

Potato Australia

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VOLUME 15

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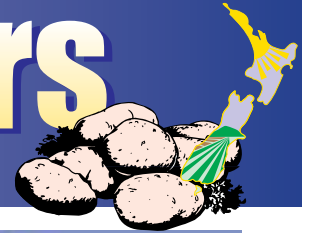


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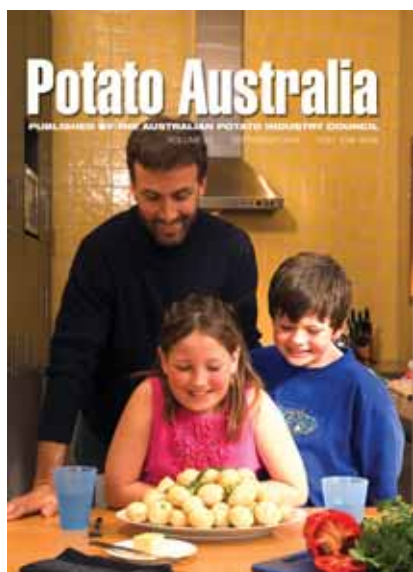
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Our cover photo of a family enjoying the delights of new season potatoes was shot in the home of Photographer, Janusz Molinski, in Kensington, Victoria. Thanks to local talent - father Glenn Munari, children Sophie Porter age nine and Will Porter, six.

Thanks also to Kensington Fruit Supply who sourced the new cocktail potatoes for the shot.

Editor: Cathy Sage

Photographer: Janusz Molinski

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Today and Beyond



In September 2005 a national potato conference will be held in Victoria. Expressions of interest for sponsorship and the trade exhibition can be lodged with the Conference Secretariat.

Full details in December Eyes on Potatoes.

**Potato 2005
Conference Secretariat
PO Box 1349
Warragul Victoria 3820
☎ (03) 5623 4188
☎ (03) 5622 0806
✉ potato2005conference@yahoo.com.au**

Potato Australia



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New delegates sought

Many thanks to Chairman Tony Gietzel who has moved to Harvest Freshcuts, and Treasurer and Public Officer Milton Rodda who has retired from McCain Foods and the Council. We appreciate their commitment over a number of years to the industry and APIC. As a result of these vacancies, new processing delegates will be selected by the Potato Processors Association of Australia before the Annual General Meeting to be held in November.

New direction for R&D

The Industry Advisory Committee (IAC) has been very active in the past year refocusing the R&D program on fewer high priority research issues.

In recent years, the R&D program has tried to do too much with too few resources. Rather than risk not achieving what industry needs, the IAC reduced the number of projects being carried out and put more resources into high priority areas. This was not an easy decision, as it meant some projects that could provide some very useful outcomes would also be sacrificed. The move, though unfortunate, is necessary considering limited funding is available to address many important industry issues.

PCN negotiations

The PCN outbreak in Victoria resulted in major problems for local growers and processors in Victoria, NSW, Queensland and South Australia. Interstate regulators, industry groups and processors worked hard to establish an effective interim protocol to enable the movement of potatoes to processing factories. If supply from the affected region (except for the PCN infested properties) had been stopped altogether, then the amount of potatoes available for processing would have been dramatically reduced having a major impact on the factories.

As the initial arrangements were short term, further discussions have been underway between Victorian and interstate regulators and industry groups to establish an acceptable protocol for the interstate movement of potatoes from the affected region. It needs to be remembered that only a small number of properties in the region have had PCN detections.

Developing a protocol that is acceptable to all the parties involved is a difficult task.

Growers and pre-packers need to be aware of the risks involved and take precautions to ensure all produce is free of soil. Any movement of soil such as with machinery risks spreading PCN. Hygiene practices must be closely watched and control maintained.

Retail Grocery Industry Code of Practice

Since the review of the Retail Grocery Industry Code of Practice, industry group meetings have been held with government agencies to resolve the question of whether a mandatory code should be introduced to replace the existing voluntary code. The Federal government supports a voluntary code which it believes reduces red tape and encourages successful outcomes. However, differences exist between grower groups and the Australian Chamber of Fruit and Vegetable Industries which represents wholesalers in Australia's six Central Markets. The major difference involves whether the code should be voluntary or mandatory and discussions are currently underway with the Minister for Agriculture, Fisheries and Forestry, Warren Truss and Minister Joe Hockey on how the Code might be implemented to assist both groups.



Geoff Moar
Acting Chairman

Changes at HAL

HAL or Horticulture Australia has undergone many changes in the past six months (see p10 for details) as it restructures its business. APIC will monitor how these changes affect the industry going forward and will report back to growers.

On behalf of the Council I would like to thank John Oakeshott for his work with the Potato IAC and wish him all the best in his new role working with other industries at HAL. I would also like to welcome our new industry liaison person at HAL – Simon Drum. He has a big task and we look forward to working with him.

On a sad yet somewhat positive note Jonathan Eccles has resigned from HAL. Jonathan has been a strong supporter of the potato industry for many years. His industry experience will be greatly missed at HAL. On a positive note though, Jonathan has taken up the new Industry Development Manager position for the vegetable industry at AUSVEG which is funded through their levy. Although not working directly for the potato industry, his work with vegetables will also probably provide benefits for our industry.

APIC General Meeting

The APIC Annual General Meeting has been scheduled for Monday afternoon, 15 November 2004, Sydney in conjunction with AUSVEG and HAL meetings.

GEOFF MOAR,
Acting Chairman
APIC
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✉ Moar@cni.com.au

Western Australia celebrates

17-year marketing success

Western Potatoes (otherwise known as the Potato Marketing Corporation of Western Australia) has been involved in consumer marketing since 1987. Consumer perceptions and awareness have shown improvement each year, unlike negative trends in other states and overseas. The campaign has engendered strong retailer support, improving potato presentation standards to consumers and providing powerful advertising materials.

Each year Western Potatoes uses a tracking survey to provide valuable feedback on purchase and consumption patterns of Western Australian grocery buyers, as well as the effectiveness of marketing and promotional messages to consumers.

The results show an integrated marketing campaign supported by a quality product at store level, and a powerful tool in defending market share and ensuring long-term industry viability.

Strong brand development

To increase potato sales, Western Potatoes changed from being production driven to more proactively oriented towards consumer needs.

As a result of the marketing efforts, brand awareness of Western Potatoes has risen from below 46% in 1998 to 91% in 2004. This has developed over a long period without losing direction or identity and remains high among the younger target markets, which is positive for future direction of the campaign.

Encouraged consumers to consume in new ways

A conscious effort has been made to encourage potatoes in traditional non-potato occasions, such as breakfast, lunch, snacks and starters. This has extended traditional consumption patterns by highlighting potato versatility and added interest and creativity to the otherwise low involvement purchase decision.

Although the marketing campaign has run for over a decade, nearly half of grocery shoppers who responded to the latest survey said it continues to tell them something new about potatoes and a further 48% say the campaign continues to make them think again about potatoes.

Leading the way against rice and pasta

Fresh potatoes continue to remain the most popular food choice in Western Australia when compared to rice and pasta. 53% of grocery shoppers would prefer to eat potatoes compared to rice (24%) and pasta (23%). This is

supported by the fact that fresh potatoes still remain the most frequently purchased product when compared to rice and pasta. Research indicates that over half the grocery buyers surveyed buy potatoes weekly or more often, compared to pasta (28%) and rice (13%). This result has remained constant in the past seven years for potatoes in comparison to rice and pasta which have declined in purchase frequency.

Positively, consumer potato perceptions have also remained strong compared to rice and pasta which have both lost share. In 2004, nearly three quarters of Western Australian grocery buyers recognise potatoes are healthy and nutritious, low in fat, easy to prepare, taste great and are extremely versatile. Furthermore, 42% of shoppers are aware potatoes are high in vitamin C. These percentages are unique to Western Australia and mainly due to the marketing program.

New products to encourage consumption

An important aspect of the marketing campaign was introduction of accessories which promote consumption of fresh potatoes. The Potato Microwaver™ and Potato Pantry® were designed specifically for this purpose and continue to have steady sales each year. The Potato Microwaver™ is a unique steaming capsule that cooks a potato in less than four minutes, which is significantly less time than traditional steaming methods. The Potato Pantry® is a convenient storage container that protects potatoes from light and maintain their freshness once purchased.

Western Potatoes also developed an award-winning range of fresh mash products in response to the trend in recent years towards fast, fresh and healthy convenience foods. The mash product uses regraded potatoes that previously offered no return to growers.

Increased awareness of potato varieties

Through a series of tactical campaigns the marketing program has developed a strong top of mind awareness of Western Australian grown potato varieties and their associated cooking attributes. When questioned about varieties, 69% of grocery shoppers recognised at least four potato varieties grown in Western Australia. In addition, each year there has been an increase in the proportion of shoppers who say they look for a particular variety when shopping.

Heightened awareness of potato varieties increases involvement at the purchaser level and plays an important part in educating consumers to distinguish local product from eastern states' varieties.

Future challenges facing the fresh potato industry

In the past 10 years, there has been a significant shift in the factors influencing purchase behaviour.

Appearance is considered the most important factor when purchasing potatoes, closely followed by the meal the shopper is intending to cook. The most important features when determining appearance are marks on the skin followed by skin colour (bloom) and size.

One of the most noteworthy trends affecting buying habits and threatening consumer attitudes towards potatoes across the globe is the highly-publicised high protein/low carbohydrate diets. One in four Western Australian grocery shoppers had either tried or considered a low carbohydrate diet in the last 12 months. When examined in detail in the younger age groups, this figure rose to one in three shoppers.



With ever-increasing numbers of new products and new food categories, it is apparent the competitive set is broadening to include other types of food in addition to rice and pasta. Fresh vegetables are increasing in popularity as a potential substitute for potatoes and competition also comes from the growing range of convenient, easy-cook, processed foods.

HELEN PLANGE
Western Potatoes
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✉ helens@potato.wa.gov.au

PotatoMagic - a possible answer

for food allergy sufferers

A new self-binding potato product, PotatoMagic, gives people who suffer from food allergies a nutritious and tasty option for a base food. The following summary was derived from an extract on ABC Television's Inventors program website featuring this year's inventions.

The PotatoMagic potato is different from other potatoes in one significant way: it is able to self-bind. PotatoMagic can be used as an alternative base for a range of meals which are safe for people who suffer from food allergies.

The process to create PotatoMagic involves heating a normal potato within a specific and controlled temperature range. The potato is then chilled.

Heating and cooling doesn't produce a chemical reaction, but results in the potato's natural starch soaking up the water, giving it the ability to thicken and self-bind.

Once the potato has emerged from the process, it can be grated and moulded into any shape. The inventor, Andrew Dyhin has used PotatoMagic to provide an additive free alternative to a variety of base products, from a pizza base, to biscuits, bread and even a sandwich. Importantly, the process does not alter the flavour of the potato.



PotatoMagic inventor, Andrew Dyhin

A normal potato that has not undergone the PotatoMagic process is full of liquid and unable to self-bind. To bind a potato in this state, you would need to add egg or flour or some kind of binding agent - additives which could be harmful for those with allergies.

For further information about the product, go to www.abc.net.au/newinventors/txt/s1150392.htm.

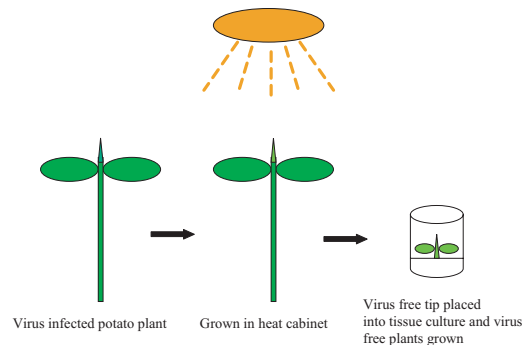
Virus elimination

in commercial potato cultivars

A new virus elimination process, thermotherapy, has the potential to save the potato industry considerable time and money. The process produces virus-free potato lines from infected material.

The Victorian Department of Primary Industries at Knoxfield maintains the National Potato Tissue Culture Collection consisting of pathogen-tested stock of over 300 potato varieties. This collection is an important source of certified holding stock of elite commercial lines for the Australian potato industry.

Before being included in the Collection, potato plant material is tested for virus, viroid, bacterial and fungal diseases. The collection is also tested annually for viral, fungal and bacterial diseases. This certified clean material can then be supplied as plants, plantlets or minitubers to accredited laboratories or breeding programs for further multiplication and incorporation into commercial production programs.



Until now, if virus free plants or tubers from elite commercial lines were not available, the lines were unable to be included in the collection. Staff at Knoxfield have developed a method of producing virus free potato lines, potentially saving the Australian potato industry considerable time and money.

Thermotherapy for virus-free stock

Through working on virus eradication programs for various plant species, scientists have successfully introduced a method known as thermotherapy, to produce virus-free potato lines from infected material. Thermotherapy works on the principle that plants can withstand higher temperatures than viruses. Virus infected plants are grown in specially constructed chambers which allow control of temperature, light and humidity. After six to eight weeks, the new growing tip (*meristem*) is removed from the plant and placed on a growing medium under sterile conditions (see diagram). Plants are then grown from the meristem and tested against potato diseases. Disease free plants are accepted to become mother plants for the National Potato Tissue Culture Collection and the potato seed multiplication scheme.

The thermotherapy process generally takes six to eight months. Conditions maintained in the growing chamber, duration of treatment, number of virus-free lines and number of attempts required depend on the potato variety and types and number of viruses involved.

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The HAL report

The Potato Industry Advisory Committee has completed its first full year under the new system of meeting as one body as well as two sub-committees under the sector groups of processing and fresh market. Each sub-committee has its own budget based on levy receipts, which allows the committees to invest in their own priority areas of work and link decisions to outcomes.

Five year R&D plan

Over the past year, the Potato Processor Industry Advisory Committee (PPIAC) has developed a five-year R&D program, which will start this financial year. This has been a major step forward as the Committee has achieved the difficult task of integrating projects into one large program. This approach will not only improve R&D outcomes, but the five year business plan also provides HAL projects with the opportunity to work with other international and domestic R&D groups to leverage funds (and results). This is an exciting, significant development for the potato industry. Potato Processor IAC members and contributing researchers deserve to be congratulated for their outstanding effort and commitment to the process. More details are on page 18.

PFIAC market development

The Potato Fresh Industry Advisory Committee (PFIAC) priority has been market development, as this sector continues to lose ground in the competitive market of carbohydrate food purchases. Market information has been gathered from overseas study tours, domestic market surveys and meetings with major packers/wholesalers to identify knowledge gaps.

Workboot series - Potatoes

An industry group has helped draft and edit the *Kondinin Workboot Series – Potatoes*. The book aims to promote the industry and products to a target audience of primary and early secondary school aged children.

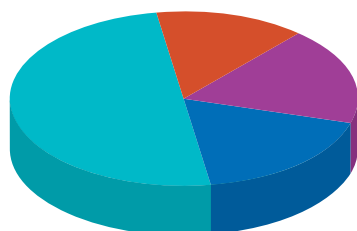
More details on page 60.

Funds allocation

It is pleasing to note the agreed horticulture R&D program eligible for matched Commonwealth funds is \$65.8 million (the 'cap'), the largest pool ever allocated to horticulture and representing an increase of more than \$5 million on 2003-04. However, the call on HAL funds has also increased with VC requests hitting \$26.5 million, with only \$14.2 million available for new projects. Applying the agreed new formula of allocating 75% (\$14.2 m) of these funds to industry-endorsed VCs, \$10.5 million has been allocated to industry programs. When added to continuing projects under management, the total industry-endorsed spend for 2004-05 is \$27.1 million. For 2004-05 budget, 88% of all HAL R&D program spending falls within direct member (including potatoes) influence, with first access to funds. The rest was allocated to projects across all industries based on concepts and outcomes following a general call that closed in early May 2003. It is encouraging that industries are supporting R&D, and the increased level of competition for funds will put pressure on applicants to align their projects even closer to industries expectations. HAL still continues to lobby the Commonwealth government for an increase in the funding cap. This cap figure is based on the value of the industry at the farm gate.

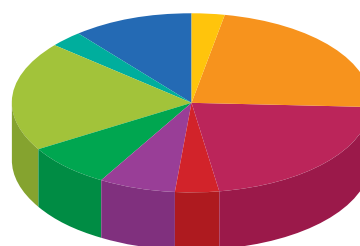


Source of funds for projects in 2004/2005



■ Fresh, seed & export growers 14%
■ Processing growers 18%
■ Processors 18%
■ Commonwealth government 50%

How the levy money was spent in 2003/2004



■ Crop management 3%
■ Breeding & evaluation 23%
■ Pest, disease & weed management 22%
■ Postharvest 4%
■ Seed development 7%
■ Market research & development 8%
■ Technology transfer 20%
■ AusHort 3%
■ Industry management 10%

New breeding and evaluation programs

Last season, a new program was put into place consisting of a core Breeding program funded from the levy and an evaluation program funded from voluntary contributions.

• Breeding program

The Breeding program underwent a comprehensive technical review to establish current program status and provide recommendations. DPI Victoria gave an excellent and thorough overview of the program and provided an industry panel with access to their busy staff. The panel consisted of industry representatives (processor and fresh), HAL, and a consultant with a speciality in plant breeding. The DPI Victoria staff and industry panel developed a report with a list of recommendations that will be incorporated into the program. Thanks to all the staff at DPI Victoria who contributed to this successful review.

• Evaluation program

Last season, three States and three companies conducted evaluation trials using the voluntary contribution system of funds. These trials allow varieties to be developed that reflect differences in market focus and regional growing conditions for each voluntary contributor. Funding for this program has been continued for the coming season. More on pages 28-33.

Potato website

A lot of background research has gone into the concept of a potato website. Records show this concept has been under investigation since 1998 with a variety of projects on attitudes, usage, workshops and a prototype development. Armed with this background research, the Potato IAC agreed it was now time to develop the Australian potato site for members. This site should be ready to access early in the new calendar year. Benefits to growers will be the ability to access R&D reports, Potato Australia and Eyes on Potatoes articles, news, information, alerts and events. More on page 21.

Financial Report (Unaudited)

Potato Investment Summary

Year Ended 30 June 2004

	R&D 2003/2004
Funds available 1 July 2003	1,312,040
INCOME	
Levies Received	1,103,688
Commonwealth Contributions	900,050
Other Income	77,158
Total Income	2,080,896
Budget	2,169,267
Variance to Budget	-88,371
PROGRAM INVESTMENT	
Levy Programs	1,599,448
Service Delivery Programs by HAL	200,650
Aushort	53,602
Levy Collection Costs	48,774
Total Investment	1,902,474
Budget	2,364,134
Variance to Budget	461,660
Annual Surplus/Deficit	178,422
Funds available 30 June 2004	1,490,462

The HAL report (continued)

HAL restructure

The HAL restructuring will provide two operational components that deal with industry members and researchers. Firstly, Industry Services will work with industry to plan and develop programs and secondly, 'Professional Services' will manage projects and facilitate delivery of outcomes.

JOHN OAKESHOTT

HAL

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New member on the Potato IAC

A vacancy has been created on the Potato Industry Advisory Committee with the recent resignation of Tony Gietzel. Allan Smith, a Field Manager with Arnotts in Queensland, has filled the position. We welcome Allan aboard.

Staff changes at HAL

Industry Services will be the first point of contact for industry. A new HAL employee, **Simon Drum**, will be Industry Services representative for the potato industry. Simon has very strong strategic planning skills and extensive experience in analysing project performance across a range of agricultural businesses. He spent five years with Elders Limited as a project manager and business analyst working in Melbourne, Brisbane and Townsville. His most recent position was strategic business analyst with OneSteel Market Mills rural division.

Under the HAL restructure, **John Oakeshott** will be moving from the potatoes portfolio to work with Industry Services for the nut and berry industries within HAL.

The potato industry would like to thank him for his continued hard work in the two years he was associated with it and recognise his ability to work with industry to effect positive outcomes in this period of major change for the industry.



Simon Drum



John Oakeshott



Jonathan Eccles

Jonathan Eccles has moved from HAL to AusVeg to take up a new position of Industry Development Manager working for the vegetable industry funded through their levy.

Jonathan started with the Horticultural Research and Development Corporation (now HAL) in 1982. His first task was to work with industry in setting up and managing the potato levy R&D program. Since then he has been actively involved with the industry and research providers to ensure the program meets industry needs.

His knowledge of horticultural industries, management skills and empathy of industry and research provider issues has been very important to the success of the potato R&D program.

Many thanks Jonathan and best wishes for your new position!

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Levy Projects for 2004- 2005

Project title	Chief investigator	Phone	Page
Processing potato industry R&D program	Rowland Laurence, Tasmanian Institute of Agricultural Research†	03 6430 4901	18
Crop management			
Coordination of the National Cadmium Minimisation Strategy	Dr Michael Warne, CSIRO Soil and Water	08 8303 8533	26
Potato tuber quality management in relation to environmental and nutritional stress	Stephen Harper, Department of Primary Industries and Fisheries, QLD	07 5466 2222	24
Sustainable agronomy packages for export potatoes	Dr Ian McPharlin Department of Agriculture WA	08 9368 3671	27
Breeding and evaluation			
Breeding potatoes for improved quality and efficiency	Tony Slater Victorian Department of Primary Industries	03 9210 9222	28
Development of genetically engineered virus resistant fresh market potatoes	Daniel Iseneggar Victorian Department of Primary Industries	03 9210 9222	EOPD4
Evaluation and development of new potato genotypes - South Australia	Dr Chris Williams SA Research & Development Institute	08 8303 9323	VC
Potato cultivar accession and testing in Tasmania	Leon Hingston, Tasmanian Institute of Agricultural Research	03 6421 7645	VC
Potato variety evaluation, commercialisation and adoption	Russell Sully Victorian Department of Primary Industries	03 9210 2222	28
Pest, disease and weed management			
Common scab threshold on tuber seeds for processing potato crops	Dr Hoong Pung Serve-Ag Research	08 6423 2044	42
Control of black dot in potatoes	Dr Trevor Wicks, SA Research & Development Institute (<i>Robin Harding</i>)	08 8303 9563	36
Developing cost effective UV protection of biological pesticides	Dr Brian Hawkett, University of Sydney	02 9351 6973	37
Development and implementation of industry biosecurity plans	Rodney Turner, Plant Health Australia	02 6260 4322	18
Eliminating viruses from Tasmanian certified seed potato stocks in Tasmania	Frank Hay, Tasmanian Institute of Agricultural Research	03 6430 4407	19
Enhanced detection of PCN and bacterial wilt to improve quarantine procedures and market access for the Australian potato industry	Dr Robert Faggian Victorian Department of Primary Industries	03 9210 9222	40
Evaluation and commercialisation of common scab resistant clones of commercial potato varieties	Dr Calum Wilson, Tasmanian Institute for Agricultural Research	03 6233 6841	43
Management options for controlling melon thrips in vegetable crops	Bronwyn Walsh, Department of Primary Industries and Fisheries QLD	07 5466 2222	41
Monitoring and developing management strategies for soil insect pests of potatoes	Stewart Learmonth Department of Agriculture WA	08 9777 0000	38
National PCN Management Strategy #	Gordon Berg Victorian Department of Primary Industries	03 9210 9222	EOPM4
PCN 'Area Freedom' for WA: Evaluation of the current status of PCN (<i>Globodera rostochiensis</i>)	Vivian Vanstone Department of Agriculture WA	08 9368 3141	19
Prediction and molecular detection of soil borne pathogens of potatoes	Dr Nigel Crump Victorian Department of Primary Industries	03 9210 9222	40
Understanding the implications of pastures on the management of soil-borne diseases of seed potatoes	Dr Dolf de Boer Victorian Department of Primary Industries	03 9210 9222	34
Evaluating a product for enhancing dormancy and storage qualities of potatoes	Ian Macleod, Serve-Ag	03 6423 2044	45
Supply chain handling systems for premium potatoes	Adrian Dahlenburg, SA Research and Development Institute (<i>Nancy Bagnato</i>)	08 8303 9416	44
Biodegradable plastics: The potential for Australian potato as an input for biodegradable polymers	David Michael Wondur Holdings	02 9369 2735	46
Health initiative 'Go for 2 & 5'	Chris Rowley Australian Fruit & Vegetable Coalition	02 8901 0329	20
Market research for potato nutrition software	Zing Hai Tan, McGregor Tan Research	08 8338 2340	EOPD

Project title	Chief investigator	Phone	Page
Seed development			
An agronomic and economic blueprint for a round seed system for Australia's processing potato industry	John Maynard Davey & Maynard Agricultural Consulting	03 6424 9311	56
Effects of potato seed characteristics on seed piece breakdown and poor emergence	Dr Hoong Pung, Serve-Ag Research	08 6423 2044	51
Maintenance and refreshment of the certified seed public variety in-vitro collection	Keith Blackmore, VICSPA	03 5962 9043	54
Optimising production and storage conditions for seed potato physiological quality	Dr Philip Brown, University of Tasmania	03 6226 2716	53
Seed potato handling and storage – implementing best practice *	Dr Doris Blaesing, Serve-Ag	03 6427 0800	52

Technology transfer			
A field guide to nutrient deficiencies and toxicities in Australian potato crops **	Norbert Maier SA Research and Development Institute	08 8303 9423	21
Communicating R&D outcomes to the potato industry through Potato Australia and Eyes on Potatoes	Cathy Sage SageWords	03 9328 5310	NR
Coordinating technology transfer in the Australian potato industry *	Leigh Walters, SA Farmers Federation	08 8232 5555	EOPD4
Implementing the Potato Industry's communication plan	Leigh Walters, SA Farmers Federation	08 8232 5555	EOPD4
International R&D workshop and industry extension meetings on common scab disease	Dr Calum Wilson, Tasmanian Institute for Agricultural Research	03 6233 6841	60
Making past industry information from R&D more accessible *	Leigh Walters, SA Farmers Federation	08 8232 5555	EOPD4
Potato Internet Service	Leigh Walters, SA Farmers Federation	08 8232 5555	21
Sponsorship for National Potato Conference – Victoria, 2005 **	Tony Pitt, Seed Potatoes Victoria	03 5623 4788	21
The Workboot Series – The story of potatoes in Australia	Catrina Nicholls, Kondinin Group	03 6374 2164	60

- New projects that have been approved and will commence once contracts have been finalised or have commenced this year.
- Projects ending in late 2003 and 2004
- Ongoing Projects
- NR No report is produced as the outcome is sent out to everyone.
- EOPD Published in Eyes on Potatoes December 2003
- EOPD4 To be published in the December 2004 Eyes on Potatoes
- † Program Leader
(Program being finalised – future report in Eyes on Potatoes)

- * Deadline for completion extended
 - ** This project is funded through the project "Implementing the industry's communication plan"
 - # The development of the plan will now be managed by AUSVEG.
 - VC Continued as VC Projects. See page 16
- In some cases projects that are supported for funding do not commence. Any new projects listed last year that are not listed this year did not go ahead. Projects that are listed as ending this year that were not listed last year are short term projects that are approved after the production of *Potato Australia*.



Don't Cut Corners on Seed

Knowledge and experience in growing seed potatoes is not a commodity. It can't be purchased or acquired through workshops and training sessions. It comes from years of working with seed crops, developing skilled inspection services, and from farmers who know what they're doing.

**Maximise your chance of a successful crop.
Beware of imitations. Don't cut corners.
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All certified seed is sold with a certification tag. This is your guarantee that it has complied with all the protocols of certification and passed all field inspections. Don't be fooled by claims that the seed is G2, G3 or G5. If it has no certified tag it has no status of any kind.

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Horticulture Australia Potato R&D

VC Projects for 2004-2005

VC or Voluntary Contribution projects are not funded by the Potato Levy. Instead of levy money being matched “dollar for dollar” by Horticulture Australia, a contribution from a non-government organisation is matched. The money may come from a company or farmer group. This money is paid to Horticulture Australia, matched and then paid back to the Chief Investigator responsible for the project as progress payments. Except for the difference in the source of funds, VC projects are managed like levy projects. Although the funding comes from a private group the work maybe done by a government department. The Potato Industry Advisory Committee prioritises the VC projects. Whether projects are funded will depend on the money available, the priority of the work and whether the proposal meets HAL’s requirements.

Project title	Chief investigator	Phone	Page
Crop management			
Crop management service for Tasmanian growers	Mark Heap, Simplot	03 8387 5124	18
Crop management tools for the French fry industry in the south east of South Australia	Robert Peake, PIRSA Rural Solutions	08 8724 2921	24
Breeding and evaluation			
Potato evaluation trials - Arnotts	Allan Smith, Arnotts Snackfoods	07 3372 7411	31
Potato evaluation trials – McCain Foods	David Ryan, McCain Foods	03 5338 0254	32
Potato evaluation trials – Simplot	Dr Rowland Laurence, Tasmanian Institute for Agricultural Research	03 6430 4901	31
Potato evaluation trials – South Australia	Dr Roger Kirkham	03 5797 8320	31
Potato evaluation trials – Victoria	Keith Blackmore, VICSPA	03 5952 9043	33
Potato varietal evaluation for Western Australia’s fresh and export markets	Peter Dawson Department of Agriculture WA	08 9892 8461	30
Pest, disease and weed management			
Developing a pests and disease crop monitoring program for Western Australian seed potato crops	Mark Holland Department of Agriculture WA	08 9368 3721	34
Disease management of potatoes on Kangaroo Island	Dr Trevor Wicks, SA Research & Development Institute (<i>Barbara Hall</i>)	08 8303 9563	35
National facilitation of adoption of methyl bromide alternatives	Dr Ian Porter Victorian Department of Primary Industries	03 9210 9222	39
Postharvest			
Development of a universal grading system for ware potatoes in Western Australia	Helen Plange, Western Potatoes	08 9228 9255	44
Market research & development			
Economic contribution of the horticulture industries to the Queensland & Australian economies	Mark Panitz Growcom	07 3620 3844	20
A partnership to build crisping potato capacity of West Java and Australian seed potato sales	Peter Dawson Department of Agriculture WA	08 9892 8461	48
Crop management service development for seed potato production in Tasmania	Mark Heap, Simplot Australia	03 8387 5124	49
Development and delivery of an induction program for new certified seed growers	Keith Blackmore, VICSPA	03 59 629043	55
Identifying variability across seed potato blocks using precision farming technology	Garry Kadwell Crookwell Potato Association	02 4832 1800	50
Improving virus control in seed schemes by combining aphid monitoring and virus testing	Mark Holland, Department of Agriculture WA	08 9368 3721	20
Minimising virus infection in early generation seed potato crops in Western Australia	Mark Holland, Department of Agriculture WA	08 9368 3721	50
Nitrogen dynamics in commercial seed potato crops and its effect on seed yield, quality, storage and subsequent commercial crop performance	Dr Doris Blaesing Serve-Ag Pty Ltd	03 6427 0800	51
Strategy for management of viruses from certified seed potato stocks	Dr Frank Hay, University of Tasmania	03 6430 4907	48
Support for seed potatoes sales to Sri Lanka: determining constraints to production	Peter Dawson, Department of Agriculture WA	08 9892 8461	19
China study tour & attendance at the World Potato Congress, Kunming, April 2004	John Rich, Tasmanian Farmers & Graziers Association	03 6331 6377	58
Seed potatoes Victoria workshop, Portland, Victoria, August 18 & 19 2003	Tony Pitt, Seed Potatoes Victoria	03 56223025	EOPD
Study Tour to the UK and Netherlands to investigate value adding opportunities for potatoes, September 2003	John Fennell Primary Industry and Resources SA	08 8389 8840	EOPD

■ - New projects that have been approved and will commence once contracts have been finalised or have commenced late last year or this year.

■ - Projects ending in late 2003 and 2004

■ - Ongoing projects

EOPD – Published in Eyes on Potatoes December 2003



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New projects

approved by Horticulture Australia

Your Levy @ Work



Processing Potato R&D Plan - Update

Since last reporting on development of the processing potato industry's research plan in the May 2004 edition of Eyes on Potatoes, work has continued in two areas.

Total available funding for the program has been determined by HAL and the development team are now able to fine-tune planned activities in line with this allocation. While available funds contributed from the industry levy has been clear for some time, the level of allowable voluntary contributions (VCs) from industry and overseas organisations has only recently been defined by HAL. This annual VC income cap determined by HAL will be \$600,000 in 2004-05.

The plan is now being refined to take into account the new budget and ensure it meets HAL's requirements.

The plan will then be reviewed by the Potato Processing Industry Advisory Committee in mid-September and considered by the HAL Board at its October meeting.

Duration: 5 years

ROWLAND LAURENCE

Coordinator, Processing Potato R&D Program
Tasmanian Institute of Agricultural Research

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Crop management

Crop management service for Tasmanian growers

The project aims to boost international competitiveness of the Tasmanian potato and vegetable processing industry by assisting rapid adoption of new crop management technology, widespread use of Agronomists and use of pooled industry data to achieve technical advances.

Expected benefits to industry are:

- higher crop production efficiency and quality
- reduced environmental impact
- rational use of water, fertiliser and agricultural chemicals.
- Improved prospects for industry growth in the long term.

Duration: 3 years

MARK HEAP

Simplot

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Pest, disease and weed management

Development and implementation of industry biosecurity plans

Plant Health Australia aims to develop industry specific Biosecurity Plans which meet the criteria of the Plant Cost Sharing Agreement. Australian plant industries are fortunate to experience relative freedom from many pests that can adversely affect them. Maintenance of this high plant health status is vital to retain existing trade opportunities, negotiate new access to overseas markets and ensure horticultural industry profitability. PHA's Industry Biosecurity Planning Guidelines give stakeholders the opportunity to work together to effectively identify, prioritise and manage key plant health risks.

A group representing the various parts of the potato industry met in Melbourne in June to discuss and start the planning process.

Duration: 10 months


RODNEY TURNER

Plant Health Australia

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Eliminating viruses from Tasmanian certified seed potato stocks in Tasmania.

This project aimed to develop a strategy to eliminate PVS and PVX viruses from potato seed stocks in Tasmania. An audit of seed handling practices in Tasmania in March 2004 recommended a series of improvements that have been passed on to the local industry for adoption. The project is defining virus levels in G2 crops, examining the spread rates of two contact transmissible viruses (PVS and PVX) in the field and defining strains of PVS to determine if local strains are also aphid transmissible. This information will be used to develop the most cost-effective management strategy for virus elimination.

This one-year project is funded by HAL on behalf of the potato industry and Commonwealth Government, McCain Foods (Australia), Forth Farm Produce, McCain Foods and Simplot Australia growers, Department of Primary Industries, Water and Environment and Tasmanian Institute of Agricultural Research.

Project started: 2004

Your Levy @ Work

Duration: 1 year

FRANK HAY

**Tasmanian Institute of
Agricultural Research**

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PCN 'Area Freedom' for WA: Evaluation of the current status of Potato Cyst Nematode (*Globodera rostochiensis*) in WA

Potatoes contribute \$40 million a year to the Western Australian economy, but only 3.5% of these potatoes are exported. Since Potato Cyst Nematode (PCN) was detected near Munster WA in 1986, strict quarantine and testing protocols have been in place. Presence of this nematode has resulted in restricted national and international trade of WA potatoes. PCN has not been detected in any WA potato crop since 1989, and there is no evidence of the nematode's spread from the original site. This, combined with ongoing quarantine and testing measures, now puts WA in an excellent position to pursue a claim of area freedom for PCN. Nowhere in the world has area freedom been granted if PCN has been detected. Intensive sampling and testing of soil, and bioassays of susceptible potatoes, will be conducted to confirm or deny the persistence of PCN at Munster. Other potato growing regions will be surveyed to add credence to the claim that PCN has not spread.

Duration: 3 years

Your Levy @ Work

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VOLUNTARY CONTRIBUTIONS

Seed Development



Potatoes growing on terraces in Sri Lanka

Support for seed potato sales to Sri Lanka: determining constraints to production

Seed performance depends on many factors.

Appropriate crop management is of critical importance. If high quality seed is not stored correctly, not given enough water, fertiliser, or adequate protection against pests and diseases, it will not perform to its potential.

Australian seed producers wanting to increase seed sales to Sri Lanka need to be able to supply practical information on how to manage the seed they sell to ensure it performs to potential.

The project seeks to determine major constraints to production in Sri Lanka. Once identified, we can look at finding solutions to offer our seed customers.

We have started to identify constraints through crop surveys. The survey will cover four planting times and include crop monitoring by experienced field staff of our Sri Lankan partner, CIC Agri Businesses. CIC is a large company supplying seed and fertiliser to Sri Lankan farmers.

Crop information to be collected includes slope, soil type, history, rotation, distance from other potato crops, tillage, fertilisers applied, seed source, seed history, seed condition, disease incidence, pest and disease control, and irrigation. Information about the farmer includes their experience and where they learnt to grow potatoes. Measurements are soil and petiole analyses, objective fortnightly crop monitoring, and yield by tuber size grade and number.

Preliminary results

The February 2004 planting survey has been completed. All 30 survey crops have been harvested. The season was drier than normal which resulted in below average disease problems.

Duration: 18 months

PETER DAWSON

IAN MCPHARLIN

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VOLUNTARY CONTRIBUTIONS

New projects

approved by Horticulture Australia

Seed Development

Improving virus control in seed schemes by aphid monitoring and virus testing

To ensure serious virus outbreaks in seed crops are minimised in Western Australia, growers must improve their control of insects that carry the viruses. The best way to achieve this is to monitor insects and their numbers. Control of insect carriers in the eastern states has improved when control measure decisions are based on crop monitoring. WA potato growers are aware of this work and want to test whether it will work locally.

The project will identify the extent of Potato Leaf Roll Virus, Tomato Spotted Wilt Virus, Potato Virus S, Potato Virus X and Potato virus Y infection in G2/G3 seed potato crops. The testing will define viral problems at grower and cultivar levels.

The project will show growers the benefits of crop monitoring through a pilot monitoring service organised by the WA Department of Agriculture. Seed crops will be monitored across five growing regions. Weekly reports to growers will identify levels of pest and beneficial insects. Advice on the need for roguing and other control measures will also be provided. Objective information on the costs and benefits of crop monitoring will be available to industry.

Duration: 1 year

MARK HOLLAND

Department of Agriculture, WA

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Market research and development

Economic contribution of the horticulture industries to the Queensland & Australian economies

The project aims to assess the economic contribution of horticulture to the Queensland and Australian economies. It is expected that project methodologies, along with part of the data, could be used in studies of other States' horticulture industries.

The project will use direct and indirect (multiplier) contributions, with information for each major horticultural producing region of Queensland in a detailed analysis of horticulture's contribution economically.

Industry and stakeholders will be better informed of the importance of the fruit and vegetable industries to both economies. This will assist the industry in developing and influencing policy and programs aimed to benefit business and primary industries.

Duration: 4 months

MR MARK PANITZ

Growcom

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Health initiative 'Go for 2 & 5' Your Levy @ Work

The fresh potato program is supporting the Australian Fruit & Vegetable Coalition's 's Health initiative 'Go for 2&5' by assisting with funding. Details about this across industry initiative are on page 22.



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Technology transfer

Potato Internet Service

The national internet site is the window to an information service that has been built up since 1998. It is part of an integrated strategy involving the publication service (Eyes on Potatoes and Potato Australia), Potato Archives and Potato Internet Starter Pak tied together through the National Database System.

The password-protected internet site or extranet will provide access to technical information for growers and the service industry.

Information is provided on contact details for technical specialists, outcomes from completed research funded by the levies, current research activities, publications, links to other relevant internet sites, coming events, news, training and industry issues. There is also the facility to receive updates on a range of topics, newsletters and industry alerts via email.

The internet offers the advantage of being open 24 hours a day to anyone who has a computer and internet connection. Useful information can also be forwarded cheaply and quickly to users by email.

A major reason for considering the internet was the need to gain greater value from our investment in research and development. The internet provides the means to more effectively use the intellectual resource that has been generated.

The internet service will be managed by the Technology Transfer Manager on behalf of the Australian Potato Industry.

To ensure the internet site is useful to growers, extensive research has been done both in Australia and overseas. A prototype internet site was developed and tested with farmers and the service industry in all states. The prototype provides the basis for the design of the site.

The site will be partly funded through sponsorship, advertising and membership fees. An important goal of the project is to increase revenue generation over time and reduce demand on levy funds.

Duration: 3 years

LEIGH WALTERS

SA Farmers Federation

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Your Levy @ Work

Sponsorship for the National Potato Conference – Victoria, 2005

Seed Potatoes Victoria has agreed to organise the next National Potato Conference in Victoria, September 2005. An organising committee has been formed and have started planning the event.

Sponsorship is being provided by HAL in the form of seed money to get the conference off the ground.

Most costs to cover the conference will be met by registration fees, industry sponsorship and trade exhibits as has been the case for previous conferences.

Duration: 12 months

TONY PITT

Ag Challenge

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Your Levy @ Work

Field guide to nutrient deficiencies and toxicities in potato crops

Last year, the CropTest Potato Crop Nutrient Evaluation System package was evaluated to determine how it could be improved to meet industry needs.

The CropTest package consisted of a manual and computer software program to enable growers and the service industry to identify nutrient deficiencies and toxicities and interpret tissue test results.

One outcome of the evaluation has been the funding of a field guide which will be available free to levy payers and for sale to others.

The aim is to help farmers and advisors recognise deficiencies and toxicities and be aware of other conditions that may produce similar symptoms.

It is often quite difficult to recognise nutrient deficiencies and toxicities in the field but the field guide will provide an important extra tool to help resolve whether a symptom is likely to stem from a nutrient deficiency or toxicity.

Duration: 3 months

NORBERT MAIER

**SA Research and
Development Institute**

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maier.norbert@saugov.sa.gov.au

Your Levy @ Work

The potato industry contributes financially to Horticulture's Across-Industry Program (previously called AusHort). This program addresses R&D common to most or all horticultural industries and is managed through HAL.

Across-industry water initiative

With its overall objective to ensure ongoing access to water for horticulture, the Across Industry Water Initiative has gained much ground in the past 12 months.

The project has sought to:

- demonstrate the economic, environmental and social contribution of irrigated horticulture to the wider community
- invest in projects that provide innovation using efficient and environmentally responsible water use
- provide policy analysis and support to decision makers regarding horticulture's needs.

A range of individual projects supports these strategies. Highlights include:

- a presentation to the ABARE Outlook Conference in Canberra
- submissions to state governments and the National Water Initiative on water reforms and impacts on horticulture
- a combined study on the value of irrigation for individual horticultural industries showing returns to the community from horticultural water use
- policy development regarding water access security, water use efficiency and environmental management systems
- projects to develop recommendations for managing water quality related to reclaimed water, salinity and blue green algae
- a new project with rural water authorities and the horticultural industry to better define future crop water requirements and design criteria for horticulture with future technology such as open hydroponics
- work with the National Program for Sustainable Irrigation (Land and Water Australia) to ensure horticulture's needs are represented in irrigation research

For more information please visit the web site www.rmcmg.com.au and follow Horticulture Australia's visitors links or contact the water initiative coordinator:

CHARLES THOMPSON
RM Consulting Group
☎ (03) 5441 4821
✉ charlest@rmcmg.com.au

Across industry health initiative

The push to implement a national marketing campaign to increase consumption of fruit and vegetables and improve Australians' health is gaining momentum.

Coordinated through the Australian Fruit & Vegetable Coalition (AFVC), the proposed campaign has gained support from industry (growers to retailers) and health organisations (National Heart Foundation, Cancer Council, Dieticians' Association of Australia).

The proposed campaign is based on the successful 'Go for 2&5' campaign, a Western Australian promotional program encouraging increased fruit / vegetable consumption. The WA campaign has achieved outstanding results lifting consumption of fruit by half a serve and vegetables by one serve according to latest market research.

Financial support to implement a pilot program is being sought by the AFVC.

Industry has pledged an initial commitment and discussions are underway with retailers, wholesalers and government to gather the necessary funds to make the pilot program a reality. With public concern over health issues such as obesity, coronary heart disease, cancer and diabetes gaining increasing prominence, the time for a practical and effective intervention campaign is right now.

Please contact AFVC for more information.

CHRIS ROWLEY
Australian Fruit & Vegetable Coalition
☎ (02) 8901 0329
✉ afvc@horticulture.com.au

QFVG on the move

The Queensland Fruit and Vegetable Growers (QFVG) moved out of Brisbane Markets in mid-August and into new headquarters north of the river at Floor 1/ 385 St Pauls Terrace, Fortitude Valley. QFVG will now be known as Growcom.

The new contact details are:
Mailing address: PO Box 202,
Fortitude Valley, QLD 4006
☎ (07) 3620 3844
Fax: (07) 3620 3880
www.growcom.com.au





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Australia needs to ensure our clean, green image for produce continues to stand up worldwide and that our growers rather than others decide what environmental risks and indicators are taken into account to support that image. This Horticulture for Tomorrow project aims to assist Australian horticulture develop one set of guidelines, compatible with existing codes of best practice, that work but do not waste growers' time.

The project's key action is to get on board with each industry to figure what environmental indicators are realistic and robust for their supply sectors, especially growers. Project officers will work with growers across Australia during 2005 to develop and test guidelines and assess how natural resources are and can be managed as an integral part of the business. The process aims to help growers link production targets to systems or practices already in place to care for the environment without creating extra work or hassle.

The project's main goal of developing industry-led market indicators and guidelines of sound environmental management is to avoid a compulsory system or assurance process being foisted on Australian horticulture from outside sometime in the future. A further goal is to avoid the situation of a few years ago with quality assurance when some growers found themselves throwing away one system and starting all over again with another.

The project is being driven by Australia's horticultural industries and funded by up to \$926,000 from the Natural Heritage Trust, through the Australian Government's Pathways to Industry Environmental Management Systems Program.

Industry and grower involvement and support is critical to the project's success.

Project flyer and website

A dedicated website www.horticulturefortomorrow.com.au provides a downloadable version of a flyer explaining the project, copies of useful materials already identified and links to other useful websites. Feedback through the site is welcome. For further information, phone Katherine Bidstrup on (08) 8272 8699 or 0411 299 428.

What's next?

- A scoping study is identifying issues, opportunities and challenges facing growers, including existing horticultural EMS and environmental assurance programs.
- An introductory guide is underway for growers (due out September 2004) who want to know more about environmental management, the issues and options available.
- Draft versions are available of comprehensive guidelines and a voluntary checklist which growers can use at their own pace to introduce and monitor environmental management outcomes. This is due to become available for industry feedback in November 2004.
- A summit of industry leaders is planned for November 16, 2004, in Sydney, on the day preceding the annual HAL conference.

- Grower trials are being conducted of the draft guidelines and checklist, due to start in early 2005. At least 140 growers are expected to be involved. More details about this phase will become available later this year.

Contact details for industry organisations

For general information about the project and its management please contact:

GERARD MCEVILLY at HAL on

☎ (02) 8295 2300.

For technical queries relating to the project please contact:

RICHARD BENNETT on

☎ (03) 5825 3753.

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Brown fleck: a plumbing problem

- causes and management

A better understanding of how brown fleck occurs and develops has led to management recommendations that can be used to reduce its impact.

Brown fleck is essentially a tuber plumbing problem where the sugar supply pipeline becomes blocked. It can occur when a single cell in the pipeline is damaged and dies. The blockages stop sugar transport to the surrounding new and developing tuber cells. These new cells fail to develop, appear glassy and ultimately die, multiplying the brown flecks or lesions.

Signs and symptoms

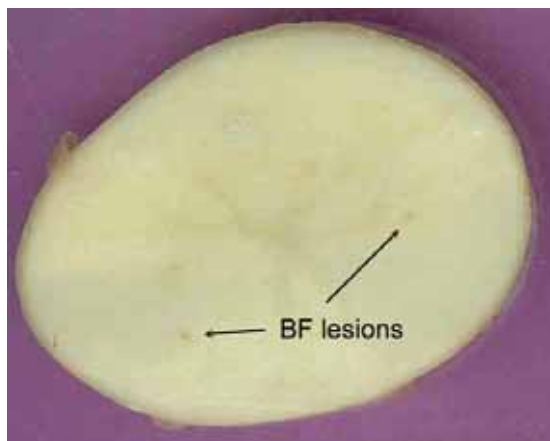
The first barely visible brown fleck lesions can appear about 80 days after planting. Brown fleck occurs when tubers grow quickly, so symptoms start to appear in weather conditions favouring rapid growth. This includes mild/warm day and night temperatures, sunny days and vigorous plant foliage; conditions that increase plant sugar supply to tubers and greatly increase brown fleck symptoms.

Growers in regions with a history of brown fleck can minimise it by preventing prolific foliage growth. This can largely be achieved by avoiding oversupply of nutrients and water to the crop. Early monitoring of tubers for the first signs of brown fleck can help determine whether preventative measures are required.

Management options

Short-term weather outlooks (three to four days) will alert growers to whether conditions favour rapid tuber growth and symptom development.

The research has demonstrated that removal of plant foliage reduces incidence of brown fleck. If conditions are favourable for growth and there is early evidence of brown fleck, careful management of crop foliage could be



Early symptoms of brown fleck, about 80 days after planting

considered. Further research is needed to give reliable recommendations but preliminary work indicates several crop foliage management measures could help. They include use of plant hardening agents (like copper or calcium), defoliants or retardants, restricting or withholding irrigation and not applying excessive nutrients that favour foliage growth.

Maintaining weed or vegetative cover when the crop ages will shade soil and prevent a large increase in soil temperatures that increase brown fleck symptoms.

This project has been funded by the Australian potato industry, HAL and Department of Primary Industries and Fisheries, Queensland. Many thanks to experimental support staff.

Project started: Jan 2000

Duration 4 years 4 months

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Crop management tools for the French fry industry in south east South Australia

A best practice crop monitoring tool, developed from spray and paddock management histories in different grower's potato fields, will be tested in the field in 2004-05.

French fry growers in the South East of South Australia participated in a review and analysis of three seasons of paddock management history and spray diary data. The data has been analysed and compared with current Best

Practice benchmarks. Growers have been interviewed about their historical records and are reviewing the Best Practice benchmarks relevant to their business.

Project start: December 2001

Duration: 2.5 years



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National cadmium

minimisation strategy

Membership of the National Cadmium Management Committee, responsible for implementing the National Cadmium Minimisation Strategy has changed. Daryl Stevens resigned as Coordinator and was replaced by Michael Warne, now CSIRO and previously at the NSW Environment Protection Authority. Committee member, Lindsay Cook (NSW Agriculture) also resigned and was replaced by Trevor Gibson (NSW Department of Primary Industries). George Rayment (Qld Department of Natural Resources, Mines and Energy) chairs the committee.

The committee has produced and distributed a *Managing Cadmium in Vegetables* brochure. Due to its success and the large number of Vietnamese speaking vegetable producers, it has since been translated into Vietnamese and distributed.

For further copies of either brochure, please visit the website: www.cadmium-management.org.au/overview.html or contact Sandra Wildman on Ph: (08) 8303 8759.

Other major committee activities include:

- negotiating national and international changes to maximum limits for cadmium in foods and advising Australian regulators and associated industries.
- participating in an Australian Government, Department



of Agriculture, Fisheries and Forestry Working Group developing consistent standards across Australia for cadmium and other fertiliser impurities. The group also aims to achieve uniform labelling of fertilisers, including consistent warning statements about impurities for users.

- maintaining a website with information on cadmium in Australian agriculture (www.cadmium-management.org.au). New additions include the Vietnamese brochure and a scientific publications list about cadmium in Australia. The site also contains an updated list of laboratories accredited to conduct cadmium analyses in plants.
- developing a National Cadmium Balance to quantify amounts of cadmium that enter, are transported and leave Australia by various sources and pathways. When complete, it will permit managers and regulators to identify critical parts of the system that would make most difference to cadmium levels in agricultural produce and the environment. It will also enable testing of various management and control strategies to assess the likelihood they will achieve the desired effect.

The Fertiliser Industry Federation of Australia, the Grains Research and Development Corporation and HAL jointly fund this project. It arose from continuing concerns about accumulation of cadmium in agriculture.


Project started: 1999

Project duration: 4 years 8 months

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for new crisp varieties

The potential of a new crisp variety is determined as much by ensuring the agronomy package is right as is the initial breeding and selection of the new line.

Proving new varieties

A lot of investment goes into improving potato yield and quality through breeding and selection. A new variety is not selected unless it shows significant yield and quality improvements over the target variety it is to replace.

However, if growers do not get the agronomy right for any new variety, they will not get the best yield and may unjustifiably discard it.

Comparing against the standard

Atlantic is the target variety or current industry standard in the crisp industry. This project showed that, when comparing new varieties with the standard, getting the agronomy (that is, growing practices such as spacing, time of sowing, irrigation, fertilisation, weed, pest and disease control) right for new varieties was important in realising their potential.

If growers plant a new variety using the same agronomic practices they always did for previous varieties, they run the risk of getting lower than potential yields and being wrongly put off the new variety.

This project trialled two new crisp varieties, *Bliss* and *Dawmor*, which already showed potential as replacements for *Atlantic*. National Breeding and Evaluation trials had showed less seed was required to achieve the same yield as *Atlantic*. The best in-row spacing for *Bliss* was 20cm and *Dawmor*, 25cm while for *Atlantic*, it was 15cm.

Getting the irrigation right is very important agronomically for getting the most out of new varieties. For example, in the first trial on a grower's property in Western Australia, sown in November, *Dawmor*, a longer –growing variety was under-irrigated compared to *Atlantic*, so it yielded lower. This meant a proper comparison of the potential of the two could not be made, given a key aspect of the agronomy package for *Dawmor* was not as good as it could be. However when the work was repeated with the irrigation optimal for both varieties, *Dawmor* outyielded *Atlantic* and had similar quality.

A second trial compared the yield of *Atlantic* and *Bliss*, another new export crisp variety sown in December. When the crop was irrigated optimally for both varieties, *Bliss* outyielded *Atlantic* by 20% and showed higher quality. In this case, there is justification in replacing *Atlantic* with *Bliss* as it has superior yield and quality when grown in appropriate conditions.



CIP extension specialist, Dr Dindo Campilan, visits a trial examining N and K requirements of new export varieties in Pemberton



Indonesian student Titik Kustiati and Project Manager Ian McPharlin examine potato varieties for the export market

Better fertiliser use efficiency

This work has also found the two new varieties need about half the nitrogen required by *Atlantic* to maximise yield and quality, even though they take four to six weeks longer to mature. It appears the new varieties have a superior nitrogen fertiliser use efficiency. This is important for growers as lower nitrogen fertiliser inputs improve profit and reduce environmental effects.

Preliminary results from this season suggest *Dawmor* will again perform well against *Atlantic* in terms of yield, quality and nitrogen fertiliser use efficiency. Trials with *Bliss* will be repeated as seed becomes available.

Project started: July 2002

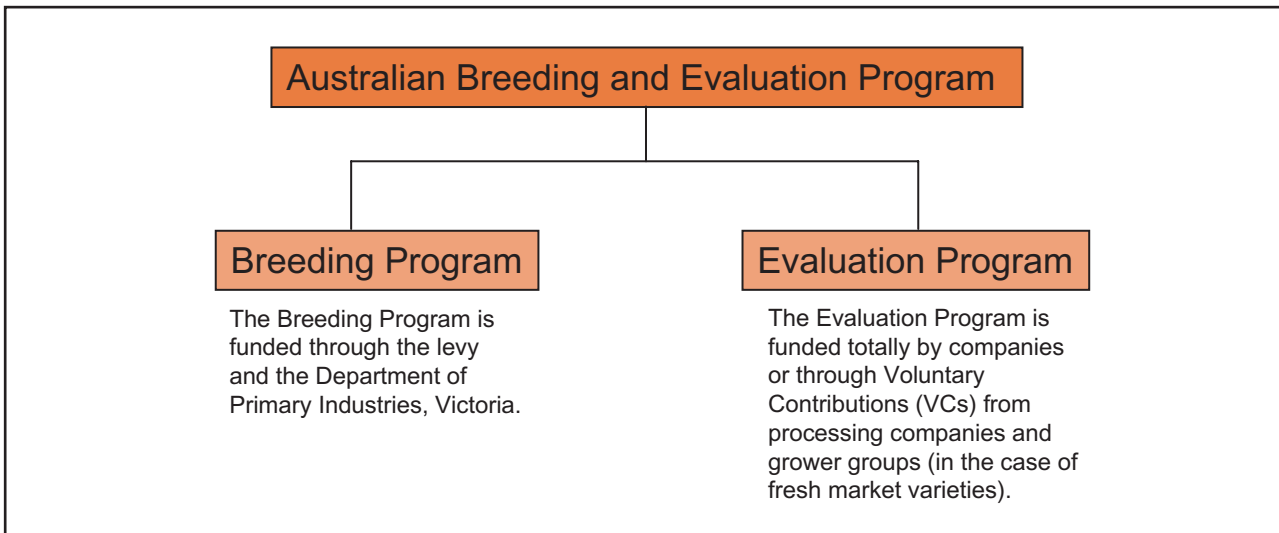
Duration: 4 years

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Your Levy @ Work

Breeding potatoes for

improved quality and efficiency

The future competitiveness and profitability of the Australian potato industry depends on a supply of new varieties adapted to Australian production conditions and markets.

The Victorian Department of Primary Industries operates Australia's only potato breeding program. This program is funded by the Victorian Department of Primary Industries and the potato industry levies through HAL. Over the past year, the program has significantly changed with development of a new operating model and appointment of a new plant breeder to the program. The new operating model has seen strong industry input into determining desirable characteristics for new potato cultivars and relies on industry to evaluate advanced selections from the program.

The desired characteristics of the new cultivars have been discussed with industry members for various market segments, and further consultation will be sought over the next few months. Pools of new potato seedlings will then be established from these discussions, and evaluated for their comparative field and postharvest performances. The size of these pools will be in proportion to the level of levy obtained from the various sectors and companies.

In 2003-04, the breeding program at Toolangi has conducted field trials on three generations of selections. Nearly 18,000 plants were grown in the field seedling trial, while 1,000 selections were grown as second generation short rows. Five third generation replicated comparative field trials were conducted; two for French fry selections; two for fresh; and one for crisping.

Advanced selections were evaluated by four companies in the processing sector and two groups in the fresh sector. Results from these trials will be analysed, and the most promising selections will be evaluated further.

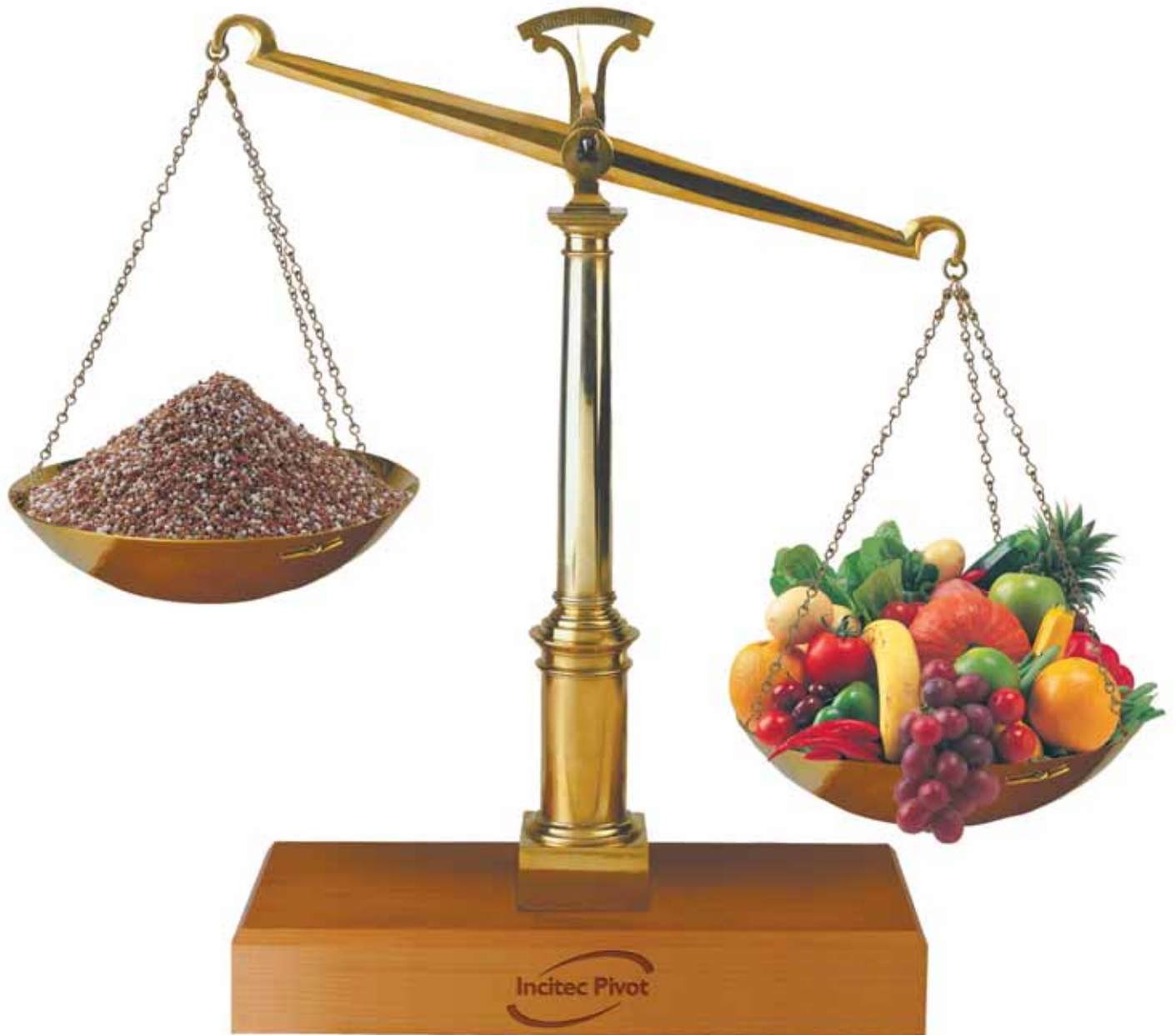


A freshly harvested trial being inspected to compare the selections



The grading of selections in the replicated trials enables yields to be compared

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Variety development for the fresh potato market in Western Australia

Variety evaluation work has been undertaken in Western Australia for many years and this project continues this work. However the industry's priority and concentration is on improved varieties for winter production.

About 200 breeding lines were selected from the Department of Primary Industries Potato Breeding Program. The breeding lines were bulked in Western Australia and screened under local conditions. Local selection means that about 30 lines are tested in a replicated variety trial. Selections from this trial proceed to a demonstration and then to small scale commercial testing as proposed under the Fresh National Evaluation and Commercialisation Committee Business Model.

One new variety undergoing commercial tests is *White Star* (97-38-2). Results are very promising. Western Potatoes report after the second year of commercial testing:

"...retail testing of the White Star was done in both small speciality fruit & veg stores and ...Woolworths. These were the same stores as we used in last year's trial. All in all it was a positive result with most consumers preferring it to un-named test potato (Nadine). All of the retailers ... were fairly happy with how the variety looked on shelf and noted it



White Star being test marketed in Western Australia



White Star undergoing test marketing with Ruby Lou and Mondial; Western Potatoes

sold quite quickly. Both commented that they would welcome more of the variety to sell if it was available as consumers tended to prefer the taste of it to Nadine during the demonstrations."

White Star also offers benefits to growers of winter crops. It has improved tolerance to powdery scab. It also produces larger tubers that may help overcome the current oversupply of small tubers. Commercial tests have shown *White Star* yields as well as the best yielding winter grown varieties.

White Star is now undergoing a third year of commercial tests. If successful, Western Potatoes will add *White Star* to their preferred variety list. They will also arrange seed supplies so *White Star* will be available to more growers.

Acknowledgements.

The Potato Producers Committee of the Agricultural Produce Commission provided the voluntary contribution. Western Potatoes assisted with commercial scale tests and test marketing. The expert help from participating growers is gratefully acknowledged.

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Potato evaluation trials - Simplot

Forty-one new potato varieties from the Toolangi breeding program and two standard commercial cultivars were planted at the Forth Vegetable Research Station (FVRS) in Tasmania on 21/11/03.

The trial site was a red krasnozem, and the potatoes were managed according to common practice for the industry standard, *Russet Burbank*. The trial was funded by a VC arrangement between Simplot and HAL. It was allowed to senesce naturally and was harvested on 13/5/04. Records, harvest notes and ratings were maintained for the trial throughout growth and during harvest assessment. Following harvest, the lines were more thoroughly assessed by separate grading and weighing of each plot into size categories.

The trial produced a moderate to strong outcome, with a processing yield of 58.2 t/ha for *Russet Burbank* and 69.4 t/ha for *Shepody*. Specific gravity was very high, with 1.094 for *Russet Burbank* and 1.083 for *Shepody*. Common scab

was prevalent throughout the trial site, and useful notes concerning the new varieties were made.

Eight new varieties showed promise in the trial. From a field perspective, they scored well against industry standards. In a SimScore system, *Russet Burbank* rated 5.8/10 and *Shepody*, 6.0/10. All eight new varieties scored over 6.7.

Simplot plans to take these eight new varieties on to a more intensive comparison in 2004-05. The best two or three will then proceed to agronomy profiling work starting in 2005-06. If any prove to be commercially viable, growers can expect to see the first large scale production in 2007/08.

A new set of breeding lines will be tested at FVRS in 2004-05.

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Potato evaluation trials - South Australia

South Australia's first evaluation trial under the new breeding and evaluation arrangements was harvested in August at Darren Eatt's property just west of Wanbi in the Mallee.

A field day was held for growers to look at prospective varieties and discuss future arrangements. Eleven new crossbred lines were compared to the standard washing variety, *Coliban*. Information from the trial was being collected and assessed at the time of Potato Australia going to press.

The trial was initiated by the Potato Growers of South Australia and financially supported through the South Australian Potato Industry Trust with matching Commonwealth funds from HAL through a Voluntary Contribution.

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Potato evaluation trials - Arnotts Snackfoods

Arnotts Snackfoods conducted four evaluation trials over 2003-04 season in Koo Wee Rup and Thorpdale Victoria, and Berrigan and Camden, NSW. The trials included seven varieties from the public breeding program and a number of varieties from international breeders. The trials were part of an ongoing program to find improved crisping lines that combine yield, specific gravity, disease resistance and low defects. The trials were funded through Arnotts with

financial support from HAL and would not have been possible without the invaluable support from the following growers: Frank Rovers, Wayne Tymensen, Hotchkin Potato Growers, Doyles Potatoes and Grech Farm Trading.

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Potato evaluation trials

- McCain Foods

Field experiments were conducted within commercial crops at Learmonth near Ballarat – Victoria (32 entries), Savernake near Berrigan – N.S.W (24 Entries), Mingbool near Penola – S.A. (12 entries) and Forthside Research Farm – Tasmania (14 entries).

The Victorian trial was planted on Alan and Jamie Baird's property in mid November and harvested in April, the Tasmanian trial was planted at the Forthside research facility in late October and lifted in mid May. The South Australian trial was planted on Terry and Wayne Buckley's property in October and harvested in early April whilst the NSW trial was planted on John Doyle's property in September and harvested early February.

During the growing season, plots were assessed for emergence, vigour, maturity and pest and disease susceptibility. At harvest, plots were assessed for tuber characteristics including colour, texture, shape, distortion, eye characteristics, size and evenness. Each plot is yield graded by sizes specific to processing parameters for French fry processing.

A Field day was conducted during the harvest of the Victorian trial which members of the McCain Grower Group were invited to attend, along with Department of Primary Industries (Vic) representatives and production personnel from McCain Food processing plant in Ballarat. Local growers and research personnel were invited to the other three trial harvest days.

Samples from each plot were removed after grading, with one sample from each plot assessed at McCain Foods (Aust) Pty Ltd or Safries Pty Ltd testing facilities for Dry Matter content and cooking ability. Also removed from each

plot (Riverina trial not included) is a storage sample which is held in commercial storage facilities and at three staggered intervals during the next seven months, one replicate of samples is removed and tested for processing attributes again.

This project has identified around 25 breeding lines that warrant further evaluation. Variety evaluation and development of new French fry varieties is required prior to the commercialisation of any cultivar. This season has shown, that with industry groups taking a far greater ownership in variety evaluation and commercialisation of new cultivars, interest in the four variety trials conducted under this project has been very high.

McCain Foods (Aust) Pty Ltd and Safries Pty Ltd in partnership with the McCain growers groups in Victoria, New South Wales and Tasmania and the Safries grower group in South Australia along with matching funds from HAL have tested these potential new potato lines for the French fry industry over the past twelve months. Future testing of potential cultivars depends on continued funding from these sources.

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Smith's Snackfood Company Crisping Variety Trials, Victoria

Variety evaluation trials were planted on the 12th & 13th November 2003 at Thorpdale, Victoria. There were 29 different varieties and among these were six crisping varieties from the Department of Primary Industries, Toolangi and the rest from Frito Lay and Smith's breeding programs. The variety *Atlantic* was used as a standard variety.

The trial was harvested on the 5th April 2004 and representatives from DPI Knoxfield and Toolangi were present together with Smith's officials. Trials were harvested and assessment done in the field for yield, tuber shape, tuber uniformity and tuber number per plant. Selected varieties were tested for crisp colour, specific gravity and for bruising at Tynong.

The performance of the public varieties in the trials compared to the company proprietary varieties are as follows:

Variety	Rank by yield	Rank by S.G
No. 1	18	3
No. 2	21	10
No. 3	19	2
No. 4	2	2
No. 5	17	9
No. 6	15	4

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Potato evaluation trials - Victoria

Twenty-seven crossbred lines from the Toolangi breeding program, Victoria, and three standard commercial cultivars were planted at L. Giardina's property at Thorpdale in November 2003. The replicated trial site was in a commercial crop of *Sebago* and the trial was managed as part of the surrounding crop. Agronomists kept a check on emergence, crop vigour, plant health and maturity of the different lines. The trial was allowed to senesce naturally and was harvested on April 15, 2004. A small field day was held in conjunction with the harvest to allow industry representatives and growers to examine the lines and assist with the field evaluation. Following harvest, the lines were assessed more thoroughly by separate grading and weighing of each plot into a number of size categories.

At time of harvest it was evident there had been high disease pressure due to powdery scab, particularly in first replications of the trial. A field assessment discarded some crossbred lines that were particularly susceptible to this disease.

Five crossbred lines stood out from the others in the trial. They are as follows;

- 00-48-1** Highest yield of marketable tubers and a good skin bloom on attractive tubers
- 00-45-1** Very low levels of powdery scab under high disease pressure
- 00-20-50** High yield of evenly sized tubers. Very high tuber numbers
- 98-33-57** Large proportion of the yield in the marketable size range. Little waste.
- 95-97-9** Good yields. Consistent performer over a large number of trials.



In all, about 15 lines warrant further evaluation. This trial is only a single evaluation at a single property in one season, and the performance of individual lines has to be considered across a number of sites.

The Thorpdale trial was initiated by the Victorian Potato Growers Council who considered this sort of evaluation was fundamental to maintaining flexibility and choice in the Victorian industry. The Council does not have funds for research and approached Victorian merchants and packing houses to generate support.

There were eight commercial sponsors of this trial work for 2003/2004. They were: Produce One, Durkin Produce, Red Gem Packers, JC Cutbush & Co, Mancarella Produce, Monaghan Packers, Allanon Produce, Cummaudo Farms.

Matching Commonwealth government funds were provided through HAL. Continuation of this work will depend on continued funds from these or other sources.

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Pest and disease monitoring program for WA seed potato crops

Continued monitoring of pests and diseases helps virus management by controlling virus carriers that may invade crops and provides guidance for growers to apply controls in a timely manner. Monitoring is also likely to reduce the need for insurance based spraying when carriers are not present.

This project aims to monitor the success of Western Australia's new seed certification schemes, with a focus on controlling viruses in seed potatoes through aphid monitoring and virus testing of generation two sown crops. It also aims to demonstrate aphid monitoring and virus testing as risk management strategies to be included in the National Standard for the certification of seed potatoes.

Virus testing and aphid monitoring progress

Virus testing and monitoring surveys were carried out on 14 properties. Of the 14, seven were clear of all viruses. Almost 6,900 plants were tested and growers are now acting on the outcomes.

In summary, potato leafroll virus was detected on five properties, tomato spotted wilt virus was found on two properties, and potato viruses S, X and Y were also detected on two properties each. These virus levels were within tolerances.

Aphid Monitoring

In general, aphids were the main virus carrier found, but at lower levels than in previous seasons. Seed crops in the Busselton region were subject to a large immigration of aphids in spring. This was detected and controlled early enough to prevent breeding. For the few crops present in autumn, there was another influx of aphids, and again early control was achieved.

Apart from aphids, no recommendations were made for control of any other foliage-feeding pest. Potato moth and loopers were the most abundant of these, but not at a level to warrant control.

Seed potato growers have welcomed the monitoring and regular reporting. It has allowed them to apply insecticides with confidence on a needs basis, with financial and environmental benefits resulting. Monitoring after chemical application confirmed control of the target pest.

Project started: July 2003

Duration: 18 months

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Understanding the role of pasture in the life cycle of soil-borne pathogens Your Levy @ Work

Long-term pastures (two years or more) are an important part of potato cropping systems in Australia's major production areas. This project is investigating the effectiveness of pastures as a break for diseases of potato crops.

In the third season of a field trial near Ballarat in Victoria, which examined the relationship between different pasture species and diseases, the *Rhizoctonia* fungus colonised white clover plants more frequently than perennial ryegrass plants. A soil-test confirmed greater incidence of the fungus in soil under clover pasture than under grass pasture.

However, the severity of damage to potatoes by the *Rhizoctonia* fungus (stem canker and black scurf) was no worse in potatoes grown after two years of clover than after two years of ryegrass. The strains of *Rhizoctonia* in the clover may be different to those in grass and further studies are being done to confirm this.

Future research will focus on pasture management strategies that may reduce levels of *Rhizoctonia* in soil prior to cropping potatoes. Incidence of powdery scab was not different in potatoes grown after clover compared with grass.

Interestingly at this trial site, the severity of *Rhizoctonia* damage in plots sown to potatoes for three seasons was only half that in potatoes sown after two seasons of grass or clover, which suggests some sort of inhibition of the pathogen in continuous potato plots. Further studies need to be done to determine the cause of this inhibition and whether opportunities exist to manage the soil environment to harness this effect for disease control. It should be noted, however, that yields in the continuous potato plots were about half that in plots where potatoes were grown after a pasture break, because of poor soil structure and other diseases.

Project started: 1 July 2001

Duration: 3 years

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Disease management of potatoes

on Kangaroo Island

Since 2002, extensive sampling of soil, potato plants and tubers grown on Kangaroo Island, South Australia, has shown the island has a low incidence of soil borne diseases compared to other seed potato growing areas of Australia.



Fungal pathogens such as black dot (*Colletotrichum coccodes*), silver scurf (*Helminthosporium solani*), common scab (*Streptomyces scabies*) and Fusarium rot were rarely found. Where they did occur, they were only found once on a few tubers and at levels less than 1%. Diseases such as powdery scab (*Spongospora tuberosum*) and *Verticillium* wilt, which can be problems in some potato seed producing areas, were not detected on the island.

The main pathogen found was *Rhizoctonia solani*, which was present at low levels on most properties. This fungus stunted and killed plants when they were girdled at ground level, and caused black scurf on tubers. The disease was most common in soils with high levels of organic matter, particularly when potatoes were planted after pasture.

Potato leafroll virus (PLRV) developed in some crops in the early years of the survey, but in recent years leaf sampling has not detected the problem, probably as a result of growers applying insecticide treatments and regular monitoring for aphids.

The potato seed industry on Kangaroo Island has been a success as production has moved from growers planting a few rows of mini tubers four to five years ago to an estimated tonnage of 3,000 tons in 2005-06. The health status of KI-produced seed potatoes has been a major factor contributing to the industry's rapid expansion.

Disease guidelines

Growers have been provided with guidelines on how to manage diseases and minimise their impact. Crops are monitored regularly and tested for presence of disease, and quarantine restriction is now in place on importation of potatoes onto the island. These procedures should ensure low disease incidence is maintained and Kangaroo Island continues to produce high quality potato tuber seed.

Two potential problems are PLRV and *Rhizoctonia*. Regular and careful monitoring for aphids, use of insecticides and testing for presence of PLRV should manage the risk. Controlling *Rhizoctonia* will be a challenge and further research is needed.

This project is funded by HAL, Kangaroo Island potato growers, the South Australian Potato Industry Trust and Southern Choice.

Project started: August 2002

Duration: 2 years

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Black dot

Control

Premature plant death, reduced yields and downgrading of produce due to blemishes caused by Black dot has labelled it a major potato disease affecting fresh and processing industries. This South Australian research has pointed to weed control, planting in low temperature / low disease soils, using clean certified seed, fungicidal seed treatments, in-furrow seed treatments, early lifting and careful water use between spray off and harvesting as ways to reduce disease levels.

Researchers looked at how the disease survives and spreads, favourable conditions for its development and control measures. Their findings are outlined below.

Survival and spread:

- Black dot is mainly a tuber-borne disease.
- Tubers can be infected externally and internally.
- High levels are found on many certified seed lots and these introduce the disease into the soil.
- It survives for 12 months or more in soil.
- Planting diseased tubers can result in up to 100% infection on daughter tubers.
- It survives on several weeds, including Skeleton weed, Fat Hen and Black nightshade.
- As soil populations increase, plant infection rates and plant death increase.
- Daughter tubers can be infected by the fungus spreading through the stolons.

Development in the field and in storage:

- Disease incidence increases as soil temperatures increase (optimum temperatures 24°C - 28°C).
- Potato cultivars vary in susceptibility, but none are resistant.
- Black dot can be detected on roots and tubers 10 -12 weeks after planting.
- Tuber infection increases the longer tubers stay in the soil after haulm death.
- Black dot does not spread between tubers in cold storage (<5°C).



Black dot infection of stolon



Black dot colonisation of main root four weeks after planting

Control:

- Control weeds such as Fat hen, Black nightshade and Skeleton weed in the seasons following harvest and before planting.
- Avoid plantings that result in crops maturing when soil temperatures (20cm depth) are at or above 24°C.
- Where soil levels of Black dot are high – fumigation may be useful but is not always effective.
- Use clean certified seed from well established seed growers and inspect seed in the field or in storage prior to purchase.
- Where disease or soil is present on tubers, treat seed with fungicides. Seed treatments with Maxim®, and Amistar®,* offer control.
- Treating seed tuber with fungicides gives significant control only when soil inoculum is low or absent.
- In furrow treatments with Amistar®,* at planting controlled Black dot.
- One foliar application of Amistar®,* (250g ai/ha) 1 week after haulm desiccation reduces the percentage of tubers infected.
- Where possible early lifting will reduce the impact of the disease.
- Reducing the amount of water between spray off and harvesting reduces the incidence of the disease.

Further in formation

More detailed results will be available at the end of 2004 on the SARDI website www.sardi.sa.gov.au and from HAL.

* Amistar is not registered as an in-furrow or seed treatment in Australia.

We acknowledge the funding provided by the national Potato R & D levy and the Commonwealth Government through HAL.

Project started: 2001

Duration: 3 years

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Developing cost effective UV protection of biological pesticides

Laboratory and field trials have shown it is possible to protect biological pesticides from breakdown by ultra violet (UV) light from the sun's rays.

This project has developed a sunscreen based on titanium dioxide to protect biological pesticides from UV degradation and enable existing pesticides to be used more effectively and others that are non viable become viable.

A tank mix additive has been developed for use with biological and hard chemical pesticides. It has potential to improve the efficiency of biological pesticides, as well as reduce the amount of UV-susceptible hard chemical pesticides required to achieve a given result.

The product mixed well over a 4-10 pH range, covering most conditions likely to be encountered in Australia. Further, the mixing qualities are unlikely to be adversely affected by additives used in other tank mix components.

Benefits for Integrated Pest Management

The main objective for Integrated Pest Management (IPM) systems is to reduce the amount of hard (broad-spectrum) chemicals needed to control insect pests in crops. Part of the IPM strategy is to use highly selective biological pesticides in place of hard chemicals wherever possible. Unfortunately, most good biological pesticides are quickly rendered less effective by their susceptibility to degradation by the sun's rays.

In laboratory trials using early-stage diamond back moth larvae pests on cabbage leaves, the formulation protected the biological control agent *Bacillus thuringiensis* (Bt) against UV degradation down to 0.1% on spray water. Laboratory

trials also found the formulation, when used at 1% on spray water, did not deter the early-stage larvae eating the Bt-covered leaves. A successful field trial with the UV product on cabbages under pressure from diamond back moth, controlled significantly more early-stage larvae than the conventional Bt treatment.

Experiments conducted on the Eureka AgResearch rainfall simulator showed the product was also very effective as a sticker to enhance rain fastness.

Successful commercialisation of this product will allow growers to expect improved performance from soft pesticide options and reductions in the application rates for UV susceptible hard chemical pesticides.

The University of Sydney and HAL are now seeking an industry partner who is interested in taking this product to the market.

Funded by the vegetable and potato industries and the Commonwealth Government

Project started: December 2001

Duration: 2 years 1 month

BRIAN HAWKETT

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Management strategies

for soil insect pests

A Management Kit for Australian soil insect pests of potatoes based on the information gathered during this three-year project is being put together and further details will appear in Eyes on Potatoes.

The main findings of the project are:

For whitefringed weevil:

- Far North QLD - pest status depended on the area of the Atherton Tableland where the crop was grown. The pest was managed with Fipronil insecticide in a crop rotation where volunteer peanut plants were controlled.
- NSW – it is a minor pest, but pre-crop monitoring in susceptible areas such as Guyra avoided crop damage in infested but untreated areas possibly because of the time of planting.
- VIC – pre-crop soil sampling provided a good guide to risk, and insecticides provided good control. Pre-crop sampling was based on using square spade samples taken in clusters of nine in nine locations across a paddock.
- WA - in most cases pre-crop soil sampling provided a good guide to risk with chlorpyrifos, Regent and metham sodium insecticides giving good control, with some exceptions. Pre-crop sampling was based on a uniform grid of 100 square spade samples evenly spaced over the paddock.
- Pre-crop soil sampling plans for Victoria and WA were similar in terms of pest density and treatment decisions. Where weevil grubs were present at very low densities, we applied insecticide – whitefringed weevil is such a potentially damaging pest, that just confirming presence indicates some degree of risk of economic loss.



African black beetle:

- NSW - can be a major pest; pre-crop sampling is important to define risk of damage, and use of light traps for invasions may help.

The light trap used to monitor for invasive flights of African black beetle adults - a warning service for growers.

- WA – pest status reduced by pre-crop monitoring. We have saved growers applying insecticide unnecessarily where beetles were either absent or at levels well below our preliminary threshold of 6 / m². The risk of damage to summer planted crops by invasive flights of beetles has been reduced by running a beetle activity warning service based on insect catches in a grid of light traps.

Cockchafers (white grubs of beetles):

- Far North Qld – one species was identified but more work is required to clarify identification of other species that almost certainly occur there.
- NSW – in the Dorrigo and Robertson areas one species was identified in large numbers in pasture. Identification and pest status of this pest group requires clarification.
- VIC – identification and pest status require clarification, over and above red-headed pasture cockchafer; use of a rotary hoe to kill larvae was not successful in one heavily infested paddock.

Wireworms:

- Far North QLD and south-east QLD – identification and pest status of species present require clarification; in-furrow application of insecticide requires assessment.
- VIC – baiting was used successfully to assess risk of damage from potato wireworm; soil incorporation of the insecticide Regent gave good control in paddocks identified as infested.

Rice root aphid:

- SE QLD – It was a minor pest in this study; its prevalence has been strongly implicated with the preceding rotation crop, with lucerne being reported as an important host for this aphid; a fungal pathogen has been isolated and identified from some infested areas.

Project start: July 2001

Duration: 3 years

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NSW Agriculture – no longer!

Please be advised that if you want to contact NSW Agriculture, it no longer exists under that name. NSW Agriculture has changed its name to NSW Department of Primary Industries.

Helping Australian Industries

Phase-out Methyl Bromide

A large national research program has enabled Australian horticultural industries to reduce over 70% of their methyl bromide (MB) use and meet Australia's obligations to phase out methyl bromide by 1 January 2005 under the *Montreal Protocol*. Worldwide reductions in MB are already reducing it in the stratosphere and this will ultimately lead to ozone layer recovery and a reduced risk of skin cancer for Australians.

This project 'Facilitating National Adoption of Methyl Bromide Alternatives' has played a key role by providing an internationally recognised communication program that keeps growers, researchers and governments informed about latest research and policy developments nationally, and from around the world.

MB Update

Critical to the success of this national communication program has been distribution of the National Methyl Bromide Update newsletter (MB Update). This twice-yearly newsletter is sent to over 1500 growers in Australia. The MB Update provides growers with technical summaries of currently available alternatives to MB, updates on industry-based trials and the latest information about the process for applying for critical use exemptions to retain MB after phase-out. To date only four horticultural industries have applied for critical use of a relatively small amount of MB post 2005 for pre-plant soil use.

MB Roadshow

Recently completed National MB Roadshows in the Sydney basin, Brisbane and Bundaberg regions

have provided industries with an overview of international, national and local region based research and development and policy issues affecting future use of MB. The Roadshow is continuing and will be held for major MB-using industries in Victoria, South Australia and Western Australia in August/September 2004.

A recent publication from this project, *Getting the most from methyl bromide alternatives* has received positive feedback from industry. The 24-page colour guide brings together results of 10 years of research by the MB team at Department of Primary Industries, Knoxfield (Victoria). This guide introduces the various methods that can be used by growers to disinfest their soils in the absence of MB. It covers issues such as choosing a soil disinfestation method, preparing soil for treatment, hygiene issues and application methods for chemical alternatives to MB. This guide is available free to Australian growers and will be distributed through the national communication network.

For further information about where you can obtain copies of this guide contact Natalie Tostovrsnik
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Better PCN and bacterial wilt detection

to improve market access

New DNA tests and improved sampling strategies for potato cyst nematode (PCN - *Globodera rostochiensis*) and bacterial wilt or brown rot (*Ralstonia solanacearum*) are intended to be faster, reliable, less expensive and improve market access for growers.



Robert Faggian

Quicker more accurate tools

The research project has developed a range of diagnostic tools that allow quick and reliable detection of bacterial wilt and PCN in plant material, potato tubers, soil and water. These tools will be quicker, more sensitive and specific than traditional testing methods. With automation, it will also be possible to greatly reduce the cost of routine testing for growers.

Bacterial wilt (brown rot) and PCN are considered two of the world's most destructive potato diseases. Both are subject to quarantine restrictions in Australia and New Zealand as outbreaks of either can severely limit trade in potatoes, resulting in millions of dollars of lost income across state and international borders.

Test identifies source of outbreak

A new DNA test developed in this project proved valuable in identifying species of the PCN in a recent outbreak in Koo-Wee-Rup, Victoria. The species of PCN was identified within 72 hours of receiving suspect cysts, compared to several months in overseas laboratories.

Effective sampling and the ability to rapidly, accurately and reliably detect presence or absence of exotic pathogens in plants, tubers, soil and water will help improve market access for the Australian and New Zealand potato industries.

This project has been a joint effort of the Department of Primary Industries, Victoria and Crop and Food Research, New Zealand.

Project started: July 2001

Duration: 3 years

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Predicting and detecting

soilborne diseases

By 2006, growers should be able to pinpoint the levels of disease in a field before they plant potatoes there, using a new high-tech soil diagnostic test.

This project is developing smart diagnostics to rapidly and reliably detect pathogenic organisms that cause diseases such as powdery scab, common scab and rhizoctonia. These soil tests will be conducted prior to planting to identify the risk of getting disease before a potato is even planted. This allows growers to make more informed decisions about paddock selection and disease management. These tests are a valuable tool for researchers as they can get a better understanding of how each pathogen survives in soil and evaluate the effect of control treatments on pathogen survival. Ultimately, this will lead to development of better

disease management strategies and a reduction in yield loss due to disease. Researchers are currently validating the tests with actual disease levels on tubers grown in commercial fields. Diagnostic tests may be commercially available within the next two years.

This project is funded by the potato industry, Department of Primary Industries Victoria, Horticulture Australia and C-Quentec.

Project started: July 2001

Duration: 3 years

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Managing melon thrips

in vegetable crops

Queensland research has shown that a relatively small investment in monitoring for melon thrips would avert a costly yield loss in Lockyer Valley potato crops attacked by melon thrips.

Potato crops in the Lockyer Valley were monitored for melon thrips in autumn and spring 2002. A 30% loss in premium grade yield was recorded in the autumn Sebago crop. A cost analysis showed a \$300/ha investment in monitoring and an effective pesticide would avert a \$2400/ha yield loss and ineffective management practice.

With regard to effective management, the load of different thrips species varies throughout the year, so correctly identifying the thrips species present allows growers to choose the best pesticide and time of spraying.

Damaging pest

Melon thrips, *Thrips palmi*, is a relatively new pest in Queensland horticultural crops. Worldwide, 50-90% yield losses have been recorded in capsicum, eggplant, cucurbits and bean crops. The pest also poses a market access problem with movement of host plant material restricted across several state borders and overseas countries.

Researchers in this project gathered information about the biology of the pest and surveyed thrips numbers and crop damage in spring and autumn in Lockyer Valley potato and capsicum crops. Insecticides were tested for short-term pest management.

Insecticide trials

Two trials sought to gather data in support of minor use permits to manage melon thrips in potatoes. Trials were frustrated by infestations of silverleaf whitefly and aphids. However, overseas data, trials in other Australian potato crops and an on-farm trial can still offer evidence of insecticides likely to be effective against melon thrips.

Thrips management essential for IPM

Managing thrips has become particularly important to integrated pest management (IPM) growers who have switched to biological pesticides to manage caterpillar pests, and who are becoming more aware of other pest species present in the crop. The information on identification, thresholds and access to control options - soft and hard are important to these growers to avoid interrupting their IPM systems.

To effectively manage thrips in potato crops, growers should:

- monitor crops and get thrips species identified
- choose a management method relevant to the thrips species found
- be aware that other agents could cause damage sometimes attributed to thrips
- be aware of all pests and natural enemies present when making management choices.

Further information

A Department of Primary Industry and Fisheries note outlining biology, seasonal abundance and management options for melon thrips in potatoes has been produced. It is a three to four page fact sheet with images, diagrams and information on thrips in potatoes. The DPI note will be available via the Internet at www.dpi.gov.qld.au. The DPI note also directs the reader to information on other pests and their management in potato crops.

Project started: November 2001

Duration: 2.5 years

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Common scab threshold on tuber seeds for processing potato crops

The project examines the effect of initial common scab incidence on crop disease levels. This will enable a more accurate threshold for common scab to be determined.

Increasingly, seed crops are not certified because they have low threshold levels for common scab based on percent of infected tubers. Changes to the certification system, (using disease severity rather than disease incidence), could result in major savings in seed production.

Six trials conducted in 2002-03 to measure the relationship between initial levels of common scab incidence on seed tubers and common scab transmission onto daughter tubers in Tasmania and Victoria indicated that transmission was closely related to the common scab incidence on seed tubers.

However, there was no relationship between common scab transmission and common scab levels on seed lines as determined by examining a small number of potatoes through the seed certification process. This is due to the

difficulty of obtaining a representative sample that is typical of the seed line when looking at a small number of tubers.

Further trials over different seasons are required to have enough information to enable a certification process to be developed that is fair to both seed producers and buyers.

Four trials were set up in Tasmania and in Victoria, in 2003-04, in commercial crops. All tubers from the trials have been harvested in May and June 2004 and are being assessed for scab incidence and severity.

Project started: September 2002

Duration: 3 years, 2 months

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Finding common scab resistant clones of commercial potatoes

The bacterium responsible for common scab produces a toxin (called Thaxtomin A) critical to development of the disease in potato. This project uses tissue culture to develop potato clones tolerant to Thaxtomin A, hence resistant to common scab.

Researchers selected more than 300 potato clones from *Russet Burbank*, *Atlantic*, *Desiree*, *Pontiac* and *Shepody* varieties and compared them to the control variety *Iwa*. About 9% of clones were more tolerant to the toxin than their unselected parent clone.

Trial outcomes

In glasshouse trials, several selected lines had fewer, more superficial scab lesions per tuber surface area than the unselected parent. The incidence and severity of lesions should be lower in clones with better tolerance to the toxin.

These results are pleasing, with about half the clones tested having better disease resistance. This provides proof for this approach of selecting for common scab resistance. Further testing is needed to screen remaining lines and confirm trial results before field assessments.

With the disease resistance data now available, researchers are confident a series of commercially acceptable disease resistant clones will be sufficiently defined to justify a Plant Breeders Rights application in the next four to five years as part of the new Potato Processing Industry Advisory Committee initiative.



Resistant clone A12

Disease resistant clone



Control cv. Desiree

Diseased Desiree potatoes

Project started: October 2001

Duration: 3 years

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A universal grading system

for ware potatoes in WA

A new grading standard for ware potatoes in WA was officially launched in July 2004 for the start of the new growing season.

Development of the standard began with a series of supply chain workshops during 2002-03, chaired by Western Potatoes. The workshops identified the need to adopt a uniform grading standard for ware potatoes based on retailer specifications.

It was agreed a new grading standard would also communicate consumer quality requirements to all supply chain sectors and provide:

- one point of reference for all industry sectors based on retailer specifications
- a descriptive and pictorial example of potato defects for each grade to aid the grading process and limit discrepancies in interpretation
- a clear indication of retailer expectation regarding size and quality
- consistent terminology used by different industry supply chain sectors

Development of the new grading standard

The project was undertaken over 12 months with participation from all supply chain sectors.

The first step involved an audit to identify the various forms of grading standards in other potato industries and their potential for the WA ware potato industry. Size and quality parameters were identified as two important factors in developing the new grading structure. Three sizes and two defect level classifications were combined into a matrix which identified four new grades: Smalls, Class 1, Class 2 and Drybrush.

Once tested and approved by the supply chain group, the minimum potato standard being delivered to the Corporation or its agents and the grading and packaging requirements were published in an easy-to-read colour poster and brochure.

Communication of the new grading standard

The poster and brochure were distributed and explained in detail to all stakeholders through industry presentations. Washpackers also undertook a comprehensive training program to ensure all staff clearly understood the new grading standard prior to implementation.

Other outcomes

Communication with industry members and involvement of industry representatives in the entire process has led to a more cohesive supply chain group. Members have also gained a better understanding of the various activities and constraints faced by different sectors of the supply chain. The group expects to continue to meet regularly to seek solutions to identified supply chain issues.

Project started: April 2003

Duration: 12 months

HELEN PLANGE

Western Potatoes

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Supply chain handling systems for premium potatoes

Your Levy @ Work

Consumer appeal and confidence in pre-packaged washed potatoes is low. Achieving a fresh, white potato appearance will help improve consumer confidence in pre-packaged potatoes. However, in practice, getting potatoes to retain their fresh white appearance is not easily achieved. This research is looking at pre-packaged material currently in use and will look at new materials to identify the best packaging for premium washed potatoes.

Packaging and problems vary

Potatoes are commonly pre-packed into plastic bags varying in colour from clear, pink, blue, black to other specially coated bags. Alternative types of packaging include netting and cardboard cartons. Shortcomings of existing packaging have been identified in retail and packing

shed surveys and include problems such as condensation forming in bags initiating tuber rots, potato greening and peel discolouration. Experiments will observe the benefits and problems of existing packaging and will also assess new packaging options. The aim is to restore consumer faith in pre-packaged potatoes by identifying packaging materials that maintain high quality white washed potatoes through the supply chain from harvest to consumer.

We would be pleased to hear from anyone who has comments about conventional or new potato packaging and its effects on pre-packaging.

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Evaluating a product for enhancing

dormancy and storage qualities of potatoes

This project aims to investigate use of DMN (1,4-dimethylnaphthalene) as an alternative sprout suppressant in Australia.

An alternative to CIPC

Temperature, humidity and air movement are the most important environmental variables in maintaining tuber quality. Environmental conditions must be monitored and adjusted regularly in storage. Use of sprout control products can also assist with maintaining tuber quality by minimising sprouting. Currently, CIPC is the only product available to control sprouting in stored potatoes. Its effects are irreversible, making CIPC unsuitable for seed potatoes. The industry is seeking alternatives due to food safety concerns and hazards associated with shipment and handling.

Alternatives to CIPC have been researched in the projects 'Use of natural sprouting inhibitors for potato storage' (PT354) and 'Improving seed potato production' (PT98008). Through these projects, the dormancy enhancer, DMN, was identified as a possible suitable product for commercial development as an alternative to CIPC.

DMN has been registered in the United States of America for use on potatoes. It is manufactured for D-I-1-4 Inc. by a Japanese chemical company, and sold commercially in the USA as 1,4Sight®.

This project set out to understand how DMN works and determine if it had a possible use in storage of Australian potato crops. A literature review of DMN found that there is a limited amount of scientific literature available regarding this product. It is likely that a large part of the literature regarding DMN remains commercial-in-confidence.

New analytical method developed

The theory is that a certain amount of DMN is needed in the tubers to stop sprouting so researchers set out to find out how much natural DMN occurred in stored potatoes.

Chemists developed a new method, more than 1,000 times better than the previous detection method which could only sense amounts of DMN up to 0.1ppm. The method confirmed that DMN does not appear to occur naturally in potatoes. However, other plants that produce DMN can contaminate potatoes.

Small scale trials challenging

Having established that DMN probably does not occur naturally in potatoes, the next step was to try to find out how DMN controls sprouting.

However, because DMN was difficult to contain, small-scale trial work was difficult. In the first year of the project, DMN-treated potatoes were stored in a refrigerated container to prevent cross contamination. However, the



Potatoes being treated with DMN



Assistant, Tim Hingston, storing treated potatoes

conditions became anaerobic and many potatoes rotted. In the second year of the project, DMN-treated potatoes were stored in a commercial potato store. However, under these conditions it was impossible to maintain the head space concentration of DMN required for sprout control.

Future product development

It is recommended DMN trials can only be successfully conducted in a purpose built trial facility or in a commercial facility where the whole store is treated with the product to correctly determine efficacy and develop commercial usage patterns. This whole-store treatment could prove prohibitively costly unless a residue exemption is obtained for DMN in potatoes. Future development of DMN for use by potato storage operators will depend on liaison between the Australian Pesticides and Veterinary Medicines Authority and product manufacturers.

Acknowledgements

Funding from Horticulture Australia Limited and D-I-1-4 Inc. is gratefully acknowledged. Many thanks to Forth Farm, Simplot Australia and McCain Foods Australia for assistance with trial work.

Project started: April 2002

Duration: 2 years

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Biodegradable plastics

from Australian potatoes

This study examines the feasibility of producing biodegradable plastics (bioplastics) in Australia from Australian grown potatoes, waste from existing potato processors or from specialised starch potatoes.

It found opportunities exist to establish an industrial starch supply chain in Australia, but operators would need to embrace the latest and most efficient processing and production technology at every stage of the supply chain to competitively grow potatoes for starch in Australia. It may be necessary to encourage a few growers from the Netherlands and Denmark with experience in starch potato production to invest here. An efficient sized potato starch plant (using 2,400t of potatoes/day) operating at 65-70% (200 days/year) capacity would need 450,000 t/year of starch potatoes within easy access of the starch processing plant, to produce 120,000 tonnes of potato starch. Identifying an area that could reliably grow this quantity of potatoes is a challenge, but it seems possible in southern NSW, where suitable land appears to be available and returns from irrigated potatoes would be competitive with other crops. This move would change the structure of the Australian potato industry.

Bioplastics market is growing, but...

The best bioplastics are yet to be discovered, but we expect continued improvement in cost and performance and growth in demand. Bioplastics made from potato starch tend to rate highly in terms of reduced greenhouse gas emissions and improved energy efficiency in life cycle assessments. It is estimated the global market for bioplastics is about 40,000 tonnes/year and growing at perhaps 10%/year. Growth rates are expected to increase over the next decade. The market for bioplastics in Australia is small and undeveloped, but as with other developed economies, market growth is expected to rise in line with a

supportive regulatory environment. The reality is that in 2003 bioplastics account for less than 1% of the plastics market.

In terms of the intermediate market for starch, Australia consumes about 290,000 t/year, 5% of which is imported.

Diverse supply chains for producing bioplastics

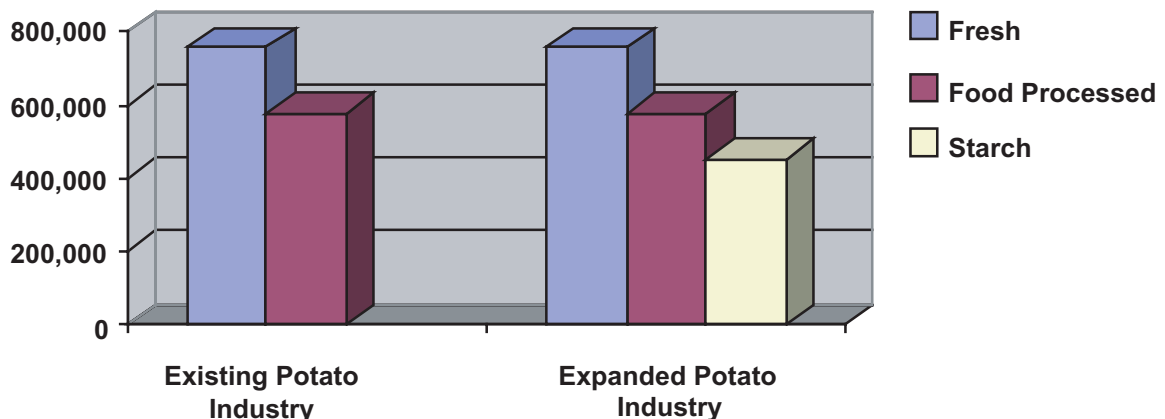
Three different supply chains for producing bioplastics from potatoes are evaluated in this study:

- Specialised potato starch seed plants used to produce starch, part of which is used to make bioplastics.
- Starch produced as a co-product from potato waste streams, peel and seconds, with the starch then used to make bioplastics. This starch could be derived from existing waste streams or from a starch processing enterprise.
- By genetic manipulation, producing polyester directly in the potato plant and manipulating the genetic material to improve starch content and tuber yields.

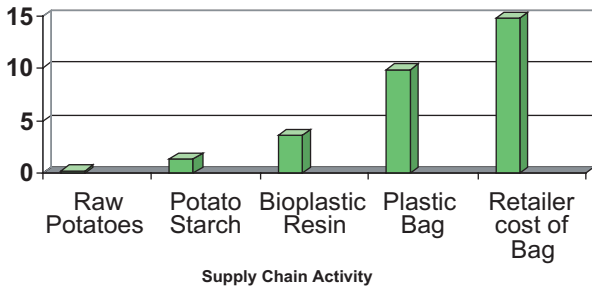
In terms of achieving impact at the farm gate, a high tech starch processing facility, supported by best practice on-farm production, would have the most significant effect. It would also have a major regional impact. An efficient sized potato starch plant would generate revenue of \$150m from 120,000t of potato starch.

If potatoes are to be used for starch and bioplastics in Australia, a program needs to screen and test new industrial cultivars, possibly including genetically modified and traditional cultivars. Suppliers in Western Europe are interested in delivering high quality starch potato seed to Australia. Selection and breeding for adaptation to local conditions would be an important factor in creating an efficient starch-bioplastics supply chain.

Australian Potato Industry: Existing Structure and With New Starch Processing Sector [Tonnes/year]



Adding Value: Raw Potatoes to Bioplastic Bag [\$/kg]



Farm Gate Competition

From a potato producer perspective, it is estimated producers would need to generate revenue of at least \$8,000/ha from the starch potato, otherwise they would not be induced to commit to supply. This can be achieved with a tuber yield of 40t/ha and \$200/t. For the starch processor, however, it could only pay \$200/t or more if the starch yield is 25% or more. The links between buying price for raw potato, starch yield, selling price for starch and earnings for processors are fundamental to viability of the whole supply chain.

With starch available at \$1.25/kg, a blended biodegradable film grade resin could be produced for \$6.00/kg. This should enable a plastic product weighing five grams to be produced for \$0.05/bag, which would be available for the end buyer at \$0.075, after distribution and wholesale margins. While this is still expensive compared to the non-biodegradable plastic bag (\$0.03 or less) it would be competitive with imports.

Waste Streams of French Fry Processors

Waste streams of French fry processors look to have most potential to supply the material for a small bioplastics industry. These firms are already producing some starch from their waste streams, though improvements to technology could improve their capacity.

Three waste-bioplastics processing possibilities were examined. Using the technology imbedded in a product like Solanyl from Rodenburg Polymer's in the Netherlands, a plant with capacity to produce at least 5,000 tonnes/year of bioplastics is needed to get some economies of scale. A 5,000 t/year plant (producing a 50% potato waste and 50% polymer blend) would need about 13,000 tonnes of waste or co-product resource to be blended with additives and purified biopolymer. This volume of waste would seem to be available at one or more processing plants in Australia.

More generally, the viability of existing waste based bioplastics depends in the first instance on their ability to minimise waste treatment costs of processors. The costs of processing, additives and polymer blends to enhance functionality are typically higher than with high quality starches.

Project started: August 2002

Duration: 2 years

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PrimeNotes

(May 2004) – Version 16



PrimeNotes is a CDROM containing 5,250 information notes on a range of topics (including more than 20 notes specifically on potatoes). The Department of Primary Industries and Fisheries, Queensland produce it in partnership with other state departments and organisations around Australia.

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Building West Java crisping potato capacity,

Australian seed potato sales

Australian farmers want to increase seed exports. Indofood, the largest potato processor in Indonesia, wants to improve the productivity of its processing crops. This research shows that both aims may be achieved with improved seed.

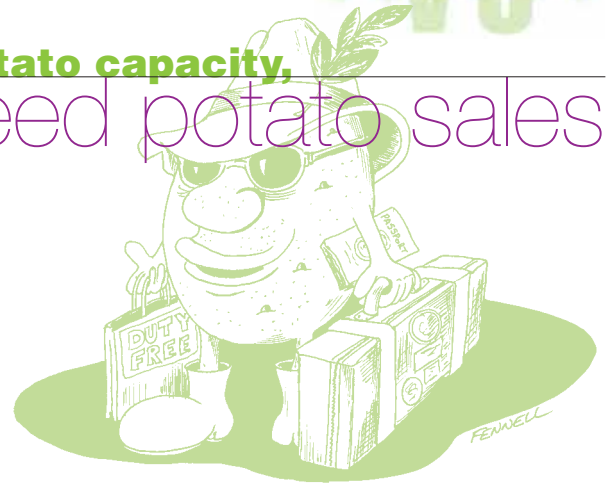
The project is demonstrating the performance of Atlantic seed from Western Australia in West Java.

Cut and round seed were planted at 1500 metres elevation in early 2003 in West Java and their performance compared. Both emerged and yielded well. Emergence from cut seed 40 days after planting was 95% compared with 99% for round seed. The round and cut seed were planted at the same density. Cut seed produced slightly lower yield than round seed, averaging 816 grams per plant compared with 959 grams per plant for round seed. However if cut seed density is increased, yields from cut seed can be expected to increase.

All yields are high for *Atlantic* in Indonesia, equating to about 27-32 t/ha, based on a density of 33,000 plants per hectare.

This finding that freshly imported cut seed performs well is important. Indonesian farmers like very small seed because it reduces planting costs as a larger area can be planted per kilo of seed. Australian seed producers cannot supply this favoured, small seed. However Australian seed growers may be able to supply a larger seed sample that can be cut to make it just as attractive as smaller seed.

A second planting is now underway. When these trials are harvested we will have the knowledge to improve seed supply to various production areas in West Java. Indofood productivity should increase and this should lead to increased seed sales for Australia.



Project start: September 2002

Project duration: 2 years

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Strategy to manage viruses from certified seed potato stocks

A survey of Tasmanian seed potato crops in 2003 identified potato virus S (PVS) at moderate incidence and potato virus X (PVX) at very low incidence. These viruses commonly occur in potatoes in other parts of Australia, except Western Australia where material is laboratory tested as part of the certification scheme. Both viruses are contact transmissible, but some PVS strains are also transmitted inefficiently by some aphid species. Strains of PVS and PVX in Tasmania are virtually symptomless and preliminary work suggests they have little impact on potato yields. However, the poor symptom expression means that they are easily overlooked during visual inspections for certification. In 2003, Tasmanian seed potato sent interstate was laboratory tested for PVS and PVX to ensure it met the requirements of

the National Standard for Certification of Seed Potato. It therefore underwent a higher level of scrutiny than seed in most other states. Steps are being taken to eradicate virus from Tasmanian seed potato crops.

This was a one year project funded by Horticulture Australia on behalf of the potato industry and Commonwealth Government and Tasmanian Institute of Agricultural Research, University of Tasmania.

Project started: February 2003

Duration: 1 year

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New-tech Seed Management Service for Tasmanian seed potato growers

A grower directed Seed Management Service (SMS), is using the latest irrigation, plant nutrition and disease control strategies to reduce crop stress and improve the yield of quality seed.

Seed potato growers are working with researchers to collect, record and analyse key crop data. The lift in seed grower performance has provided Simplot Australia with a surplus of quality certified seed for the first time in memory in 2002-03 and 2003-04.

Early outcomes

Tasmanian potato seed growers have been quick to make changes in response to trends emerging from the collective data. Seed crops are now being planted much later and harvested earlier than before. This change has been made to successfully reduce crop rejections due to common scab and to lower the physiological age of *Russet Burbank* potato seed. Attention is being given to crop management, with improvements being made to irrigation, plant nutrition and disease control strategies to reduce crop stress.

SMS aims

The SMS service aims to:

- promote new technology for seed potato crop management
- encourage the widespread use of agronomists and consultants
- combine, analyse and extend key data on seed crop production (irrigation, plant nutrition, pests and diseases) for the benefit of all growers.

The process

A steering committee represents growers and provides direction for development of the service. SMS has been well received and strongly supported by industry. The full service was provided to 31 potato seed crops in 2002-03, which rose to more than 50 seed crops in 2003-04.

Small group workshops have been conducted with seed growers to discuss major findings of the 2002-03 season and will soon be repeated for results of 2003-04. The major findings are also relevant to Tasmanian processing potato growers and have been communicated through publications and workshops.

Project started: July 2002

Duration: 3 years

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Seed growers, Troy and Ian Wright examine grower seed lines at Rianna, Tasmania, with Scott Morris (centre), Manager, Simplot Farming.

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Minimising virus infection in early generation seed potato crops

Based on a survey, the new certified and registered seed potato scheme is successfully controlling all major viruses found in Western Australia, as well as improving infection with PLRV, TSWV and incidence of PVS and PVX

Twenty one generation 2 sown seed potato crops were sampled and tested for five major seedborne viruses: potato leaf roll virus (PLRV), potato virus Y (PVY), tomato spotted wilt virus (TSWV), potato virus S (PVS), potato virus X (PVX).

Key findings

An average of 497 plants were tested per grower. The survey showed only 139 positive results for all viruses from 10450 plants tested. No virus was detected in seven crops. The most prevalent viruses detected were PLRV and TSWV (66 and 64 infected plants respectively), followed by PVS (five infected plants from three growers) and PVX (four infected plants from one grower). PVY was not detected.

Potato Leafroll Virus was found to be under control in both seed schemes. However, it was detected at eight of the 21 properties, underlining the need for growers and seed certification inspectors to remain vigilant.

Hidden symptoms

PVS and PVX symptoms are practically invisible in the summer production period. Both were non-existent in certified and registered seed schemes and showed a vast improvement on the 1987-88 survey (Wilson & Jones, 1989) from the Albany swamps, with PVX infecting 73% of plants and PVS infecting 55%.

Three serious virus outbreaks of virus were detected, two of PLRV and one of TSWV. Crops exceeding critical levels of virus were rejected from the seed scheme preventing serious losses in larger future generation 3 (G3) sown seed crops.



Mark Holland monitoring aphids on a seed potato crop

Standards proposed

The results of the PVS and PVX testing propose the introduction of standards to enable rejection of crops identified with excessive levels. Continued testing to identify disease outbreaks could see these viruses almost eliminated from the Registered Seed Scheme in the near future.

The methods used so effectively in Western Australia are being studied by seed schemes state wide through the Seed Potatoes Australia Group (SPAG) and in Tasmania where a survey has shown seed to be seriously infected.

The results of the PVY testing considered by the Department determining to undertake an eradication campaign when PVY was subsequently detected in breeding plots.

Project started: July 2002

Duration: 18 months

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Identifying variability across seed potato blocks using precision farming technology

A pilot program looked at identifying the variability across seed potato blocks using precision technology.

Multi-spectral imagery at one metre resolution was taken from a low flying aircraft and compared to an electro magnetic survey and deep core soil samples on ground.

An agronomy package is being developed based on the trial results. Early indicators are that large yield increases are possible through irrigating efficiently on identified different soil types in a single paddock.

Further work is required to build a broader data bank and fully evaluate the potential of precision farming technology.

Project started: September 2002

Duration: 1 year

This project is jointly funded by HAL and the Crookwell Potato Association.
GARRY KADWELL
 Crookwell Potato Association
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Nitrogen dynamics in

commercial seed potato crops

The nutrition of each seed potato crop has to be managed according to its own site-specific history, crop removal figures and monitoring results from soil and plant tests, rather than following production recipes.

Monitoring soil nitrogen levels and adjusting fertiliser applications according to a nitrogen budget will lead to a more balanced nitrogen supply throughout the season.

Improved management guidelines have been developed for site-specific nitrogen management of seed potato crops using real-time monitoring tools. Guidelines were established by investigating the relationship between soil nitrate nitrogen, plant nutrient levels and seed quality/performance. Nitrogen mineralisation patterns were studied in seed potato crops grown in soils with high and low organic residue levels.

The project also investigated effects of high nitrogen levels in mid summer, caused by nitrogen release from pasture residues, on storage and performance of seed potato crops. Nitrogen from mineralisation and fertiliser carryover from the previous season can influence a crop by producing unexpected nitrogen flushes, which may affect tuber set, and seed performance. Nitrogen extremes may also lead to growth spurts resulting in deficiencies of other nutrients, as well as higher susceptibility to foliage diseases. On the other hand, nitrogen deficiency at any time will be detrimental to yield.

The test for monitoring available soil nitrogen levels, *N-check*, was adopted from Europe, where it is the recommended method to manage nitrogen inputs into crops

to improve yield and quality and avoid environmental problems through nitrate leaching into waterways. The test for monitoring nitrogen uptake into the plant, *NU-test*, analyses nitrate levels in petiole sap and shows current nutrient uptake, reflecting availability in the root zone and uptake conditions.

Project results show that the crop preceding potatoes influences soil, plant and tuber nitrate levels. However data did not allow analysis of nitrogen and other factors in relation to stem or eye numbers and harvest assessments. It did show seed crops were, at times, under or oversupplied with nitrogen. Levels were less than 50 kgN/ha to more than 500 kgN/ha, depending on paddock history and sampling time.


The project report, available from HAL, provides a calculation of nitrogen fertiliser requirements (N-balance) based on a draft nitrogen budget for seed potatoes.

Project start: December 1999

Duration: 3 years

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Effects of potato seed characteristics on seed-piece breakdown and poor emergence

A feasibility study was conducted to investigate the potential of various measurable tuber seed properties, including specific gravity, nutrient elements, skin firmness, wound healing, and susceptibility to dry rot as indicators of seed quality and field performance.

Sixty seed lines including 58 *Russet Burbank* and two *Ranger Russet* were examined in the laboratory and field.

There was a positive relationship in yield between the percent of large tubers from a field trial and total nitrogen and phosphorous levels in laboratory tests. There was also a decrease in the susceptibility of tuber seed to *Fusarium* dry rot with an increase in nutrient levels of total nitrogen and


magnesium, as well as improvement in skin firmness. Calcium levels in tuber seeds had no direct effect on skin firmness. The specific gravity of the seed tuber was related to its potassium level, but had no direct impact on subsequent potato yield.

Project started: 2002

Duration: 2.5 years

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Your Levy @ Work

Seed potato handling and storage

– implementing best practice

A do-it-yourself manual based on feedback from seed growers, handlers and storage operators will help all involved recognise, assess, prevent and manage the different handling and storage risks.

The project team surveyed seed potato storage operators, processing and ware potato growers, consultants, Industry Development Officers and processors in Victoria, Tasmania, New South Wales, South Australia and Western Australia. Store visits and phone discussions/e-mails provided a good understanding of the variable seed potato handling chains, from seed potato paddock to commercial paddock.

Priority list of issues based on feedback

The survey uncovered several storage and handling issues that needed addressing. They were (in priority order):

- **Seed quality issues**

1. Curing
2. Cool storage
3. Hygiene

- **Seed industry issues**

1. Documentation (seed production and handling history, seed lot labelling, etc.)
2. Communication (seed grower – seed store operator – transport operator – ware or processing crop grower).

Priority has been given to including in the manual:

- self-assessment and troubleshooting/hazard warning sections to allow operators to rank activities with greatest potential effect on seed performance
- preventative, corrective or alternative actions when best practice has not or could not be followed
- colour coding /symbols for different operators and activities
- tables, diagrams and photos
- checklists, work instructions and record sheets that can be either copied or even removed for display
- the option of using the manual to develop or improve *HACCP based Quality Assurance systems
- simple explanations of essential physiological processes and diseases/disease prevention.

The manual will deal with a range of issues. They include:

- what can go wrong - risks associated with different activities
- how to prevent problems, risk management – how to prioritise and focus on issues that potentially cause the biggest losses/problems
- what to monitor to identify and prevent problems
- specifications (which conditions to aim for and how to go about it)
- how to pick and choose options for existing storage/handling operations.

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Major seed handling and storage issues identified during industry consultation

ACTIVITY	OPERATOR	ISSUES
Plan and prepare for harvest Harvest Holding seed in paddock prior to transport Transport to seed or commercial grower for curing, grading or storage	Seed grower or Harvest contractor or Transport contractor	Machine maintenance, bin availability, labelling and hygiene, damage, disease, soil moisture, bruising, soil on tubers and in bins, timing in relation to haulm kill/maturity, in-ground storage, soil temperatures Sun burn, soil drying on tubers, rain Extreme temperatures, lack of airflow under tarps or in bulk-a-bags leading to sweating and suffocation, documentation, load ID
Management of seed on receipt Plan and prepare for curing Curing (before or after grading) Prepare for grading Grading	Seed grower or Commercial grower or Contracted cool store operator	Airflow, temperature fluctuations Space, hygiene, time to load store, equipment, ventilation/air circulation, temperature, humidity, condensation, isolation of (diseased) batches Line maintenance, hygiene, capacity, bin availability and labelling, dust extraction, waste removal, quality control, mechanical damage, bruising
Plan and prepare for storage Holding prior to storage Chemical treatment prior to storage Ambient storage	Seed grower or Commercial grower or Contracted cool store operator	Hygiene, capacity, compatibility with other stored products, equipment maintenance, airflow/ventilation set up Extreme temperatures, lack of airflow, sweating Wet tubers Head space, isolation of crops, temperatures, ventilation, air circulation, light, aphid control, rodent control, bin location plan
Cool storage Warming up ex cool store	Seed grower or Commercial grower or Contracted cool store operator	Head space, temperature, chilling injury, ventilation/air circulation, atmosphere (O ₂ , CO ₂ , Ethylene), humidity, condensation, bin location plan, isolation of crops, aphid control, rodent control Space, timing, airflow, temperature control
Chemical breaking of dormancy Sprout removal Pre-sprouting	Seed grower or Commercial grower	Tuber age, planting time Timing, temperature, exact planting time Grading after storage Bruising, hygiene, shoots
Seed cutting Pre-plant seed treatment Holding of cut and treated seed (planting delay) Transport to paddock	Seed grower or Commercial Grower or Contractor	Hygiene, suberisation, seed piece size, eye number per piece Chemical selection, application technology Airflow, humidity, seed piece breakdown Sweating

Your Levy @ Work

Best production and storage

for seed potato quality

How do you produce the best quality seed tubers? Many aspects of seed crop management and the growing environment are thought to affect seed quality. Time and temperature in storage are also known to impact on seed physiological age. This project has been examining seed production and storage conditions to identify areas with the greatest impact on seed performance.

Two aspects of management shown to affect tuber physiological age are time of haulm kill before harvest (early haulm kill can improve seed performance) and exposure to high concentrations of carbon dioxide in storage (decreases seed performance). Planting conditions also have a strong influence – differences of more than 50% in stem numbers

per plant have been recorded for the same seed lot planted on different dates or at different sites.

Assessment of the relative contribution of seed production and storage factors, planting environment and ware/processing crop production practices on seed performance will be available at project end.

Project started: October 2002

Duration: 3 years

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Certified seed collection

ensures public varieties keep performing

Commercial growers need vigorous true-to-type seed to have the best chance of achieving high yields of quality potatoes. To ensure ongoing access to good seed of public varieties, a collection is maintained by ViCSPA on behalf of the Australian potato industry.

Commercial growers need vigorous true-to-type seed to have the best chance of achieving high yields of quality potatoes. To ensure ongoing access to good seed of public varieties, a collection is maintained by ViCSPA on behalf of the Australian potato industry.

The collection is used for all seed schemes in Australia and is held *in vitro* at Primary Industries Victoria's research centre at Knoxfield with a duplicate collection at Toolangi. The Department of Primary Industries Water and Environment, Devonport, Tasmania also holds some public varieties *in-vitro*.

Conceptually the project aims to minimise the risk of off-types being multiplied in seed schemes, and each year to refresh the *in vitro* cultures of five varieties. Some of these varieties have been in culture for many years.

Each year, six to 10 mini tubers from each accredited laboratory are planted in field plots to check the plants produced are true-to-type. The plots help identify off types or mutations and variety mixes. This year 208 plots were grown. During growth and at harvest, all plots are closely checked for variations. This year, two plots were found to have a mix and one was labelled incorrectly at packing. The respective laboratories were notified so the G1 plots could be checked.

Each year, plants of five varieties are selected for re-testing (re-indexing) for diseases and DNA fingerprinting. The varieties are also checked to ensure they are free from *Bacillus*, which can contaminate cultures. These five varieties are then added to the *in-vitro* collection.

The aim is to refresh the whole *in-vitro* collection every eight to 10 years and ensure the best types and vigorous seed of each public variety are available to industry through state certified seed schemes.



Produce from one minituber of Ranger Russet



ViCSPA's Accreditation Officer is checking for trueness to type in plots. He also reports on minituber performance to supplying laboratories.

Status of variety selections

Ready for release

The following varieties were selected in 2001 and are ready for release to accredited laboratories. They are *Atlantic* (to be known as *Atlantic Line C*), *Sebago* (*Line E*), *Bison* (*Line C*), *Bintje* (*Line B*) and *Coliban* (*Line C*).

Varieties selected in 2002 are also ready for release. They include *Exton* (to be known as *Exton Line E*), *Kennebec Line 2* (*Line 2 (b)*), *Kennebec* (*Line D*), *Snowgem* (*Line B*) and *Trent* (*Line B*).

Red La Soda, *Sequoia*, *Shepody*, *Spunta* and *Wontscab* have been sent to Knoxfield for pathogen testing after selection and harvest in 2003.

Selections for 2004 include *Desiree*, *Crystal*, *Ranger Russet*, *Simcoe* and *Pontiac*.

The research is undertaken by ViCSPA with assistance by Primary Industries Victoria and is funded by Horticulture Australia.

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Induction program for new certified seed potato growers

This induction program introduces new certified seed potato growers to the industry. It instructs new growers, their staff and family members on seed production history and principals, the basis of modern seed schemes and rules and processes for Certified seed production.

This year, Induction programs were held at Kangaroo Island, South Australia for four growers, their staff and families and at Warragul, Victoria for eight participants.

The program is based on a powerpoint presentation and Seed Growers Handbook, which summarises the course material, industry processes and some pre-existing ViCSPA protocols.

The induction workshops will continue to be part of the ViCSPA communications strategy. Every new grower will be required to attend a workshop. New staff members from existing growers/companies will also be targeted to attend.

Project start: July 2003

Duration: 4 months

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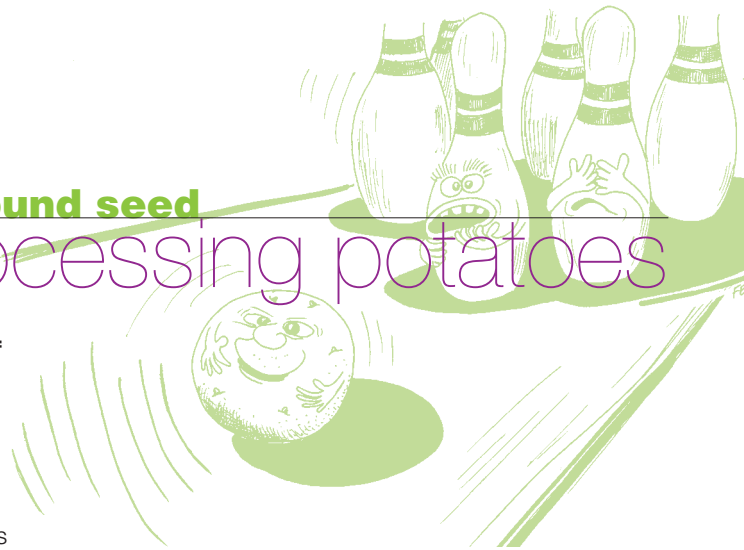
Blueprint for using whole, round seed for processing potatoes

The likely benefits to French fry processing growers of growing round rather than cut seed include better, more uniform and reliable yields bringing greater returns. This project analysed the growing conditions, seed densities and price these seed growers required to successfully grow round seed rather than cut seed.

Seed quality and planting efficiency are key factors influencing yield and returns for processing potatoes. Many seed lines contain tubers that are too large for efficient machine cutting, resulting in blind and misplanted setts. Under certain soil and environmental conditions, the cut seed surfaces can break down, resulting in poor stands, misshapen tubers and low yields.

This project investigated how use of round seed would benefit the processing French fry industry in Australia. Potential benefits of round seed to processing growers include more reliable yield, size uniformity and higher returns. Potential benefits to the processor include more uniform raw material, greater predictability of yield forecasting, higher factory recovery rates and lower per unit costs. However, for processors and their suppliers to achieve these gains, the seed grower must be able to successfully grow round seed profitably. The results of this project show how seed growers can maximise yield of round seed and the price needed for profitability. It also reports the conditions under which processing growers can afford to use round seed.

To evaluate how seed growers could successfully grow round seed, five Tasmanian field trials were conducted from 1999-01 to 2002-03 on red ferrosol soils at Riana and Forth in the North-West Coast and on duplex soils near Cressy in the Northern Midlands. At all sites, cut setts produced higher yields of total tubers or round seed tubers than whole setts. Round seed in trials was defined as tubers with a width range of between 30mm and 60mm and a maximum length of 85mm. Under good growing conditions, similar yields could be expected irrespective of whether cut setts or whole setts were used. As crop rotations and hygiene conditions for seed crops are more demanding than for processing crops, it was concluded growers should establish seed crops by adopting the cheaper method of using cut seed.



Forthside - general trial view

With the exception of Cressy in 1999-2000, increasing density from 1.5 to 20 setts per square metre had no effect on total yield but significantly increased round seed yield and tuber number. The highest yield and number of round tubers occurred at the highest density trialed at each site. However, in most situations there was no economic advantage in exceeding a sett density of 6.5 per m². 6.5 setts per m² is very close to the average density currently used by Russet seed growers.

High seed densities work

If seed growers want to maximise round seed yield, a density of at least 20 setts per m² is necessary. This would require more seed at an increased cost and to compensate for these extra costs, a premium price is required.

The required premium has been calculated to enable the gross margin of a seed crop to be the highest at 20 setts per m² and enable the grower to make at least an extra \$500/ha higher gross margin using a sett density of 20 setts per m² than at 6.5 setts per m². \$500 represents an allowance to cover additional interest costs on the extra seed planted compared to the normal density of around 6.5 setts per m² (an extra 8.7 tonnes per hectare of seed) plus associated costs of storage, cutting, treatment and transport, at 10% interest for an average of 11 months.

Using this criteria, the premium price required for round seed produced on ferrosol soils is 35% and the same for round seed grown on Cressy soils is 180%. This equates to an effective round seed price of \$450 /t and \$940 /t respectively. The higher premium calculated here for Cressy-grown seed is due largely to a tendency to produce higher round seed yields at lower densities than on ferrosol soils. A higher premium is therefore required to satisfy the criteria set above.



Leon Hingston taking emergence counts

John Maynard, Rowland Laurence and industry representatives inspecting harvest



Calculated Premium Round Seed Price	Riana, Forth (Ferrosol)	Cressy (Duplex)
Increase Over Existing		
Effective Certified Price*	+35%	+180%
Effective Price per Tonne	\$450	\$940

* Compared to the 2002-03 effective contract price of \$335 per Tonne

Variable response

These results indicate that the response of *Russet* crops to different densities can vary from one location to another. They suggest that production of round seed in Tasmania should probably be centred on the ferrosol soils on the North-West Coast in preference to the duplex soils near Cressy.

If round seed is used at the same sett density as cut seed, processing growers suffering yield losses of 8.5% or more could afford to pay \$450/t for round seed. However, round setts generally produce fewer stems than cut setts. To make a more accurate comparison, a re-calculation is needed at the same stem density. More seed is needed per hectare to produce the same stem number, meaning processing growers can afford to pay less for round seed.

Under these conditions, processing growers suffering yield losses of 20% or more could afford to pay \$450 /t for round seed. However, if growers are confident that round seed will prevent yield reductions, \$450 /t for round seed is still a relatively cheap price to pay.

Project started: July 1999

Duration: 4 years

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The 5th World Potato Congress, held in Kunming in southwestern China, March 2004, was postponed from its original date in 2003 due to the SARS virus scare. Thirty Australians attended and nineteen continued on the post conference study tour. Kunming, the capital of Yunnan province, has a population of about five million people and the city is the centre of a large potato producing area. The local farmers association is reported to have 1.3 million members. China produces 65 million tonnes of potatoes, (about 43 times as much as Australia), making it the world's largest producer. The congress attracted 1100 delegates from 43 countries. Attendees included growers, marketers, researchers, government officials and suppliers of goods and services to the industry.

Chinese officials place high emphasis on potato production and saw the conference as an opportunity to showcase their industry and attract foreign investment. The Chinese industry is not without its problems, with yields averaging only 13.7 t/ha, about one third of Australia's average. Many opportunities exist for Australian companies particularly in the area of new seed production technologies. China is also keen to foster relationships with research and development (R&D) organisations.

Conclusions and recommendations drawn from the conference are:

- The potato industry worldwide needs to look to the future and identify pertinent issues such as environmental management systems, genetically modified organisms and integrated crop management. It will then be possible to pinpoint strengths and weakness in the industry and plan to adapt.
- Breeding programs need to incorporate these trends and in particular address climate change.
- Experiences in erosion control and certain practices employed on Prince Edward Island may apply in Tasmania and certain areas in Victoria.
- Public awareness on use of chemical crop protectants is increasing so environmental friendliness of protectants will become more important.
- An opportunity exists for Australia (and Tasmania) to take advantage of its planting season to supply seed to some south east Asian regions. Appropriate marketing of Australian seed will widen these opportunities.
- The fresh market industry in particular needs to focus on changing consumer trends to halt decline in fresh consumption.
- Marketing of potatoes in the UK could act as a model for Australian potato promotion.





- Use of computer technology in potato production is increasing rapidly. Information systems such as quality assurance, environmental management systems and integrated crop management are becoming the norm and technology is improving flow of information.
- The market for potatoes in China is evolving rapidly. Already the largest producer and consumer of potatoes in the world, China's demand for processed potatoes is exploding. However, efficiency of production is still low with yield averaging only 15 t/ha for processing crops. Opportunities exist for technology transfer in agronomy and the processing industry.
- Viral contamination and poor control of seed handling and storage in China are areas of greatest concern and Australia has considerable expertise.
- China is keen to develop ties between the Australian industry and their growers to develop their expanding industry.
- Global climate change will present new challenges to the industry and predicting these changes will be critical in allowing industry to adapt.
- Climate change predictions indicate Tasmania will suffer relatively little, losing 0% - 10% average yield in the next 50 years (a considerably lower impact than predicted for other states and countries). These changes may create opportunities for the local Tasmanian industry if production shrinks in other areas.
- Australia needs to focus on breeding and/or selecting varieties with shorter growing seasons, greater heat tolerance and lower water requirements.
- In agriculture in general, we need to further focus on water use efficiency, as supplies will only get tighter in the future. It is likely the environment will be the big loser as the climate dries out.
- Greater preparation for incursion of the sexual strain of late blight is required now, before the disease appears.

- Worldwide, there appears to be a shift from fresh potato consumption to processed. Australia lags behind Europe in development of value added products and needs to establish pre-prepared potato products.
- Australian R&D and industry organisations need to link better with international organisations such as the British Potato Council to benefit from their experience in product development, marketing and R&D.

For a full report on the conference and tour contact John Rich TFGA House, Crn Cimitiere and Charles Sts, PO Box 193, Launceston Tasmania 7250 Tel 03 6331 6377

The delegates thank HAL for contributing funds to the conference tour.

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International R&D workshop and industry extension

meetings on common scab disease

The 13th International Symposium on the Biology of Actinomycetes was held in Melbourne, December 2003.

This international meeting brought together leading scientists from around the world who work with actinomycetes in agricultural, environmental, medical, and pharmaceutical context. Given the agent of common scab disease is an actinomycete, a special workshop session on the disease was included in the program, as well as industry focused seminars involving the world's best scab researchers.

A successful half-day scientific session was held in early December where overseas delegates presented the latest findings in common scab research. The presentations covered varying studies including the evolution of pathogens and their incidence (and why there are so many of them in our environment), development and screening for resistance, detection of the pathogen in soils, soil factors associated with disease and control, and basic research on pathogen and its interaction with the potato host and the consumer. The meeting was valuable in cementing relationships and collaborative linkages to advance work to defeat common scab.

Following the conference, two industry workshops were held, one at Knoxfield in Victoria the other in Devonport, Tasmania. Key international speakers presented to an industry audience a summary of their experiences and current research outcomes, with an opportunity for audience members to share their experiences at the end. In Tasmania, overseas guests visited a typical north west potato farm and toured the Simplot French fry processing plant in Ulverstone.

Acknowledgements

Special thanks go to Dolf deBoer and his Institute of Horticultural Development / Department of Primary Industry colleagues and to Iain Kirkwood (Tasmanian Department of Primary Industries, Water and Environment) for their support and tremendous input into the organisation of the Melbourne and Devonport sessions, as well as local industry and researchers who participated in the three sessions. PowerPoint presentations at the industry sessions will be available either as printed copy or on CDROM. To obtain copies, please contact:

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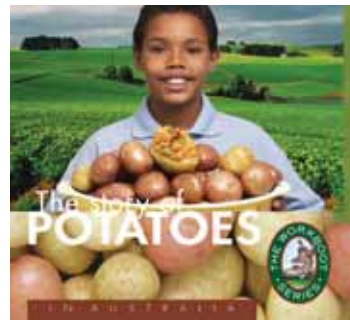
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The story of potatoes in Australia

The Workboot Series - The story of potatoes in Australia has been completed. The high-quality, 68-page hardcover educational resource covers in detail Australian potato production. The book follows the standard format of Kondinin Group's award-winning series of Workboot Series texts and covers the five areas of potato production - source, producer, product, consumer and the environment.

Publications such as these require input from many people working in the potato industry and the support provided has been excellent. For all who have provided information, supplied photos, allowed us to take photos of their operations or checked sections of the book - Thank You! Particular thanks go to Stephen Wade and Leigh Walters for their extensive copy, photographic and editing inputs.

The book aims to address, in part, the lack of well developed and presented educational materials for children of primary and secondary school age and their teachers and families.



Direct mail campaign

A direct mail campaign to schools across the country and a national launch are planned for September/October. Ongoing marketing will be through state education department newsletters, Kondinin Group publications and trade magazines.

An order form is enclosed for those interested in purchasing a book.

If you have city friends, the book makes a great birthday or Christmas present for children. Many adults will also find the book very interesting!

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Achievements of the WinHort program

The Women in Horticulture (WinHort) program continues to work to fulfil horticultural women's personal and professional goals and benefit industry through their greater contribution.

WinHort is led by Cathy McGowan and guided by a national advisory committee made up of regional and industry representatives with a range of complementary skills.

WinHort program achievements since its start in the Year 2000 include:

- an Order of Australia award to Cathy McGowan for her work with women in regional communities
- development and delivery of the National WinHort Training Meeting, Hobart, May 2003
- WinHort email discussion group with more than 300 active participants and national distribution of a Winhort brochure
- WinHort groups offering training and mentoring established at state/regional levels in Tasmania, South Australia, Victoria and New South Wales, and progressing in other states
- leverage through State FarmBi\$ to participate in registered skill development activities
- support / assistance with the International Rural Women's Congress, Spain, October 2002 horticultural study tour and South East Asian processing tomato and fresh stonefruit women's study tour
- networks with related state / national government, industry and community groups
- presentations to the Australian Potato Industry Council, AusVeg, Queensland Fruit and Vegetable Growers, Nursery and Garden Industry Australia, Australian Citrus Growers, Strawberries Australia, SnackFruit Australia Conference, Australian Mango Industry Conference and HAL Industry Development Officers/Managers
- relationships with Woolworths, South Australia Food strategy, Rural Womens Networks and FarmBi\$.



Cathy McGowan (L) and Anne Ashbolt



Delegates at the WinHort National Training meeting, Hobart 2003

Women in the potato industry interested in being involved in WinHort program activities should contact Libby Abraham or Cathy McGowan, WinHort Project Leader, Ph: 02 6024 6834 or email cathy@cathymcgowan.com.

The program is supported by HAL and significant in kind support is provided by industry.

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TRAINING: Horticulture Australia chairwoman Dr Jane Wilson and WinHort program manager Libby Abraham at the recent WinHort national training meeting.

Forum looks at women's roles

BUILDING the personal confidence to join committees, boards and industry organisations was identified at the recent Leading the Future conference in Hobart as one of the keys to increasing women's participation in decision making in the horticulture industry.

Leading the Future was the first national training meeting for women in the industry.

More than 70 professional horticulture industry businesswomen from around Australia took part in the conference.

Many Tasmanian and Australian horticultural identities led discussions on leadership, marketing and personal development, developing a horticultural enterprise, funding opportunities and media skills.

Keynote speaker was Horticulture Australia Ltd chairwoman Dr Jane Wilson who suggested practical steps to get more women involved in state and national advisory roles. Dr Wilson sits on six boards.

Within the horticulture industry only 7 p.c. of positions on boards and in industry groups are filled by women.

Dr Wilson suggested women take the first step to taking up a board position by benefiting from the training opportunity offered by joining committees.

WinHort is a joint project of Horticulture Australia and various horticultural industries. It aims to encourage personal and professional development among women in the industry.

Ultimately, the project aims to increase the involvement of women in decision-making positions.

WinHort project leader Cathy McGowan said most horticultural businesses were run by families, yet few women were taking up decision-making roles.

The feminine future of horticulture

TASMANIA will host the first national training meeting for Women in Horticulture from May 12 to 14, the

hort Advisory Committee, Amabel Fulton, said more than 50 women from all over Australia are expected to take part.

"Women in Horticulture is a 'growing' movement throughout Australia and participants in regional activities to date have exhibited great enthusiasm in the program," Ms Fulton said.

Carmen Formosa, Executive Officer, Murrumbidgee Horticulture Council said a number of women from the Murrumbidgee region were looking to travel to Tasmania for the conference.

The event will involve a number of interstate speakers

on leadership, marketing and personal development. Tasmanian women and guests will provide training workshops across a range of topics such as marketing, managing people, developing a new horticultural enterprise, funding opportunities available to horticulture, representing your industry and working with the media.

The major sponsors of the event are Horticulture Australia and FarmBi\$.

Those interested in attending should contact Carmen Formosa at the Murrumbidgee Horticulture Council 6964 2420.

Page 10, "The Area News" Monday, March 31, 2003

The Mercury Newspaper

Cover crop practices to minimise

fertiliser input, erosion and water run off

Scientists and growers are developing cover crop practices in the Robertson district to decrease fertiliser costs and environmental impact.

The Robertson area of NSW is characterised by high rainfall, rolling hills and iron rich soils (*ferrosols* or *kraznozems*). The highly weathered soils of this region can fix large quantities of phosphorus (P) making much applied P fertiliser unusable by potato crops. To compensate, growers apply large quantities of fertiliser for a small return in plant use. This leads to build up of soil P that is not accessible by many plants.

New cover crop practices

Cover crops, including white lupin and rangi rape (a *Brassica*), can be expected to accumulate soil P, making it available to potato crops and therefore decreasing erosion and offsite transport of P into waterways. If successful, the changes should greatly improve environmental management of the Wingecarribee catchment area, south of Sydney, by reducing P loading of the soil.

Soilborne diseases such as *Rhizoctonia* are also a problem for potato growers. Historically, soil fumigants have been used, which are detrimental to the environment. More recently, use of plants as biofumigants has become more common. Rangi rape is an example of a plant with biofumigation potential. When grown as a companion crop with white lupin, it should capture P released from the soil by the lupin.

Trials

Experiments show cover crops of white lupin and rangi rape, when used as green manure, potentially reduce the mineral fertiliser needed for a potato crop. Both greenhouse and field based trials will examine these cover crops to maintain potato quality and yield, while suppressing incidence of soilborne diseases.

Preliminary greenhouse studies using two soils collected from the region have shown that while a large amount of P exists in the soil (1600 and 2500 mg P/kg of soil), it is not accessible by cover crops such as rangi rape and oats. Growth of these two species was slow and showed P deficiency within weeks of emergence. Other experiments will look at organic and inorganic P distribution through the soil when amended with green manure; the pools of P various cover crops and potatoes use in the soil; and the potential of soil applied citric acid to reduce P required by various crops.



Rangi rape brassica, white lupin (Kiev), lupin / rape combination and Blackbutt oat cover crops used in the phosphorous management study

Importance to growers

Positive results will mean decreased P fertiliser costs and environmental impact – especially on waterways, while maintaining yield. Other benefits include fodder for cattle, increased organic matter and decreased erosion during rainfall. Results from these trials will be relevant to other potato producing areas on ferrosol soils, including Ulverstone (Tasmania), Toolangi (Victoria), Guyra and Dorrigo in NSW, as well as other areas with P fixing soils (such as *red chromosols*).

This research is funded by the Australian Research Council – Linkage Grant, Australian National University, CSIRO, the Sydney Catchment Authority and growers from the Robertson District Potato Advancement and Land Care Association.

Project start: July 2003

Project duration: 3-3.5 years

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