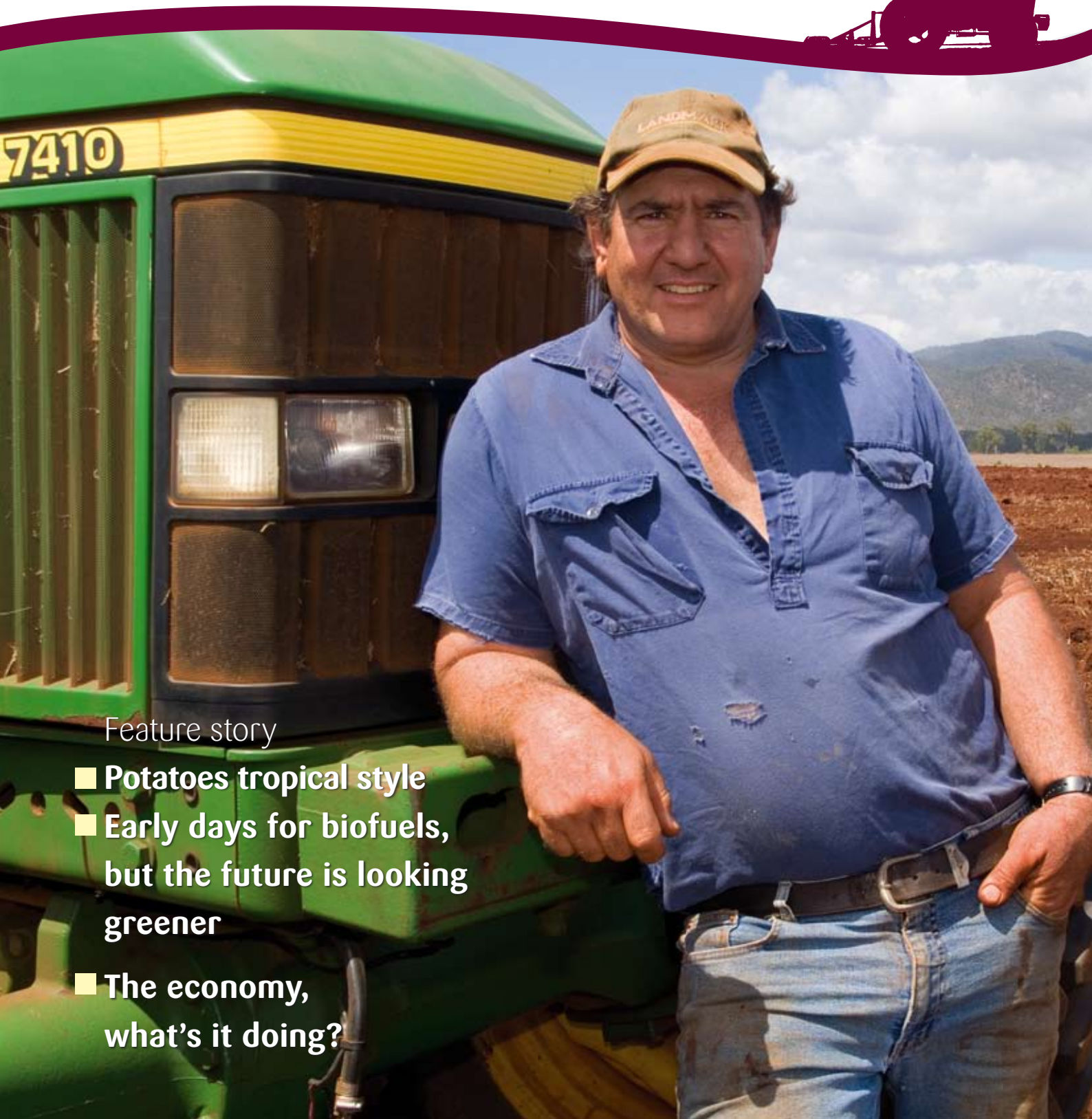


# potatoes australia

Informing and connecting  
Australia's Potato Industry  
December 2006



Feature story

- Potatoes tropical style
- Early days for biofuels,  
but the future is looking  
greener
- The economy,  
what's it doing?



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## Chairman's message

I hope you had a safe and joyous Christmas and New Year with your family as the potato industry embarks into 2007, a year which looks to have some tough times ahead with many regions struggling with drought and fire.

AUSVEG, in partnership with Potato Processing Association of Australia (PPAA), Government and industry is working hard to find ways to minimise the impact of the drought and look at long term solutions to water issues, which look to be here to stay as our climate experiences change.

The drought will also have implications for the National Potato Levy investment as money to the industry is squeezed. However, through the Fresh Potato and Processing Potato Industry Advisory Committees (IAC) this issue has been carefully considered and included in future planning considerations ensuring the research and development program continues to bring significant benefit to the industry.

AUSVEG is also changing to better fit with the needs of industry. Our AGM held in January 2007 will ensure we work with our members to reshape our organisation. An introduction to our new Board Members will be outlined in the next edition of *Potatoes Australia*.

And finally, the AUSVEG Vegetable Industry Awards are now calling for nominations. A form is included with this edition of *Potatoes Australia*. National Australia Bank (NAB) is one of the sponsors of this event and we welcome their support of our industry. Winners will be announced at the official dinner to conclude the Australian Vegetable Industry Conference in Sydney on Thursday 31 May, 2007.

There are many worthy recipients of these awards, but often people are too humble for recognition, so tap someone on the shoulder and nominate them!

Don't forget to register for the conference; it will be a fantastic event and a great opportunity to network.



**Michael Badcock**  
AUSVEG  
Chairman

## Welcome to the new... potatoes australia

After much planning and a few hiccups along the way the first bi-monthly edition of the new *Potatoes Australia* magazine has arrived.

For what has been a baptism of fire for me in taking over the role of Editor, *Potatoes Australia*, I am thrilled to have the magazine up and running. I have been fortunate enough to have a great team assisting me, including Advertising Representative, Max Hyde. Max has been so diplomatic and patient during this transition period whilst liaising with the supportive advertisers we are fortunate enough to have on board.

The contributors to the magazine have been a great help. The quality of content has been excellent, making my job so much easier.

As much as I have enjoyed editing *Potatoes Australia*, I am delighted to announce that a new Editor/Publications Officer has been appointed to the role. Simon Adams, who is experienced in publication production and editing, joins AUSVEG in early January and he will be based in the Melbourne office.

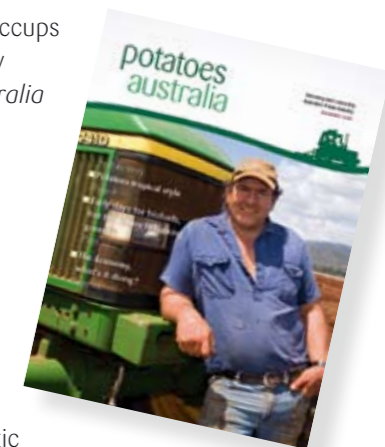
Simon has recently been working in the videoconferencing industry, a role he has combined with freelance writing and is looking forward to the challenge of editing *Potatoes Australia*. Simon also has an interest in cartooning and will no doubt bring his own style to the publication which we look forward to.

I will put my 'old hat' on again and go back to managing the publications and coordinating the potato industry communications including the strategy and direction.

We welcome your feedback on the magazine or any articles that may appear, so please direct your feedback to me at [toni.davies@ausveg.com.au](mailto:toni.davies@ausveg.com.au)



**Toni Davies**  
Editor





# Potatoes

## tropical style

For many, the Atherton Tablelands are home to World Heritage listed rainforests, national parks, mountains, rivers, lakes and waterfalls. However, the region is also rated as one of the richest agricultural plains in Australia due to the rich volcanic land at altitudes between 600 and 1000 metres.

*The Cunzolo farm with its rich volcanic soils.*

It is here, 1869 kilometres north of Brisbane, in the rich Tableland region that crops such as potatoes, peanuts, maize, sugar cane, corn, beans, strawberries, macadamia nuts and lettuce prosper. Cattle grazing and chicken rearing are also major industries.

*Potatoes Australia* asked local potato grower Fred Cunzolo to explain ....

### Who in the family works on the farm? (How many generations?)

My brother Anthony, his wife, Jackie, myself and my wife Kim, are all second generation farmers working with our parents Leo and Ada in a three way partnership.

### Where is the farm located?

At Tolga, about 100km south of Cairns on the Atherton Tablelands.

### What are the climatic conditions like? Why grow potatoes in North Queensland?

April through to July is the best time to grow potatoes as the ground temperature, 10° to 14°C, is just right and the variation in temperatures is perfect for growing most varieties of potatoes. Unlike the months of May through to September when conditions

range from 3° to 25°C with some odd rainfall and October to about January when temperatures increase from 15° to 40°C.

### When is the main growing season and how long does it last?

We plant potatoes from April through to July and harvest August through to November. This is our best window to meet a high quality standard for the markets.

### What is the annual rainfall, and what is the region's soil type?

An annual rainfall of 1400mm and the region has red volcanic soil about 30m deep.

### What varieties are grown, and are best suited to the climate?

The main variety grown on the Atherton Tablelands is Sebago which is the best all rounder potato in Australia but varieties such as Charlotte, Valor, Nickela, Spunta, Atlantic and Pontiacs also grow extremely well in this region's climate. The Atherton Tablelands are known to have the best tasting, quality potatoes in Australia due to the rich volcanic soils.

### How big is the property and do you just grow potatoes?

The property is about 320 hectares and we also grow peanuts, corn, grass seed, hay and sugar cane.

### How many tonnes of potatoes do you produce per year and for what markets?

We produce about 2500 plus tonne of potatoes per year which are sold by our local agent David Nix to packing sheds in Brisbane, Sydney, Melbourne and Canberra. The potatoes are then packed and sold onto the large retailers.

### Why have you chosen the particular markets you send to?

We've had positive feed back from our main buyer, 'Produce One', a Sydney based packing shed and some of the other packing houses we deal with. Over a period of time feedback regarding prices has caused us to change the way in which we grow our potatoes. We aim to meet the specifications that are demanded from the large retailers.

### On average, what sort of prices you're receiving, and are they covering the farm's production costs?

In 2004, we sold potatoes as low as \$150 per tonne, or 15 cents a kilogram, this is about \$3700 per hectare below the cost of production. This season, 2006, we sold potatoes for a round \$600/t, we really need to sell our produce for 45 to 50 cents per kilogram on-farm to meet the production costs and have some confidence in the industry.

### How do you manage water related issues, such as: where does your water supply come from and; how many mega litres do you use per year?

We get our water supply from the farm's five bores and a spring fed dam. The farm's potatoes require five mega litres per hectare to grow, but it varies according to the time of planting.

### What sort of irrigation methods have you adopted, and how much water is required for the volumes you produce?

The majority of our watering is done with lateral moves and hard hoses.

### How is the drought affecting the way you water and what have you done to cope with the tough dry season?

The drought is not an issue for us as we can water all of our property even in the dry years; we are fortunate that our bores have never gone dry.

### What sort of pests and diseases do you struggle with?

At this stage the biggest pests we have are rats, pigs and cockatoos which at times can be a challenge to control.

### What is the production size of the local potato industry in and around the Atherton Tablelands?

About 35,000 tonnes.

### How do you feel about the potato industry in Queensland and Australia?

If each area could stick to their own window of supply the consumer would then have the best quality potatoes available to them for 12 months of the year. That in itself, would increase consumption per capita.

### What does Australia's potato industry's future look like for you?

The brushed potatoes are gaining consumer confidence due to its tasting qualities and reliability. Our family has a very positive attitude towards the future potato industry but, in the back of our minds there is that nagging demand that we must be more efficient and reduce costs. I feel that we are currently producing a near perfect quality product for an affordable price.

### Identify four key points that you have incorporated into the farm's management to try and be more productive and profitable:

1. We have consolidated our farm to one area.
2. We have turned our watering systems into an easy and manageable configuration.
3. We do our own agronomy and rarely use foliar insecticides to grow our crops.
4. We are completely self-sufficient, not having to rely on any outside contractors.



*Above: A potato farming family of three generations (from the top left Matthew, Leopold, bottom left Leo, Ada and Fred.)*



## Using the website yet?

Remember, the new, and updated potato section of the AUSVEG website is now online and ready for you to use.

As technology progresses and more information is offered electronically AUSVEG endeavours to provide growers with relevant information so please support the service that supports you.

All projects funded by the potato levy are listed on the site under potato levy and by using the project number at the bottom of articles in *Potatoes Australia* you can find out more about projects which directly affect you.

There are links to the latest news and issues, copies of the Potato publications and all R&D information.

Registration is free, so log on now!

Free registration allows you to set up a profile. Once the online form has been completed the process will take approximately 48 hours, then the levy payer will have access to the various sections including:

- **News:** informing growers of the latest happenings in the potato industry both nationally and internationally

- **Potato Archives:** database of completed potato projects issues prior to 2005
- **Issues:** updates of key issues affecting the potato industry
- **Processing Potato R & D (PPR&D):** general information on the processing R&D projects
- **R&D Projects:** database of current potato projects
- **Downloadable Publications:** the latest Potatoes Australia publications

- **National Potato Levy:** general information on the Potato Levy
- Links to the Vegetable Industry Conference to be held in Sydney on 29 May are also included. Have a look at the program which includes a great range of speakers and information being offered to potato growers. If you are considering going to this bi-annual event you can make your booking online, just follow the prompts.

We encourage your use of this site and can assist you setting up your profile, or helping you with an overview of what resources are available. Please contact Communications Coordinator, Toni Davies on 03 9554 8098 or 0400 242 713.



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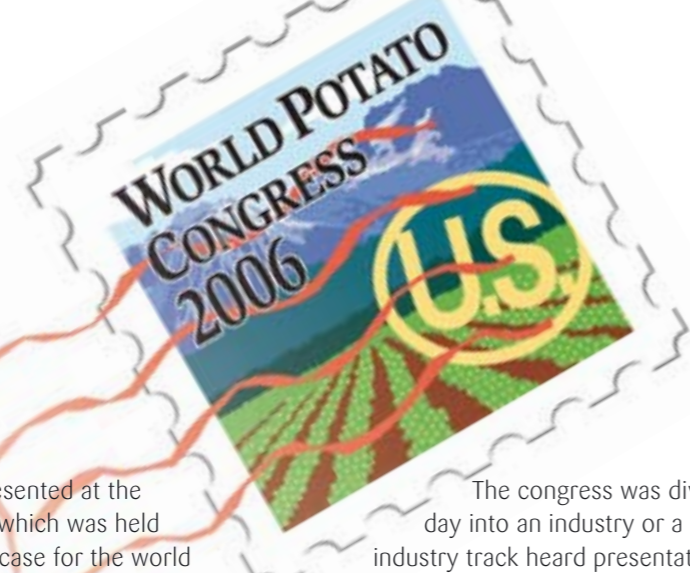


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## World Potato Congress 2006



The Australian potato industry was well represented at the World Potato Congress in Boise, Idaho, USA which was held in August. The triennial conference is a showcase for the world potato industry and attracts leading industry representatives and researchers. Forty two Australians attended the conference, making it the third largest group in attendance after the United States and Canada.

Iain Kirkwood, Project Leader of the Potato Processing Research and Development Program (PPR&D) was part of the contingent and reports back on his findings from Idaho which is a major centre for potato growing in the US and claims to be the 'home of the potato'.

The first day of the conference focused on the global outlook for the potato industry. Presentations from Dr Pamela Anderson, Director, International Potato Centre (CIP) and Jim Godfrey, Chair of the board of CIP described the production progress of potatoes in developing countries where in some cases production has tripled in the past forty years. The session detailed the research currently being undertaken by CIP aimed at alleviating poverty, malnutrition and raising living standards.

During the day presentations explored opportunities and challenges facing the industry and outlined key developments in both supply and demand and the impact the supply chain has in various potato producing regions.

Dr Patrick Moore, co founder of Greenpeace addressed environmental concerns and emphasised the importance of sustainability and consensus building. Patrick commented on the campaign he calls the environmental extremists against genetically modified organisms (GMO) which he believes is stifling efforts to improve nutrition and environmental health.

The congress was divided on the second day into an industry or a science track. The industry track heard presentations on how grower cooperatives can effectively control industry forces, considered out of the reach of growers. Changes occurring in early generation seed potato production and how nutrition trends influence the industry were also discussed.

A wide range of subjects were covered in the science track including global pest problems, disease forecasting, soil health, seed physiology for commercial advantage, storage technology, agronomic issues, variety development and the all important issue relating to the Australian industry of water and irrigation management.

The congress concluded with a farm show held on a property close to Boise where there were a variety of demonstrations including planters, harvesters, tillage equipment and crop protection systems.

The proceedings ended on a high note with an optimistic picture painted despite the recent downturn in the global potato industry. The consensus was that the industry has a bright future providing focus is placed on meeting the shifting market demands.

## PCN – outbreak

Outbreaks of PCN have again occurred, prompting a national meeting to be held to discuss the management of PCN in Australia.

Delegates from State Government, plant health and plant security agencies are scheduled to meet in Melbourne in February, 2007 to establish an action plan to address key issues faced by potato growers around Australia.

Interstate and international trade are topics on the agenda which will also examine protocol pertaining to surveillance, testing, seed production, hygiene, awareness and the regulations surrounding the infested land.

*Potatoes Australia* will be reporting outcomes and details of the meeting in the April edition but for further information please contact meeting convenor, Laura Bowles on 03 5622 3025 or [ljbowles@tpg.com.au](mailto:ljbowles@tpg.com.au)

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## Who are the high achievers driving the Australian potato industry?

**Do you know a great grower, up and coming young grower, researcher, innovator, marketer, industry leader in Australia? Nominate them for an Australian Vegetable Award...**

AUSVEG the national peak body for the vegetable industry is calling for nominations for the Vegetable Industry Awards 2007.

AUSVEG Chairman, Michael Badcock, said that the Australian Vegetable Industry Awards are an opportunity to reward your industry's champions, whether they are growers, researchers or a part of the supply-chain.

"From Cape York to Hobart, Sydney Basin to Carnarvon, our industry stretches right across Australia and the nominations are open to every grower, researcher, marketer and industry leader that has contributed to making our industry what it is today."

"The awards are about recognition, recognition for the finalists and the individuals that win the awards, and for those who have been involved in assisting those individuals achieve an outstanding level of excellence," Michael said.

Michael said the awards are open to all of industry including potatoes, vegetables and onion levy-paying growers, and

members of the greenhouse, hydroponic and organic industries are also eligible to nominate for the awards.

"There are some outstanding individuals within the wider Australian vegetable community who are contributing immensely to professionalism of our industry and growing the best vegetables in the world."

There are five awards categories which reflect all parts of the vegetable industry, from the R&D, to industry leadership and right up and down the supply-chain.

"Growers constitute a large proportion of our industry, but there are also some excellent marketers, exporters and researchers who equally play a very important role in innovating and ensuring that Australian product is the best that in can be," Michael said.

The following awards are open for nomination in 2007: NAB Grower of the Year, Young Growers of the Year, Researcher of the Year, AUSVEG Chairman's Award and Innovative Marketer Award.

For the Awards Entry Form visit [www.ausveg.com.au](http://www.ausveg.com.au) or alternatively call Brooke Summers on 02 9380 2555 for more information.



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Nominations close Friday, 23 February 2007 for more information visit [www.ausveg.com.au](http://www.ausveg.com.au)

NOMINATIONS ARE NOW OPEN FOR:

- NAB Grower of the Year Award
- Young Grower of the Year Award
- Researcher of the Year Award
- Innovative Marketing Award
- AUSVEG Chairman's Award



# Early days for biofuels, *but the future is looking greener*

**It seems that every time you read the rural press someone, somewhere is about to build another biofuel plant. But what is really happening and what do growers need to think about when contemplating biofuels? Duncan Handley explores.**

Record oil prices in mid 2006 and a heightened awareness of climate change are combining to challenge the way we think about fuel. Petrol and diesel are still the main menu items for fuelling motor vehicles and machinery, but alternatives like biofuels are now finding their way onto the list of viable alternatives.

## Biodiesel or ethanol?

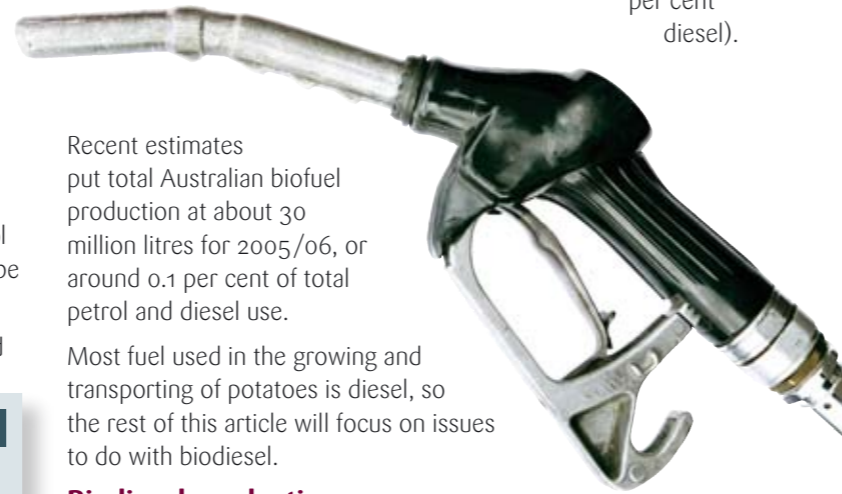
Talk biofuels in Australia and you talk ethanol or biodiesel.

Ethanol, made from 'starchy crops', can be a substitute for petrol and biodiesel made from fats and oils can, as the name implies, be a substitute for diesel.

In Australia most ethanol is made from either wheat or sugar and

most biodiesel is made from used cooking oil, animal fats (such as tallow) or oilseed (such as canola).

Ethanol and biodiesel are typically used in Australia as blends, a common blend for ethanol being E10 (10 per cent ethanol: 90 per cent petrol) and B5 or B20 for biodiesel (5 per cent biodiesel: 95 per cent diesel or 20 per cent biodiesel: 80 per cent diesel).



Recent estimates put total Australian biofuel production at about 30 million litres for 2005/06, or around 0.1 per cent of total petrol and diesel use.

Most fuel used in the growing and transporting of potatoes is diesel, so the rest of this article will focus on issues to do with biodiesel.

## Biodiesel production

At this point, Australia can produce over 350 million litres of biodiesel each year. An additional 440 million litres of production capacity is currently being built and more than 170 million litres additional capacity is being planned.

The Australian Government has a biofuel production target of 350 million litres by 2010. But Adrian Lake, President of the Biodiesel Association of Australia, points out that the 2010 target does not reflect the true potential of the Australian biofuels industry.

"Projects already committed to for biodiesel production alone [as outlined above] will give us about one billion litres of production capacity, or about 10 per cent of our diesel requirement, by 2008, two years ahead and nearly triple the government's 350 million litre target," says Lake.

Accurately predicting future biodiesel production is difficult, but the trend is definitely for significant increases. Difficulties in forecasting stem from the range of forces that impact production and uptake of the fuels for the longer term (see Box 1).

Of these limitations, Adrian Lake suggests it is the combination of a restrictive taxation system and the production limits of our current oilseed crops that will prove to have the greatest impact.

"Our tax system effectively limits blends of biodiesel to 20 per cent and the limited and unreliable production of the current oilseed crop means we need to explore different cropping alternatives," says Lake.

## Biodiesel quality

Biodiesel has some different characteristics to diesel and growers need to be aware of these and change their management practices

to maximise the potential of the fuel and their machinery.

Simon Vigour, Marketing Manager for New Holland provides a handful of practical tips to get the most from biodiesel and the machinery (see Box 2).

"One important point for growers to keep in mind that biodiesel is hydroscopic. This means it absorbs water and care needs to be taken when storing," says Vigour.

In addition, the Australian Government is developing a blend fuel quality standard. A discussion paper has recently been released and is available on [www.deh.gov.au](http://www.deh.gov.au) for those who would like to know more.

## Engine manufacturers

Many engines used in Australia have their roots in the northern hemisphere where biodiesel is more commonplace. This means the technology has been adapted for US and European fuels and conditions.

Vin Delahunty, Executive Officer of the Tractor and Machinery Association says manufacturers need to be confident their machinery will perform satisfactorily under Australian conditions using Australian fuels.

To get this confidence, they carry out tests to assess performance. Manufacturers are at different stages of this testing process, so recommendations will vary by manufacturer.

"Growers should check with engine manufacturers to confirm recommendations for the use of biodiesel," says Delahunty.

Simon Vigour of New Holland says all their vehicles are fully tested and can run in Australia without problems for blends up to B20.

"We are now taking this a step further and are doing a lot testing for the use of B100. We have had TM190 that would run for 500 hours non stop using B100 without any reduction in performance or economy," says Simon.

## The good oil

Biodiesel is making its mark in many Australian agricultural industries. Production and availability of the fuel is relatively low, but production capacity is increasing and, given the right circumstances, long-term production has the potential to increase significantly.

For growers considering biodiesel, they need to be aware of the different characteristics of the fuel and change their management practices accordingly. They should also check with their engine manufacturer to confirm the recommended blend for their machines.

The Australian biodiesel industry has no illusions about taking over the traditional diesel market - there are just not enough raw materials. However, the industry does see it has a part to play in providing a sustainable alternative and is busy building an industry that will do just that.



*Above: Rob Henry of Macquarie Oils, in Cressy Tasmania*

## Potato grower has the good oil

One potato grower venturing into biodiesel production is Rob Henry of the Macquarie Oil Company located south of Cressy in the Northern Midlands of Tasmania.

Rob says he entered biodiesel production by chance.

"We originally bought a press to crush canola seed for livestock. We now see an opportunity to produce biodiesel and are planning to have a continual-flow biodiesel plant up and running by late 2007," Rob says.

With the plant located in an agricultural centre, Rob expects a large proportion of his fuel will be used on local farms in tractors, trucks, farm vehicles and irrigation pumps. He says he plans to produce a 100 per cent blend of bio diesel and will sell direct to local businesses.

"We think biodiesel will be a popular choice for farmers in our area," says Rob, "not only will buying our oil be good for the local community, the excise available to farmers makes it a good economic decision for them as well."

Rob is aware of the importance of quality when it comes to biodiesel and says his plant will produce fuel to Australian standards. He is also aware of the importance of oil and grain prices to make a competitive product.

"The drought has pushed up the price of seed this year, which means we produce less," says Rob, "but with the end of the drought and a return to lower prices, we expect to be able to increase our production significantly."

### Box 1

#### Factors influencing biofuel production and uptake

##### include:

##### Economic

- International fossil fuel prices
- The value of the Australian dollar

##### Environmental

- Availability of source crops, e.g. wheat, sugar and canola
- Breeding of alternative crops, e.g. mustard seed

##### Political

- Tax and excise structures for biofuels
- Government support in manufacturing

##### Technical

- Ability to use alternative raw material sources
- Quality control and labelling

##### Social

- Acceptance of biofuels as a practical alternative
- Adequate distribution/availability of biofuels

### Box 2

#### Tips for using biodiesel:

1. Check the water separator daily
2. Change oil and filters as recommended
3. Fill fuel storages to brim to minimise available moisture in tanks
4. Before storing machinery, flush through with 100 per cent diesel



## Vegetable growers stand by the Horticulture Code of Conduct

AUSVEG, the peak industry body for vegetable growers in Australia is concerned that some growers are being intimidated by a number of wholesalers that think the new Mandatory Horticultural Code of Conduct is an unnecessary administrative burden.

Michael Badcock, AUSVEG Chairman, said that emotive letters sent to growers from wholesalers have been misleading and opportunistic during times when many growers are vulnerable as a result of the worsening water situation.

“We need to work together as an industry to resolve concerns and issues surrounding the code, not use underhanded tactics to force an outcome,” Michael said.

An enforceable Horticultural Code of Conduct will give growers the ability to trade in a fair and open market. The code will provide transparency and clarity in defining the rights and responsibilities of the participants in the horticulture industry and will include a robust disputes resolution with minimum red tape.

“These letters and other similar issues are why we need the mandatory horticulture code of conduct. Vegetable growers must not feel they are

being forced to sign contracts under any circumstance and if they do we encourage them to contact AUSVEG, the Australian Competition and Consumer Commission (ACCC) or their local state growing organisations immediately as this behaviour will not be tolerated.

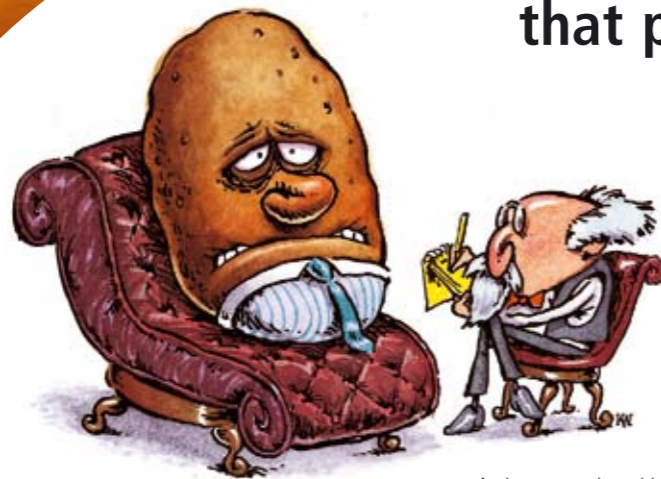
“I would also like to thank Peter McGauran, Federal Minister for Agriculture for supporting growers through the implementation of the code. AUSVEG looks forward to working with wholesalers to ensure the obligations of the code are understood by all and there is a positive outcome for the vegetable industry,” Michael said.

The ACCC has been alerted to the unfair practices used on growers and are encouraging threatened growers to provide information.

“If this behaviour is detected, wholesalers may risk contravening the unconscionable conduct provisions of the *Trade Practices Act*,” Michael said.

If any growers feel they have been subject to improper conduct they should conduct the ACCC immediately on 1300 303 502 and AUSVEG on (03) 9544 8098. Your enquiry will be treated in the strictest confidence.

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## Rhizoctonia and how Phd research is helping

MEET Cathy Todd, a second year PhD student at the University of South Australia's Waite Campus with a passion to make a difference to the potato industry through significant research into the control of *Rhizoctonia* disease – one the of the industry's most significant ailments.

*Rhizoctonia* has the potential to affect the processing industry due to the formation of sclerotia on tubers, malformation and root and stem damage that causes yield loss. In South Australia, some work has already been done on the *Rhizoctonia* sub-specific groups affecting the fresh potato industry. A significant amount of research has been directed at *Rhizoctonia* diseases in cereals within Australia.

In the past year, however, Cathy has made significant inroads identifying three of the 14 known *Rhizoctonia* sub-specific groups on the stems, roots, tubers of stolons of potatoes

The identification has been made possible though the aid of DNA-based technologies that are being developed as detection tools to determine which *Rhizoctonia* sub-specific groups are present within field soils. It has been noted that not all the *Rhizoctonia* sub-specific groups cause disease problems. To date, groups 2,3,4,5,8 and 9 have been found to cause a range of disease symptoms.

Cathy's aim is to minimise the disease's impact on yield and potato malformation and, through identifying the different *Rhizoctonia* sub-specific groups, eventually isolate which groups cause the most debilitating problems.

Current methods of *Rhizoctonia* control are crop rotation, fertilisation and fungicide application, which are generally effective at minimising black scurf but there is scope for reducing other *Rhizoctonia* disease symptoms.

Cathy's research is looking at two different types of controls: Fungicides: The aim is to determine the most effective fungicide. Cathy said, already, positive laboratory results had found that different sub-specific groups showed variable sensitivity to commonly used fungicides. These results will be presented at next year's Australasian Plant Pathology Society (APPS) conference and the National Potato Conference. However, Cathy stressed that fungicides were not necessarily the most effective form of control as they could have environmental implications.

Micronutrient Fertilisations: This is new work being explored by Cathy and other scientists at the Waite Campus. The work involves adding specific micronutrients to see if they aid in the tolerance to *Rhizoctonia* diseases. The provision of adequate micronutrients potentially enhances the natural defence mechanisms of the plant.

Cathy's research is part of the \$14 million Processing Potato Research and Development Program (PPR&D) which was launched last year. The five-year program is a boost to the Australian processing potato industry, given recent uncertainty and strong international competition for local markets.

Her research is using the PPR&D field plots throughout Victoria, South Australia and Tasmania.

Cathy believes growers will benefit from the PPR&D program that could eventually lead to controls and predictive tests for diseases such as common scab, powdery scab, *Rhizoctonia* and tomato spotted wilt virus.

“These diseases represent a significant production challenge to the industry in terms of damage and losses. Better management of diseases will lift processing yields and reduce costly wastage to improve industry competitiveness in the global market,” she said.

Cathy added that *Rhizoctonia* is an extremely interesting fungus as it was identified more than 100 years ago but still very little was known about its disease-causing capabilities.

“We can't pinpoint why it attacks the host (potatoes), what we do know is that it exists in many different sub-specific groups,” she said.

“The work is extremely exciting and so much more needs to be done to combat all the different types of potato issues, such as diseases.

“I hope the industry will have as much funds fuelled into its research and development as say the rice and viticultural industry have – it is vital for the industry's productive future.”

The PPR&D program is jointly funded by the Australian Government through Horticulture Australia Limited and Australian potato growers and processors, with major contributions from the Tasmanian Institute of Agricultural Research, South Australian Research and Development Institute, Victorian Department of Primary Industries, New Zealand Crop and Food Research Institute and Agriculture & Agrifood Canada.



Above: Cathy Todd in the shadehouse where the pathogenicity (disease) trials are run in pots (none are actually there but set up like the cherries behind) with a healthy (control) plant being discarded in the crate after scoring disease.



# CEO's message

**The term 'strategic planning' does not conjure up excitement for many people, however, good planning is a necessity for a business is to run smoothly and investments are to be made wisely.**

The potato industry has quickly followed the precedent set by the overarching vegetable industry strategic plan, VegVision 2020 launched by The Minister for Agriculture, the Honourable Peter McGauran in September 2006 with its own long term plans for the future.

In December, the fresh and processed potato industries released their strategic plans which found that the top priorities for the industry are improving; consumer demand, industry competitiveness, communication and leadership. Both these strategy documents can be found on [www.ausveg.com.au](http://www.ausveg.com.au). They are well worth the read and will guide the National Potato Levy investment and work undertaken by AUSVEG.

Potato Cyst Nematode (PCN) is a serious issue that continues to plague the potato industry, especially in relation to interstate and international trading. AUSVEG is working closely with state potato growing representatives to resolve some of the concerns. In early February, the Victorian Potato Growers Council will be convening a National meeting on behalf of AUSVEG with key industry stakeholders to discuss items such as trade, a National agreed surveillance and testing protocol, regulations on seed, on farm hygiene protocols, and monitoring of infested areas. More information will be available in the next edition of Potatoes Australia, visit [www.ausveg.com.au](http://www.ausveg.com.au) or contact Laura Bowles at the Victorian Potato Growers Council on (03) 5622 3025.

Tony Slater, Department Primary Industries, Victoria has been working tirelessly over the last few months in exploring the viability of the potato breeding program and working with stakeholders to determine its future. The outcome of this is expected to be known in early February and a complete report will be available in the April edition of Potatoes Australia.

The Seed Potato Advisory Group (SPAG) had their annual meeting in South Australia in late November to discuss and implement the seed certification process for potatoes in Australia.

In other news, the discussion paper on the Security Sensitive Chemicals was released by Minister McGauran for consultation. AUSVEG will work with members throughout January and February to develop a response which is due on 1 March 2007.

The draft regulations for the Horticultural Code of Conduct will be presented to Federal Parliament in early February. Full implementation of the code commences in May 2007 including an extensive educational session.

The National Australia Bank (NAB) is sponsoring the AUSVEG Vegetable Grower of the Year Awards. Nominations for these awards opened in late December, so please nominate yourself or encourage someone else to do so.

Winners will be announced at the 2007 Australian Vegetable Industry Conference in Sydney which will be held at the Sydney Exhibition and Convention Centre, Darling Harbour. Registrations for the conference are open now and it certainly is the 'Vegetable Event' not to be missed.

AUSVEG member and grower meetings have been held across Australia to discuss the new AUSVEG constitution. The meetings have generated lively debate and helped broaden growers understanding of the new constitution and highlighted some differences between the various State members. There have been some excellent points raised and various options on moving ahead put forward. This direct input from industry has been critical in shaping the constitution for a robust National industry organisation. This consultation will continue as our organisation shapes itself for the future.

I hope you all had a Merry Christmas and New Year, despite the drought and the significant hardship it has bought to many families.

I also wish to thank my staff for their tremendous effort throughout 2006. Well done!



**John Roach**  
AUSVEG  
CEO



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# Strategic planning

**The Australian vegetable industry and the Department of Agriculture Fisheries and Forestry's (DAFF) have been involved in an extensive program over the past eighteen months to form an Industry Partnership Program (IPP).**

This program has generated three key documents important to the future direction of the Australian vegetable industry, Taking Stock, Setting Directions which can be accessed at [www.ausveg.com.au](http://www.ausveg.com.au) and the latest Strategic Plan which can be found on the Australian Vegetable Industry Development Group website at [www.avidgroup.net.au](http://www.avidgroup.net.au).

Completion of the overarching strategic plan for the entire vegetable industry has seen both the fresh and processed sectors of the potato industry review their own strategic plans and direction.

The review process commenced in August 2006 with extensive industry consultation

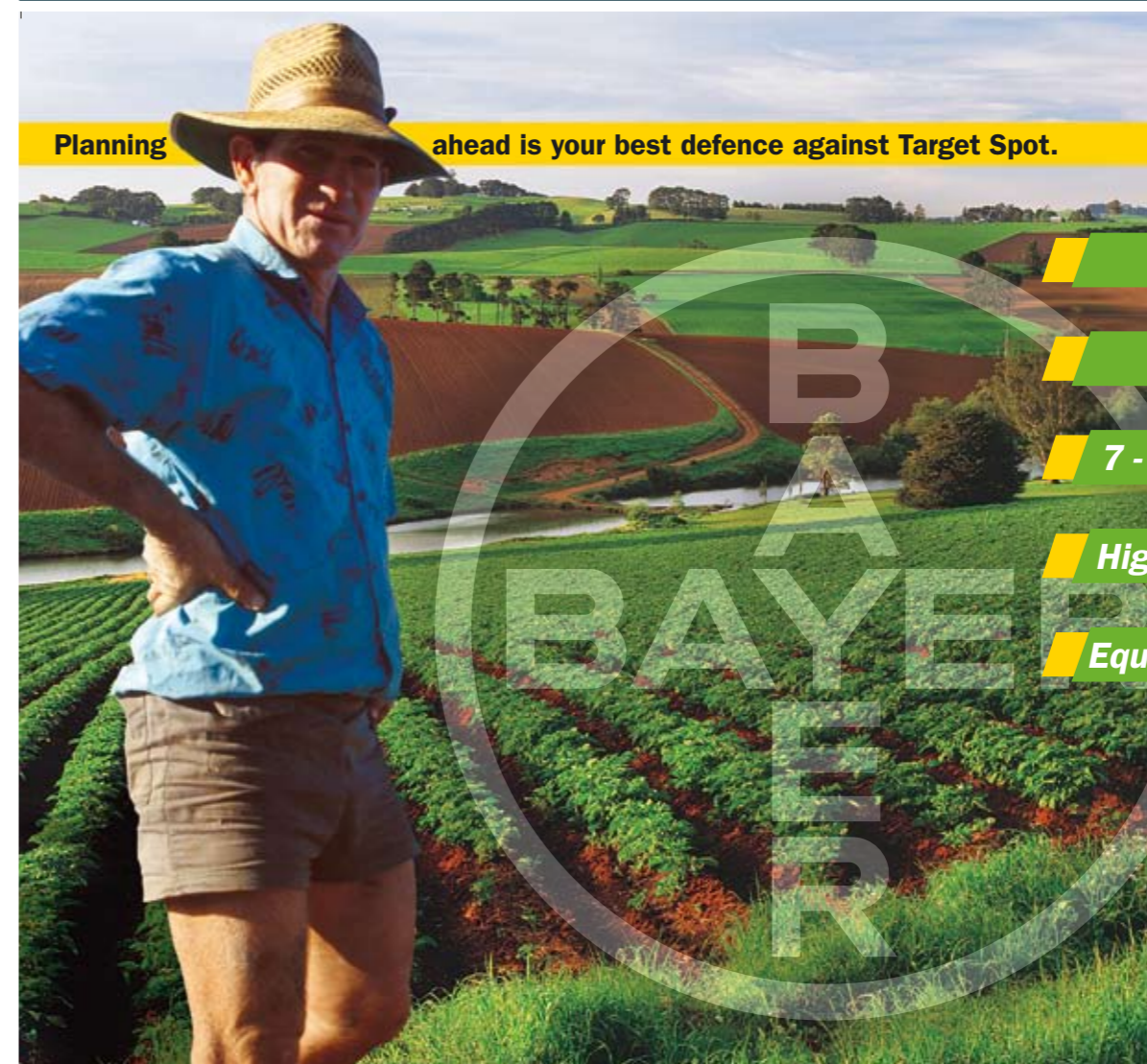


which included representatives from all sectors of the supply chain meeting to participate in a series of planning workshops. The strategic plans no become the framework for the industries to base their investment decisions upon until 2010.

The strategic plans for the respective industries are now available to access on the AUSVEG website at [www.ausveg.com.au](http://www.ausveg.com.au)



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**The Australian economy is providing mixed signals about the health of the economy. In this article, Ian James, AUSVEG Economist provides some insight into the state of the economy and where it is heading.**

**Economic growth in 2006**

Economic data provided confusing signals on the health of the Australian economy as 2006 closed. Official figures on economic growth showed that the economy slowed sharply throughout 2006; however, other economic indicators told a different story as business reported buoyant conditions.

Business credit growth was strong, stocks were being run down and business continued to invest and employ additional workers, a sure sign that demand was strong. So what explains this paradox? Slowing in the early months of 2006 reflected not so much weak demand, but capacity constraints, but the story was less clear towards the end of the year.

Employment remained strong, investment slowed significantly as much of the investment associated with the commodities boom had been put in place. Mixed economic signals like this often occur when the economic cycle is turning.

Economists regard employment as a 'lagging indicator' as it reflects economic conditions in earlier times, for example there is a time lapse between the decision to take on more labor and the actual placement of workers in jobs. In all probability, the official growth figure for 2006 underestimated the strength of the economy but portends to some easing of the strong economic growth apparent at the beginning of the year.

**Consumers**

Consumers were buffeted by variations in the price of petrol and rising interest rates. However, in general, consumption spending remained strong throughout 2006 and retail trade was buoyant. Whilst wages remained in check (with the exception of Senior Executives) consumer expenditure was supported by tax cuts and increased family allowances after July 1.

The strong employment market assisted in providing consumers with a sense of security, enabling easy access to credit, particularly against equity in the family home and supported spending. Confidence was also bolstered by a strong share market and indications that the feared collapse in property prices was not occurring.

**Variation in state performance**

A feature of the economy was a lack of uniformity in economic conditions across the nation. Riding on the back of a boom in commodities, Western Australia and to a lesser extent, Queensland outperformed. Labor was in short supply in Western Australia, and unemployment at record lows saw Perth house prices accelerate rapidly. Conditions however were weak in New South Wales and Tasmania, and to a lesser extent in Victoria and

South Australia where the high value of the Australian dollar was hurting manufacturing.

**International performance**

The Australian economy gained support from the international economy as world economic growth remained strong. As the year progressed, an economic recovery in Japan and Europe offset some weakening of the US economy.

Demand from Asia, particularly China, remained strong for Australian mineral exports and prices of key exports rose providing a significant boost to incomes in Australia. Nonetheless, the export performance could have been better. Much of Australia's infrastructure was caught short by the surge in demand for commodities from 2004, and we were still playing catch up in the first half of 2006.

In the meantime, import growth remained strong reflecting both the buoyant domestic economy and the high level of machinery imports required to further develop resource projects.

**Australian dollar**

The Australian dollar remained high despite imports exceeding exports every month of the year with Australia's foreign debt rising to a record \$552 billion.

Overseas investors continued to provide funding for the profligacy of Australians hell-bent on spending, rather than saving. The lack of domestic savings by consumers meant that the capital necessary to finance the development of new mineral and infrastructure projects was sought from overseas. Foreign investors had confidence that the commodities boom would continue, and Australian interest rates remained attractive especially to Japanese investors.

The high value of the Australian dollar not only hurt returns to exporters, but had a big impact on import competing producers with domestic manufacturing remaining weak.

**The outlook for 2007**

The investment boom associated with the development of new and expanded mineral projects will have largely passed as 2007 commences. The main economic feature in the early months of 2007 will be the impact of the drought and what the affect through the economy will be. Already the signs are ominous. The Australian Bureau of Statistics is suggesting that it will directly knock a sizable 0.5 off Australia's economic growth over the financial year 2006/07. This doesn't allow for the downstream impact on agricultural dependent industries.

Agricultural incomes are forecast to fall over 72% and will impact severely on consumer spending in rural and regional Australia. As the drought wreaks havoc, the commodity boom flattens and in the absence of stimulus from the government, the Australian economy will become more dependent on the maintenance of healthy consumer spending and robust demand for Australian commodities in overseas markets.

**So what are the prospects of these occurring, and what are the potential dislocating issues?**

**Consumer spending**

Consumers remain heavily indebted, but there is little sign that their new found love affair with debt has ended. Economists worry endlessly about the recent build up in debt and the spending of the kids' inheritance. Some households are setting themselves up for a huge crunch if economic conditions turn for the worse and unemployment rises.

However, all the testing of worst case scenarios amongst the major financial institutions suggests that there is no systemic risk to the economy. If a crunch is to come, it is more likely to fall on over committed individual households rather than companies and the financial institutions as was the case in 1990.

**Petrol prices**

Petrol prices have the potential to impact. The petrol price is a twofold story - strong demand, and little growth in supply primarily due to lack of investment in the industry over the last decade. The year 2006 saw a sharp hike in prices which temporarily flattened demand which alone was unlikely to bring consumer spending to heel.

The more detrimental impact on the economy is likely to be the increasing costs to business and the danger this poses for the passing on of increased costs in the form of higher prices (inflation). Petrol prices are likely to remain flat or drift down in 2007, but of course an implosion in the Middle East could see them sky rocket destabilizing world economies.

**Interest rate rises**

Economists remain divided on the direction interest rates will take. As mentioned the economy appears to be slowing, and this teamed with the impact of the drought will certainly take effect.

The Reserve Bank is unlikely to be moved by sectional interests or the economic growth story as it will be clearly focused on inflation. Inflation remains above the Reserve Bank's target rate, bringing it tantalizingly close to the upper level of inflation the Bank will tolerate.

The drought may well make inflation worse as the prices of agricultural products rise. An early autumn break would also see livestock prices increase as farmers restock. In addition, there is some credence in the argument that the recent resurgence in agricultural prices may not be a temporary phenomenon. As standards of living improve and more agricultural land is alienated in Asia, particularly China, world demand for food may well increase, hence, a fall in food prices is unlikely.

In a nutshell, there is little to suggest the Reserve Bank will be rushing to cut interest rates. The domestic situation suggests more of the same in 2007 as far as official economic growth is concerned,

but with other economic indicators more adequately reflecting this growth story the economy will feel like it is slowing.

**Collapse of US dollar**

The general consensus amongst economists is that world economic growth is likely to remain strong with China, India and other Asian countries underpinning growth. This will be offset by some weakening in the US economy providing some comfort for Australia, yet the question throughout world markets remains, of what the fate of the US Dollar is?

For years the US has run large trade deficits. These deficits have been instrumental in underpinning growth in the emerging economies, such as China, as these countries have run up large trade surpluses with the US.

So why hasn't the US dollar collapsed? Simply because Asian nations have sent their excess savings back into the US, to finance the excessive expenditure of American consumers, which is a similar story here in Australia. This is a vicious cycle for Asian nations as the US dollar denomination assets grow compounding the increasing risk of exposure to the US dollar.

Signs show that Asia's central banks are becoming wary of the potential for catastrophic losses should confidence fall and the US dollar collapse. Indications are that they are likely to scale back their investments in the US. It is in everybody's interest that this occurs in an orderly manner implying a slow depreciation of the US dollar.

A disorderly collapse of the US dollar would dislocate global markets, harm world economic growth and undermine the commodities boom that has underpinned Australia's economy in recent times.

**Bottom line:**

Australia has enjoyed unprecedented economic prosperity in recent times underpinned by a commodities boom and strong consumer expenditure. There are signs that the boom may be passing. However, unlike in other post boom periods there is nothing to suggest a collapse is eminent but risks remain.

The sun is still shining, but take an umbrella in case it rains.



Informing and connecting Australia's Potato Industry



## VegVision update

Increasing exports of Australian vegetables will play a key role in achieving VegVision 2020, the industry wide strategic plan which has set the target of doubling the value of fresh, processed and packaged vegetables by 2020.

On November 22 in Melbourne, the Australian Vegetable Industry Development Group (AVIDG) convened a meeting of several leading Australian vegetable exporters.

The exporters included Nigel Carey (Webster Fresh), Dene Lampard (Center West Exports), Phil Jauncey (Matilda Fresh), David De Paoli (Austchilli), Nick Tana (Sumich Group), Sean Limbrey (Momack) and Neil Armstrong (Harvest Moon). AVIDG Chairman Richard Bovill, AVIDG project manager Brian Ramsay and Simon Drum, HAL Vegetable Industry Services Manager also attended the meeting.

The purpose of the gathering was to discuss the obstacles and opportunities in growing Australian Vegetable exports.

Nigel Carey from Webster Fresh says he was encouraged by the gathering and the tone of the discussion. "It was great to sit in the room with some of the other major Australian vegetable exporters. The discussion revealed there is an acceptance that the whole industry will benefit if we can work together more closely and share our ideas and experiences. A positive, co-ordinated export initiative as part of VegVision 2020 will benefit the industry," he said.



Members of the AVIDG meeting in Melbourne

"We'll all be well served if the VegVision 2020 process can provide us with more accurate information to base some of our business decisions. Everyone working in export wants to grow and wants to be viable. There is some real upside in us working together and I know that I speak on behalf of Webster Fresh when I say that we will be making a positive contribution to this initiative".

David De Paoli of Austchilli said he believed targeting premium markets and moving quickly will create opportunity for Australian exporters.

"The production and manufacturing cost for Australian companies to get to international markets is something that has to be addressed as a priority. At this point in time we are up against low cost competitors. But, if we identify affluent markets, understand what the customers are looking for, meet that need and move quickly, then we're a good chance of succeeding. I'm very optimistic," David said.

Mr De Paoli was also encouraged by the day's discussion and the promise of greater collaboration amongst exporters to identify solutions to current issues.

"I've been around this industry for 30 years and I've never been in the same room as some of the other major export players; I've never even met some of them before. It was great for us to meet and talk about our common issues and get to know one another a little better. It's the start of an informal exporting network, which has got to be a good thing for Australian vegetable exports".

One of the decisions taken by the exporting forum was to recommend an assessment of the potential of China as a market and as a competitor.

AVIDG Chairman, Richard Bovill says the "China project" will help the industry gain a better understanding of the potential export opportunities that may be available and the competitive threats that China is expected to present to the Australian vegetable industry in both our domestic and export markets.

It was unanimous amongst the forum they'd like to know more about exporting vegetables to China. The purpose of the AVIDG is to fund projects that will help us achieve our aim of doubling the 2006 production of fresh, processed and packaged vegetables by 2020. China is obviously a huge and growing market and this project will give us hard information to better inform the decisions our exporters make as they attempt to break into that market".

For more information about the work of the AVIDG and VegVision 2020, please visit [HYPERLINK "http://www.avidgroup.net.au"](http://www.avidgroup.net.au) www.avidgroup.net.au. We encourage everyone with an interest in the future of the Australian vegetable industry to register for updates from the AVIDG.

## If you want to understand China's economy, think of it as a potato



Financial data spun out by Beijing is often prone to official censorship. Potatoes, a humble crop that has been a low-cost dietary staple in much of the West, is one of the more illustrative and reliable barometers for the state of the Chinese economy.

Rice and wheat are considered strategically important foodstuffs by Beijing, which can set prices and production, potatoes are not. Increasingly, they're consumed as convenience food, allowing their growth trajectory to mirror the population's income growth, as well as the expansion of the national economy.

"Potatoes are now considered as a high-valued crop and a vegetable in China. Demand for potatoes has been growing when other bulk commodities, such as rice and wheat, have seen demand declining," said Jikun Huang, a professor at the Centre for Chinese Agricultural Policy under the Chinese Academy of Sciences.

Consumption has gone up by more than 40 per cent over the past five years, compared with a 2.45 per cent global rate during the same period. Domestic production has kept pace, making China the world's largest potato grower and largest consumer by volume.

French fries are one of the major reasons. China now eats more than 90,000 tonne of frozen fries each year, 70 per cent of them imported. According to a recent Rabobank report, China is expected to consume 20 per cent more potatoes over the next five years, a reflection of the growth of the fast-food restaurants.

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## Revolutionary – fast, fat free fries!



A new method of fast cooking fries has been developed and patented by Sydney Engineer, Jim Maguire without using oil or fat. Jim calls it the 'Hot Gas Oven'.

Jim's project has been in the pipeline for many years, and his perseverance is now coming to fruition as the patent has been approved in the United Kingdom and is about to be granted in the United States and Australia.

If marketed successfully, the hot gas oven has the potential to revolutionise the processed potato industry and have a major impact on consumer's dietary intake.

"I've achieved this no fat, no oil cooking procedure using oxygen free gases at very high temperature and pressure in specifically designed ovens. The ovens cook the fries in around 3 minutes, which is essential for fast food outlets," Jim said.

The cooked potatoes emerge from the hot gas oven needing flavouring and colouring which enables the commercial operation cooking them to add their own range of flavours and sauces.

Jim said "when cooking fries by this method there is no oil seal around the hot potato leading to a faster loss of moisture than oil cooked fries. This loss of moisture can lead to the crisp outer layer becoming soggy; therefore it is recommended that consumption occurs as soon as possible".

Estimations of pricing for the ovens are difficult to predict, however Jim anticipates the ovens will come in at under \$5000 for a four oven cooker. At this stage of the process Jim is concentrating on getting prototypes operating to enable the first mass of taste tests. "Obviously establishing anything for the first time is expensive, but once we are through this process the ovens will be able to go into full production." Jim said.

With the patent about to be granted Jim is now seeking interested parties to assist him with the production of the revolutionary ovens so fast fat free fries are available to the general public possibly on an international scale.

Jim Maguire can be contacted via email at odillo88@hotmail.com



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## Chips a look at what's new in potato information and technology



### Section One: RESEARCH SUMMARIES

#### CROP MANAGEMENT AND AGRONOMY

**0631-025 Dakota rose: A bright red tablestock potato cultivar that retains its skin color in storage.** Released in North Dakota, the new medium-maturing cultivar Dakota Rose is red-skinned but white-fleshed and the tubers have very smooth skin with an oblong shape. Yields are equivalent, or superior, to Red Norland, with a high percentage of U.S. No. 1 tubers and few oversized tubers. Dakota Rose gives standard tablestock cultivar scores for baked, boiled and microwaved potatoes but early season nitrogen applications and chemical vinekill 3 weeks prior to harvest are needed to ensure adequate skin set. *American Journal of Potato Research* (2006) 83: 317- 323.

**0631-010 Enhancing tuber calcium concentration may reduce incidence of blackspot bruise injury in potatoes.** This series of trials in Wisconsin, USA, applied a water-soluble calcium/nitrogen blend to five cultivars (Russet Burbank, Atlantic, Snowden, Superior and Dark Red Norland) over three seasons (1999-2001). Tubers were allowed to be bruised during normal machine harvest and over 100 tubers from each replicate were examined for the incidences of bruise and internal brown spot. Tuber tissue calcium concentration increased with in-season calcium application. Atlantic and Snowden had the lowest calcium concentration, while Superior and Dark Red Norland had the highest calcium concentration and a low incidence of bruise. Blackspot bruise incidence was reduced with calcium application in Atlantic, Burbank and Snowden. Blackspot bruise and internal brown spot were also significantly related. *Hortscience* (2006) 41: 1213-1221.

**0631-011 Effect of soil salinity on internal browning of potato tuber tissue in two soil types.** Increasing levels of NaCl were applied to potatoes cv. Atlantic growing in pots. The increased salinity was associated with an increase in browning of tuber tissue, and greater proline and chlorogenic acid contents in the tubers. In addition there was a reduction in yield per plant and average tuber weight but an increase in tuber number with the increased NaCl. The trial was repeated the following year, using soil with a much higher organic matter content. This led to greater sodium and chloride ion concentrations at equivalent application rates and the effects on potato tubers were more severe. *American Journal of Potato Research* (2006) 83: 223-232.

**0631-009 Influence of non-woven fleece on the yield formation of early potatoes.** In this study, carried out in the Czech Republic during 1999-2003, a white nonwoven polypropylene fleece was applied as a ground cover after potato tubers had been planted. The covering increased the air temperature in the ground layer by 2°C and the temperature at 100 mm soil depth by 1.8°C. Mean marketable potato tuber yields and tuber dry matter content were increased by the fleece in both cultivars tested, Adora and Impala. *Plant, Soil and Environment* (2006) 52: 289-294.

#### FEATURE – MOLECULAR BIOTECH AND POTATOES

Molecular techniques will have a big impact on potato production systems in the future, e.g. new techniques have the potential to reduce the ca 64,000 tonnes of pesticides that are sprayed on to potato fields each year. Five scientific papers describing these techniques are reviewed here. Not all molecular techniques involve transgenic approaches. The first paper (0631-021) describes how "functional genomics" will be used to understand the genes responsible for disease resistance and tuber quality traits. Once desirable genes have been identified, genomics can be used to locate the genes in a wide range of potato varieties and introduce them to other varieties using classical breeding techniques.

Expanding the functionality of potatoes by modifying them to produce therapeutic or industrial compounds is discussed in the second paper (0631-017). Advances in the fields of structural and functional potato genomics and integrating genes of interest into the potato genome are discussed.

Researchers from Lincoln, New Zealand, have shown that it is possible to express a toxin in potato leaves that is active against potato tuber moth (*Phthorimaea operculella*), but the toxin is not produced in the tubers of potatoes (0631-015). The toxin gene was controlled by a promoter that was induced by light hence the toxin was at very low or nil levels in the tuber growing underground. Two forms of the toxin, cryAc9 and cryAa2, can be expressed in a potato plant. This may help provide more durable resistance to potato tuber moth (0631-016).

The fifth paper (0631-006) analyses the costs and benefits of the introduction and uptake of five hypothetical genetically modified (GM) crops in Ireland. At present there are no GM crops cultivated in Ireland. The research showed that the economic returns varied substantially between crops and the genetic traits introduced. However, when disease pressure and/or weed concentration was high, it was predicted that certain GM crops would be more profitable.

**0631-021 Finding the perfect potato: using functional genomics to improve disease resistance and tuber quality traits.** *Canadian Journal of Plant Pathology- Revue Canadienne De Phytopathologie* (2006) 28: S247-S255.

**0631-017 Potato in the age of biotechnology.** *Trends in Plant Science* (2006) 11: 254-260.

**0631-015 Expression of cry1Ac9 and cry9Aa2 genes under a potato light-inducible Lhc3 promoter in transgenic potatoes for tuber moth resistance.** *Euphytica* (2006) 147: 297-309.

**0631-016 Evaluation of transgenic approaches for controlling tuber moth in potatoes.** *Communications in Agricultural and Applied Biological Sciences* (2005) 70: 641-650.

**0631-006 An economic cost benefit analysis of GM crop cultivation: an Irish case study.** *AgBioForum* (2004) 7: 149-157.



**0631-003 Freezing behavior of potato (*Solanum tuberosum*) tubers in soil.** Because volunteer potatoes can be a major problem in subsequent crops, this laboratory and field study was initiated to examine the cold temperatures required to kill potato tubers in soil. Potato tubers were cooled to -3 to -7°C in air-dry soil columns, after which they exhibited a distinct “exotherm” and stabilised at -1.4 to -1.5°C (effectively their freezing point). Tubers cooled but removed before the exotherm were able to sprout and did not appear to be injured by freezing, while tubers that experienced the exotherm were unable to sprout. Tubers exposed to freezing point but not undergoing an exotherm had various degrees of injury, which increased with length of exposure up to 24 hours. In field trials in the Columbia Basin of Washington, tubers buried at 5 cm depth were more likely to experience lethal cold temperatures than tubers buried deeper. Monitoring soil temperatures could be used to predict the severity of volunteer potato infestations in the following season. *American Journal of Potato Research* (2006) 83: 305-315.

## PESTS AND DISEASES

**0631-020 The host range of *Spongospora subterranea* f. sp. *subterranea* in the United States.** The research described in this paper examined the host range of *Spongospora subterranea* f. sp. *subterranea*, causal agent of potato powdery scab disease, on crops and weeds in the north-eastern United States. Seedlings of selected plants were grown in nutrient solutions and inoculated with *Spongospora subterranea* spore balls. Fourteen days later the roots were microscopically examined for the presence of the pathogen and then the plants were transferred to a greenhouse and grown in a soil-less mix for 4 months. Of the 26 species tested, 16 were found to be susceptible, with 12 species being newly recorded hosts. Galls were found on six species and spore balls on three species. This is the first evidence that this can occur on species outside the potato (*Solanaceae*) family and has important implications for control of the disease. *American Journal of Potato Research* (2006) 83: 343-347.

**0631-004 Effect of foliar applied plant elicitors on microbial and nematode populations in the root zone of potato.** The process where a plant successfully resists a pathogen and then becomes highly resistant to other infections of the same or a range of other pathogens is known as systemic acquired resistance (SAR). In general, research on the compounds that induce SAR has focused on plant leaves and little is known about what happens to plant roots and soil micro-organisms. In this study, conducted in Washington State University, USA, two SAR-inducing compounds (benzo (1,2,3) thiadiazole-7-carbothioic acid S-methyl ester (BTH) or the microbial protein harpin) were applied to potatoes in various combinations, timings and rates. Over 2 years, no effects were seen on soil microbial biomass, culturable bacteria, *Pseudomonas* populations or N-mineralisation potential. However, BTH and harpin both reduced the numbers of lesion nematodes (*Pratylenchus* spp.) and BTH reduced root knot nematodes (*Meloidogyne chitwoodi*) by potato harvest. Other non-pathogenic nematode populations increased in BTH and harpin-treated plots. While potato yields were not affected by BTH or harpin, the number of culled potatoes was reduced by 26% compared to the control. It is not known whether any effects of the plant elicitors on soil biological properties are direct or indirectly via changes in plant properties. *Communications in Soil Science and Plant Analysis* (2006) 37: 1747-1759.

**0631-005 The occurrence of PVYO, PVYN, and PVYN:O strains of Potato virus Y in certified potato seed lot trials in Washington and Oregon.** This paper describes trials involving over 1200 potato seed lines from across North America. These were planted in Washington and Oregon during 2001-2003 and tested for strains of potato virus Y (PVY). Incidence ranged from 16-26%, with a trend of increasing PVYO, PVYN:O, and PVYN strains during the trial period. PVYO only causes yield reduction but PVYN:O also causes internal and external damage to tubers. The work suggests PVY poses an important threat to potato production in the United States and that current measures to reduce the incidence of this virus are inadequate. *Plant Disease* (2006) 90: 1102-1105.

## STORAGE AND PROCESSING

**0631-027 The sustainability of the supply chain for fresh potatoes in Britain.** This interesting study surveyed 240 potato growers, 17 potato merchants and 4 retailers in the UK to assess perceptions of the relative importance of economic, social and environmental factors as they influence decision making in relation to sustainability. Economic and related market factors were the dominant concern for all supply chain participants, but social and environmental factors also influenced decision making and tended to affect business uncertainty. Environmental performance was driven by a mix of compliance requirements and perceived market preferences. *Supply Chain Management: An International Journal* (2006) 11: 317- 327.

**0631-008 Glycoalkaloid development during greening of fresh market potatoes (*Solanum tuberosum* L.).** Two completely independent compounds are synthesized in potato tubers in direct response to exposure to light. The first is chlorophyll, the green pigment associated with photosynthesis in plants, and the second is glycoalkaloids, a group of bitter, toxic compounds that can make tubers unfit for consumption. This study measured chlorophyll and glycoalkaloid concentrations in 4 potato cultivars under lighting conditions consistent with those of retail markets. Glycoalkaloids were highest in Dark Red Norland followed by Russet Norkotah, Yukon Gold and White Rose. Glycoalkaloids were highly correlated with greening level and chlorophyll for Dark Red Norland and Russet Norkotah tubers, but for White Rose and Yukon Gold glycoalkaloid concentrations were rather variable and did not increase in direct proportion to greening level and chlorophyll content. The levels of glycoalkaloids were 3-7 times higher in skin than flesh samples, with none of the flesh samples exceeding limits that are presumed safe for human consumption. *Journal of Agricultural and Food Chemistry* (2006) 54: 5847-5854.

**0631-014 The response of carbohydrate metabolism in potato tubers to low temperature.** This paper focused on the biochemistry of the pathways that lead to cold-induced sweetening in potato tubers. Radioactively labelled glucose was added to tuber slices incubated at 4 and 25°C. In contrast to a widelyheld hypothesis, the activity of enzymes at cold temperatures was not a major factor in cold-induced sweetening. *Plant and Cell Physiology* (2006) 47: 1309- 1322.

## NUTRITION

### 0631-012 Evaluation of potato varieties with high antioxidant activities by measuring phenolic acids in different tuber parts.

The antioxidant levels of 29 potato cultivars varied 8-fold in this study. For 5 cultivars, 3 different sections, cortex, perimedullary and pith tissue, were measured separately, and it was found that antioxidant levels were 2-fold greater in the cortex tissue (includes skin) than the other tissues for all cultivars except cv. Bora Valley, which had purple flesh. As expected, purple-skinned potatoes showed higher antioxidant activity than red-skinned tubers, with yellow-skinned tubers having the lowest antioxidant activity. Chlorogenic, caffeic and ferulic acids were the major phenolic acids contributing to the total antioxidant activity. *Horticulture, Environment and Biotechnology* (2006) 47: 126-131.

**0631-022; 0630-029 Antioxidant capacity, anthocyanins and total phenolics in purple- and red-fleshed potato (*Solanum tuberosum* L.) genotypes.** In contrast with widely held beliefs, this research has demonstrated that antioxidants are not just found in potato peel. While concentrations of anthocyanins and phenols were up to 2-fold higher in the skin, because the flesh make a much greater contribution to the total tuber volume, total amounts of antioxidants were greater in flesh than skin. In addition, it was shown that concentrations of anthocyanins and phenols were greater at the stem-end than the bud-end of the tuber. *American Journal of Potato Research* (2005) 82: 271- 277.

**0631-023 Entire potato consumption improves lipid metabolism and antioxidant status in cholesterol-fed rat.** This study showed that rats fed a potato-enriched diet (cooked potatoes with skin on) for 3 weeks had reduced plasma cholesterol and triglyceride levels and liver cholesterol. In addition, the antioxidant status of the rats was improved. This contrasts with the common impression that potatoes are just a starchy food. *European Journal of Nutrition* (2006) 45: 267- 274.

**0631-024; 0630-032 Influence of different processing methods on the glycemic index of potato (Nicola).** Volunteers (21 people) attended glucose tolerance and glycemic response tests of 7 processed potato products. Freshly prepared potato products (steam boiled, oven-baked and mashed) gave high glycemic indices (95-106), but these were reduced by approximately 25% through cooling, cold storage and reheating of the same products. *Journal of Food Composition and Analysis* (2006) 19: 372-378.

**0631-026; 0630-033 Presence and growth of *Bacillus cereus* in dehydrated potato flakes and hot-held, ready-to-eat potato products purchased in New Zealand.** *Bacillus cereus* can survive as spores in dehydrated potato flakes and can germinate and multiply in the rehydrated product, causing foodborne illnesses. After testing 50 packets of potato flakes, it was found that eight contained greater than 100 colony forming units (CFU) of *B. cereus* per gram. Forty-four hot-held food products containing ready-to-eat mashed potato were tested and 86% of them were below the safe hot-holding temperature of 60°C, but only 2 portions contained high levels of *B. cereus* (a potato-topped pastry and a container of potato and gravy). Rehydrated potato flakes containing naturally occurring *B. cereus* were held at 37, 42 and 50°C. After 6 hours *B. cereus* had exceeded 100 CFU/g at all temperatures. It is recommended that hot-held potato products are safe for consumption if held at 60°C or above or discarded within 2 hours. *Journal of Food Protection* (2006) 69: 1173-1177.

**0631-028 Use of near infrared spectra to identify cultivar in potato (*Solanum tuberosum*) crisps.** Several types of analysis were used on near infrared spectra from single batches of potato crisps made from two cultivars, Whitu and Fianna. There was a 93% success rate in separating the spectra into respective classes, suggesting that these analyses can be used to identify potato cultivars. *New Zealand Journal of Crop and Horticultural Science* (2006) 34: 177-181.

**0631-002 Food for thought or thought for food? - A stakeholder dialogue around the role of the snacking industry in addressing the obesity epidemic.** This paper is based on a review of the literature and interviews with experts, and discusses the factors that play a role in the current obesity epidemic. These include the basic physiology and genetics of the individual, self-control, socioeconomic factors, physical environment and external pressures from the environment, such as commercial push and seduction and obesogenic cultures. It is suggested that the role of potato chip producers is to introduce specific diet products, improve the nutritional quality of their products, engage in healthy lifestyle marketing and to limit the promotion of unhealthy consumption patterns. *Obesity Reviews* (2006) 7: 303-312.

## Section Two: POPULAR ARTICLES

### BOOKS AND BULLETINS

**Haverkort AJ, Struik PC (eds) 2005. *Potato in progress: science meets practice.*** Wageningen Academic Publishers, Wageningen, Netherlands. 366 pp. This book contains the Proceedings of the Potato 2005 Congress, held in Emmeloord, The Netherlands. With contributions from both the potato industry and scientists, there are 41 chapters grouped into 7 sections. The topics covered include nutritional aspects of the potato tuber, volatile consumer moods in saturated or new markets, latest developments in potato breeding and seed potato production, present and future role of decision support systems in managing pests and inputs of nitrogen and water, innovations in technology development in potato production and storage, and trends in potato trade.

**Poggi V, Setti L, Bordoni A, Biagi PL 2005. *Vegetables as functional foods: selenium-enriched potatoes.*** In: Dris R. ed. *Vegetables: growing environment and mineral nutrition.* World Food Ltd, Helsinki, Finland, Pp. 204-216. This book looks at mineral nutrition in vegetables, with one chapter focusing on the selenium enrichment in potatoes through foliar fertiliser application. The potential of selenium-enriched potatoes in improving human health and well-being is discussed.

**Olson KD, Badibanga T, Radcliffe EB, Ragsdale DW 2005. *Producers' use of crop borders for management of potato virus Y (PVY) in seed potatoes.*** A Staff Paper Series Bulletin, Department of Applied Economics, University of Minnesota, No.P05-14, 17 pp. Available at <http://agecon.lib.umn.edu/mn/p05-14.pdf>. Like the scientific paper described earlier in this issue of *Chips*, this bulletin looked at the serious problem of potato virus Y (PVY) in the USA. In early 2005, 23 potato seed potato producers in Minnesota and North Dakota responded to a survey about using crop borders to manage PVY. Five of these producers said they had used crop borders in 2004. While 96% of crops passed summer inspections for PVY, only 74% of lots sent for winter inspection passed. The use of crop borders was significant in explaining whether a seed lot had passed



the winter test (97% of potatoes with crop border passed compared to only 54% planted without a crop border). The choice of border crop did not affect the proportion passing the winter test.

## Potato Review

### JULY 2006

#### “Pests: Late flights a blip in longer term trend” p. 12.

While cold weather delayed insect flights in the UK in spring 2006, there is a clear trend that aphids are being caught on average 29 days earlier now than in the 1980s. Entomologists from Rothamsted Research Station say that this is due to climate change, with eight of the warmest winters in the last 100 years occurring since 1990. There is a strong relationship between January/February temperatures and aphid flights, with a 1°C increase advancing flights of the peach-potato aphid (*Myzus persicae*) by 2 weeks. A similar relationship exists for potato aphid (*Macrosiphum euphorbiae*), with the total numbers of this species in the critical early part of the growing season increasing significantly. In addition to earlier flights, aphids are showing increased resistance to some insecticides, particularly the carbamate pirimicarb. The changes in aphid populations will affect both seed and ware producers and new management strategies will be needed. For example, earlier planting would make crops more resilient and sprays will have to be applied earlier. In addition, growers will have to select insecticides carefully to account for localised resistance patterns. Two new products (flonicamid and thiacloprid) are being introduced this year, which will give growers more options.

#### “Diagnostics: In-field tests for decisions on the move” p. 16.

In the UK, potato growers have access to a wide range of laboratory tests for identifying pests, diseases and chemical contaminants. However, the next step is providing in-field tests that will enable growers to make rapid decisions about crop management on site. Although some field diagnostic kits have been available, these are difficult to use and interpret and often gave quite variable results. The recent introduction of lateral flow devices (LFDs) by the Central Science Laboratory (CSL) has led to a major improvement in field-based disease diagnosis. LFDs are available for the detection of viruses Y, X, A, V and S, watery wound rot (*Pythium ultimum*), stem canker and black scurf (*Rhizoctonia solani*), late blight (*Phytophthora infestans*), brown rot (*Ralstonia solanacearum*) and pink rot (*Phytophthora erythroseptica*). Other tests are being developed.

#### “Irrigation: evaluating the options for potatoes” p. 24.

This interesting article looks at the options for UK farmers wanting to change from standard hose reel/ rain gun irrigation systems to new alternatives. There are a number of reasons why hose reel systems have been so popular, including their flexibility and low capital cost, relatively short irrigation season, uneven topography, low infiltration rate soils and irregularly shaped fields. However, growers are looking to reduce labour costs, increase crop productivity and improve water use efficiency. The main alternatives are boom systems, solid-set micro-sprinklers and trickle irrigation. Where topography and field shape are regular, boom systems are becoming the standard choice. Solid-set systems can be economic if frequent applications are required and although the costs of extensive pipe networks appears

high, these systems operate at lower pressures and cheaper plastic pipes can be used. Technology advancements and the introduction of low-cost disposable trickle tape have led to an increased interest in trickle systems but there is still only limited evidence of their performance in potato growing systems. Because of the high capital cost and significant management input, the benefits need to be very clear for growers to invest in these systems, but as water becomes more expensive the margins may improve due to the efficiency of trickle systems. The article finishes supplying three references that give information on improving irrigation efficiency. These are:

- Irrigation best practice: water management for potatoes, a guide for growers. Produced by Defra (ian.senior@defra.gsi.gov.uk)
- Improving irrigation efficiency: five minute irrigation performance checklist. pdf file available from the UK Irrigation Association (www.ukia.org)
- Improving irrigation efficiency: optimising rain gun performance in field-scale vegetable production. www.silsoe.cranfield.ac.uk/iew/students/timlacey.htm

## www.spudman.com

### MAY 2006

#### “Potatoes on drip” p. 20.

On the other side of the Atlantic, University of Idaho researchers are also looking at drip irrigation systems for potatoes. This team has thought even more laterally, by examining the trickle irrigation systems for potatoes grown in beds as well as the traditional rows. The advantages of bed systems are better sunlight capture and disease management along with efficient water and nutrient use. By combining bed and drip systems, the advantages are additive, leading to major improvements in potato growing. One of the main benefits of beds is that the canopy closes earlier, resulting in greater utilisation of the incoming sunlight to grow potato tubers and increase yield. In addition, having less bare soil can improve crop quality, since a closed canopy keeps soil cooler and can reduce defects such as hollow heart, which may result from high soil temperatures. The researchers also found that drip irrigation systems supplied water, nutrients and pesticides more accurately and timeeffectively, leading to improvements in yield and quality and less disease. Initially the researchers had challenges producing large tubers in bed systems, but tentative guidelines are 18–22 inch spacings in an offset grid pattern and this has produced higher quality tubers than in conventional rows. Because hilling and cultivation are almost impossible in bed systems, weeds become more of a problem. Cost savings are achieved because of fewer field operations. The researchers worked with a machinery company to develop 6 and 12 foot bed planters that bury drip tape 2–3 inches below the soil surface. Dramatic results were seen in drip irrigated beds, with increases in tuber numbers, size and total yields, as well as reduced tuber rot. In particular, the more uniform soil moisture may reduce soil-borne diseases, such as Verticillium wilt, pink rot and Pythium leak. Other advantages were reduced canopy wetness, which will potentially impact foliar diseases that require moist conditions, such as late blight, early blight, brown spot, white mould, grey mould and bacterial vine rot. Disadvantage of the bed/ drip irrigation may include more weed problems, dust mites and powdery mildew, since the latter two thrive in a dry canopy environment.

#### “Late Blight: different practices can help manage late blight in sprinkler-irrigated potatoes” p. 24.

Listed in this article are a number of practices to minimise late blight in potato grown under sprinkler-irrigation. Sanitation is the first main factor that can reduce late blight infection, and this includes planting certified lateblight free seed that has been treated with fungicide, planting within 24 hours of cutting the seed, eliminating cull tubers and managing volunteer potatoes. The next group of practices involves cultural and irrigation management. For example, since the first 80 feet of a pivot centre is often the wettest area and late blight infections often begin here, try to avoid growing potatoes in this zone. This only represents 0.3% of a 125 acre field and from a total yield and quality perspective, not planting it may have little overall effect. In addition, irrigation should be restricted until just before tuber initiation, and avoid pivot overlaps or irrigating during rainy or dewy periods. Planting tubers deep and adequate hilling will prevent infection of tubers in the field by late blight spores. Avoid over fertilisation that may promote excess vine growth and monitor fields regularly for signs of late blight. Tubers should be harvested during dry weather and cooled to the correct temperature as quickly as possible. Good fungicide use practices can also help minimise late blight infections. This includes consulting forecasting models for the correct timing and intervals of fungicide application, using the correct fungicides throughout the season and following product information labels. In the semiarid environment of the Colombia Basin and southern Idaho in the USA, it is recommended that the first fungicide application is by air and then rotating this with chemigation thereafter.

## Snippets from www.potatonews

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.

### JULY 2006: NEWS HEADLINES

#### “Global: All eyes on Potatoes in 2008”

In November 2005 the United Nations announced the formal designation of 2008 as the International Year of the Potato. The International Potato Centre in Peru (CIP) has established a preliminary web page (www.cipotato.org/pressroom/iyp.asp) that will develop into a primary resource as the agenda develops. For further information contact Paul Stapleton, head of the CIP Communications and Public Awareness Department (p.stapleton@cgiar.org).

#### “Scotland: Aphid monitoring program on track in Scotland”

Aphid populations in seven separate “Aphid Control Areas” (ACA) of Scotland can be seen at the web site of the Scottish Agricultural Science Agency (www.sasa.gov.uk/seed\_potatoes/aphids/aphmon.cfm). For Level 1 of the Aphid Monitoring Programme three potato crops in areas of known high aphid risk are selected in each ACA. These crops are monitored weekly by threshing 100 plants, and when adult peach-potato aphids (*Myzus persicae*) are present or there are high numbers of adult potato aphids (*Macrosiphum euphorbiae*) in any crop, monitoring begins at Level 2. At Level 2 all seed crops within an ACA are regularly monitored. Growers are advised if any aphid colonies are found on a sample of 105 leaves

taken from 35 plants, and if more than 5 aphid colonies are found in a crop. Under the latter situation, growers must apply effective aphid control over the next 7 days or destroy the crop. If, at any stage, more than 10 colonies are found on 105 leaves, the grower must undertake postharvest testing of that particular crop for viruses before the stock will be accepted for certification.

### SEPTEMBER 2006: NEWS HEADLINES

#### “United States: Specialty potatoes ready to shine”

This article refers to a Press Release (www.capitalpress.info/main.asp?Search=1&ArticleID=27096&SectionID=67&SubSectionID=&S=1) that explained how discussions at the recent World Potato Congress concluded that potato consumers are looking for different colours, flavours and texture, and that potato breeders need to meet that demand. Because of plant variety protection laws, new varieties will be privately held rather than general public releases in the future, so there will be opportunities for breeders to partner with marketing organisations. For example, a new variety, Huckleberry Gold, is being prepared for release in 2–3 seasons. This purple-skinned, yellow-fleshed variety has excellent culinary quality, and a new marketing strategy will be used to promote it. Part of this will involve producing only what the market needs, and no more, in order to ensure that the variety remains profitable for a long time.

#### “North America: North American growers join forces to boost spud prices”

It has been reported that 80% of potato production in the US and Canada is now coming from growers who have joined a cooperative founded in Idaho. The aim of the cooperative is to increase potato prices by controlling potato production. The cooperative is encouraging growers to reduce debt so they can reinvest in efforts to improve efficiency of their operations.

#### “USDA announced \$13 million for PCN survey”

Potato cyst nematode (PCN) was discovered on 19 April by the US Department of Agriculture’s Animal and Plant Health Inspection Service and the Idaho State Department of Agriculture. The US Agriculture Secretary announced in August that nearly \$13 million will be invested in emergency funding to survey this pest in the USA.

### SEPTEMBER 2006: FEATURE ARTICLES

#### “New Pink Rot Bulletin now online”

An updated pink rot bulletin has been prepared by staff from the Department of Plant Pathology, Michigan State University. Available at www.potatodiseases.org/pinkrot.html, the bulletin describes the symptoms of the disease with some good photographs and then goes on to discuss the disease cycle. The pathogen, *Phytophthora erythroseptica*, is soil-borne and produces oospores that can persist in the soil for up to seven years. Although transmission by infected seed tubers has always been considered of minor importance, it is significant, as it can be a source of infection in new locations. There is no single effective control measure for pink rot and a combination of resistance, cultural and chemical control methods are required. These include reducing inoculum in fields by removing crop debris and having a 3–4-year rotation in legumes. Improving drainage and irrigation systems can help reduce pink rot as it thrives in moist soils. Good harvesting, curing and storage techniques will









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