potatoes australia

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October 2009

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John Cresswell

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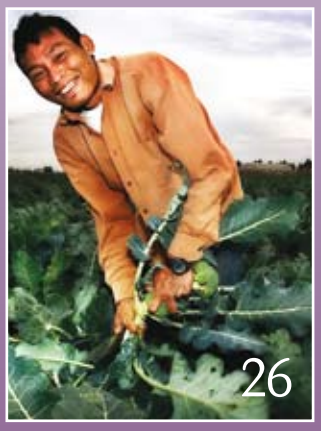

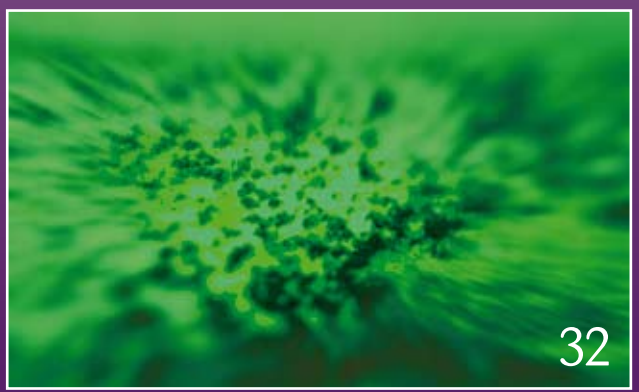

News & Views

Spudscape

Regular Items

potatoes australia

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All research and development projects are facilitated by HAL in partnership with AUSVEG and the PPAA and are funded by the National Potato Levy and/or voluntary contributions from industry. The Australian Government provides matching funding for all HAL's R&D activities.
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Cover image:
John Cresswell on his farm in Branxholm, TAS.
Photo by Mark Seaton

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Graham Ramsay. *Carrington Farms Bundaberg – QLD.*

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AUSVEG Chairman's message

The challenges continue for potato producers. The country continues to be battered by extreme weather conditions that have brought floods to Tasmania and blanketed parts of NSW and Queensland with dust, and there is continued pressure from overseas countries in the area of potato imports.

Despite these harrowing conditions, there are positive signs.

Our researchers are collaborating on a number of international efforts to beat disease and pests, such as rhizoctonia, as well as the potato psyllid which has been hampering production schedules in New Zealand for the past year.

These initiatives say a great deal about the research richness of the industry, and the scientific inroads they are continuing to make.

The efforts to ease some of the hardships are continuing in other areas as well, with an intensified focus on reaching consumers, supply chain partners and the political sphere.

Our news reports and feature articles in this edition (see pages 22-23) show how our growers and other industry representatives are getting behind efforts to promote the versatility of potatoes as a food and increase public awareness about how they are grown.

Here at AUSVEG our advocacy initiatives have included the establishment of a strong industry-enhancing partnership with Elders Australia, and our presence at the recent Horticulture Leaders Summit in Canberra, which I attended together with CEO Richard Mulcahy.

We were able to meet with key decision makers and industry leaders and put forward the concerns that are of high importance to growers, such as trade and country of origin issues.

Finally, Horticulture Australia Limited has consolidated its commitment to invigorating the horticulture industry, with the appointment of a new CEO and the establishment of new service areas. AUSVEG looks forward to continuing to work together with HAL to improve the outlook for our potato and vegetable industries.

As such, I would like to take this opportunity to welcome and congratulate John Lloyd on his appointment as the new CEO for HAL, and also welcome new Industry Services Manager for the potato program, Stuart Burgess.

John Brent
AUSVEG Chairman

Editor's message

The past few months have brought several tenacious people to our attention.

There was Jack Dunnett, a world-famous breeder who twice telephoned all the way from Caithness, Scotland—at two a.m. Scottish time—to share his enthusiasm and years of potato experience. Jack is well past retirement age and shows no signs of slowing, but we're certain you'll find his views thought-provoking.

HAL's new Industry Services Manager for potatoes, Stuart Burgess, ready to immerse himself in the potato industry, was happy to sit down for a spur of the moment chat.

Steve Johnson a potato specialist from the University of Maine who appeared at the Australian Vegetable Industry Conference in May, answered two tiny interview questions with an eight-page description of how Maine tackles challenges to give our Australian growers a 'look in' to how things are done elsewhere. We condensed that, leaving in all the good bits of course.

John Cresswell who was the 2008 Simplot/Rabobank Young Grower of the Year was happy to discuss production and compare his observations about overseas farming, to what we have here. He was also kind enough to pose outside for our photographer despite the heavy rain.

We were delighted to see the forward thinking of people who are passionate about potatoes on display in the Spudhunters exhibit, a simple concept that reaches one of the vegetable sector's most important consumer segments (mothers and children), on their own turf.

Our regular columnist Ian James has been hard at work analysing the issue of imports, exports and nations of origin, and his findings might surprise many.

Scientist Robin Harding updates us on developments in programs that can forecast black dot in soil, while Gretel Sneath reports on a recent water assessment project in Mallee potato crops. With strange weather patterns already upon many parts of Australia, this is timely R&D information.

Finally, there's a reader survey to fill out and return to us, and thanks to the support of Syngenta, we have a prize valued at around $1000 to give away. There's much to read, so I hope you enjoy the issue.

Jenan Taylor
Editor
Potatoes Australia

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Growers get first-hand education in PCN awareness

ECG students and trainers

Victorian potato growers studying the Diploma in Horticulture specialising in potato production at the Education Centre Gippsland (ECG) in Warragul, Victoria, will be well-prepared to tackle the challenges presented by the management of potato cyst nematode in the future.

During a recent visit to the school, the Executive Officer of the Victorian Potato Growers Council Laura Bowles said many of the students were involved in farms within a PCN positive area or under property or area freedom zones.

As a result, some of the students had experienced working in a PCN positive area and the legislative requirements, costs and paper work involved.

Mrs Bowles who is project managing the plan, which aims to provide agreed, uniform regulations and protocols to contain or eradicate the disease, and minimise impact on affected businesses, commended ECG for initiating the diploma course for the potato industry.

"An increasing number of potato farmers are reaching retirement age so encouraging a new generation of leaders is critical. These students have grown in confidence and knowledge since starting the course. We are watching the future of our industry use the knowledge they have gained through this course to make informed contributions to industry meetings and events. It is fantastic to see."

ECG Trainer Tony Pitt said the two year course aims to develop a new generation of potato farm managers capable of dealing with current and future challenges. Students attend campus for an intense training period where they are given access to industry experts, and undertake field trips and workshops.

"Until now there has been no accredited pathway for people in the potato industry to progress their production management skills. This course covers everything from managing plant and soil health, chemical use and safety, weed pests and diseases, managing staff, as well as sustainable land use, occupational health and safety management, and how to develop production and marketing plans."

The course has attracted participants from across the state including Gippsland, central and western Victoria. The program's flexible delivery mode makes it accessible for distance education students. The on-campus component of the course is delivered in block modules where students attend campus for a five-day intense training period and then undertake their assessment tasks in their farm workplace.

For more information on the Diploma of Production Horticulture (Potato Production Specialisation) phone ECG McMillan on 03 5622 6000 or visit: www.ecg.vic.edu.au pa

HAL appoints new CEO

Horticulture Australia Limited (HAL) has appointed Mr John Lloyd as its new Chief Executive Officer.

Mr Lloyd has previously been the CEO/Vice President of CNH Australia/NZL, General Manager Commercial at Incitec Pivot, and General Manager Marketing at Wesfarmers Dalgety. Until recently he was also in charge of a management consultancy specialising in operational and strategic advice to agricultural clients.

Mr Lloyd will take up the position on 2 November from Ms Vanessa Goss who has been acting CEO since April. pa

Science, machines and awards as PotatoEurope concludes

PotatoEurope 2009, held in Emmeloord in the Netherlands has come to a close after a very successful event visited by an estimated 11,000 people from over 50 countries.

Around 200 exhibitors filled a huge exhibition hall attracting thousands of people from the entire international potato sector for two days.

Visitors and participants also had the opportunity to go to the gigantic field day component of the event.

Australian potato grower Wayne Tymesen who spent 17 days travelling around Europe and six days visiting and meeting potato farmers, said the field day was unbeatable.

"I was really impressed at the types of machinery on display. We also were able to take in the latest from the breeders and the breeding companies that were in attendance at the field day.

"There was the chance to see trials in action and the sheer scale of the event was incredible, because it was all potatoes. There were five semi trailers off-loading spuds the entire time."

A great number of potato varieties as well as effects of several plant protectors and fertilisers on these varieties were also showcased during the field trials.

In addition to the comprehensive congress programme which offered an interactive platform for both the scientific and the potato trade sector, visitors had a chance to witness the awarding of the prestigious PotatoEurope Innovation prize.

This year it went to the Restrain Company Ltd for its break through, long-anticipated Restrain Generator. The machine produces low levels of the natural ethylene gas to prevent potatoes from sprouting. Ethylene gives zero residue on the tuber.

PotatoEurope takes place in Germany next year, in Belgium in 2011, France in 2012 and returns to the Netherlands in 2013. pa

Further discussions for PCN Plan

In a recent presentation to potato diploma students at the Education Centre Gippsland, the Executive Officer of the Victorian Potato Council Laura Bowles spoke about the progress of the PCN Management Program.

"We have three known PCN-positive growing areas within Victoria, with most other areas undergoing regular testing. The frustration for farmers within these known areas is that they are operating under different state regulations and protocols. Regulations also vary across each state so there is quite a lot of confusion."

The National PCN Management plan would play an important role in giving growers clear guidelines and confidence to manage PCN if they are affected so they can continue to grow potatoes and have pathways into local and interstate markets.

She said the National Committee expected to meet later this year to discuss a final draft of the plan, which will then be released to the Australian industry for comment. The process of putting together a management plan that is acceptable to the national potato community has been a priority for the industry for some years now. pa

Plant Breeders need more breeders

Concerns about a decline in qualified plant breeders across the globe brought representatives from the Food and Agriculture Organisation of the United Nations, Grain Research and Development Corporation (GRDC), Australian universities and international crop improvement centres together recently.

The forum was part of the 14th Australasian Plant Breeding Conference (APBC) and 11th Congress of Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO) in Cairns.

According to SABRAO not enough plant breeders are being trained to face the enormous challenges in developing countries.

"It's a problem right across agriculture—there are fewer students in the areas of plant breeding and genetics", said Queensland Primary Industries and Fisheries principal plant breeder Phillip Banks.

"Plant breeders need more education and training to help strengthen international plant-breeding research both in developed and developing countries.

"If we improve education and training in Australia there will be less need to employ plant breeders from other countries."

Discussions centred on the need to attract more young people into plant-breeding courses and ways of emphasising their vital humanitarian role in providing food security.

"Global food production needs to double by 2030 just to keep pace with spiralling population growth," Dr Banks said.

"Climate change, diminishing water resources, higher temperatures and more frequent extreme weather events all impact on production.

"The increased production needs to be principally from genetic improvement because additional land area, water and fertilisers will be scarce or too expensive. pa

New Industry Services Managers

Following HAL's implementation of a series of proposed changes relating to the structure of the Industry Services Team, HAL has announced the appointment of Mr Stuart Burgess as the new Industry Services Manager (ISM) for the potato program, and Mr Will Gordon as the new ISM for vegetables.

The appointments form part of HAL's vision for a "productive, profitable and sustainable Australian horticulture sector," in which the company has a view to "strive to achieve better outcomes for levy payers, industry and the community".

To facilitate greater communication and collaboration with members, four new geographical hubs are to be established in Melbourne, Mildura, Brisbane and Sydney. These smaller team environments across the hubs will lead to greater collaboration in delivering industry service activity with the new ISMs helping to improve services by being located closer to the members they serve where possible.

Mr Burgess will replace Ms Lucy Keatinge on the potato program. Potatoes Australia introduces the new ISM in a profile on page 25 of this edition. pa

Fresh and Processed Potato IAC meetings

The future directions for research in the fresh and processed potato industries formed a major part of the agenda when the Fresh and Processed Potato Industry Advisory Committees (IACs) met at the offices of HAL in Sydney in August.

The Processed Committee viewed presentations from various tenderers for the job of managing the APRP 2 project, and it is anticipated that announcements regarding the awarding of this tender will be made in the coming months.

The Fresh Committee discussed the future directions for the way in which the Fresh levy would be spent.

The Committees also received briefings from AUSVEG staff including Chief Executive Officer Richard Mulcahy and Communications Manager Hugh Tobin as part of the ongoing communication between the Committees and the peak industry body.

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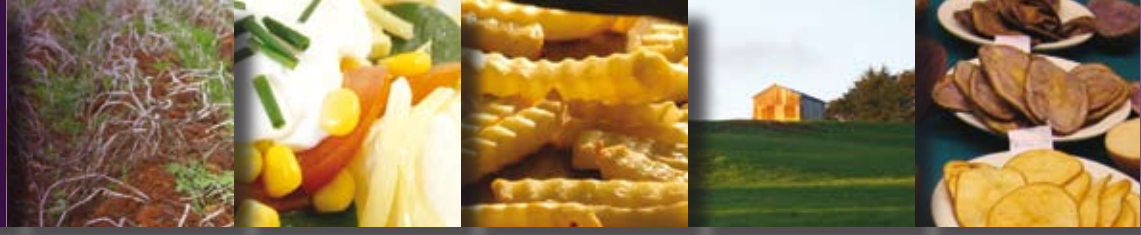

From page 7 ▶

Processed IAC member David Addison also announced his resignation from his position after nine years of service. pa

International effort to knock out disease

Researchers involved with the Australian Potato Research Program are working together with scientists from the Scottish Crop Research Institute, Scottish Agricultural College, and others from New Zealand and South Africa to address disease issues that will benefit levy payers around the world.

The consortium will be working collaboratively to address powdery scab and rhizoctonia, which have continued to present difficulties to the global potato industry.

The British Potato Council's Head of Research and Development, Dr Mike Storey has told journalists that the collaboration would improve the chances of discovering workable solutions, such as the forecasting system for powdery scab, that is similar to the black dot predictive scheme.

"It's a great opportunity to extend limited resources, gives a larger pool of research data, and we can share knowledge with leading international experts.

"By conducting trials in both the southern and northern hemisphere we can maximise seasons and study two crops a year, gaining data much faster," he said. pa

Scientists grasp potato genome

FoodWeek Online reports that an international research consortium has mapped 95 per cent of the potato genome.

The result could revolutionise breeding programs, Plant and Food Research scientist Dr Jeanne Jacobs, a member of the Potato Genome Sequencing Consortium (PGSC) steering committee, told the news agency.

This would enable researchers to gain genetic control of important attributes including disease resistance, nutritional value, colour and flavour. The genome sequence would also enable potato breeders to reduce the period of 10 to 12 years currently needed to breed new varieties.

"If you know exactly which part of the chromosome holds the genes for a particular trait, then you can precisely target crop improvements using molecular markers and so speed up breeding," Dr Jacobs said.

The work which took around three years, was initiated by the plant breeding department of Wageningen University and Research, Netherlands, and developed into a global consortium of research groups from 14 countries according to the report.

Earlier this year, another global group of scientists mapped a genome of the bacteria, Phytophthora which causes potato blight. pa

Heritage and boutique spuds fight back

A new project aims to reintroduce older and Heritage potatoes into the consumer arena and give some old fashioned tasty Tasmanian potatoes the exposure they deserve.

The fresh potato promotion is a collaborative effort between the Seed Certification Unit at the Tasmanian Institute of Agriculture Research (TIAR) Devonport and the Vegetable Industry Marketing Committee (VIMC) in partnership with industry members and is part of the "Taste is in our nature" branding campaign.

Seed production and Certification Officer Leonie White said the project targeted and promoted specific varieties by emphasising their unique tastes and uses in order to stimulate the demand for Tasmanian potatoes.

"We have eight certified seed growers state-wide participating in this initiative who have identified 20 of the most commercially-likely varieties of heritage, boutique and former popular varieties," Ms White said. "The growers will grow out a single furrow each to test the varieties for commercial viability and to provide samples for cooking."

TIAR Vegetable Centre Marketing and Business Development officer David Wells said that extensive surveys conducted by a number of nationally recognised organisations clearly indicate that consumer groups are becoming more discerning when choosing fresh produce.

"Taste, freshness and providence are now rated before price in many consumer groups and more and more people are comparing taste and interest in the origin of the product," said Mr Wells.

Certified seed potato grower Gary Huett is a project participant. The Beulah farmer grows more than 25 varieties including Nichola, Dutch Creams and Kennebeques, and also supplies the gourmet market whose demand he says he often struggles satisfy.

"We are lucky to have so many varieties in Tasmania. I am keen to be involved and am looking forward to producing a greater range of produce," Mr Huett said.

Local distributor and Director of Tas fresh Nigel Squibb, and Launceston-based agent for Tasmanian vegetables and agent for Surasak Import Export from Thailand, Rob Giblin, have both thrown their support behind the initiative.

As noted Chefs with good restaurant industry connections in Australia and overseas, Mr Squibb and Mr Giblin's involvement with the project will enable the final varieties of potatoes to be cooked and reviewed by some of the nation's most influential and leading Chefs.

"Our growers hope to harvest around February next year and the first samples will be ready to go to our celebrity Chefs for trial. After that we'll roll out a strong campaign to promote these wonderful potatoes and increase the demand to our small and medium growers who don't supply the processed market," Mr Wells said. pa

For more information contact David Wells on 0412048788 or email david.wells@utas.edu.au

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Expressions of Interest Invited

Potato Levy Payers who have an interest in serving on either the Industry Advisory Committee for Fresh or Processed Potatoes are invited to register their interest with AUSVEG.

Role of the IAC:

- To represent potato levy payers by acting as the final advising group to HAL in recommending the investment of industry R&D levy funds.
- To assess the relative return to growers from investing in one area over another, and determine a weighting of significance for each strategy based on chance of success, value of return to growers, relative cost, and significance to the industry as a whole.

Requirements for Appointees:

- Must be levy payers.
- A knowledge and commitment to horticultural industry issues and R&D work is essential.
- An ability to participate in monthly one hour teleconferences to discuss R&D proposals and to attend face-to-face meetings on two occasions each year for approximately 3-4 days in total.
- Must be capable of reading and reviewing R&D project proposals.
- Preference will be given to those applicants demonstrating involvement with established industry networks that provide linkages with other growers of their product at state or national level.
- Willingness to participate in an interview as part of the selection process for the Committee.

Successful nominees will receive Sitting Fees for face-to-face meetings at the rate of $315 per day (taxable), plus reasonable expenses incl. economy class air fares, accommodation and meal costs for attendance at meetings.

Individuals who wish to be considered for appointment should enclose curriculum vitae and any other information demonstrating the ability to undertake the role and write to:

IAC Expression of Interest
C/- AUSVEG Limited
PO Box 563
MULGRAVE Vic 3170
OR email richard.mulcahy@ausveg.com.au (CEO of AUSVEG)
...by no later than November 15 2009.

All applications will be treated as confidential to AUSVEG and HAL. Nominees may expect to be interviewed in November/December 2009 by representatives of the PIB, and the successful appointees will be notified after agreement is reached between the PIB and HAL with a view to commencing as IAC members in 2010.

For additional information please refer to HAL document "Investment of Levies for Australian Horticultural Industries -Roles and Responsibilities" available from AUSVEG or through the AUSVEG website: www.ausveg.com.au

Industry communication is facilitated by HAL in partnership with AUSVEG and is funded by the National Potato and Vegetable Levies. The Australian Government provides matched funds for all HAL's R & D activities.

Young & restless

Words | **Karen Shaw**
Photos | **Mark Seaton**

John Cresswell loves a challenge and as one of the industry's young guns, will try anything at least once to stay ahead.

The 33-year-old farmer from Branxholm was last year named the Simplot/Robobank grower of the year, and a highlight of winning the award was a three week grower tour of the United States, Netherlands, and Germany.

For John it was a great opportunity to see what was happening in other parts of the world and evaluate how Australia compares on an international scale. He was amazed at the sheer size of farms in Washington State. "We visited huge properties that were harvesting 300,000 tonnes of potatoes - just enormous volumes. And that's with similar yields to us in Tasmania, so you can imagine how much ground they use," he says.

"It was interesting to see farmers dig high volumes, which were sent to the factory for processing within 12 hours of harvesting. This quick turnaround helps prevent the effects of bruising causing losses.

"Farmers in the US are growing rotational crops of alfalfa, mint and corn," he says. "But growers in the Netherlands were using similar crop monitoring and growing techniques to us.

"I was also pleased to learn that farmers in the US were using a computer program, which is like the potato calculator we use. Adding inputs such as ground type, and information gleaned from soil tests, together with weather data helped produce an irrigation schedule and yield estimate," John said.

"In Tasmania, we found that using the program was really interesting. It wasn't spot on in its yield estimates, but that's because our weather data wasn't accurate. In future we are looking at inputting more accurate data," he says.

Farming is in John's blood. He grew up on a dairy farm near Hobart before the family moved to the north east and bought a 191 ha property on Red Hill Road. After completing an

Grower information

Producer:	John Cresswell
Location:	Branxholm, TAS
Crops:	Russett Burbanks, also previously poppies and onions
Other activities:	Sheep and breeding cattle
Soil type:	Red and grey loamy soil
Favourite dish:	"There is nothing better than sitting down to a bowl of chips or wedges with sour cream."

agricultural apprenticeship, he worked with parents, Elson and Gwen. But recently he took over and now runs the business with his wife, Jenni.

He started as a certified seed grower, but has diversified into processing or ware potatoes. For John part of the challenge of growing potatoes is the constant search for new methods to improve yields and performance.

"We mainly grow Russet Burbank because these are what Simplot want for quick service restaurants. But one of the talking points both internationally and here is the need to introduce new varieties. This would give farmers the chance to try potatoes with different characteristics—better for crop rotation and disease control.

"There are other varieties that offer good potential; it's not about moving away from Russet Burbanks, but about looking for varieties that help us work around production issues such as resistance to diseases," John says.

He has also been doing small trials on his property to select improved lines of Russet Burbank. "I've been working with the department to select tuber lines with good shapes, resistance to disease and plants with high stem numbers. These are the characteristics we want to breed from. I believe it's important to keep refreshing the line of Russets, so we are constantly improving the potatoes we produce," he says.

John's philosophy on farming is about ensuring the land is looked after long term. "It has to be sustainable in terms of making enough money to keep going, but as part of that it's important to look after the land for the future and for our children."

As part of this philosophy he is trialling bio-mustard as a green manure crop just before he plants the potatoes. "There is research to show that bio-mustard is a fumigant in the ground. I am hoping that it will help us control scab.

"Another technique that has helped improve yield has been furrow spraying with Amistar at planting time. This seems to help prevent rhizoctonia," he says.

"There is also a push in Tasmania to control Potato Virus S. We have gone back to a generation three system to try and decrease the amount of time the seed is in the ground, and thus decrease its likelihood of picking up the virus," he explains.

> "When we were away we tried popular fast food restaurant chips around Europe and the US. Many had black spots and were not up to the high standard expected here in Australia."

John is positive about the future of the potato industry. "When we were away we tried popular fast food restaurant chips around Europe and the US. Many had black spots and were not up to the high standard expected here in Australia. We have the best potatoes and chips in the world," he says.

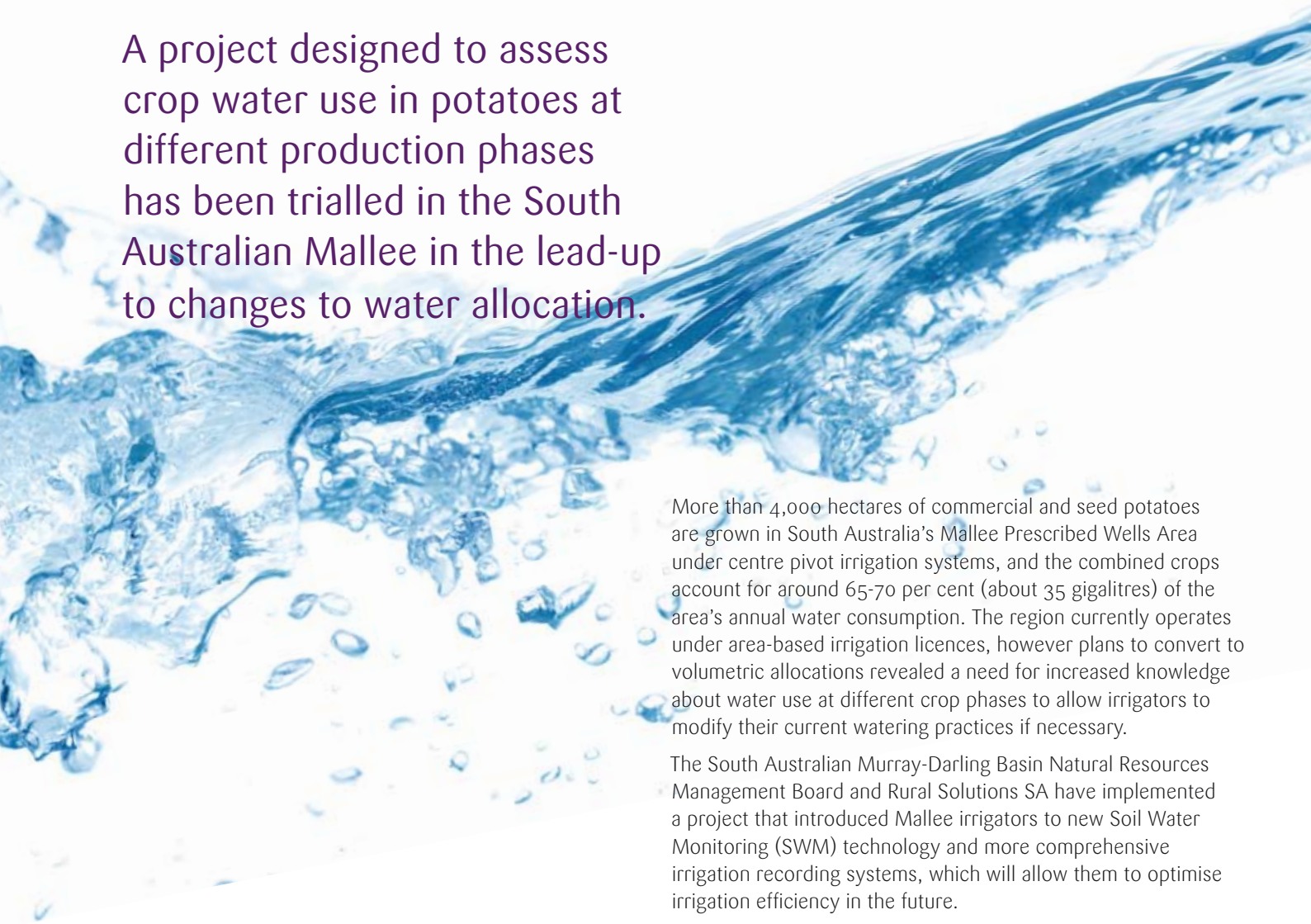
"But we are going through tough times and there are many challenges ahead, particularly with talk of climate change and emissions trading legislation. It's really the unknown and how that will affect the entire agricultural community that is worrying.

"It's a bit early to determine whether my children will be interested in being potato farmers, but I would hope that we are building a good industry for the future. I love what I do, it's great to see things grow and there is always something challenging happening in the industry," he says. pa

Precision irrigation

Words | **Gretel Sneath**

A project designed to assess crop water use in potatoes at different production phases has been trialled in the South Australian Mallee in the lead-up to changes to water allocation.



More than 4,000 hectares of commercial and seed potatoes are grown in South Australia's Mallee Prescribed Wells Area under centre pivot irrigation systems, and the combined crops account for around 65-70 per cent (about 35 gigalitres) of the area's annual water consumption. The region currently operates under area-based irrigation licences, however plans to convert to volumetric allocations revealed a need for increased knowledge about water use at different crop phases to allow irrigators to modify their current watering practices if necessary.

The South Australian Murray-Darling Basin Natural Resources Management Board and Rural Solutions SA have implemented a project that introduced Mallee irrigators to new Soil Water Monitoring (SWM) technology and more comprehensive irrigation recording systems, which will allow them to optimise irrigation efficiency in the future.

Gawler River Produce farm manager Nick Brown was one of six irrigators who took part in the project, which has been partly facilitated by Horticulture Australia Limited and the South Australian Potato Industry Trust.

"This was the first time I'd used SWM equipment, so it was certainly a great opportunity to trial what is available," he says. "No-one wants to over-water, because they don't want to waste resources or money, and with the imminent challenge of meeting the requirements of volumetric allocations, we need to try everything."

Test findings

Combinations of different SWM systems, including EnviroPro, EnviroScan, EasyAG, GBLite, SM200, T4e UMS and Green Light/Red Light were trialed at each of the six sites, and Soil Solution Samplers were also installed to help growers monitor root zone salinity and soil salinity in conjunction with irrigation water quality.

System assessments for centre pivots at the trial sites provided an understanding of the conditions under which irrigation was operating and demonstrated how evenly water is applied across the pivot. These assessments highlighted some areas for improvement in systems operation to achieve greater water use efficiency.

Project officer Rebecca Arnold says the data analysis for Crop Water Partitioning was particularly interesting. "At present the irrigators have an allocation that specifies the area they can plant up, yet water usage on the same area can vary a great deal between properties. When irrigators have a volumetric allocation which they cannot exceed, the amount of water the crop actually requires at different stages will prove more critical," she explains.

Using the SWM equipment, planting dates, irrigation records and meter readings, the participants confirmed that the majority of water was applied during the crop growth period, with application rates varying from 474 to 789mm/crop. The results showed high water use efficiency where soil profiles were dry at the beginning, and as long as there was little or no drainage.

"Tracking soil moisture levels and water movement through the profile, using equipment such as tensiometers, gypsum blocks and capacitance probes will assist irrigators to minimise drainage and detrimental effect s on plant health," Ms Arnold explains.

Participants were encouraged to keep comprehensive irrigation records throughout the season, including production stage and any other relevant issues affecting irrigation such as weather conditions (to control drift or frost, for example).

"The idea was to train and support irrigators to download the data themselves and to understand the software and soil water monitoring graphs," explains project leader Sarah Kuchel.

Challenges

Time-poor irrigators say the manual entry system does have its drawbacks, however, and that system modifications would be welcomed.

"I had a couple of loggers at our Pinnaroo Site that I had to go out to the paddock and download before bringing it back and loading it onto the computer; it would have been better if it was automatically transmitted to the computer," says Mr Brown.

> With the imminent move to volumetric allocations, there will be more demand for tools such as these to inform irrigation management decisions.

Systems that use remote downloading were seen as an advantage, however undulating land created some problems with radio signals for telemetry. Irrigators in this area found IrriMax, MEA Bug and Magpie 2 software to be relatively user-friendly.

The cost of the SWM systems can be a barrier to more widespread adoption; soil types and crop varieties can vary from pivot to pivot, so having equipment in each crop provides a better picture of soil moisture movements, but presently this can be an expensive exercise. Irrigators found that the "hands on" method of digging the ground to check soil moisture levels is still important to verify the data their SWM equipment gives and to be able to check what's happening elsewhere under the centre pivot.

Continued over page ▶

From page 13

Next steps

"Overall, the participants have gained good information about their crops and irrigation practices through using the equipment. It has enabled them to generate a baseline of soil moisture for their crops and tailor their irrigation scheduling practices to optimise the soil moisture content for crop health," says Ms Kuchel.

There is high optimism about the future adoption rate of SWM equipment and increased record keeping, and with the imminent move to volumetric allocations, there will be more demand for tools such as these to inform irrigation management decisions.

"Growers who are already using new technology in other areas of crop production are the most keen to use it, with preference shown for equipment which is easy to download and maintain, and most importantly, able to be installed elsewhere once an annual crop is finished," says Ms Kuchel.

"However SWM equipment is only one tool employed to monitor crop water use requirements. General observations of plant health, digging the soil, and using agronomy support are also important." pa

For further information visit:

http://www.samdbnrm.sa.gov.au/Our_Plans/Water_Allocation_Planning/Mallee_PWA.aspx

Snapshot of the Area:

The Mallee Prescribed Wells Area (Mallee PWA) is within the South Australian Murray-Darling Basin Natural Resources Management Board's region. It is an area of approximately 11,000 km2, including the townships of Pinnaroo, Parilla, Lameroo, Peebinga, Wanbi and Karoonda. It relies on underground water as the main and sometimes only water supply. The Mallee PWA supports around 4,000 hectares of commercial and seed potatoes each year, using approximately 35,500 megalitres of water annually. (Source: Mallee Prescribed Wells Area Annual Water Use Report 2007/2008).

PT07035

The Bottom Line

Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

HAL
Know-how for Horticulture™

- The project aimed to introduce new technology and systems that improved irrigation quality.
- It helped irrigators to understand and hence use the software and equipment more efficiently.
- The equipment enabled irrigators to get quality data about their crops and practices.

CEO's message

Over the last few months AUSVEG has achieved a number of significant advancements for the potato and vegetable industries.

I am particularly excited about a new strategic partnership between leading rural services organisation, Elders Australia and AUSVEG, which will focus on sharing R&D initiatives as well as collaborations on a number of industry events planned for the next 12 months.

This partnership will enhance the strong advocacy base that AUSVEG has been fast establishing for the benefit of our potato industry members and is timely given the uncertainty under which the industry prevails, particularly in light of produce from other source nations flooding our markets.

As such, I welcomed the news that the Federal Government has accepted key recommendations from the Joint Standing Committee on Treaties in relation to the ASEAN Free Trade agreement which includes evidence put forward by myself and Consultant Economist Ian James. This means that the potato and vegetable sectors can look forward to closer cooperation between trade negotiators and our industry.

AUSVEG Chair John Brent and I had further opportunity in September to continue talks in Canberra about the aforementioned issues and other important topics with policy-makers including the Federal Minister for Agriculture Tony Burke and other industry leaders, and cement the good relationships we have already set in place on behalf of the sector.

On a recent visit to Western Australia, I had the pleasure of engaging with industry leaders including vegetablesWA and Potato Growers Association Executive Officer Jim Turley, AUSVEG WA Director Paul Bogdanich, VGA President Maureen Dobra, and a group of Bunbury potato growers who raised a number of topics including issues relating to Horticulture Australia Limited, communications, and R&D. I also met with the WA Minister for Agriculture Terry Redman, and was pleased to note the very constructive relationship that Mr Redman has with Jim Turley and the potato and vegetable sectors in that State.

At recent fresh and processed potatoes Industry Advisory Committee meetings, Geoff Moar was appointed as an ex-officio member on both committees as an AUSVEG Board representative. This movement was part of an AUSVEG Board decision to improve liaison and communications on IAC matters for the benefit of levy-payers.

Finally, I had the opportunity to welcome and meet with new Industry Services Manager Stuart Burgess at the AUSVEG offices in Melbourne and introduce him to AUSVEG staff. I am optimistic that Stuart's energy and enthusiasm will lead to more positive outcomes for the potato sector. We are looking forward to working with him for the benefit of levy-payers in the potato industry.

Richard Mulcahy
Chief Executive Officer
AUSVEG

Trade sums equal an imports tsunami

Words | **Ian James**

The recent release of trade data for the latest financial year, 2008-2009 should send alarm bells ringing through the Australian potato industry.

The value of imports of potato and potato products soared 47% on the previous year. This follows an increase of 43% in the previous twelve months after a sharp rise in 2006-2007. Over the three years the import value of potatoes and potato product has more than tripled and now totals $126 million.

The presumption of the industry is that the bulkiness and distance from other markets provide protection for the local industry. To some extent that still applies as the need for phytosanitary clearance and bulkiness provides some protection against the import of fresh potatoes. But this does not apply to processed potato imports.

The deluge of imports is coming in the form of frozen prepared potatoes. The value of frozen prepared potato imports soared 68% last financial year, up $44.2 million on the previous year. Over the last three years the percentage increase in frozen prepared potato imports has been stratospheric and in actual Australian dollar terms up over $90 million.

There has been a fall in the value of frozen non prepared potatoes suggesting that further processing of these imports in Australia has been curtailed and that imports are coming in shelf ready for retail outlets.

In terms of volume, frozen prepared potatoes totalled 113,000 tonnes in 2008-2009. We do not as yet have production data for the Australian potato industry for 2008-2009. But if we take the Australian Bureau of Statistics (ABS) estimates for Australian potato production for 2007-2008 of 1,400,206 tonnes this represents a loss of potential production of 8% to the industry.

More disturbing, if we exclude the ABS estimates of potatoes produced for the fresh market, this represents a potential market loss of 13.5% of total processed potatoes.

There has been plenty of press about the increased competition from China and the growth in imports of vegetable products. In the case of potatoes, China is not the problem.

Countries of origin

So where are all these frozen prepared potatoes coming from. In recent times there has been plenty of press about the increased competition from China and the growth in imports of vegetable products. In the case of potatoes, China is not the problem. Surprisingly the processed potatoes are not being sourced in low labour cost countries.

Historically New Zealand has been the major source of frozen prepared potatoes and traditionally provided around 87% of total frozen prepared imports. While imports from that country increased by 31% in 2008-2009 the bulk of the import surge over the last two years has come from North America and Europe. Last year 40% of imports came from New Zealand 32% from Europe and 28% from North America.

On face value the huge growth in imports has come from Canada, the Netherlands and Germany. However this may not necessarily be the case. The trade data is recorded at the port of departure and where countries are in close proximity the departure port can vary. As an example the data shows that $10 million worth of prepared frozen potatoes were imported from Germany in 2008-2009 after recording no imports for the previous year. These imports may well be coming from other European countries but transhipped through German ports. The same may well apply in North America between Canada and the USA.

Table 1

Potato and potato product imports (A$ millions)

Product	Jul 04-Jun 05	Jul 05-Jun 06	Jul 06-Jun 07	Jul 07-Jun 08	Jul 08-Jun 09
Total Imports	**33.5**	**37.9**	**60.0**	**86.3**	**126.8**
Frozen prepared potatoes	20.9	18.9	38.2	65.1	109.3
Flakes, granules and pellets of potatoes	1.9	1.6	4.8	5.0	6.3
Potato starch	4.5	3.9	4.6	6.9	5.3
Non frozen prepared potatoes	3.4	4.9	4.7	5.3	5.2
Seed potatoes	0.0	0.0	0.0	0.1	0.3
Frozen potatoes boiled In water	2.8	8.4	7.6	3.6	0.2
Flour and meal of potatoes	0.1	0.1	0.1	0.2	0.1
Fresh potatoes	0.0	0.0	0.0	0.0	0.1
Dried potatoes	0.0	0.0	0.0	0.0	0.0

Table 2
Frozen prepared potato imports by country (A$ millions)

Country	Jul 04-Jun 05	Jul 05-Jun 06	Jul 06-Jun 07	Jul 07-Jun 08	Jul 08-Jun 09
Total Imports	**20.9**	**18.9**	**38.2**	**65.1**	**109.3**
New Zealand	18.1	16.4	33.3	33.1	43.4
Canada	0.5	0.7	0.9	11.1	28.1
Netherlands	0.7	1.1	2.0	10.0	17.0
Germany	0.0	0.0	0.0	0.0	10.9
Belgium	0.0	0.2	0.8	6.1	7.3
United States	0.6	0.3	0.8	3.0	2.4
Japan	0.0	0.0	0.1	0.1	0.1

Whatever the source nation the picture from the trade data is starkly clear. The humble Australian spud is being dumped. Australians are eating mountains of chips and potato fries which are being sourced globally. Australian potato growers are the losers in this new wave of globalisation. And the soaring Australian dollar is only compounding the problem.

The exports landscape

Free trade advocates will argue that the heavy inflow of frozen prepared potatoes imports may just reflect specialisation. The Australian potato industry may offset this by specialising in other potato products and exporting them to other countries to offset the loss of market share in frozen prepared potatoes. How realistic is this?

A starting point would be to look at the export figures for potatoes to ascertain whether the seismic shift on the import side is being replicated on the export side. The trade data shows that the major export is frozen prepared potatoes which is precisely the import causing so much damage. But the exports pale in significance as opposed to the imports and largely reflects the nature of the Trans Tasman vegetable processing industry where sourcing of product remains flexible between the two countries.

Of more relevance is whether other potato products are showing marked growth in exports. Both fresh potato and seed potato exports increased last financial year. But it is hardly a ringing endorsement. Potato exports in both categories are lower than what they were four years ago.

Tariffs and quotas

Trying to exploit trade opportunities is difficult when the trade fields are so tilted against Australian potato producers. Australia places no quotas or tariffs on the import of fresh potatoes and potato seed. Contrast this with South Korea which used to be our major export destination for fresh potatoes. The South Koreans place a quota on the import of potatoes to limit potato imports to their needs. They also place a tariff on these in quota imports of 30%. You can actually export to South Korea over and above the quota but you will have to pay a tariff of 304% which in effect excludes potato imports.

Nor is there much joy in other markets close to home despite Australia signing free trade agreements. Under the Australia/Thailand Free Trade Agreement quotas and substantial tariffs apply as potatoes are considered a 'sensitive' product by the Thais. And in the widely heralded ASEAN Australia New Zealand Free Trade Agreement, touted as the best deal Australia has ever done on free trade, the results for potatoes were, to say the least, disappointing. Under this 'free trade agreement' Indonesia is retaining a tariff on fresh potatoes of 25% until 2025 when it will reduce it to 18.75%,and the Philippines a tariff of 40% until 2020 when it will reduce it to 32%. Still, it is better than quotas.

In short, the Australian potato industry, particularly the processing side, is under siege Australian potato growers have a right to feel aggrieved, seemingly abandoned by the processors and retailers on the import side and ignored by Australian trade negotiators on the export side. Will future generations of Australians lament the fact that their Friday night snack of fish and chips has a decidingly foreign taste about it? pa

Table 3
Potato and potato product exports (A$ millions)

Product	Jul 04-Jun 05	Jul 05-Jun 06	Jul 06-Jun 07	Jul 07-Jun 08	Jul 08-Jun 09
Total Exports	**40.8**	**39.2**	**33.0**	**34.8**	**36.0**
Frozen prepared potatoes	13.0	12.2	15.4	21.6	18.9
Fresh potatoes	16.2	14.6	10.8	6.9	9.5
Seed potatoes	9.4	9.4	5.0	4.6	6.3
Frozen potatoes boiled in water	1.5	1.9	0.4	0.6	0.7
Non frozen prepared potatoes	0.6	0.9	0.9	0.8	0.2
Flakes, granules and pellets of potatoes	0.0	0.1	0.1	0.1	0.1
Flour and meal of potatoes	0.0	0.1	0.1	0.0	0.1
Potato starch	0.1	0.1	0.3	0.0	0.1
Dried potatoes	0.0	0.0	0.0	0.0	0.0

Table 4
Australian potato exports by country (A$ millions)

Country	Jul 04-Jun 05	Jul 05-Jun 06	Jul 06-Jun 07	Jul 07-Jun 08	Jul 08-Jun 09
Total Exports	**40.8**	**39.2**	**33.0**	**34.8**	**36.0**
New Zealand	10.0	12.5	13.5	21.5	17.3
Mauritius	2.2	2.3	1.3	1.8	2.7
Indonesia	3.7	2.5	1.7	1.4	2.6
Singapore	2.5	2.6	1.9	1.8	2.5
Korea, South	6.6	7.2	3.9	1.2	1.8
Malaysia	3.6	1.9	2.2	0.9	1.8
Thailand	3.1	2.6	1.5	1.3	1.2
Hong Kong	1.9	1.3	1.1	0.8	1.1
United Arab Emirates	0.6	0.6	0.7	0.8	1.1
Philippines	3.2	2.3	2.1	1.2	1.0

SPUDSCAPE

§ Ideas

§ Inspiration

§ Innovation

§ Imagination

A Scottish P

Adaptation | **Jenan Taylor**

Recently, Scotland's world famous Dr Jack Dunnett— Father of the phenomenally successful 'Nadine' variety—gave a talk to a group of Scottish growers, in which he highlighted the continued importance of potato breeding to the global industry, and the significant role that Australia could potentially play.

§ About twenty years ago Jack Dunnett decided to leave his stable, salaried position as a public potato breeder which he had held since 1953, for a path which enabled him to pursue, develop and use his own ideas about breeding. Since then, he says, his main source of income has been from the royalties earned by his varieties under a worldwide system of Plant Variety Rights.

Taking the lead

"I do all the breeding myself, beginning with approximately 5,000 new seedlings each year, each of which will be genetically distinct and potentially a new variety of potato. I proceed to select them over the next six or seven years and if even one of them survives to complete its National List Trials after another three years, I will consider myself lucky and luckier still if it grows in popularity," he says.

"The first 10 years of a breeding programme are the lead-in time when the physical work becomes more demanding until named varieties can possibly come on stream. Eventually the varieties keep on flowing while the work gets less and less. That is the lead-out time and it means that all I have to do between planting time and harvest time is watch my potatoes grow, spray them against blight occasionally, and get on with my landscape gardening.

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otato Breeder's Harvest

From page 18 ▶

It sounds relatively straight forward, but for Jack, who at present has 16 varieties on the UK National List, and three in progress, a great deal more than luck and physical slog goes into successful breeding. People networks are essential to the equation.

"In essence, potato breeding is not unlike landscape gardening. The way that plants of various species compete and jostle for position in a bog garden reminds me of the way that potato varieties compete for market share.

The way that plants of various species compete and jostle for position in a bog garden reminds me of the way that potato varieties compete for market share.

"It has been said that every new potato variety needs a champion and it falls to me to champion my own new varieties in the earliest stage of their development. Later on, if a variety is successful enough, the growers will come to know more about the variety than I do, sometimes to my amazement, in far away countries," he says, citing as example two of his most famous potatoes.

"I bred my variety *Valor* in Caithness, in the far north of Scotland. It was taken up by my associated seed growers in Perthshire, who exported just over 5,000 tonnes of seed of it last year, mostly for planting in Israel and Egypt. I do know that some of the Egyptian crop was exported for consumption in Russia. What really amazes me is that I was able to find organically grown Valor from Israel and Egypt in Marks and Spencer's store in Inverness and Tesco's in Wick.

"So, thanks to a good many people, *Valor* had travelled far and experienced desert conditions before coming back to its roots in the cool and windy climate of Caithness. It can also be said to have become naturalized in Australia, Canada and South Africa, where its only connection with Scotland is the fact that it was bred in Scotland and earns royalties for me.

"Then there is *Nadine* which I rate as the most significant and profitable variety that I have ever bred, although it has now fallen out of favour in some British supermarkets who look upon it as high yielding and good looking but lacking in flavour," he says. "I don't believe there can be much wrong with its flavour, or it would not have been the leading variety for fresh market purposes in New Zealand for the past twelve years or so. It also more or less dominates the Australian fresh market."

Beating a food crisis

Jack says that while being a private, commercial potato breeder has brought him a share of tribulations at times, it has also given him the scope to give deep consideration and hence voice to some major issues, not least of these is the global food crisis, in which potato production has the potential to play a big role.

"Feeding the world will require a doubling of the world's food supply by the year 2050 if present trends continue, according to most leading opinion formers. Since we are already well into the present century, perhaps it would be better to say that food production needs to increase by 75 per cent by 2050.

"Although there is hope that the world's population will eventually stabilize, as has already happened in the more developed countries, perhaps we should look at how to bring about the necessary increase in food production by considering what we cannot do or would not wish to do," he says.

"We could make more efficient use of the world's food crops by eating less meat but that has serious implications for farming and involves a change in human nature, which will not come about quickly.

"We could farm more intensively. It has been said that Africa could feed the world, but as we see the Sahara advancing and a return to subsistence farming in Zimbabwe, that seems unpromising. We could keep on cutting down Brazil's rain forests in the interests of intensive agriculture, but that means robbing our planet of much of its biodiversity.

"We could aim to grow food crops in the vast empty, arid and sometimes salty areas of the world. Here again it has been suggested that genetic engineers could come to our rescue by producing drought and salt tolerant cultivars. But drought resistance in the wider plant kingdom is essentially a matter of survival until the rains come, which can be unpredictable,' he says. Hence, it is the potato varieties that could well shape the outcome of food production efforts.

"Certainly we could make the desert bloom if we had the water or, more precisely, if we had a crop that would more than repay the costs of irrigation. That we already have in the form of existing varieties of potato.

"Potatoes can yield more digestible dry matter per unit area of ground than any other crop, about one and a half to two times as much as wheat. That is why they were the crop of last resort for the impoverished people of Ireland. Potatoes have a mat of shallow roots to mop up any much needed water and nutrients that may be added.

"I have seen *Nadine* flourishing under centre pivot fertigation in the Australian outback and yielding over 100 tonnes per hectare or 40 tons per acre, an enormous yield close to the theoretical maximum. Naturally, some of the water was being lost by evaporation from the foliage but that cooled the plants, just as evaporation cools the contents of your refrigerator. *Nadine* loved the conditions, even though the temperature outside the watered area rose to 46C when I was there.

"That is all very well, but what is the point of producing a massive surplus of fresh potatoes in the desert and paying for all the irrigation if you cannot transport the potatoes around the world because they are about 80% water, heavy and perishable, and liable to sprout?"

Thanks to a good many people, *Valor* had travelled far and experienced desert conditions before coming back to its roots in the cool and windy climate of Caithness.

The future is history

"The people who domesticated the potato about 7000 years ago could hold the answer. They foraged for wild potatoes which often tasted bitter, left them to freeze on the hillside overnight, and then left them to dry in the sun. Under freezing conditions much of the starch was converted to sugar (the low temperature sweetening that potato processors have to beware of because it affects fry colour) so the raw product became palatable. It is called *Chuno* and is still made and highly esteemed in the highlands of Peru and Bolivia.

"*Chuno* looks and feels as light as potatoes made from polystyrene, and can be stored indefinitely. Presumably *Chuno* production could be modernized and scaled up, with Australian scientists looking into the possibilities of producing and stockpiling *Chuno* to show the way. It would mean adopting and modifying an ancient technology—a lot safer than relying on race-specific resistance genes, which is very risky. Solar energy rather than fossil fuel could be relied on here.

"So, as far as potatoes are concerned, I suggest that the problem of feeding a world running short of food is more a matter for civil engineers than genetic engineers. Providing enough water and energy cheaply enough is the key." pa

Jack has written about his experiences, successes and ideas in his popular book, *A Scottish Potato Breeder's Harvest*. Updates and extracts from the book are available through the website, http://www.caithness.org/caithnesspotatobreeders/index.htm

What's On

16 - 17 October 2009

Wandin - Silvan Field Days

Where: Wandin East Recreation Reserve, Upper Yarra Valley

What: Now in their 40th year, the Field Days continue to be a major focus for the Horticultural and Agricultural producers of the Yarra Valley and Dandenong Ranges region of Victoria, and beyond.

Further information: www.wandinsilvanfielddays.com.au

20 - 22 October 2009

Australian National Field Days

Where: Australian National Field Days site, Borenore, Orange, NSW

What: Australia's oldest annual agricultural exhibition, featuring an array of agricultural machinery, implements, services and ideas.

Further information: www.anfd.com.au for more information.

21 - 22 October 2009

FoodTech Connect 09

Where: The Grand Pavilion, Rosehill Gardens Racecourse, Sydney

What: A food business conference aimed at briefing participants on R&D, product development, branding, and best practices in food safety, sustainability and ethical sourcing.

Further information: www.foodprocessing.com.au

9 - 11 November 2009

Eurofruit Middle East Congress

Where: Dubai, UAE

What: The preeminent event for fresh produce traders and growers who want to optimise their business opportunities.

Further information: www.mideastcongress.com

9 - 12 November 2009

Keep it Real 2009—6th national food safety, quality and environmental assurance conference

Where: Hotel Grand Chancellor, Launceston, TAS

What: A national food safety, quality and environmental assurance conference. Includes announcing winners of Tasmanian Quality Assurance Global Insights Award

Further information: www.tqainc.com.au, e: keepitreal@tqainc.com.au, ph: 03 6423 6008

25 - 26 November, 2009

British Potato 2009

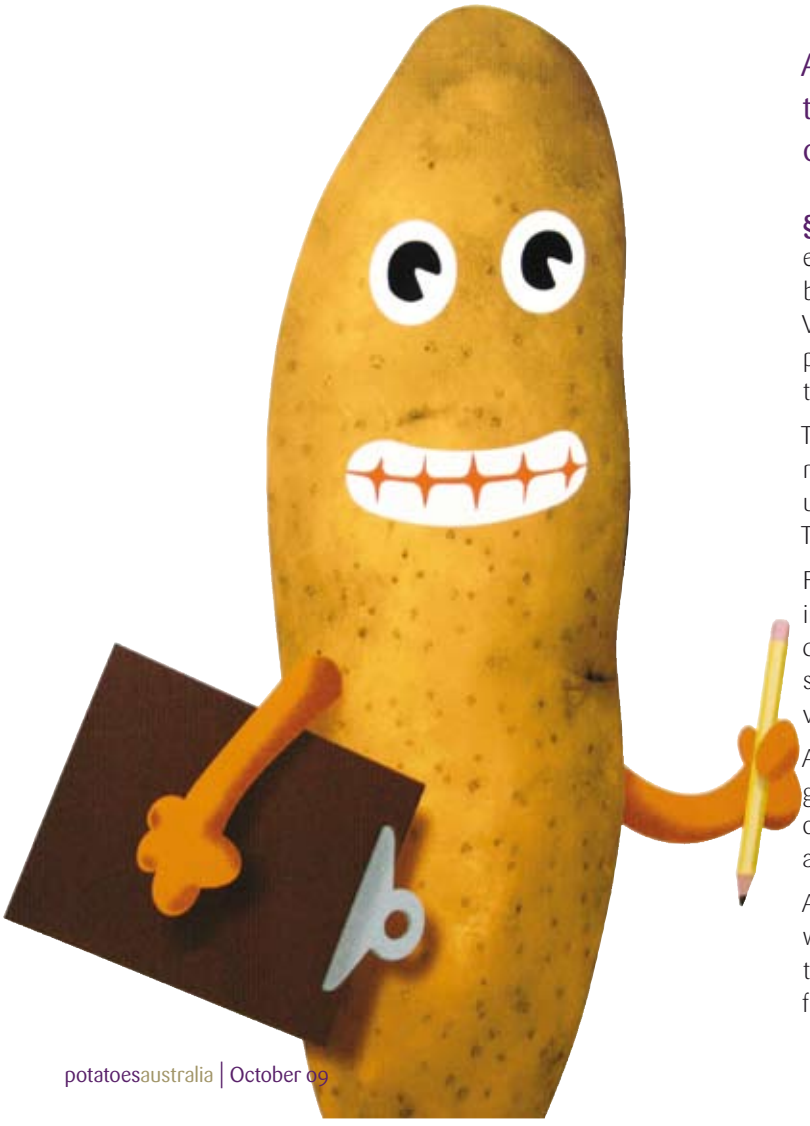
Where: Yorkshire Event Centre, Harrogate

What: The Potato Council's biannual, two-day event dedicated to everyone involved in all facets of the potato production and supply chain.

Further information: www.potato.org.uk

Making friends and influencing people

Words | **Jenan Taylor** Photos | **Erin Lyall**



As ideas go, Spudhunters, the 'roadshow' that takes potato education to the people, has to be one of the smartest initiatives around.

§ Spudhunters mastermind Gary Thomas and a handful of enthusiastic representatives from Slow Food, and other Victorian-based food associations, the Department of Primary Industries Victoria, Seed Potatoes Victoria, ViCSPA, and a number of local potato growers, pulled all stops to promote the amazing potato at this year's Royal Melbourne Show.

The exhibit drew groups of children aged from about three to nine, who dug, watered and turned mulch in virtual potato beds, until they were able to "harvest" the potatoes "planted" by Gary Thomas and his team in the mulch.

From there, they were able to compare their potatoes to the images on several posters and flyers adorning the stand that detailed the what, why and when of potatoes. A large box stood in one corner containing a number of different Australian varieties, each of them signposted.

A potato grower was on hand to talk the children and their guardians (mostly, it seemed, mothers) through the processes of the exhibit's virtual potato production, and answer questions about the realities of farming.

After completing a short, practical exercise that reinforced what they had learnt, the kids could go off to another corner of the stand where a cook, stationed behind a portable hot plate, flipped potato pancakes to give them a taste of the outcome of

the produce and simultaneously reward them for their work.

As hundreds of visitors continued to descended on the exhibit on opening day, it was clear that the Spudhunters idea was a major attraction—ironically, it seemed to draw many children carrying show bags bearing the markings of an immensely popular fast food chain.

Gary was triumphant. "If you stand here long enough, you really notice at first, how the children scratch tentatively at the soil. It's as if they're not sure about it," he said.

"And then you realise that it's largely because these children have no concept of the fact that so much of their food—especially those fries they love so much—comes from the earth. The best part is seeing their faces, when the penny drops.

Gary has taken Spudhunters to a number of other shows around Victoria, but is unaware of any other similar and on-going potato initiative interstate. He hopes to be in a position to take it nationally in the near future.

"One of the most valuable things Spudhunters does, is give children, especially those who live in the urban centres, the chance to get their hands dirty and make a connection to the source of their food and the people who produce it for them." pa

Ask the industry

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

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

While planning a potato agronomy training workshop recently, I contacted an industry colleague for a few presentation slides on his philosophies on the essential basics for the production of a good quality and high yielding potato crop. His very first slide stated "Know your seed and understand what quality means" and then later, "Understand how the seed should be grown, handled and stored so that it does what you want."

During the workshop, discussion around seed handling quickly turned up numerous examples from the field of how poor seed handling by some commercial growers had lead to less than desirable seed being planted and a resultant poor yield being achieved.

So when does management of a potato crop begin?

Management of the next season's potato crops should begin with the contracting and purchase of good quality seed—that is both cosmetic and physiological quality. It is imperative that commercial growers and seed growers communicate and discuss with each other throughout the season, the progress of the seed crop and that each understands "what they want the seed to do" in the commercial phase.

From experience, some commercial growers really do not start managing their crops until planting, yet it is the steps prior to planting that can have the greatest impact on the final yield results achieved. Once that quality seed has been purchased and delivered, the very next step is often where some growers fall down in their overall crop management.

How important is seed handling and storage by growers prior to planting?

The purchase of good quality seed is critical to the production of a good commercial crop and there is some excellent seed available each year from the seed producing regions.

It is by far one of the most significant investments a grower makes each year in the production of a crop, yet, often once delivered some growers store the seed in poorly maintained or poorly ventilated sheds with fluctuating temperatures. These fluctuations can contribute to accelerated physiological aging of seed (and subsequent loss of vigour) and quite often dusty sheds where diseases such as silver scurf thrive ready to infect the year's seed.

In some instances, we grade the seed using poorly maintained and dirty equipment, where exposed steel and high drop points can easily bruise or damage a seed tuber leaving it open to infection from disease such as fusarium and bacteria that cause seed piece decay. Often old potato residue from previous mechanical grading can be found on the shed floor or jammed up under belts or between rollers. All are a potential source for disease transfer to the season's seed.

Good shed hygiene practice as well as use of properly maintained handling equipment is absolutely critical when storing and handling potato seed as we prepare for the commercial cropping phase.

For most, there is a great deal of TLC that goes into producing a quality seed article, not to mention the significance of the investment by the commercial grower purchasing the seed. So, it is imperative that growers pay attention to detail when handling and storing seed to ensure they can maximise the returns from the subsequent crop via production of good quality and high yielding potato crops.

It is also important that growers consider the benefits of protecting their investment in quality seed from disease at planting by applying either a seed treatment such as MAXIM 100FS for control of Rhizoctonia, Silver Scurf and suppression of Common Scab and/or use an 'In Furrow' application of AMISTAR 250SC for control of Rhizoctonia and suppression of Silver Scurf. pa

A well set up creep feed is an excellent way to handle seed potatoes, but steel surfaces should be rubberised to protect tubers from damage due to dropping and rolling.

Phil Hoult

Meet...Stuart Burgess

Recently, Stuart Burgess, the new Industry Services Manager for the potato industry, had an epiphany.

"It dawned on me how important food security is in the context of edible cropping, and just how reliant we were on our food agriculture. I hadn't realised the ramifications," he says, "and the issues surrounding water shortage especially, has really brought food security into focus for Australian farmers."

Stuart brings a wealth of experience and skills to the role. He has more than five years experience in Industry Services positions at Horticulture Australia, exposure across a range of commodities, qualifications in horticulture from the University of Western Sydney, has run a number of agricultural enterprises, and has a third generation dairy farming background.

This broad curriculum vitae has given him a well-rounded knowledge of some of the issues that are common to farmers across the agricultural sphere. Although deeply concerned about food security, Stuart recognises that it is one of a myriad challenges facing the potato industry in the context of global trade.

"There are hurdles presented by imports, disease, biosecurity, health, the superfoods trend, food miles, investment, diminishing returns and, of course, succession."

Having left the family farm to pursue life beyond the farm gate, he has a deep understanding about why many farmers leave the land. 'But,' he adds, 'if someone had said to me back then that there were possibilities for flexibility in farming, I might have reconsidered.'

Still, Stuart's love for the outdoors led him to pursue a career in agricultural science, and the combination of his practical farm experience, together with his agronomy expertise has increased his enthusiasm for helping horticultural industries deal with some of the many issues they face.

He sees increasing numbers of growers becoming educated, with some holding multiple qualifications and skills, and although he is new to the potato industry, believes that knowledge is the key that could get the industry over the line.

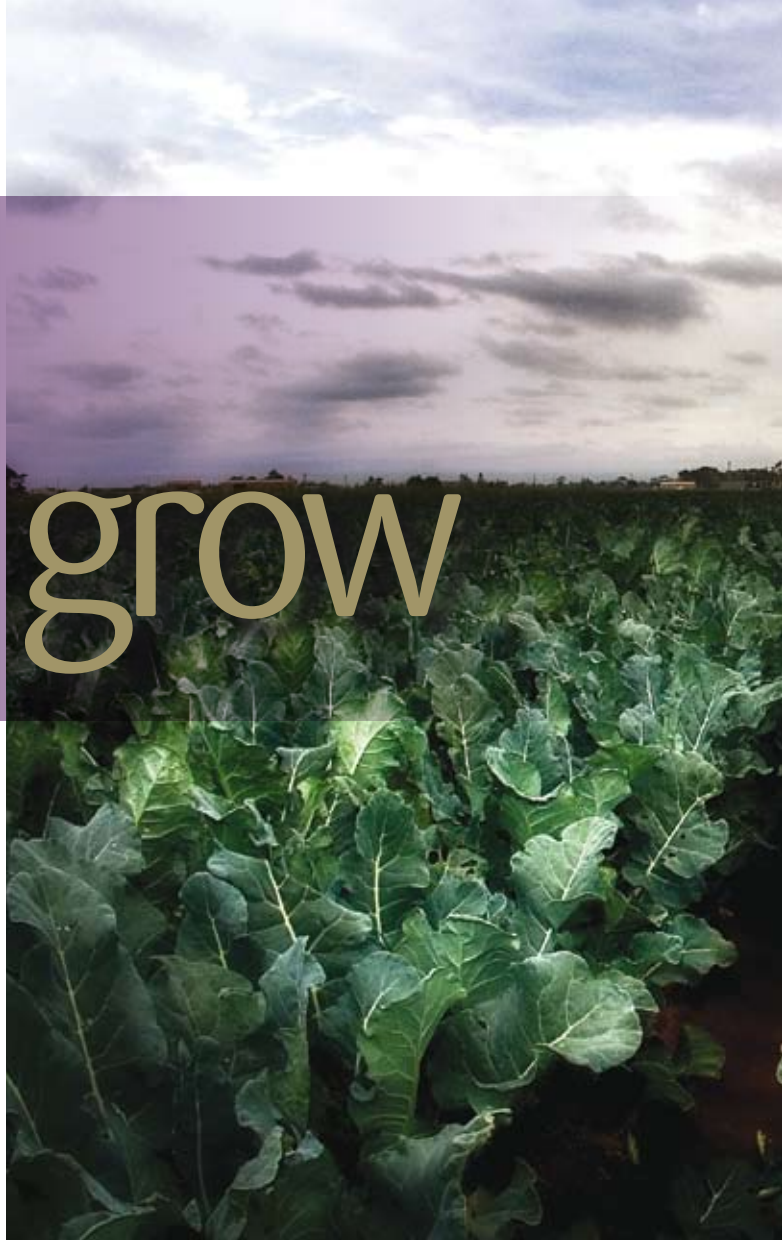
"We need to innovate as much as possible. We're competing with global markets and even though, generally, Australian farmers are more environmentally sound in their practices, we need to continually look at and review the ways in which we operate in the industry. This means working smarter, not harder, in our operations and on our products," Stuart says.

"There needs to be collaboration and connection, not cannibalism. It all needs to be a group effort." pa

How your levy is being spent

Project	Title	Start Date	End Date	Service Provider	Industry Priority
MT09040	Development and demonstration of controlled traffic farming techniques for production of potatoes and other vegetables	1/09/09	30/06/14	TIAR	Objective 2: Improve industry competition
MT09067	Managing the nematode threat	1/09/09	30/09/12	TIAR	N/A
PT09013	Managing and Implementing the National Potato Industry Communication Strategy	1/01/10	30/06/12	AUSVEG Ltd	Objective 3: Improve industry communication and information systems
PT09014	Publication of the bi-monthly magazine, Potatoes Australia.	1/01/10	30/06/12	AUSVEG Ltd	Objective 3: Improve industry communication and information systems
PT09018	Fresh Potato Industry Development Needs Assessment	1/10/09	31/12/09	Horticulture Australia Ltd	Objective 4: Improve leadership and Management capability
PT09019	Importance of tuber borne inoculum on seed potato health	1/09/09	30/09/14	TIAR	Objective 2: Improve industry competition
PT09023	APRP2 - Diagnostic tests for soilborne pathogens-International Collaboration	1/09/09	30/09/14	South Australia Research & Development Institute (SARDI)	Objective 2: Improve industry competition
PT09026	APRP 2 - Soil Health/disease mitigation program	1/09/09	30/09/14	Victorian Department of Primary Industries (VICDPI)	Objective 2: Improve industry competition
PT09027	Delivering cost-effective and better targeted IPM to manage key insect pests of potatoes	1/07/10	30/06/15	TIAR	Objective 2: Improve industry competition
PT09029	Enhancing the understanding of Verticillium spp. in Australian potato production	1/09/09	30/09/12	University of Melbourne	Objective 2: Improve industry competition
PT09040	APRP2 program management	1/10/09	31/05/14	Horticulture Australia Ltd	Objective 4: Improve leadership and Management capability
PT09042	Scoping study: push:pull decoy mechanism in potatoes for Tomato Spotted Wilt Virus	2/11/09	30/11/09	Horticulture Australia Ltd	Objective 2: Improve industry competition
PT09044	Potato communications package- to Dec 2009	1/07/09	30/12/09	AUSVEG Ltd	Objective 3: Improve industry communication and information systems
	APRP2 program investment	2/11/09	30/06/15	Horticulture Australia Ltd	Objective 2: Improve industry competition
PU09900	Fresh Potato Partnership Agreement 2009-10	1/07/09	30/06/10	AUSVEG Ltd	Objective 4: Improve leadership and Management capability
PV09900	Processed Potato Partnership Agreement (Ausveg) 2009-10	1/07/09	30/06/10	AUSVEG Ltd	Objective 4: Improve leadership and Management capability
PV09920	Processed Potato (PPAA) Partnership Agreement 2009-12 Consultation	1/07/09	30/06/10	Potato Processors Association Australia	Objective 4: Improve leadership and Management capability

Helping growers grow



Words | **Jenan Taylor**

The Adult Multicultural Education Services (AMES) and its Agri-access program might have the answer for growers who need extra staff help, without the legal headache.

Before they came to Australia, Mr Mah Meh and Ms Soe Paw Gay were used to the kind of farming schedules that were enough to make most grown men baulk. Working days in their native country of Burma could stretch for up to 12 hours or more and often involved transporting the produce they hand-harvested, on their backs. But their unique perspectives helped to develop a deep understanding and appreciation for farming the land that can be difficult to find in many workers these days.

Now, thanks to the AMES Agri-access program, there are employment pathways for agriculturally skilled, enthusiastic workers like Mah and Soe Paw to contribute to farm enterprises who in turn need help filling their labour service needs.

AMES is an adult education institution which aims to connect migrants and refugees with settlement, education and employment opportunities. In 2007, it worked and partnered with farming organisations, community groups and individual growers to develop and provide a competent workforce for permanent and seasonal employment for the horticulture sector.

The Agri-access scheme consists of a horticulture specific labour hire program, in conjunction with a three-month practical training component for students. It was launched in 2008.

"Some of our students such as Mah and Soe Paw come from Burma while others are from Afghanistan, Iraq and Eritrea," says Evan Dukas, AMES Business Development and Program Adoption Manager.

"Although many of these workers are perceived as having come from disadvantaged backgrounds, their experience in agricultural systems actually complements what we have here."

Evan says that that the initiative helps prospective employers in the horticultural industry play a part in the specific practical development of potential employees. This also means that prospective employers can then meet, train and select the most suitable people for their enterprise—at no cost.

"Growers can come to us or employ our students directly. There is also a wage subsidy available for staff employed directly on an ongoing basis. The subsidy component is on a percentage basis for the first six months' of wages for full-time permanent situations, and will vary depending on individual circumstances.

"AMES undertook a great deal of scoping work to determine the specific needs of different farming sectors, the business needs of farmers, and our students' needs. We then developed systems that incorporated appropriate operating platforms, and in 2008 we started the practical training component for our students."

"Students are taught horticulture sector-specific skills, the basics of farm machinery, Occupational Health and Safety systems, and we also help them develop their English skills. There is also a

compulsory module that places students on farms for up to two weeks at a time, so that they are prepared to meet the operational needs of potential employers."

"We provide employers with regular access to interpreters at any time to help them through any language concerns that might arise with the staff we provide," he adds.

According to Evan, the scheme has placed 95 percent of its labour resources at Werribee in Victoria and the feedback they have had from farmers has been outstanding.

"What people don't realise is that our students approached us about learning how to help out on farms, not the other way round. Many have endured some incredible challenges in their past, but when they saw our farms, they were immediately excited about the possibilities of getting back into farming," he says.

"They have brought to us commitment, willingness to learn, to acquire skills and develop and integrate into the socio-economic life of our country, which is of course what AMES is all about. We're helping eager workers to settle in and follow their goals, and at the same time we offer farmers the opportunity to achieve theirs." pa

For further information contact Evan Dukas on 03 9926 4664 or email DukasE@ames.net.au

The Maine way

As told to | Jenan Taylor

Steven Johnson, Potato Extension Specialist for the University of Maine, has developed late blight detection software, which has been a part of robust combative strategies against diseases in Maine, USA. It is a system that places management in growers' hands.

Potato late blight, caused by Phytophthora infestans, is one of the most destructive foliar diseases on potatoes and has been around for over 150 years. Most potato-growing areas have developed prediction schemes to schedule fungicide application to control this pathogen.

Late blight prediction and control in Maine is not new. It has been ongoing for over 30 years with varied levels of participation on the grower's part. Much of the activity has involved an active Integrated Pest Management (IPM) program during that time.

Historically, the formal prediction and the formal scouting for potato late blight has been done by University of Maine field scouts rather than the potato grower. First observation or discovery of the disease in the field has been by the university representatives, farmers, or other service personnel monitoring the field. However, final management of late blight in the field and related decisions always rests with the farmer.

In Maine, the potential for late blight to appear is predicted with severity values via "Blitecast", a computerized forecast of potato late blight. Severity values are based on weather conditions and accumulate when weather conditions are appropriate for the development of the disease. Severity values are also based on hours of relative humidity above 90 per cent and the average temperature during this period and are accumulated in the manner demonstrated in Table 1.

Table 1. Calculation of Severity Values

Temperature °C		Hours of 90% or higher relative humidity (RH)			
7 - 12	< 15	16-18	19-21	22-24	25-27
13 - 15	< 12	13-15	16-18	19-21	22-24
16 - 27	< 9	10-12	13-15	16-18	19-21
SV	0	1	2	3	4
At 7-12°C, >27 hrs. 90% RH (Total hours - 1)		At 13-15°C, >24 hrs. 90% RH (Total hours - 1)		At 16-27°C, >21 hrs. 90% RH (Total hours - 1)	
SV = ---------- - 4		SV = ---------- - 3		SV = ---------- - 2	
3		3		3	

The first occurrence of late blight is predicted seven days after 18 severity values have accumulated. Once 18 severity values have accumulated from emergence, the first spray is recommended. As can be seen from Table 1, three separate six-hour periods of relative humidity greater than 90 per cent will not accumulate any severity values. However, an 18-hour period of relative humidity greater than 90 per cent will accumulate severity values, depending on the average temperature during that period (three severity values at 20°C, 2 at 14°C, 1 at 10°C and 0 at 4°F or 30°C).

Subsequent protective sprays are recommended based on additional severity value accumulation during the previous seven days (Table 2). Fungicide treatment for the prevention of late blight should begin immediately if the disease is developing from seed or has otherwise been sighted in the field or in nearby fields.

Table 2. Spray Interval Based on Severity Values

7-Day Severity Value Accumulation (< 30 cm of rain)	7-Day Severity Value Accumulation	Spray Interval (≥30 cm of rain)
>6	≥5	5 day
≥5 <6	≥ 4 < 5	7 day
> 4 < 5	>3 <4	10 day
≤4	≤3	10–14 day

The road to decentralising late blight forecasting

The traditional approach comprised centralised late blight prediction using weather data collected from on-site equipment. Local late blight predictions were then extrapolated from these on-site data. With centralised late blight prediction, emphasis was placed on local rather than on-farm predictions, an approach which removes the grower from the process.

This situation came about because the minimum weather data needed for developing late blight prediction include air temperature, relative humidity and rainfall, on an hourly basis.

This brought the usefulness of on-farm weather data collection into question because of major concerns over the time required, the complexity of use, the initial and maintenance cost of the equipment. However, with very reasonably priced, good quality, dependable automated weather stations coupled with user-friendly software, these hurdles were overcome.

Thus, on-site data collection became a viable option that has enabled on-site late blight prediction that can in turn be extrapolated to local predictions. The weather stations are on-farm and operated by growers.

A decentralised weather network and late blight prediction network actively involves the producers in their own decisions.

On-site data analysis is the key that enabled the shift from centralised late blight prediction to on-site late blight prediction. But the viability of on-site late blight prediction was challenged by the time that such a system required of the grower, the complexity of use, the risk of late blight appearance, and the risk attached to an unknown or unproven prediction scheme for the Maine potato production areas. There is effectively a zero tolerance for late blight in the Maine potato production system. The computer model "NoBlight" helped to overcome those challenges

How NoBlight works

NoBlight was developed in Maine specifically to address the concerns of the Maine potato grower. It is simple, fast, and uses the long accepted late blight prediction system of severity values. NoBlight calculates the severity values of any given day, the previous seven days and year to date, as well as a spray interval recommendation. NoBlight is used to guide the initial and subsequent applications of fungicides for control of potato late blight in Maine.

NoBlight is based on "Blitecast". The NoBlight model calculates severity values starting at 50 per cent plant emergence. NoBlight, like Blitecast, gives more weight to relative humidity than rainfall in predicting the timing of the applications.

However, NoBlight differs from Blitecast in the calculation of severity values based on relative humidity. NoBlight does not stop accumulating conducive conditions where the relative humidity drops below 90 per cent. NoBlight uses 76.5 per cent relative humidity to discontinue accumulation of infection conditions. More importantly, this does not stop the accumulation of conducive conditions when the relative humidity drops to just below 90 per cent for a period of time.

Giving power to growers

The late blight prediction software is on site and operated by growers. Twice weekly during the growing season, weather data are electronically sent to a central location. The information is extrapolated to local predictions and put onto a Late Blight Hotline. The Late Blight Hotline is a voice mail system operating on a toll-free telephone line available on a 24-hour basis.

As with any model, NoBlight is no better than the data it analyses. The value of a predictive model is to provide the user with a reliable estimate of when conditions are conducive for late blight development and when conditions are not conducive for late blight development. The model provides some guidance on when a grower can stretch spray intervals with minimal risk, as well as when the spray interval needs to be reduced because the crop is at risk.

The interpretation of the weather data and the skill of the forecaster are still critical factors in late blight prediction. With practice, growers can interpret weather data and become better forecasters. The more information available to the grower, the better the decision becomes. A decentralised weather network and late blight prediction network actively involves the producers in their own decisions. On-site late blight prediction by potato growers is proving a successful approach and is increasing in Maine.

Beyond predictive control strategies

Late blight prediction is only part of the approach to late blight control in Maine. Timely and accurate fungicide applications are performed by the potato grower. Their part of the control lies in initial inoculum control, proper timing and rate of the application, and potentially the partial crop destruction, if conditions warrant. First and foremost, control of initial inoculum is critical.

The organism causing potato late blight overwinters in infected tubers, cull piles, and in infected volunteer plants. Infected tubers sprout and the organism develops and under moist conditions, spore production is initiated. NoBlight, like most late blight prediction schemes operates under the assumption that initial inoculum is present. The key to control is ensuring that the levels of initial inoculum are very low.

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In Maine, most years start with low levels of initial inoculum. High quality seed and conscientious growers see to that. Importing seed from areas where late blight occurred changes the assumption of low initial inoculum. Growers need to pay very close attention to seed imported from a known late blight area.

Under severe late blight pressure, a seed screening program is offered. Samples of seed are collected, incubated, and then evaluated for the visual presence of late blight infection. This is a parallel process to a winter grow-out test for viruses. Potato ground keepers, in the unusual event that they do occur, are chemically or mechanically removed.

Basic principles of fungicide application are also an integral part of late blight control tactics. NoBlight provides guidance on timing of initial and subsequent protective measures.
The backbone of late blight preventative programs in Maine is the application of protectant chemicals, whether chlorothalonil or EBDC materials.

The proper timing of the material is far more important than the choice of material. Success or failure with protectant chemicals is more a matter of timing than choice of material. Poorly timed applications with any chemical will likely result in failure of late blight control under even slight disease pressure. However, there are situations that dictate these protective applications be applied more frequently than in a normal growing season.

> It appears that we are not finished with late blight in Maine or elsewhere for that matter.

If the initial application for disease control is predicted to occur when the plants are actively growing, more frequent applications may be needed to insure protection of the newly emerged foliage. Potato plants can double their leaf area in five days or less when growing rapidly. This could leave half the leaf area unprotected. At this time, the timing of material is more critical than the rate of protectant material used. The first 30 days after emergence is a period of rapid leaf area increase. If protective applications for late blight are called for during this period, lower rates but increased frequency are used. The key to coverage with protectant fungicides is putting the material where it is needed and replacing the eroded fungicide.

Under the best of situations, the crop will remain late blight-free when protectant chemicals are used exclusively and applied judiciously. There are, however, sometimes circumstances beyond our control and late blight may appear in a field. There are times that a suggested schedule cannot be kept. These gaps in the control program are often the time the late blight pathogen enters the field. Once late blight is present in a field, the goal switches from how to keep the pathogen out to how to contain the disease to a limited area. Once late blight reaches a high proportion in the field, protectant fungicides will not control it.

Destroying crops

If seed-borne late blight is present in the field and is moving up the stems and sporulating on the stems, there is no control. These, plants and possibly the entire field should be destroyed. The destruction will help protect other fields from spread of inoculum; the field most likely would never have produced a marketable or storable crop anyway.

Aside from the seed-borne late blight issue, once late blight is present in a field, most of the prediction models become less useful. This underscores the importance of correctly timing the applications to keep the disease from occurring.

With late blight in a field, rainfall and showers become more important in the disease cycle. A field without late blight present must have the pathogen enter the field and initiate the infection process. A field with late blight present has the pathogen present and likely sporulating, so inoculum is immediately available to start the infection process. Predictions may call for a 10 to 14-day schedule for a field without late blight. Stretching the interval that

long in a field with late blight is risky.

The first decision to be made is whether to physically remove, by disking or other means, the portion with late blight. This technique has been highly successful in many situations. As the pathogen is already present and causing disease, the goal is containment. Applying chemicals and expecting them alone to control the disease usually leads to disaster. Removing the hot spots in the field combined with chemical applications, is far more successful than either one alone.

It appears that we are not finished with late blight in Maine or elsewhere for that matter. The future of late blight control in Maine depends in proper application (timing, rate, coverage) of protectant materials because the future of the Maine potato industry lies in economics. If late blight control can be accomplished by fewer, more timely chemical applications, it will help control escalating costs.

Better adoption of forecasting spray intervals will be the challenge for potato growers. Real-time forecasts with real-time weather and grower-level data collection are the challenges for the scientific community that serves the potato growers. This is being addressed with current automated weather stations and computer models on-site to predict late blight using real time weather collected at the grower level.

One key component of the Maine late blight control approach is that the automated weather stations and the NoBlight computer program is being operated by growers on their farms. Another key is the conscious effort of the potato growers to control late blight with a combination of chemical and nonchemical approaches.

Together, these constitute the Maine approach to late blight prediction and control. pa

Evolving NoBlight software

I've updated NoBlight through the years to accommodate changes in computer systems. I've added a few modifications as suggested by growers over the years but essentially, the framework remains unchanged. Early blight prediction for Maine has been added. This is based on physiological days. The weather in Australia is less conducive to late blight than Maine weather. As far as I know, some of the aggressive strains that have dominated the Maine and other growing regions have not appeared in Australia. Should these arrive, the situation may change. Certainly, if irrigated areas get late blight established in the field, the pathogen can be very difficult to slow down.

Predictive technology targets black dot

Tuber skin blemishing caused by the disease black dot

Words | **Robin Harding**

New developments in diagnostic testing of soils for black dot are giving researchers and growers powerful tools in the war against diseases

It's no secret that the disease "black dot", caused by the fungus *Colletotrichum coccodes*, causes significant economic losses due to the downgrading of blemished tubers and reductions in yield. Previous research by the South Australian Research Institute (SARDI) has validated a DNA test that calculates the amount of black dot in the soil and identified a number of strategies that can reduce the impact of this disease. A current project aims to maximise these strategies.

The research project is further developing the black dot DNA test as a diagnostic tool for commercial potato growers to help them evaluate the risk of the disease developing within a field, prior to planting. This project also serves as a preliminary feasibility study for the establishment of a soil testing service for growers using quantitative DNA assays.

The DNA test in action

Last year 2000 soil samples were collected prior to planting from 11 commercial centre pivots within the main potato growing regions of SA. All of these samples were then analysed for black dot DNA levels and preliminary disease risk management zones were identified within each centre pivot. At harvest, each of the risk zones were assessed for incidence of black dot on tubers.

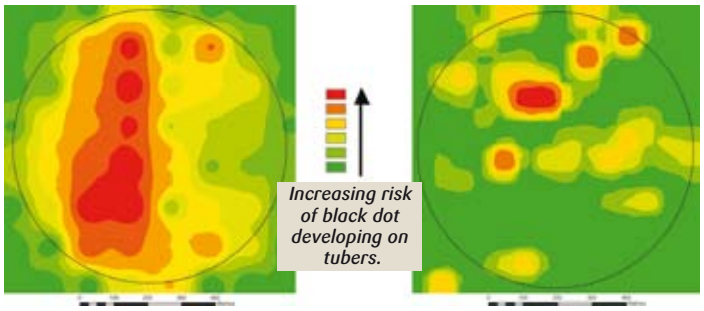
Risk zone categories	Low 0 - 10 picograms DNA/grams soil	Medium 11 – 100 picograms DNA/grams soil	High over 100 picograms DNA/grams soil

Results

The levels of black dot DNA within the test areas ranged from zero picograms DNA/gram soil where potatoes have never been planted, to over 6000 picograms DNA/gram soil where three crops of potatoes had been planted in the last 10yrs.

Of the 11 pivots sampled, just two comprised multiple risk zones (Figures 2 & 3), while the remainder of pivots comprised only one risk category— either low, medium or high.

At harvest, the degree of disease developing on tubers was



Black dot risk map of centre pivots (50ha)

So what does this mean?

These preliminary results confirm that the black dot soil DNA test can be used to identify fields at risk of the disease prior to planting. Growers can use this information to avoid fields of high risk or implement disease control within the different risk management zones via:

a) conventional methods identified by previous research (e.g. planting of infected sites in cooler conditions, early harvest, seed/soil treatments with Maxim® or Amistar®) or

b) better targeting of soil fungicide treatments through the use of precision farming technology, such as variable rate application.

Tools for the future

With soaring demands for higher quality produce and tighter environmental standards, the soil DNA assay for black dot along with DNA tests for other potato diseases being developed by the Australian Potato Research Program (APRP), will be a major benefit to the potato industry.

It is envisaged that field scale disease maps created from these assays will eventually be combined with other soil property maps, based on texture, organic matter, pH and nitrogen. These maps will vary in degrees of accuracy and usefulness based on individual grower needs.

While some growers may only want enough information to choose between low and high risk pivots, others will want to know where the low and high risks zones are within a pivot. In the latter, precision agriculture (PA) will play a key role, as this approach allows growers to apply inputs (pesticides) at the right place, right time and in the right quantity within a field. Ultimately this will lead to environmental and economic benefits to the Australian potato growers through optimal disease control and improved tuber quality.

There are further opportunities to increase existing knowledge with research that:

- evaluates PA products on black dot disease control. e.g. precise dosing of pesticides using site-specific on-line sensing.
- evaluates Australian potato varietal susceptibility to black dot. Identification of less susceptible varieties will provide growers with additional tools to manage the disease

DNA diagnostic tests are also being developed for powdery scab and Rhizoctonia as part of the Australian Potato Research Program involving SARDI, Tasmanian Institute of Agricultural Research (TIAR), Victorian Department of Primary Industries (Vic DPI), New Zealand Plant and Food Research Institute (NZ CFR).

For more information contact Robin Harding on 0419856406 or email robin.harding@sa.gov.au pa

PT08046

The Bottom Line

HAL Know-how for Horticulture™

- The development of the black dot DNA test as a diagnostic tool will optimise strategies that can reduce the impact of black dot.
- With soaring demands for higher quality produce and better environmental standards, the soil DNA assay for black dot and DNA tests for other potato diseases currently under development by the APRP, will benefit the industry.

Horticulture New Zealand

chips

A look at what's new in potato information and technology

Studies

Three papers on *Bactericera cockerelli* - the tomato-potato psyllid are profiled

The recent incursion and establishment of the tomato-potato psyllid in New Zealand is a serious concern for the potato industry. This small insect (less than 3 mm long) will infest most plants in the Solanacea family and has been associated with outbreaks of the disorder psyllid yellows and zebra chip disease. The insect is also thought to be a vector of the pathogen *Candidatus* Liberibacter solanacearum (which is synonymous with or closely related to *Candidatus* Liberibacter psyllaurous).

The first paper (Teulon et al.) recently published in the *New Zealand Plant Protection* journal describes the incursion, dispersal and current distribution of the insect in New Zealand. It is thought that the insect invaded New Zealand during the summer of 2005-06. By June 2006 it was widely distributed in the Auckland area and had spread throughout much of New Zealand by April 2009, probably through both natural and human-mediated dispersal.

In the second paper (Berry et al.) 13 insecticides were tested for their ability to control the tomato-potato psyllid in laboratory bioassays. Using the equivalent of recommended field rates, six insecticides (dichlorvos, lambda-cyhalothrin, methomyl, taufluvalinate, methamidophos and abamectin) gave 98-100% mortality after 48 hours, while four insecticides (azadirachtin, spiromesifen, spirotetramat and thiacloprid) gave 82-100% mortality after 168 hours. Mortality was less than 53% for the remaining three insecticides (buprofezin, pymetrozine and imidacloprid).

In a greenhouse experiment (Diaz-Valasis et al.) 200 adult psyllids were released on to two-month-old caged potato plants from 20 cultivars. All cultivars showed typical yellowing symptoms on foliage after 15-20 days. There was a large variation between cultivars in the number of nymphs found on the plants at this time. Four cultivars, Alpha, Gigant, NAU-6 and Lady Rosetta, showed from none to mild internal tuber browning, while remaining cultivars had moderate to strong discoloration in response to the psyllid. The yield and number of tubers were significantly reduced by *B. cockerelli* in all cultivars.

***Bactericera cockerelli*: incursion, dispersal and current distribution on vegetable crops in New Zealand.** *Teulon et al. (2009) New Zealand Plant Protection 62: 136-144.*

Laboratory studies to determine the efficacy of selected insecticides on tomato/potato psyllid. *Berry et al. (2009) New Zealand Plant Protection 62: 145-151.*

Responses of potato cultivars to the psyllid *(Bactericera cockerelli)* under greenhouse conditions. *Diaz-Valasis et al. (2008) Agricultura Tecnica en Mexico 34: 471-479.*

Candidatus Liberibacter solanacearum/psyllaurous

First report of the detection of '*Candidatus* Liberibacter' species in zebra chip disease-infected potato plants in the United States. Zebra chip disease is characterised by intermittent dark and light patterns in affected potato tubers, and is particularly noticeable when the tubers are fried. Six Russet Norkota plants exhibiting typical zebra chip symptoms were collected in Texas, USA, in June 2008. DNA was extracted from roots, stems, midribs and petioles of the infected plants and some sequences were determined. These sequences were 99.7% identical to a new species of *Candidatus* Liberibacter identified in New Zealand in potato and tomato. In addition, there was 97% identity with Candidatus Liberibacter asiaticus, and 94% with Candidatus Liberibacter africanus and *Candidatus* Liberibacter americanus. *Abad et al. (2009) Plant Disease 93: 108-109.*

Association of '*Candidatus* Liberibacter solanacearum' with zebra chip disease of potato established by graft and psyllid transmission, electron microscopy, and PCR. Zebra chip disease was first seen in Mexico in 1994 and subsequently found in the southwestern United States in 2000. As described in the previous paper, the disease has been associated with a pathogen that has been given the preliminary name *Candidatus* Liberibacter solanacearum. In this study the transmission of the disease between infected and uninfected potato and tomato plants that had been grafted to each other was demonstrated by electron microscopy. In addition, greenhouse experiments showed that potato psyllid insects collected from potato plants naturally affected with zebra chip disease could transmit the disease to uninfected plants. DNA sequences from the *Candidatus* Liberibacter solanacearum pathogen used in these experiments (from several locations in the United States, Mexico, and Guatemala) was almost identical to a sequence reported from *Candidatus* Liberibacter solanacearum isolated from solanaceous plants in New Zealand and the United States. *Secor et al. (2009) Plant Disease 93: 574-583.*

First report of '*Candidatus* Liberibacter psyllaurous' in zebra chip symptomatic potatoes from California. A bacterium, designated '*Candidatus* Liberibacter psyllaurous', has recently been isolated from potato plants with 'psyllid yellows' symptoms, which resemble the foliar symptoms of zebra chip disease. This paper describes how the laboratory received ten tuber samples (cv. Dakota Pearl) from a potato grower in Southern California, five of which had symptoms characteristic of zebra chip disease. These five tubers were shown to contain *Candidatus* Liberibacter psyllaurous, which is the first identification in California, and indicates the continuing spread of the disease. *Crosslin & Bester (2009) Plant Disease 93: 551.*

First report of '*Candidatus* Liberibacter psyllaurous' in potato tubers with zebra chip disease in Mexico. Like the previous paper, the research described here took samples of potato tubers (cv. Atlantic) with and without zebra chip symptoms from a commercial field – this time near Saltillo City in Mexico during September 2008. Seven of eleven symptomatic tubers and one of six asymptomatic tubers indicated the presence of *Candidatus* Liberibacter psyllaurous, which is the first positive identification of this bacterium associated with zebra chip disease in Mexico. *Munyaneza et al. (2009) Plant Disease 93: 552.*

Research Summaries

Slow- or controlled-release fertilisers

Release mechanisms for slow- and controlled-release fertilisers and strategies for their use in vegetable production. This review describes the two groups of slow- or controlled-release fertilisers, and notes that they are particularly important for crops grown on sandy soils with relatively low nutrient and water-holding capacities. The fertilisers in the group that relies on a biochemical reaction for their release may be limited in situations of low soil temperatures where microbial activity is restricted. In addition, soil fumigation may destroy the micro-organisms that enable the release reactions, and the fertilisers are therefore ineffective. The other group of fertilise rs has a coating around the fertiliser prill and is not dependent on micro-organisms but will be affected by soil moisture and temperature. In addition, other beneficial leachable materials (e.g. minerals) can be incorporated into the coating, although this will increase the cost. Thus, the growing situation of the crop will have a major influence on the type of slow- or controlled-release fertiliser that is selected. *Morgan et al. (2009) Horttechnology 19.*

Controlled-release fertiliser for vegetable production: the California experience. In California, despite being available for several decades, controlled-release fertilisers are still considered niche products, and are only used on a small percentage of vegetable crops. Because annual rainfall in California is low and most vegetable crops are grown on relatively fine-textured soils with high water-holding capacity, the nitrogen leaching potential is low. In addition, there is widespread adoption of drip irrigation, which enables cheap nitrogen sources to be used regularly at low concentrations to match crop growth requirements. Thus, in this situation there is little advantage from using the higher-cost controlled-release fertilisers. *Hartz & Smith (2009) Horttechnology 19.*

Potato response to a polymer-coated urea on an irrigated, coarse-textured soil. A limitation of slow-release polymer-coated urea (PCU) fertilisers has been the high cost. This research examined a new, lower cost PCU in a two-year field study on a loamy sand soil using Russet Burbank potatoes. The trial treatments included several rates of the PCU applied at emergence or two split applications of soluble N. Total tuber yields and net monetary returns were similar for PCU and soluble N at equivalent N rates. Petiole nitrate concentrations in PCU treatments were lower early in the season but higher later in the season than with soluble N. It was concluded that an advantage with PCU is that split applications of N could be eliminated. *Wilson et al. (2009) Agronomy Journal 101.*

Use of potato by-products

A review of the potential of bio-ethanol in New Zealand. This paper investigated the potential of sugarcane, sugar beets, maize, potato waste and spoilt kiwifruit as sources for fermentation to produce ethanol for blending with fossil fuels. To replace all New Zealand gasoline with a 10% blend, 300 Mega-litres (ML)/ year are required. Based on laboratory-scale trials, the current maize production (150,000 tonnes/year) would produce 45 ML ethanol/year. There is also potential to utilise 100,000 tonnes/

year of potato processing waste and 18,000 tonnes/year of spoilt kiwifruit. Sugarcane and sugar beets are currently not grown on a large-scale in New Zealand, but the former would be useful as it produces high ethanol yields. *Vishesh & Young (2008) Bulletin of Science, Technology and Society 28*.

Anaerobic digestion of by-products of sugar beet and starch potato processing. This study investigated the levels of starch, sugar or protein that might inhibit anaerobic digestion being used for environmentally friendly recycling of agricultural by-products. Digestion was carried out at 37.5°C for 28-38 days. The by-products tested gave successful digestions. Sugar beet by-products gave higher methane yields than potato by-products, and a steam pre-treatment significantly increased the methane yield from potato pulp. *Kryvoruchko et al. (2009) Biomass & Bioenergy 33*.

A family history of potatoes. A recent article in the prestigious Science magazine, by a researcher from the Department of Botany, The Natural History Museum, London, investigated the family history of cultivated potatoes. The study reviewed previous classifications of potatoes and found that they have variously been considered as anything from 21 different species to one hugely variable species. However, a recent publication suggests that there are four taxa, within which there are different multiples of the chromosome set (ploidy levels).

Celebrating spuds. *Knapp (2008) Science (Washington) 321*.

www.spudman.com

Controlling silver scurf

Silver scurf is caused by the fungus *Helminthosporium solani*, which spreads during storage, reducing the quality and weight of tubers. Spores can survive in the soil for up to two years and so the easiest method of control is to keep rotation lengths longer than three years and ensure that seed is clean when planted. Other recommended methods for control are using smaller seed pieces and planting at a lower density. Some varieties are more susceptible to infection by the fungus than others. During tuber storage, cooler temperatures are important to minimise growth of the fungus and minimising airflow will help to reduce spread. Postharvest treatments with phosphorus acid, azoxystrobin or fludioxinil have been shown to control the fungus.

snippets from www.potatonews.com

A small selection of the articles that are posted on the Global Potato News website is listed below

China to increase potato output drastically. China plans to increase its potato production from 70 to 120 million tonnes per annum, and is seeking the assistance of the Lima-based International Potato Centre (CIP). The main gains will come from increasing the per hectare productivity, which currently stands at around 15 tonnes, well below yields in Europe and the USA. To meet this target the focus will be on better seed systems and control of diseases, particularly late blight, bacterial wilt and viruses.

Microwaveable packaging growing in popularity. In the US, the microwaveable packaging market was estimated at $400 million in 2003 and an annual growth rate of 16% to 2013 is forecast. While much of this total market does not directly involve potatoes, there is still growing demand for potatoes that have been cleaned and are packaged so they are ready for immediate microwave cooking.

United States: Researchers try to understand why specialty potatoes fade in storage. Scientists from the University of Idaho are beginning a research programme to understand why the vibrant skin colours, such as red, yellow, purple or blue, of many specialty potatoes don't last. After several months in storage the lustre of the skin is noticeably duller than immediately after harvest. The project will continue over several years, and it is hoped that the outcome will be a comprehensive set of recommendations for maintaining skin quality.

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