily available.

“Working with Agrifood Canada’s Dr George Lazarovits has been the most rewarding collaboration. George is open in sharing ideas and outcomes. We have been working on how to improve soil health to suppress diseases of potatoes.”

Recently, this has included studying the beneficial microbes in soil using DNA technology that was entirely developed overseas. Without this collaboration, Nigel says, the Australian industry may not have had access to this capability.

Nigel believes there is great potential for the Australian industry through sharing information, which will provide long-term benefits for growers.

“There’s so much more we can achieve when we work smarter, rather than harder.” 



Winged invaders warning

The Victorian and NSW Departments of Primary Industries (DPI) around Australia are advising growers to prepare for a potential Australian Plague Locust invasion. With locusts favouring the hotter and drier conditions, growers whose operations are already suffering the effects of the drought in south-eastern Australia, could have their troubles exacerbated.

The Victorian Department of Primary Industries Commissioner Andrew Tomkins says that following a survey of location of eggs laid by locusts last autumn there are likely to be hatchings this season. "Egg-bearing locusts were observed throughout the area bounded by a line from Bendigo to Wangaratta and north to the Murray River," said Mr Tomkins, indicating that landholders needed to start putting into practice their preventative measures.


"If no control is undertaken in October/November and there is adequate green feed for immature locusts (hoppers) to complete their development and become winged adults, it is highly likely there will be a more significant and dispersed egg-laying period in December/January."

Mr Tomkins said that locusts are best managed during the hatching season to minimise the potential severe damage they can cause to horticulture and cereal crops and pastures.

The NSW Minister for Primary Industries Ian Macdonald said "Farmers who sight hatchings on their properties should contact their local Rural Lands Protection Board, while we also ask people generally to keep an eye out for locusts, especially in those areas where major damage was experienced in 2004."

NSW and Victorian landholders will be meeting with Departmental officers to discuss the actions to take in the event of an outbreak. There is a possibility that some of the measures might include Departmental action on private land if intensive steps become necessary.

A collaborative approach between growers, the DPI and the Australian Plague Locust Commission will help to minimise the damage to crops and pastures and curtail the further spread of the pest.

For further information, visit www.dpi.vic.gov.au/locusts or www.dpi.nsw.gov.au/agriculture/pests-weeds/insects/general/locusts or call the Australian Plague Locust Commission on 1800 635 962 


Consumers love potatoes - survey

Potato growers delight! According to just released results of the first of a two-stage consumer research initiative conducted on behalf of HAL, potatoes have consistently been in the top five vegetables in the consumer shopping baskets in 2008, thus far.

The project, Vegetracker, collected information about Australian vegetable consumption patterns from a total of 1200 grocery shoppers in five states around the nation. The first phase covered 600 respondents, with more than 70 per cent indicating that potatoes and tomatoes were top among the staple vegetables they bought when shopping for fresh produce.

The results of the survey also showed that most of the respondents were buying more vegetables in 2008, and that around half preferred to purchase Australian-grown produce, giving potato growers reasons to be optimistic about the future.

The November edition of *Vegetables Australia* will carry a detailed article about Vegetracker.

Australian growers now have access to more valuable consumer information with the availability of data collected by another tracking tool, Homescan, conducted by Nielsen. For more information about Homescan contact Nielsen's Fresh Produce Specialist Lisa Cork, on lisa.cork@nielsen.com 

Science students get positive with potatoes

What's short, brightly dressed and mad about spuds? Answer: A bunch of school students singing a hip hop rap in honour of one Dr Nigel Crump.

Nigel, who has been helping the Grade Four students of Templeton Primary School in Wantirna, Victoria, with their International Year of the Potato science project, has been such a hit that the children penned him a potato pathology rap and performed it in a special assembly at the end of last term.

"Dr Crump set the students a challenge to come up with all they could about the International Year of the Potato," said Joanne Roberts, the school's Science Coordinator. "They were so enthused they all threw themselves into research. Some of them Googled Nigel's work and when they realised he was no lab coat scientist there was no stopping them," she said.

GM Spunta hopes to buoy South African potato industry

In South Africa, genetic engineering of potatoes is being hailed as potentially providing the best solution to small-scale farm enterprises.

According to the Genetic Modification (GM) interest group, AfricaBio, the introduction of the Spunta potato variety, which has been developed by the Agricultural Research Council (ARC) is resistant to the potato tuber moth, which is the major pest for small scale farmers who do not have the capacity to store crops under ideal conditions.

“The GM potato is intended for the growing number of small scale farmers in South Africa, who we believe will play a vital role in food security in future,” said Jocelyn Webster of AfricaBio. This would help the South African industry against losses estimated at around A\$8 million each year.

Following six years of research, ARC has now applied to the South African agriculture ministry for a safety evaluation and general release approval so that growers can begin trialling the potatoes. ARC has also stated that the Spunta variety will be used on a small scale only by farmers who could not afford access to insecticides and who would not be exporting. Further, the GM potatoes would be clearly labelled.

However, the industry body, Potatoes South Africa, remains sceptical of the plan, saying the advantages of GM potatoes did not weigh up against the possible consumer resistance and export losses. South African consumers remain resistant to GM produce although GM soybeans, maize and cotton have had some success there in recent years.

Source: www.sindhtoday.net/world. September, 2008.

You can read about the arguments by Australian experts for and against the synthetic approach to potatoes, and also get the perspectives of a handful of growers from around the nation in this edition. [pa](#)

A Jim Beam turkey

The Adelaide Advertiser has reported that a new Jim Beam- branded potato chip has hit the supermarket shelves—bourbon-flavoured potato crisps. Parents and consumer groups are deeply concerned about the snacks and don't think the chips, which have no alcohol content as such, should be made available to children.

Melissa Thompson Horrocks, a 29-year-old parent told the Adelaide Advertiser the bourbon-flavoured chips should only be sold at licensed venues. “You would think that they would have alcohol (ingredients) by looking at them. If you were 13, you'd probably think it was cool,” she said.

The Executive Director of the Drug And Alcohol Services South Australia Keith Evans said the chips contributed to a “positive association” between an alcohol brand and popular snack foods for children. “How much does it take for people to recognise that you can't promote alcohol in this way to young people, and I would see it as an advertisement, irrespective of whether it contains alcohol,” he said, adding that it was more than likely that Jim Beam were aware of the correlation.

Sean Cook, a spokesperson for Jim Beam said the chips were aimed at adults and were to be “predominantly” sold in liquor stores, indicating that Jim Beam were concerned about placing limits on where the chips were being sold.

However, a Manager of an Adelaide grocery store that stocks the chips said he was unaware that they were supposed to be for licensed premises, and that they were readily available through local distributors. [pa](#)

Joanne says the impact on the students' studies has been immense with most keen to know more about potato diseases and pests, and how to incorporate their findings into growing their own potatoes.

“We have been very conscious here at Templeton about how the students are learning about their world. They are exposed to a lot of negative information in the media, so we're always looking for ways to make new information more positive for them. Nigel's helped reinforce that by helping the children learn that there is such thing as optimistic science,” Joanne said.

Following the school assembly, the students demonstrated their new-found knowledge about potatoes by each relaying different facts about the history and science of tubers. They were also particularly interested in how to pronounce some of the jaw-breaking names of diseases.

Nigel will continue to advise the Grade Four class about cultivating their own potatoes, and they in turn have promised to leave behind a legacy of their new skills for the up-coming Grade Fours of 2009. [pa](#)



CEO's message

In the August edition, I mentioned that a vote would be put to the members to adopt the proposed new constitution. The change aims to enable all potato and vegetable levy-payers to become members of AUSVEG thus giving them direct voting rights to elect the AUSVEG board. This can only deliver greater benefits for growers in the future.

At present, the membership of AUSVEG is comprised of six state-based grower associations and nine individuals. While the six state associations aim to represent growers' interests, not all national potato and vegetable levy-payers are members of these associations.

The new constitution entails a move away from a federated membership-based model to an all-inclusive national membership base and a skills-based board. It will give growers direct participation in the governance and policies of AUSVEG, foster greater industry bonds and collaboration, and ensure that AUSVEG fully represents the needs of all potato and vegetable growers.

How will this happen? If the change is adopted, growers who are presently members of the six state-based organisations will automatically become members of AUSVEG. Growers who are not members of the representative state organisations can

become direct members of AUSVEG. All grower members of AUSVEG who wish to vote for a board director from their state will have the opportunity to cast their vote directly.

The new board would include six board directors, one from each state (elected by levy-paying growers in their state), and three skills-based directors. The Chair would be elected from the board.

A special General Meeting of the company will take place at 12:00 noon on Friday 24th October 2008 to vote for the new constitution.

AUSVEG received terrific responses from many of you about the Potato Nutrition Report with some of you displaying it to promote your produce. We're also very excited about the huge potential benefits of a Potato Marketing Levy for the industry and will shortly approach some of the key stakeholders in the industry to gain support for this new levy.

As always, I look forward to meeting and hearing from you, so don't hesitate to drop me a line at Robert.Lawler@ausveg.com.au or on 03 9544 8098.



Robert Lawler

Acting Chief Executive Officer
AUSVEG

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On the right course

On an excursion to a Victorian packing facility, Rachel Abels, a student in the new Diploma of Production Horticulture (Potato Production Specialisation) imparts an insight about her family's potato export business, while her fellow six students and a teacher listen intently. Later, Pauline McPherson a Seed Certification Officer who is also completing the course, makes everyone rinse off their shoes in a decontamination bath before they hop on the excursion bus to return to their classes at Education Centre Gippsland (ECG) Warragul campus.

Dale Engleton, Kain Richardson, David Scott, David Jennings and Paul Jennings, Rachel and Pauline come from varying potato production backgrounds and regions and, clearly, all already have individual knowledge about different aspects of potato operations. By the time the seven students finish the course, what they know about potatoes may very well have been optimised for the benefit of an entire industry.

The Diploma was developed to overcome the shortfall in trained managers in the potato industry as well as offer growers opportunities to increase their education levels with a nationally-recognised qualification. Babis Lagos, the Manager of ECG's Horticulture and Agriculture programs says the course is broad, and would be suitable for people who are new to the potato industry, but at the same time fulfills industry demand for courses that cover areas of specialisation. "The ECG's Diploma places emphasis specifically on the potato sector," he said.

The course has strong support from ViCSPA, Ag-Challenge and the Victorian Department of Primary Industries (DPI) and has been designed to complement the daily on-farm work of the students. Students also benefit from the broad experience and agricultural expertise of Russell Bell a ViCSPA Area Manager; Tony Pitt, the Course Facilitator, Chris Waddell an Agribusiness Coordinator and Babis Lagos. In addition, a host of guest lecturers including Nigel Crump and Mirko Milinkovic from the Victorian DPI, are on hand to provide specialised viewpoints about potato production.



Tony Pitt, Course Facilitator

Decontaminating shoes

According to Babis, the extra-curricular schedule enables the students to undertake excursions to visit other potato enterprises, and meet industry consultants and professionals to further their knowledge. "With e-learning and open classroom the students can connect with overseas universities and exchange information with scientists from other continents," said Babis, adding that future subjects will also include marketing and business management studies.

Russell Bell believes that the structure of the course will be a boon to those who would normally have to attend to the demands of real-life farm work and as a result stand to miss out on some important opportunities. "The diploma gives growers a chance to take a crack at moving ahead with skills. Most management training is not farm-oriented. It needs to be, so that management can pass on their knowledge to others," he said. "Hopefully growers will see the value and opportunities in this course, so that it will become a part of the industry."

For those who want to take the Diploma even further, Babis says they can credit units studied toward other higher education pathways. "Some of the students have already expressed interest in the Advance Diploma of Rural Business Management which focuses on business practices and financial management," he said. With such opportunities for advancement available to the current and prospective students, it looks as if the future of the Victorian potato industry will be in very good hands. [pa](#)

Engineering a better potato

Dr Rick Roush believes those with a morbid fear of “unnatural” genetically modified (GM) foods, including potatoes, need an urgent reality check.



Dr Rick Roush

“The facts are we’ve been modifying food genetics for thousands of years,” says the Dean of Melbourne University’s School of Land and Environment. “We can just do it a lot faster now. And for the planet’s sake we need to.”

Dr Roush’s presentation on GM advances at the recent Victorian Seed Potato Conference in Marysville, in which he

highlighted the environmental benefits available through GM technology, was well received by growers.

He pointed out that many of the foods we consider most healthy and natural are actually the result of human intervention.

“For instance, the ancestor of the lettuce was a tall, thin weed with prickly leaves. Over thousands of years we selected qualities that looked better, and tasted better, until we produced the totally unnatural varieties we know today.”

Dr Roush says the same applies to virtually all grain crops – originally their seed heads were small and disintegrated easily.

As for health, “the notion that natural foods are always better could not be further from the truth,” says the US academic who moved to Australia in 1995.

Potato farmers would be familiar with the dangers of glycoalkaloids in green potatoes.

“Lots of naturally-occurring foods also contain known carcinogens,” says Dr Roush. “And many are known allergens, such as the kiwi fruit and peanut. A GM food that caused reactions at those rates would never be approved.”

Sometimes it’s as simple as producing a plant with features that insects don’t like, such as a waxy film that gums up their mouths.

Indeed the European Commission’s Joint Research Centre (JRC) recently concluded that “no demonstration of any health effects of GM food products submitted to the regulatory process has been reported so far”.

The findings were in line with conclusions reached by the World Health Organisation and assessments by the European Food Safety Authority (EFSA).

So what will it take to change the public’s aversion to GM foods? Dr Roush believes it could be a greater awareness of GM’s green credentials. He says biotechnology has produced crops that require less tillage – reducing fuel consumption, greenhouse emissions and erosion. Even more important are GM varieties that can out-compete weeds, defend themselves against insects and use nitrogen more efficiently – reducing the need for herbicide, pesticide and fertiliser.

Nitrogen-efficient canola plants that produce the same yield with only a third of the fertiliser have been developed. This is particularly significant not only in regards to lower production costs but because excess nitrates contaminate soil, groundwater and run-off – creating algal blooms that poison drinking water and devastate rivers and coastal waters. Nitrates in the soil can also be converted to nitrous oxide, a greenhouse gas 300 times more potent than carbon dioxide.

Dr Roush also points to recent UK research that found from 1995-2005 GM crops reduced the global use of pesticides by 224 million kilograms, reduced CO₂ emissions (through lower fuel use) by close to one billion kilograms and increased the amount of carbon stored in the soil due to a reduction in tillage by more than eight billion kilograms.



*The ancestor of all modern lettuce varieties.
Photo courtesy of Wayne Parrott,
University of Georgia.*



*The varieties alongside each other in the field.
Photos, courtesy of Monsanto.*



"New Leaf" GM potatoes (left) resistant to potato leaf roll virus compared to a conventional variety.

He says it is ironic that anti-GM activists, on health grounds, have ensured agriculture relies instead on dangerous pesticides. "In China alone, between 400 and 1000 people a year died from exposure to cotton pesticides," he says. "But GM cotton technology has been absolutely fantastic in terms of reducing pesticide use and poisonings by 80 per cent."

How does it do this? Sometimes it's as simple as producing a plant with features that insects don't like, such as a waxy film that gums up their mouths. Other times it involves inserting a gene so the plant produces a substance harmless to humans but lethal to a particular pest.

The science underlying this new technology is not new. Since the 1930s Bt strains of the bacterium *Bacillus thuringiensis* (Bt) producing "crystal" proteins have been grown in fermentation and sprayed on crops to kill caterpillars. More recently the tenebrionis strain was similarly used against potato beetles.

In 1995, Monsanto's 'NewLeaf' potato was transformed with a 'Cry3' gene modified from this tenebrionis strain, eliminating the need for spraying. Then, in 1999, Monsanto released potatoes resistant to potato virus Y (PVY) while a team at Michigan State University developed potatoes with a "Cry1A" gene resistant to the potato tuber moth.

"A different Cry 1A toxin, very specific to some groups of caterpillars, has been used in Bt cotton in Australia for at least the last 10 years," says Dr Roush. "Although still in a very experimental stage, Bt proteins that kill nematodes are under investigation and might be used eventually for Potato Cyst nematodes."

Around 12 million farmers from at least 22 countries, collectively representing more than half of the world's population, now grow GM crops.

Dr Roush says the New Zealand Institute for Crop and Food Research conducted field trials in 2001 on potatoes with proven resistance to the potato tuber moth, the major potato pest for New Zealand. These found GM Russet Burbank and Red Rascal lines had less than 0.2 per cent of tubers with potato tuber moth "mines", while 25 per cent of the tubers in the control sample were affected.

Dr Roush says the same agency has also developed potatoes with resistance to bacterial soft rot. "More recently, BASF Plant Science has been field testing in northern Europe potatoes resistant to late blight, using two genes from wild potatoes. BASF has also been developing the Amflora potato, which contains only starch with the amylopectin component – a potential renewable raw material to the starch industry."

However activists opposed in general to all GM crops have successfully campaigned to stop producers using any of these new potato varieties. In 2000, as a result of activist pressure, McDonald's told its french-fry suppliers to stop using GM potatoes. McDonald's was soon joined by J.R. Simplot Co., a major maker of French fries.

With the loss of market endorsement, Monsanto withdrew the potatoes from the market in 2001.

Dr Roush says around 12 million farmers from at least 22 countries, collectively representing more than half of the world's population, now grow GM crops.

However there are no official GM potato crops, due to concerns over loss of market share by major food retailers.

"We've had a decade of lost opportunities," he laments. "But the potential for GM potatoes is still enormous." [pa](#)

Natural resistance

Words Gretel Sneath

A former CSIRO senior research scientist says arguments that GM crops can benefit the environment do not take an ecological approach. Instead, Dr. Maarten Stapper describes them as a temporary band-aid, or ‘techno-fix’, masking the real cause of our problems – degrading soils.



Dr Maarten Stapper

Soil is funny stuff. It can be the source of many crop disasters, but it’s also the key to strong growth and internal resistance to insects and disease. Farming systems agronomist, Dr Maarten Stapper, says we must unlock the method for obtaining the right balance—and it needs to happen naturally rather than in a laboratory.

“It’s all about harnessing the power of natural soil processes, improving their use of inputs and understanding those practices that negatively impact on soil health,” he explains. “Healthy soil produces better crops and pastures, requiring less fertilisers and agro-chemicals for similar productivity, and resulting in healthier feed for animals and healthier food for humans.”

Dr Stapper doesn’t believe that can be achieved through Genetic Modification (GM), which he says tends to target the symptoms rather than the cause, supplying short-term solutions...and possible long-term problems. He says we should be working out how to get the most out of existing plant, animal and human genes in preference to investing time—and risk—into working out whether one gene will make a difference.

“Isolated genes can’t fix soils degraded by farming—they only treat individual symptoms and not the wider cause of soil degradation, and are therefore simply a tiny part of a highly complex production system,” he explains.

Such views have sent Dr Stapper off-side with many other scientists who vigorously support the GM concept. Indeed, it has been widely-publicised that he and the CSIRO parted ways in 2007 after 23 years, because of his biological farming direction and criticism of GM crops.

Dr Stapper says that he felt compelled to tone down his vocal opposition to GM crops. “I didn’t want that because I have a connection with the farming community and they trust me,” he says.

The CSIRO has denied that was the case. Either way, those very farming communities which instilled their trust in Dr Stapper are now reaping the benefits of his extensive knowledge. He now works as a private consultant assisting growers in the gradual transition from industrial to biological farming systems with more resilient soils. His research work, discussions with Landcare groups and a wide range of farmers have helped cement his belief that science must take a broader view to achieve the sustainable development of agricultural industries.



On field trials



“Current soil problems are the result of gross oversimplification of fertilisation and ‘plant protection’ practices that use harsh chemicals and ignore the delicate balance of microbes, trace minerals and nutrients in the soil,” he explains.

Resistance is then nature’s answer; a genetic adjustment to adapt to changed conditions and withstand the next attack. Supporters of GM argue that they are overcoming that resistance, but Dr Stapper says the solutions are only short term, and haven’t been applied to the ‘real world’.

“They don’t get the whole picture, as the environmental climate the genes end up in is much more complex than a laboratory. These crops need to be tested in the field for 10 years before they can be said to be safe, and health and fertility testing should be done over at least four generations by feeding mice or rats GM food, for example, and then dissecting the animal and checking the condition of the liver, which is a main detoxifier of the body.”

Dr Stapper is also concerned that GM developments will lead to the loss of independence in food production, and fears that the seed-chemical-fertiliser supply chain and its regulation will be controlled by a few multinationals.

“There is no independent science possible on GM crops as companies don’t supply seed for such studies unless they see results first to prevent negatives becoming public. Hence experiments are designed to get the answers wanted,” he claims.

Instead, Dr Stapper says we must look at the entire farming system, acknowledging that biological systems are non-linear and massively interconnected.

“Plant biology alone (eg. Genetically Modified Organisms) cannot provide the answers as plants interact strongly with a complex soil biology as influenced by soil, water and nutrients, climate and management. Increased complexity and diversity of the organisms, species and interactions within the soil foodweb allows the establishment of a living, self-organising, re-generating, healthy soil, which results in higher plant productivity,” he explains. “The aim is to balance minerals and provide a food source for the soil biology and, by increasing their activity, to improve calcium and phosphorus availability, nitrogen fixation, decomposition of crop residues, and the health of plants and grazing animals without reliance on chemicals or drugs.”

If chemicals are needed as a last resort, Dr Stapper says only fertilisers and herbicides with the least impact on soil biota

should be applied in small amounts, in conjunction with additives to make input more effective and to boost surviving microbes.

He says it’s not as far fetched as it may sound – instead, it’s a holistic systems approach, where farming works with nature, rather than against it.

“In most districts today, there are properties applying such farming practices with resulting productivities above district average. These practices have been achieved with persistence by the manager – through trial and error, under financial pressure, and on fragile soils in our highly variable climate,” he says.

“Biological agriculture leads to higher biodiversity on farms and a greatly reduced impact on catchment environments. This process can achieve a doubling of the organic carbon content of the soil, and, if practised Australia-wide, could capture most CO₂ released in the country and slow climate change.”

For more information, log on to <http://biologicagfood.com.au>

Recent high-profile Australian campaigns against GM practitioners

August 2008: Bendigo Shire Council held a GM-free forum, as part of its bid to be a GM-free district.

May 2008: Greenpeace targeted GM food in a campaign using high-profile chefs, which was designed to pressure state and federal governments to ban GM foods and change labelling laws to make sure consumers know what they’re eating. Sydney Chef, Neil Perry, was among those to sign a GM-free charter, agreeing not to include GM products in their ingredients.

May 2008: MAdGE (Mothers Against Genetic Engineering) took its opposition to genetically altered food to the streets to coincide with a GM crops summit in Melbourne. MAdGE was formed in 2007 when the Victorian ALP government announced it was reviewing the moratorium on GM food. The organisation slammed the limitations of the government review, saying the panel was only required to look at the economic aspects of lifting the ban, and there was no obligation to examine the health effects of GM crops or their effect on the environment.

Grower perspectives

Is there room for GM in the Australian potato industry?

Ken Labbett, VIC: Yes, I don't see a problem with it for potatoes. It could be the way forward. Potatoes don't cross pollinate and they're one of the safest crops to grow. I think GM might help to solve problems with PCN, and also some other current problems. It'll be a goer for improving our spuds - if not through GM then by breeding, so that diseases can be eradicated, but it will just take longer.

John Young, TAS: I think it would help us overcome some disease issues and water problems, but there are the moral questions that need to be addressed, such as what the results are for the consumers.

Ben Dowling, SA: I'm hesitant about GM, because I worry about the novel protein compounds in GM that aren't present in nature, purely because of the imperfect way in which they are introduced into the plant.

David Nix, QLD: Yes, but it comes down to the public's acceptance of it. There's potential for production increases, cheaper food, more disease eradication, it should be easier and cheaper, basically for us and those in developing countries. However, there'll be very short advantage for us, because once the experts in countries such as China grab that bull by the horns, they'll have the market upper hand almost right away.

Dean Ryan, WA: No, there are other avenues we can go down. I'm 100 per cent conventional in my practices but I am starting to look at organic and there seems a fair bit of scope to improve with new technology. We're better off investigating that path instead of fighting nature. We should work with it, and there's plenty to work with at this stage. The only ones to gain out of it are the biotech agronomy giants—GM provides another way for them to control things. I run a large operation and I've been trying to improve with chemicals and all kinds of fertilisers, but I've thrown my hands in the air. So, I'm going to start trialling organic methods and I'm confident they can help.

Geoff Moar, NSW: There's room for it. GM can lead to saving water, better transport, better processing. We need to be able to bring the public along to accept it before we do anything, which is difficult, because they don't want to get involved with GM. At the same time they're demanding things like lower prices or unbruised produce. We're just trying to keep up. We're not doing what other countries, who are prepared to export lower standards to us, are doing. The industry in Australia is of a very high standard, it's clean and green. So in trying to supply good quality potatoes, we're sticking to high standards and coming up with the products that can do this. We're not going to take any risks, we're only going to use the best tools possible.



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Surplus lines to be discarded from public variety collection



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The public variety collection is maintained for the Australian potato industry by ViCSPA. It is housed at Toolangi and Devonport and is contracted to ViCSPA respectively by the Victorian Department of Primary Industries (DPI) and the Tasmanian Institute of Agricultural Research (TIAR). The majority of the collection is at Toolangi.

The project also funds the refreshment of up to five varieties annually. Each year selected Generation two tubers are taken from the verification plots at Toolangi and sent to the DPI at Knoxfield to be “re-indexed” or tested for disease, and then put into the in vitro collection. The aim of the refreshment process is to ensure that Australian growers have access to true-to-type and vigorous lines of the public varieties.

Funding for the project limits the number of lines covered, however. As new, refreshed varieties are added to the collection, we need to remove the old lines that have been replaced and/or old lines that are no longer used by industry.

The following changes are therefore proposed:

- Umatilla is maintained at both Toolangi and in Tasmania. The project does not need to fund both and the Toolangi stock will not be funded by the project and will be discarded
- Atlantic line A, Kennebec line 2, Russet Burbank Line A (Ruen) and Sebago line B are no longer required as these lines have been refreshed and replaced by new ones. As such, the old lines will be discarded.
- Bremer and Cadima are currently not being used by industry and will be discarded unless someone wants to pay for their maintenance or believes that they do have a role to play in the future of the industry.

Interested parties should contact me by Friday 7 November if they believe that Bremer or Cadima are required by industry and should not be discarded.

0407 883 774
 Manager.vicspa@bigpond.com

This project has been funded by HAL using the potato levy and matched funds from the Australian Government. 

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“It’s more than just dirt!”

A farm hygiene program for potato growers



Hygiene - why?

The practice of good on-farm hygiene may seem like a strange idea to many growers as potato farms and sheds are naturally dirty and dusty places. However, it’s not the dust and dirt itself that poses the threat; it’s what’s carried in the dirt, the disease causing organisms, which are the real concern.

Research has shown that the shed is a significant source of disease and that the pathogen levels in shed dust are often higher than the levels found in paddock soil. Therefore, the reduction of dust and debris in the shed/store is an essential practice in order to minimise the risk of disease. This is where hygiene programs come into play.

Review operations

- Is the floor sealed (concrete or asphalt) to allow easy cleaning?
- Can the grading area be separated from storage area to prevent contamination of nearby seed lots?
- Can dust be reduced by:
 - the installation of point extraction fans along the grading line?
 - the use of ultra-low spray of water or steam at key points on the grading line?
 - vacuuming the traffic areas (where the forklift travels) to prevent dust disturbance?

Clean it

✓ Remove dust and debris from surfaces. This alone effectively reduces the spread of diseases.

- scrape soil and debris from rollers and belts or use high pressure water units to clean equipment.
- wipe surfaces clean with a cloth.

✓ Vacuum dust from surfaces especially under graders, wash down graders and seed cutters to remove dirt and traces of potato between seed lots.

✓ Do not sweep surfaces - this just redistributes the dust and spreads the pathogens.

Use a disinfectant

✓ Do not always rely solely on a disinfectant - in combination with cleaning (i.e. remove soil and debris) they are more effective at eliminating pathogens.

✓ There are many different types to choose from. Select a disinfectant that is not neutralised by high organic loads and will not cause tainting of produce.

Develop a routine

✓ Clean equipment (grader, cutter) at the end of the day or between seed lots, especially after diseased potatoes.

✓ Clean floors regularly to prevent build-up of dust.

✓ Mark bins that have contained diseased potatoes or soil so that they can be high pressure washed.

Implement a plan

✓ Write a hygiene plan for your shed and your situation and use it as a guide for all in the shed to follow.



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Australian potato growers**

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IPM at AUSVEG

A new Integrated Pest Management (IPM) section is now available in the Grower Portal on the AUSVEG website. Growers who have log-in access can visit the new IPM sub-site on www.ausveg.com.au/levy-payers/login.cfm. Unregistered users can enquire about access through the AUSVEG website, however, potato levy-payers can register at no charge.

The IPM sub-site is comprised of a general information page in the public part and a comprehensive IPM area in the Grower Portal. There are four categories of information within the second area: IPM in Australia, R&D Projects, Current Issues and Priorities and IPM Resources.

IPM in Australia

This section explains what IPM is and outlines its use in Australian vegetable crops. Users will find expert comment and tips from growers, researchers and IPM consultants who have been extensively involved within Australian IPM in this area.

There are also individual grower case histories on cucumber and capsicum greenhouses in Western and South Australia and several audio interviews, which can be downloaded.

R&D Projects

Users can explore an extensive database of Research and Development (R&D) projects, which are funded by the National Vegetable Levy, in this section.

To obtain fast, relevant results to their searches users just need to enter either an IPM-related phrase or project number into the search function, and press enter.


Current Issues and Priorities

This section focuses on the pest management issues, strategies and products that are constantly changing in industry.

As new pests and diseases emerge, chemical resistance may become an issue, seasonal, climatic and market factors play a major role, as do the crops and practices of neighbouring landholders.

IPM Resources

This category contains a wide range of reliable resources and support including manuals, UTE guides, industry publications, case histories, expert contacts and more for information on pest and diseases, training, tools and commercial expert help for on-farm practices.

For further information contact Lucy Jarman, AUSVEG Communication Officer on 03 9544 8098 or email lucy.jarman@ausveg.com.au. 



for Potatoes

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New Omni Gold™ is a compound fertiliser formulated using the same manufacturing process as OmniBlue™, but formulated to better suit potato planting nutrient ratios.

This ensures that every granule contains the same NPK and TEs.

In traditional blended products TEs are added as a powder which means they settle out in a mix with much larger granules and result in an uneven application.



Omnia recommends consultation, analysis and soil balancing prior to embarking on a general program. Fertilizer inputs to particular soils may provide too much or too little of specific nutrients which may be essential to the success of a crop.

Please contact us for information, soil/sap analysis and individual programming.

Omni Gold™ early in potatoes

Research has shown that the application of certain minerals at certain physiological stages of potato crops can have a dramatic influence on tuber numbers and subsequent tonnages.

Higher yields require more Phosphorous just prior to tuber initiation, which increases the tuber numbers in the set. With this in mind OMNIA have introduced Omni Gold™ to increase P without too much early Nitrogen, with higher levels of Zn and P to supply the energy required for higher yields. The key to higher yields is timing and monitoring.

Omni Gold™ applied at planting, just prior to tuber initiation and hilling coupled with foliar applications of Mega-Kel-P® will provide additional P, Kelp and TEs to the crop and will assist in a healthy tuber set.

Weekly monitoring is essential after this to tailor other nutrients inputs (N and K plus the TE balances) relative to the numbers of tubers under the ground.

For example: the required inputs for a crop carrying 6 tubers per stem is far greater than that of a crop carrying 2 to 3.



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King of the crops

ECONOMIC FORECAST ECONOMIC FORECAST ECONOMIC FORECAST

The vegetable industry now has access to a wider range and greater depth of statistics than ever before. The Australian Bureau of Statistics has significantly upgraded its collection of data on the vegetable industry. While the ideal would be to have a record of production from each grower this is difficult to achieve. The latest statistics for potatoes are for financial year 2006/07. Data for this year was collected from a survey of growers and therefore, statistically, will not be as accurate as the data for 2005/06 which was a census year. The new data is available in what are called mesh blocks and taken from the registration records for growers operating with an Australian Business Number. Subject to confidentiality constraints, this information can be used to ascertain production and the number of growers at National, State, Division and Local level.

The data provides some interesting insights into the Australian potato industry. For financial year 2006/07, potatoes were Australia's largest vegetable crop on all measures, number of growers, volume, area planted and value. Some key statistical features from three areas of data on the Australian potato industry are presented page 23.

Grower numbers and production

In 2006/07 there were 1,270 potato growers producing for the fresh and processing market. This was a significant fall on the number of growers producing potatoes in 2005/06. Grower numbers were down just over five per cent, with slightly more growers withdrawing from fresh than processing potatoes. Potato growers planted just over 34,000 hectares of potatoes from which they produced just over 1.2 million tonnes with an average yield of 36 tonnes to the hectare. Slightly higher yields compensated for a smaller planting to leave total production largely in line with the figure for 2005/06.

There were more growers producing for the fresh potato market than for the processed market, 745 as opposed to 650, although some growers produced for both markets. While the number of growers producing for the fresh market is larger, as is the area planted, the volume of production from the processed sector, as the accompanying pie chart shows, was much more substantial.

Table 1 (see page 23) shows the number of growers per State, potato production, plantings and yields for both processed and fresh potatoes. Tasmania has the largest number of potato growers while South Australia is the largest potato-producing State by volume and area planted. Victoria has the largest number of fresh potato growers but Victorian growers on average have small operations particularly compared with South Australia. Tasmania has a surprising number of fresh potato growers but their operations on average are even smaller than in Victoria. Traditionally, yields are higher in Tasmania and this was reflected in the latest figures with yields in Tasmania averaging 46 tonnes per hectare. In contrast, yields were lowest in Queensland at 25 tonnes per hectare. Yields for processed potatoes exceeded those for fresh potatoes in all States but only marginally so in Queensland and Western Australia. The gap is widest in Tasmania

Value of potato production

Crop production across Australia was just under \$18 billion in 2006/07 with wheat being the largest crop. Vegetable production constituted 17 per cent of this with production valued at just over \$3.1 billion. Value of production is usually calculated at the first point of sale which, in the case of potatoes, is usually the process price or the wholesale price. In 2006/07 the value of potato production was estimated at \$514 million, up from \$464 million in the previous year. This reflected higher prices received per tonne with an average price across Australia of \$410. The value of production of potatoes exceeds that of tomatoes, the next largest vegetable by 75 per cent. A similar gap lies between the next two highest value vegetable crops lettuces and mushrooms.

Table 2 (see page 23) shows the value of potato production both nationally and by State compared to other major vegetable crops.

South Australia was also the largest producing State when measured by value. Queensland punched significantly above its weight by value reflecting the much higher prices received for potatoes in that State. By contrast, growers in Tasmania who produce largely for the processing sector, received much lower prices than fellow producers for the fresh market. The price differential between potatoes produced in Tasmania and Queensland was huge—\$273 a tonne compared to \$627 a tonne, reflecting how poorly paid potato processors were in 2006/07.

Regional Factors

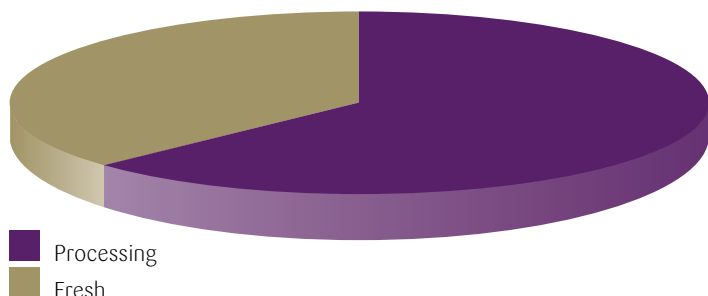
By statistical division, Mersey-Lyell in northern Tasmania, covering the area west of Devonport, was the largest producer of potatoes in Australia in 2006/07 with tonnage estimated at 179,000 tonnes. Potato farms in Mersey-Lyell are on average smaller than on the mainland with an estimated 287 growers. Murray Lands in South Australia was the second largest producing division in the country with production estimated at 163,000 while the south-east of South Australia produced an estimated 151,000 tonnes. In contrast with Tasmania, potato farms in South Australia are large with 82 growers accounting for production from these two districts. Other statistical divisions estimated to have had production in excess of 75,000 tonnes, were Tasmania's northern regions stretching from Deloraine to the east coast, the Central Highlands area based around Ballarat in Victoria and the Gippsland region centred on Thorpdale.

State figures can hide significant variations between regions. NSW is a classic case. Potato farms in NSW are generally small scale especially in the Sydney basin. However in the Murray statistical division which produced 45 per cent of potatoes in NSW, potato growers averaged production of 6000 tonnes.

Conclusion

The potato industry has better data than ever before to enable it to promote itself as one of Australia's major cropping industries.

Share of total production by volume



Source: Agricultural Commodities – Small Area Data 2006-07 ABS Cat. No. 7125.0

The Bottom Line

- Potatoes were Australia's largest vegetable crop in terms of value, number of growers, volume and area planted in 2006/07.
- The fresh market has the largest number of growers, but the volume of production from the processing sector is bigger.
- The value of potato production was estimated at \$514 million for the 2006/07 financial year, an increase of \$50 million from the previous year.

Further information can be found at www.ausveg.com.au/levy-payers/login.cfm

Table 1

2006/07	Australia	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania
Processing - area sown (hectares)	18,564	2,701	3,957	1,287	3,915	823	5,882
Processing - production (tonnes)	745,017	85,358	141,005	33,239	167,821	34,218	283,375
Processing - yield (tonnes per hectare)	40	32	36	26	43	42	48
Processing - number of growers	650	34	97	43	74	46	356
Fresh market - area sown (hectares)	15,532	1,867	4,141	2,211	5,488	1,089	736
Fresh market - production (tonnes)	466,972	37,371	115,472	54,843	196,433	44,480	18,372
Fresh market - yield (tonnes per hectare)	30	20	28	25	36	41	25
Fresh market - number of growers	746	104	219	132	94	65	132
Potatoes - processing and fresh market - area sown (hectares)	34,096	4,568	8,098	3,498	9,403	1,911	6,618
Potatoes - processing and fresh market - production (tonnes)	1,211,988	122,729	256,478	88,083	364,255	78,697	301,747
Potatoes - processing and fresh market - yield (tonnes per hectare)	36	27	32	25	39	41	46
Potatoes - processing and fresh market - number of growers	1,270	130	286	161	146	90	458

Source: Agricultural Commodities – Small Area Data 2006-07 ABS Cat. No. 7125.0

Table 2

2006/07	Australia \$m	New South Wales \$m	Victoria \$m	Queensland \$m	South Australia \$m	Western Australia \$m	Tasmania \$m
Total crops	17,944.6	3,693.0	3,498.5	4,751.8	2,247.7	3,120.2	500.6
Total vegetables	3,103.0	428.9	704.4	1,002.3	477.7	267.8	192.6
Potatoes	514.4	50.3	109.4	55.2	178.6	38.3	82.5
Tomatoes	296.0	13.6	82.9	169.1	12.2	16.8	1.3
Lettuces	282.9	65.6	87.0	98.4	16.8	12.5	2.4
Mushrooms	259.5	68.6	91.5	46.2	24.3		
Onions	189.9	11.1	12.5	33.5	83.1	18.1	31.1
Carrots	158.4	9.5	27.5	21.7	49.9	26.8	23.1
Capsicums	138.6	1.6	5.0	112.8	8.7	9.7	0.8
Potatoes (\$/t)	424	410	426	627	490	487	273

Source: Agricultural Commodities – Small Area Data 2006-07 ABS Cat. No. 7125.0 



INTERNATIONAL YEAR OF THE POTATO 2008 • INTERNATIONAL YEAR



Spudway digs deep for Riley

Above: Paul and Coby Morgan. Below: Spudman

The concept of guilt-free eating has taken on an added dimension thanks to the heartfelt fundraising effort of a South Australian spud seller.

Paul Morgan is one of Mount Gambier's larger than life characters. With a big smile, a booming voice and a gigantic heart, he's a self-made food entrepreneur who specialises in...spuds!

"It's a meal in a jacket that won't cost a packet!" he beams

The brightly painted 'Spudway' bus owned by Paul and his wife Coby can be seen parked on the regional city's main street five nights a week, complete with flashing lights, music, a 'Spud Man' who waves at passing cars...and enthusiastic queues of customers who manage to devour 500 kilograms of locally grown pontiac potatoes each week.

"Some of them are such regulars that we know their order off by heart, so we start getting them ready before they even get out of the car - we like the old fashioned service," Paul says.

The Morgan family entered the spud game six years ago.

"We could certainly see an opening for such a business - we've got five kids, and there's not much around that's particularly healthy in the way of fast food," Paul says.





OF THE POTATO 2008 • INTERNATIONAL YEAR OF THE POTATO 2008

Mind you, there's nothing that sounds too slimming about Spudway's 'Mongrel of Mongrels' served with garlic butter, lamb, chicken, bacon, onion, cheese, pineapple, sour cream and coleslaw. (Woah!)

"That's definitely our biggest – but it's also one of the most popular," Paul smiles.

On the night that Potatoes Australia visited, 'Mongrel of Mongrels' were clearly the order of the day. But the Morgans were also handing out free jam doughnuts, "just to show our customers how much we appreciate them". Several weeks earlier, they'd organised a jumping castle for the kids.

"I love the atmosphere of working from a roadside stall – it has a real carnival feel to it, and we have a great time," Paul says. "We genuinely like our customers, and we try to demonstrate that as much as possible."

But the concept of giving something back recently gained momentum when Paul and Coby read about the plight of a young Mount Gambier boy, Riley Cook, who is battling a serious form of cancer.

"We were moved by an article in the local paper and really wanted to help the family in some sort of way, so we decided to donate all of our takings for a night," Paul explains.

What makes the gesture all the more heartfelt is the fact that these potato gems had never met four year old Riley or his parents.

"I could just relate to them – I've got young kids myself, so it just sort of struck a chord," Paul says.

After a quick ring around and door knock, the Morgans managed to convince other local businesses to chip in prizes for a raffle. The local Win Television station also helped spread the word about the fundraising effort via its local news service. And the community responded generously; a total of \$3600 was raised within days of the family's plight going public.

"We were amazed at the response, and the Cooks were thrilled, and somewhat embarrassed, I think," said Paul.

The campaign was so successful that the Morgans have vowed to hold large-scale charity events twice a year.

"We've always done a lot of things that no-one knows about like donating to the Royal Flying Doctor Service, but this feels a lot more personal, as you're helping out a particular family from your community," Paul says.

"I would never have thought that selling spuds could make a difference – but selling good spuds does." **pa**

I would never have thought that selling spuds could make a difference – but selling good spuds does.



Kylie, Riley and Mollie Cook accept a cheque from Coby Morgan



INTERNATIONAL YEAR OF THE POTATO 2008 • INTERNATIONAL YEAR



Spud sack race

Spuds + rings =

2008 has been an incredibly busy year with the Olympics, the International Year of the Potato, the newest challenges presented by environmental change, and a host of other things. So how do young school children get a handle on so many world affairs, let alone learn from it all? At Ashgrove State School in Brisbane, they came up with a novel idea—combine everything into one memorable program, call it the “Potato Olympics”, run it over three days in conjunction with Science Week and see what you get.



Edible garden produce



Spud-letes

Photos Nelson Herbert



OF THE POTATO 2008 • INTERNATIONAL YEAR OF THE POTATO 2008

smart, young things

For students like Emma Nihill and Alice Harding, the event provided a chance to meet some past Olympians, eat some great food and gave them more than just a dash of learning. "Prior to the potato Olympics we were clueless about the origin of the potato. Now we are confident that they are from South America," they said. "We are also confident in the fact that potatoes taste exquisite."

The school invited former Olympians, Toby Jenkins and Helen Johnson, as well as Queensland Department of Primary Industries (DPI) Scientist, Jodie Campbell, and a handful of growers and chefs to deliver specialised perspectives of athletic prowess, potato pathology and creative cooking with spuds.

In the line-up of activities, however, Ashgrove's very own edible garden which graces the front of the school yard, played a starring role. "The edible garden was set up by the students as part of their school curriculum about natural eco systems," said Helen Lynch, the school's Deputy Principal. "It's an above-ground installation. They laid newspaper down to combat weeds and connected it to a tank for watering purposes. It is regularly tended by gardeners and members of the community, but also by the children who have rostered class times around the cultivation of the garden," she said.

The garden became a focal point during the Potato Olympics when DPI Scientist, Jodie Campbell, and the visiting potato growers came to explain the art and science of potato cultivation.

When the chefs arrived to talk about cooking and prepare dishes for the entire school, the students got to harvest and taste the proud produce of their own garden in dishes such as gnocchi and also potato tortillas as whipped up by the tuck shop convenor.

"Outside of the Potato Olympics we source produce from the edible garden when there's fresh stuff in season, for cooking," said Helen Lynch, "but we're also picking things from the vines to eat. The tuck shop convenor is applying for grants to make an outdoor kitchen from which to harvest things and incorporate them into cooking classes for the kids.

Helen also says that apart from being a great source of fresh food, the edible garden and its surrounds provide the ideal place of respite for students and staff, at times. "Students with socialisation issues often go to it to just sit or have a dig around and they seem to find it quite therapeutic."

The three-day event spawned another innovative idea at the school. The students developed an Olympic torch relay with a twist. Instead of spewing forth mystical flames, the torch carried snippets of Olympics trivia and potato facts from classroom to classroom. For students Emma and Alice, all the activities have uncovered many possibilities. "Learning so much about the beautiful vegetable we think we would definitely consider growing our very own potatoes," they said. Pa



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Ask the industry

Ask the Industry is a regular advice column covering issues from resistance management and chemistry to occupational health and safety.

Are there any alternative products on the Australian market for the control of Pink Rot (*Phytophthora erythroseptica*) other than Ridomil Gold 25 G (25g/kg Metalaxyl – M)?

This question brings the issue of fungicide resistance to mind. The development of resistance to some fungicides varies from case to case and depends on a range of issues. These include susceptibility of the product to developing resistance (i.e. Mode of Action and use pattern), the nature of the disease or pathogen and environmental conditions.

We have a good understanding of the resistance model, in relation to Ridomil 25G and other formulations of Metalaxyl – M. Ridomil Gold 25 G is unique to all other Metalaxyl products available on the Australian market. Generic formulations rely on the old technology (Metalaxyl), which Syngenta developed and then refined to capture the superior formulation of Metalaxyl – M (Mefanoxam).

UK researchers discovered that only half the Metalaxyl active ingredient in the formulation actually has efficacy against fungal diseases and the other half is inert (ineffective). As a result of the development of Metalaxyl - M, growers now benefit by not putting as much chemical out on to paddocks as only the active component that has the efficacy is used with the Ridomil range of products.

Unfortunately, there is no effective alternative to Metalaxyl – M (or metalaxyl) in Australia for Pink Rot control in potatoes. Whilst alternatives are available in other countries, studies completed by independent researchers and Syngenta show nothing is as efficacious as Ridomil Gold 25G, followed by two consecutive foliar applications of RIDOMIL GOLD MZ.

Is potential resistance the main reason poor efficacy sometimes occurs?

The “resistance” to Metalaxyl –M that has been experienced in other regions of the globe is expressed as a reduced sensitivity. This means that the efficacy curve moves but the product is still effective at higher rates. So resistance develops slowly.

A key contributor to reduced sensitivity is farm hygiene. Pink Rot can survive for many years in the soil as mycelium in decaying plant material such as discarded tubers. An integrated approach to disease management is essential to effectively manage fungal diseases in potato crops and to prevent or delay the onset of fungicide resistance.

- Avoid planting into wet and low-lying areas without good drainage (areas prone to water logging)
- Plant varieties that are the least susceptible
- Avoid over-watering
- Harvest suspected areas of the paddock last and handle separately
- Introduce long rotations between potato crops
- Promptly remove crop debris after harvest

The other major factor is that of application and accuracy of application. Ridomil Gold 25G at the label rate of 10kg per hectare is placing a very small amount of product in to the mould near the seed piece, however concise application is critical to give adequate control.

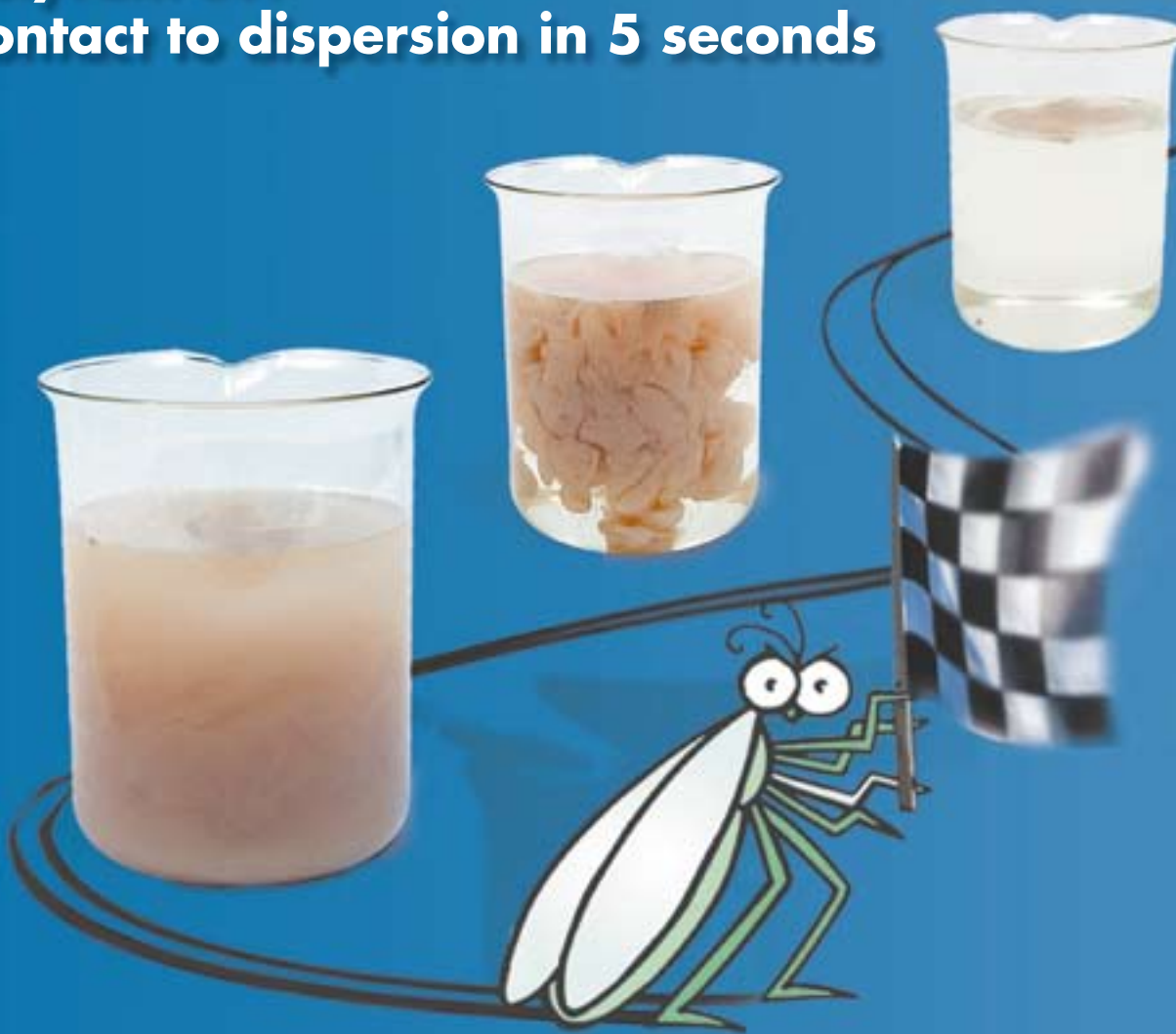
Why apply Ridomil Gold MZ as a follow-up for Pink Rot control?

As the Ridomil 25G (Metalaxyl-M) component in the soil is diluted from the active being used to control Pink Rot, more active is required to give adequate control of the latter stages of the crop. We suggest the following treatment offers potato growers the best protection against Pink Rot infections. Apply RIDOMIL GOLD 25G at planting followed by consecutive foliar applications of RIDOMIL GOLD MZ 14 days apart at between four and six weeks after planting. Please refer to the label for details.

Growers must be mindful of assessing their risk to the disease. If you are at high risk and the paddock has a history of Pink Rot infections, then it is important to apply the correct product at the correct rate and time to gain maximum control. You should be aware of working in conjunction with other Integrated Disease Management practices such as paddock hygiene and best practice to reduce further risk of Pink Rot infections within your subsequent crops.

Sean Richardson, Syngenta

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The European Potato Conference

The 17th triennial conference of the European Association for Potato Research (EAPR) took place in Brasov, Romania from 6-10 July and was attended by 345 participants from 42 countries.



Conference delegates and presenters

With 15 plenary lectures, 72 oral presentations and 145 posters reporting on potato studies from around the world, the conference provided detailed insight into the main concepts and activities in potato research in Europe and beyond. It also presented great opportunities to develop collaboration between research bodies in Australia and other knowledge groups.

Themes

The conference focussed on breeding and variety evaluation, genomics and molecular breeding, climate change and drought tolerance, genetics and wild *Solanum* resources, pathology, virology and disease resistance, physiology and health qualities, seed production and agronomy, and storage and processing quality. While there were a wide range of themes to the presentations the majority of presentations related to breeding cultivars with superior traits.

Anton Haverkort (Netherlands) reported on climate change and predicted its impact on potato production in Europe. He forecasted that the Netherlands will receive warmer temperatures, which will result in a longer growing season. The increased carbon levels will result in larger tubers with higher starch, but will decrease protein content, and there may be a need to increase phosphorus applications. There will also be an increase in hollow heart and a change in disease pressures.

Norbert Hasse (Germany) reported on the healthiness of potato for the human diet. They have analysed a range of cultivars for their composition and reported that they vary in their glucose, rapidly-available starch and resistant starch. They calculated the glycaemic index (GI) and found that boiled potatoes have a GI between 60 and 80, while French fries are slightly lower. While they have a medium to high GI level, they also have a high satiety level which reduced the amount that people eat. He reported on the tuber's glycoalkaloid content, which when high imparts a bitter taste, and acrylamide which is formed by the Maillard reaction, but leaves the body within a few

Words **Tony Slater, Mirko Milinkovic, Philip Brown and James Kirkham**

hours and is much lower than other foods and very concentrated in cigarettes. He then raised the antioxidant and vitamin C content, which again varies between cultivars, and vitamin C can increase in storage.

Pamela Anderson (Peru) raised the work that the International Potato Centre (CIP) is doing to promote potatoes as a means to reduce poverty and hunger in the developing world. She also spoke about the effects of climate change on these sensitive areas where drought is already affecting the ability of these nations to grow their own food.

Conference Chairman Sorin Chiru (Romania) provided an insight into the Romanian potato industry and the issues affecting it.

Howard Davies (UK) discussed genomics and genetically modified (GM) potato. Their work has looked at the genomics of flavour and used microarray technology to mine for genes that regulate flavour and aroma, which he believes they have found. He then discussed GM in potatoes. There are currently no GM potatoes grown anywhere despite a number being developed.

Other interesting presentations included:

- Jozefa Kapsa (Poland) on potato production and the effect of pathogens and pests.
- John Bradshaw (Scotland) on the Scottish crops breeding program.
- Charles Brown (USA) on antioxidants and novel potatoes.
- Eric Bonnel (France) on potato breeding from a commercial perspective.
- Kazuto Iwama (Japan) on physiology of the potato root system.
- Richard Visser (Netherlands) on potato genomics.
- Rich Novy (USA) on introducing resistance genes for PVY and PLRV from wild Solanum.
- Jussi Tuomisto (Finland) on reducing seed costs by using GM virus resistance varieties
- Jean-Pierre Goffart (Belgium) on potato crop nitrogen status

Going organic

Several speakers presented research on organic production of potatoes in Europe. While many challenges were acknowledged, the move towards organic production appears to be much stronger than in Australia. Research on the development of agronomic packages and breeding of cultivars specifically for organic production was presented. Related work on environmental impacts of potato production, particularly associated with nitrogen fertiliser management, will become increasingly relevant.

Australian research was presented in two posters; "Effects of soil nitrogen supply on tuberisation and tuber development in plants grown from mini-tubers" (Tasmanian Institute of Agricultural Research), and "Effects of age and pre-treatment of tissue-cultured potato plants on subsequent minituber production" (Victorian Department of Primary Industries). These posters attracted good interest and gave us, the authors, the chance to discuss our work with many international colleagues.

This was just a quick taste of the content of this important and informative gathering, but with 72 oral presentations and 145 posters, we could not report on all the information we obtained and the discussions held in this short article. However, it was clear that scientific investigations into developing better potato crops are very active, especially in the current changing face of the world, and the Australian industry should benefit from these investigations with future collaboration. ^{pa}



Browsing research posters at the conference



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PCN Management Plan update



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Almost a year's work has gone into compiling the PCN Management Plan which will include strategies for the control and testing of PCN, basic farm hygiene methods and grower information aimed at helping them to reduce the risk of transferring the pest onto their property.

A draft of this initiative should be ready for industry comment in early 2009. At its core, the Risk Analysis is taking some time to sort out and get right, but once it is completed the plan will be ready.

The Seed Potato conference in Marysville in July was fortunate enough to coincide with the nematology conference in Brisbane, with Jon Pickup from the Scottish Agricultural Science Agency (SASA) and Vivian Blok from the Scottish Crop Research Institute (SCRI) in attendance.

Jon and Vivian were able to sit down with a few of the PCN Harmonisation meeting members, which include members from the Potato Processors Association of Australia (PPAA), Plant Health Australia (PHA), State regulatory representatives, and AUSVEG, to discuss certain issues from an international perspective.

Jon's experience in setting up the PCN protocol for the European Union (EU), and Vivian's extensive nematology knowledge shed some light on testing strategies, detection methods, risk analysis hurdles and other small issues that confront us with putting this

plan together. As Jon said, 'It took the EU 10 years to agree on a plan, Australia is only one country!'

He had confidence in what we had done, particularly in terms of our unified approach to harmonising State regulations, the extensive work in under-grader sampling and washing techniques. Jon also had some practical suggestions to improve State harmony with reference to regulations and expectations of PCN management.

It was interesting to note that Jon shared the view of scientists internationally – stop PCN before it's too late as ignoring it will only cause heartbreak in the future.

The members of the committee will be meeting again later on in the year to discuss a second draft of the plan.

PT08023

The Bottom Line

- A plan which includes management strategies for PCN is still being drafted.
- Strategies will include methods for PCN control on-farm.

For further information, contact Laura Bowles, Executive Officer, Victorian Potato Growers' Association at laura@ag-challenge.com.au

This project has been funded by HAL using the potato levy and matched funds from the Australian Government



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a look at what's new in potato information & technology



Studies

Marketing, consumer perceptions and regulations

Five scientific papers look at various aspects of marketing, consumer perceptions and regulations, all which of can have a major effect on potato growing operations.

In the first paper (Jemison), a two-year survey of 275 consumers in Maine, USA, investigated potato characteristics that influence fresh potato purchase. Skin quality and place of origin were the most important characteristics, with many participants expressing interest in buying locally-grown potatoes. When tubers were cut in half, flesh colour was also considered an important characteristic, with yellow-fleshed varieties with white and purple skins being more popular than yellow-fleshed, red-skinned varieties.

The second paper (Sulzer) presents the results of some market research studies in German supermarkets. The research examined the ways that potatoes were presented and packaged, and found that improving the overall presentation and offering potatoes in carry-home bags increased sales of all potatoes by 20 per cent. An important finding was that young consumers were willing to pay more for potatoes with the new packaging.

The third paper (Ooraikul), investigates product design processes using potato industry examples. It is particularly important for the company behind the product concept to be involved in the whole process leading to the product launch, even if it is just a small or medium-sized organisation. In this situation, some aspects of the process may need to be done by another organisation, so ultimate decision-making should be clearly defined.

A very important part of product marketing is considering the sustainability issue. The fourth paper (Yakovleva) investigated potato

supply chains in the UK, using a sustainability assessment model that looked at implications for the economy, society and the environment. All stages of the chain, including agricultural production, food processing, food wholesaling, food retailing and food catering, are considered and the implications of the application of this model are discussed.

Another aspect of sustainable agricultural production is the use of crop protection chemicals, and many consumers are demanding food that has low levels of pesticides. Local, national and international regulatory organisations have placed many restrictions on the use of chemicals, and in some cases have banned the use of some pesticide groups. The fifth paper (Bernard) reviews the use of chemicals for crop protection since the 18th century, and questions the recent sharp decrease in the number and diversity of active ingredients. It is felt that this is a major threat for agriculture, because integrated control techniques require a range of mechanical, biological and chemical tools to control weeds, pests and diseases.

Factors influencing consumer preference of fresh potato varieties in Maine. Jemison et al. (2008) *American Journal of Potato Research* 85: 140-149.

Smarter presentation for higher turnover. Sulzer (2008) *Kartoffelbau* 59: 148-150.

From basic research to marketable product - success and failure of instant baked potatoes. Ooraikul (2008) *In: Case studies*

in food product development. Woodhead Publishing Ltd, Cambridge, UK. Pp. 163-184.

Measuring the sustainability of the food supply chain: a case study of the UK.

Yakovleva (2007) *Journal of Environmental Policy and Planning* 9: 75-100.

The use of chemicals for crop protection and sustainability. Bernard (2007) *OCL-Oleagineux, Corps Gras, Lipides* 14: 332-344.

Research summaries

Rhizoctonia solani, the cause of black scurf and stem canker

Salicylic acid induces resistance in potatoes against *Rhizoctonia solani*, the cause of black scurf and stem canker. Under greenhouse conditions salicylic acid was applied either to leaves or as a soil drench to potatoes (cv. Atlantic) with or without *R. solani* inoculation. Salicylic acid treatments increased plant canopy height and potato tuber weights, and reduced black scurf disease severity in stems compared to controls. These results indicate that salicylic acid has potential application for the management of black scurf disease. Al-Mughrabi (2008) *International Journal of Biological Chemistry* 2: 14-25.

Biocontrol of *Rhizoctonia solani* in native potato (*Solanum phureja*) plants using native *Pseudomonas fluorescens*. This study demonstrated the potential of six *Pseudomonas fluorescens* strains to reduce

disease symptoms produced by *R. solani* in native potatoes in Columbia. Further, all strains induced growth of the potato, although there were differences between strains' capacity to colonise the potato crops. *Bautista et al. (2007) Acta Biologica Colombiana 12: 19–32.*

Physiological disorders affecting potato processing

Internal heat necrosis of potato – a review. “Internal necrosis” generally describes a group of disorders that, include internal rust spot, internal browning, physiological internal necrosis, internal brown fleck, chocolate spot, internal brown spot and internal heat necrosis. Actual symptoms vary with cultivar and the environment, with Russet Burbank, Atlantic and Yukon Gold being particularly susceptible. The disorder is characterised by brownish-red necrotic patches of tissue that typically occur along and/or inside the vascular ring. The frequency and severity of the disorder tend to increase with high day and night temperatures early in the growing season, combined with low rainfall. Calcium has been shown to improve expression of the disorder, but there has been little research into other biotic and abiotic factors, such as biochemistry and genetics. This paper summarises previous research on internal heat necrosis and outlines potential new areas of investigation. *Yencho et al. (2008) American Journal of Potato Research 85: 69–76.*

An acoustic impact method to detect hollow heart of potato tubers. This study describes an acoustic sorting system that could detect hollow heart in potato tubers cv. Spunta. When tubers impacted on a steel plate, solid potato tubers emitted higher magnitude sounds than hollow tubers, and this could be detected with a microphone. Digital signal processing hardware and material handling equipment was used to separate the potatoes, with approximately 98 per cent classification accuracy. *Elbatawi (2008) Biosystems Engineering 100: 206–213.*

Effect of soil type and nutrient management on potato after-cooking darkening. After-cooking darkening is an undesirable trait of potatoes and is caused by oxidation of a chlorogenic acid-iron compound during cooking. This darkening effect is cultivar-dependent and varies with climatic conditions. Three experiments investigated the effects of soil type, management practices and storage on after-cooking darkening susceptibility. In

general, the darkening was reduced when climatic conditions and management practices were favourable for crop growth. For example, after-cooking darkening increased with N deficiency. However, these effects were small relative to the changes in after-cooking darkening due to cultivar and storage duration. *Wang-Pruski et al. (2007) American Journal of Potato Research 84: 291–299.*

Agronomy – Irrigation and Crop Rotation

Effect of drip tape placement depth and irrigation level on yield of potato. Subsurface drip irrigation enables the application of the small amounts of water to the soil through the drippers placed below the soil surface. A key variable is installation depth of the drip lateral, which involves consideration of soil structure and texture and root development pattern of the crop. This paper describes a three-year experiment with var. Kufri Anand potatoes on a sandy loam soil at irrigation levels of 60, 80 and 100 per cent of crop evapotranspiration and five manual placement depths (0, 5, 10, 15 and 20 cm). When tape was placed on the surface or at 5 cm, there was considerable upward movement and consequent loss of irrigation water. However, with tape placed at 10, 15 and 20 cm, the soil surface remained relatively dry. Maximum yields were recorded for placements at 10 or 15 cm. The highest benefit:cost ratio was found with 10 cm placement because of the higher costs for the installation of drip tape at greater depths. *Neelam & Rajput (2007) Agricultural Water Management 88: 209–223.*

Bacterial pathogens recovered from vegetables irrigated by wastewater in Mexico. The microbiological quality of 50 vegetable samples, including potatoes, was measured after irrigation with untreated waste water in Mexico. There were high levels of enterococci, faecal coliforms and total coliforms, but coagulase-positive *Staphylococcus aureus* was not detected in any samples. It was concluded that these vegetables pose a serious health risk to consumers. *Ibenyassine et al. (2007) Journal of Environmental Health 69: 47–51.*

Optimal crop rotation of Idaho potatoes. To counteract increasing price and production risks, Idaho potato growers have shortened their crop rotations. This paper describes an analysis of the effects of shortening the crop rotation on expected revenues. Land constraints due to equipment, labour and capital efficiency altered optimal rotations,

but where there were no such constraints, a Potatoes-Wheat-Wheat-Potatoes rotation was the best. Longer rotation cycles generated the highest expected revenue/ha. Other conclusions from this modelling exercise were that the open market generated higher expected revenue than contracts, but that producers could counteract some of the lower returns from contracts by lowering production risk by using longer rotation cycles. *Myers et al. (2008) American Journal of Potato Research 85: 183–197.*

Patent

Method for preserving potato. This patent describes a method for storing potatoes at room temperature that suppresses sprouting, requires no special storage equipment and is safe. It involves bringing the surface skin of the potatoes into contact with hot water at 60–100°C for 7–100 seconds. *Sato et al. (2008) Tokyo University of Agriculture, Japan, Patent Number JP2008000117-A.*

Popular articles

Integrated Pest Management (IPM) and Pesticide Resistance Guidelines

Four documents available on www.potatoes.com/Research-IPM.cfm outline IPM and Pesticide Resistance Guidelines for the Pacific North West of the USA. They are: IPM of insects and mites in Idaho, Oregon and Washington potatoes; Fungicide Resistance Management; Herbicide Resistance Management; and Insecticide Resistance Management. The IPM guidelines, in particular, are very comprehensive, giving good descriptions of pests and how to control them.

Snippets from www.potatonews.com

Listed below is a small selection of the articles that are posted on the Global Potato News website. Please visit the site for further details or follow the links that are indicated.

March 2008: News Headlines.

United Kingdom: New fungicide option for potato blight control. The product Shinkon (amisulbrom) has been approved in the UK for protection against foliar and tuber blight. Trials carried out by the Scottish Agricultural College indicated that amisulbrom-treated plots had 0.2 per cent incidence of foliar

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blight compared with 0.5 per cent for mancozeb, 0.1 per cent for cyazofamid and 0.9 per cent cymoxanil + mancozeb, whereas untreated plots were almost completely killed by foliar blight. Tuber blight incidence for the four fungicide treatments was 0.3 per cent (amisulbrom), 9.2 per cent (mancozeb), 0.8 per cent (cyazofamid) and 6 per cent (cymoxanil + mancozeb). Growers will be allowed up to six applications per crop, but the product cannot make up more than 50 per cent of the total blight spray programme. See www.fwi.co.uk/Articles/2008/03/03/109633/new-fungicide-option-for-potato-blight-control.html.

May 2008: News Headlines

China, New Zealand: Wanted – lots more Kiwi spuds to feed China. An Auckland potato chip-maker, Steven Wong, is excited by the potential of New Zealand's free trade agreement with China and is spending \$2.8 million on new machinery to double production. Currently, his price is about 5c above what the Americans and Europeans charge, but that will change when tariffs are eliminated. However, his major challenge will be satisfying the huge market. Already they are facing a 4000-tonne shortfall this year, and they can only supply about one-quarter of the Chinese requirement.

March 2008: Feature Articles.

Disinfecting potato tubers using steam treatments. Research carried out in Israel has found that the steam treatment of potato tubers reduced the incidence of pathogens from 26–59 per cent in untreated controls to 1–3 per cent. The steam treatments were applied to tubers in a commercial packing house using a nozzle system that was fitted to a conveyor belt and attached to a diesel-powered steamer. At 120 days after planting the daughter tubers of steam- or organic mercury-treated tubers had 3–4 per cent incidence of seed-borne pathogens compared with 26–31 per cent in the untreated controls. Steam treatment was slightly more effective against pathogens that were exclusively seed-borne than those that were both seed- and

soil-borne. See http://article.pubs.nrc-cnrc.gc.ca/ppv/RPViewDoc?_handler=HandleInit&Get&journal=tcjpp&volume=24&articleFile=k01-054.pdf.

New research to help fight against blackleg of potato. Scientists at the University of Cambridge have identified a gene in *Erwinia carotovora*, the bacterium that causes blackleg, that when inactivated abolishes the ability of the pathogen to break down the plant's cell walls. Not only will the finding allow the development of new strategies for preventing rots in potatoes but it has opened up new targets for developing pesticides. Blackleg is one of the key diseases in the British potato industry and is a particular concern in warm and wet growing conditions. Most varieties of potato have no natural resistance to soft rot diseases and there are no pesticides that effectively control blackleg, so the research is particularly important.

Antioxidants give potatoes a market edge. According to Dr Michele Korschuh, a research scientist with Alberta Agriculture, Food and Rural Development in Canada, the antioxidant lutein could provide an incentive for price premiums in potatoes (www.fruitandveggie.com/index.php?option=com_content&task=view&id=1094). Lutein is known to help slow the onset of age-related macular degeneration, an eye disease that affects a large proportion of the population over the age of 55. Only three to six mg/day is required to help prevent the damage, and leafy greens such as broccoli are regarded as good sources of lutein. In a series of trials on five fresh market and five processing potato varieties, lutein stability and availability were measured. Over all varieties, lutein concentrations after cooking averaged 60 mg/100 g fresh weight, with Satina and Agria having particularly high levels. In contrast to many vitamins it appeared that cooking boosted lutein availability. Thus, it was concluded that potatoes could contribute a significant portion of the daily allowance of lutein, but this depends on variety, with deeper yellow fleshed tending to yield more lutein. Marketing consultants thought that this could be a significant benefit, enabling growers to charge a price premium for high lutein varieties.

April 2008: Feature Articles.

What to do about Potato Virus Y. In the February issue of Spudvine (www.if.uidaho.edu/~bingham/Feb%202008.pdf), Jonathan Whitworth and Phillip Nolte, potato specialists at the University of Idaho, explain that the importance of managing Potato virus Y (PVY) has increased since 2002 when new strains of PVY began to spread across North America. Also, some new potato varieties produce only mild PVY symptoms so infection is hard to detect. The article discusses options for managing the disease, including understanding the interactions with the different species of aphids that transmit the virus, using quick tests to detect the virus in the field, using properly certified seed and growing resistant cultivars. Specific recommendations for preventing virus transmission within early generation seed crops are also given.

March 2008: Press Release.

New small scale ethanol plants provide highly efficient waste to ethanol production. A USA company, Diversified Ethanol, has recently developed new innovative technologies for ethanol production that reduce water use by up to 85 per cent and use existing liquid waste products as feedstock in the conversion process. One of the techniques separates solids from the water used in processing, meaning that the water can be theoretically infinitely recycled. The techniques also allow the use of by-products from processing operations rather than energetically-expensive dedicated crops such as maize. By using small-scale ethanol production units, the ethanol can be used locally and does not have to be trucked from large production facilities. It is envisaged the units will be used for a range of by-products across the USA—from citrus in Florida to wood chips in the Northwest to potato waste in Idaho.

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