

2013 Potato Growers' Study Tour - USA & Canada

Richard Mulcahy
AUSVEG Ltd

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PT12704

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Purpose of Report: The purpose of this Final Report is to provide HAL and the Australian potato industry with feedback and recommendations arising from the project PT12704 – 2013 Potato Growers' Study Tour – USA & Canada.

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Media Summary

The 2013 Potato Growers' Study Tour – USA & Canada provided 9 Australian potato levy payers with a comprehensive understanding of the methods and practices utilised by the United States and Canadian potato industries and an invaluable opportunity to observe the various operational, research and development (R&D), marketing and business initiatives undertaken in the two countries.

The tour was funded by HAL using the National Potato Levies, voluntary contributions from industry and matched funds from the Australian Government.

The primary focus of the study tour was to provide participants with a contrast between Australian and North American potato growing, processing and research activities. This was achieved through the development of an extensive itinerary that explored the United States' largest potato-growing state, Idaho, and Canada's primary potato-producing regions, New Brunswick and Prince Edward Island. The tour group visited several major growing facilities, processing plants and research and development (R&D) institutions, as well as the Potato Association of America (PAA) annual scientific conference in Québec City, Canada.

Through this 10-day tour, Australian potato levy payers, including growers and processors, gained an extensive and newfound knowledge of the international potato industry – important information that can now be disseminated to the wider Australian potato industry through extension projects, word-of-mouth and the on-farm implementation of acquired skills.

Amongst the sites visited by the tour group, no other was more vast and impressive – according to participants – than Idaho. Attendees marvelled at the sheer scale of Idaho's potato-growing and processing operations and were impressed by growers' irrigation initiatives. Additionally, attendees were provided with a tour of Simplot's state of the art processing plant in Caldwell where a significant amount of the country's French fries, potato gems and hash browns are processed.

By comparison, New Brunswick shares a similar scale to Australian potato-producing operations, and participants found it very useful to observe the novel production techniques employed in a familiar farming environment to that of Australia.

The tour leader, AUSVEG representative William Churchill, assisted participants throughout the duration of the tour. Written evaluations were undertaken by all tour members at the end of each day and debriefing sessions were held throughout the trip to discuss key information learnt and any points of interest. Findings were recorded on evaluation forms and in the tour diaries supplied to participants at the commencement of the tour.

To ensure the long-term competitiveness and viability of the Australian potato industry, it is vital that opportunities continue to be made available to Australian potato levy payers to undertake formal development programs and learn from others in the industry in the future.



Tour Participants in Quebec

Tour Itinerary

Sunday 21 July

Melbourne – Boise (D)

Today you will depart Melbourne for the USA on QF93. After clearing customs and immigration, you will transfer to your connecting flights for Boise, Idaho. Upon arrival, you will be met and transferred to your hotel for check-in. The tour group will gather in the evening for dinner.

Overnight at:

Oxford Suites Boise Idaho Hotel

1426 S. Entertainment Avenue, Boise, Idaho 83709 USA

Phone: +1 (208) 322 8000

Monday 22 July

Boise (B, L, D)

After breakfast in the hotel, the group will tour the largest potato-growing state in America by mini-coach. We will travel throughout Idaho to visit local growers and processing operations. Idaho is the single largest potato producing state in the US, with approximately 400,000 acres planted annually. Around 60 per cent of these are used in the production of French fries. The largest college football fixture in Idaho, held in Boise, is actually called the Potato Bowl.

Overnight at:

Oxford Suites Boise Idaho Hotel
1426 S. Entertainment Avenue, Boise, ID 83709 USA
Phone: +1 (208) 322 8000

Tuesday 23 July
Boise – Twin Falls (B, L, D)

After an early breakfast, you will travel two hours by mini-coach to the city of Twin Falls. Today you will visit local potato farms and the University of Idaho Potato Research Centre to discuss disease and pest management.

Overnight at:
La Quinta Inn & Suites Twin Falls
539 Pole Line Rd, Twin Falls, ID 83301 USA
Phone: +1 (208) 736 9600
Tel: (928) 783-8000

Wednesday 24 July
Twin Falls – Salt Lake City (B, L, D)

After breakfast, the group will travel four hours to Salt Lake City, visiting a number of local potato-growing operations along the way.

Overnight at:
Little America Hotel
500 S Main St, Salt Lake City, UT 84101 USA
Phone: +1 (801) 596 5700

Thursday 25 July
Salt Lake City – Fredericton (travel day) (B, L, D)

After an early 4.30am start and breakfast, you will travel to the airport to board your flight to Canada, travelling via Denver and Montreal. On arrival at Fredericton Airport, you will be transferred to your hotel by mini-coach.

Overnight at:
Crowne Plaza Fredericton
659 Queen St, Fredericton, NB E3B 5A6, Canada
Phone: +1(506) 455 3371

Friday 26 July
Fredericton (B, L, D)

Starting at 9.00am, the tour will explore New Brunswick, the largest potato-growing area in Canada. The group will visit local farms and the Fredericton Potato Research Centre. Over 250 varieties of seed, table and processing potatoes are grown in the province.

According to Potatoes New Brunswick, the area has the perfect climate and topography for growing potatoes. This actually enhances the flavour of the potatoes, or as some of the French speaking natives call them, *pommes de terre*, which translates as apple of the earth.

Overnight at:

Crowne Plaza Fredericton
659 Queen St, Fredericton, NB E3B 5A6, Canada
Phone: +1(506) 455 3371

Saturday 27 July Fredericton – Prince Edward Island (B, L, D)

After an early breakfast, the group will depart at 7.00am for Prince Edward Island, approximately three hours from Fredericton by mini-coach, where 25 per cent of Canada's potatoes are produced. You will visit several growing operations, research plots and an early generation production facility on the island's south.

After lunch, you will return to Fredericton by mini-coach for dinner.

Overnight at:

Crowne Plaza Fredericton
659 Queen St, Fredericton, NB E3B 5A6, Canada
Phone: +1(506) 455 3371

Sunday 28 July Fredericton – Québec City (B, L, D)

Following breakfast, you will travel to the airport for your 11.00am flight to Québec City via Montreal. After arriving in Québec City, the group will check in to the hotel and spend the afternoon on a guided walking tour of the city from a local.

Overnight at:

Hôtel Château Laurier Québec
1220, Place George-V Ouest, Québec G1R 5B8 Canada
Phone: +1 (418) 522 8108

Monday 29 July Québec City (B, L, D)

Today you will attend the Potato Association of America (PAA) annual conference at the Hôtel Château Laurier. The PAA was formed in 1913 by a handful of dedicated individuals from Maine, New York, Colorado and Washington D.C.

The major objective of the PAA is the collection and dissemination of the best available technical and practical information relating to all aspects of potato production and biology.

Overnight at:

Hôtel Château Laurier Québec
1220, Place George-V Ouest, Québec G1R 5B8 Canada

Phone: +1 (418) 522 8108

Tuesday 30 July
Québec City – Melbourne (B)

Today is the last day of the tour.

After breakfast, you will check out of the hotel and travel to the airport for your return flight to Melbourne on QF94 via New York City and Los Angeles.

Discussion – Tour Report and Farm Visits

Day 1 – Sunday 21 July

The tour arrived at Tom Bradley International Airport (LAX) at approximately 6.00am local time before connecting on a regional United Airlines flight to Boise Idaho at 3.00pm. The tour arrived at 6.40pm in the evening and all participants retired to rest.



Advertisement at Boise Airport

Day 2 – Monday 22 July

Agenda for the day:

- 8.00am Tour of Caldwell or Nampa Simplot Plant
- 9.00am Leave for Grandview Farms West (Arena Valley)
- 9.30am Arrive and tour research trials
- 10.30am Leave for Grandview Farms West (Umatilla field)
- 11.00am Leave for Gross Farms – Bannock and Ranger fields
- 12.15pm Lunch in Nampa
- 1.30pm Leave for Allen Noble Farms – Ranger fields

2.15pm	Leave for Grandview Farms
3.00pm	Arrive in Grandview and tour Bondi and Ranger fields
4.00pm	Leave for Boise
5.00pm	Arrive in Boise

N.B.: Some of the farms and fields listed in the agenda have not been reported on as many were facing similar production challenges.

Tour of Simplot Caldwell Processing Plant

Processing Capacity

The tour group met in the morning with Mr Brad Russell, Simplot Caldwell Raw Plant Procurement Manager, at the company's potato processing factory in Caldwell. The factory consists of three plants built in the 1960s and 1970s that purely process raw potatoes. Simplot has invested in a new processing plant that is currently being constructed on the same site. It is estimated that this new plant will process up to four million pounds or 1,814,369 kilos of potatoes per day. The Simplot Caldwell plant processes Russet Burbank (approximately 50 per cent of Caldwell's production), Ranger Russet and Sheppard varieties.

The Caldwell factory currently processes 1,814 tonnes of potato daily and operates for nearly 24 hours a day, seven days a week, only stopping for 24 hours every three weeks for a full clean out of the machinery. From this, the factory alone will process 631,272 tonnes of potato per year. By comparison, Australia processed a total of 744,842 tonnes of potato in 2010/11.

Simplot Caldwell's biggest customer is fast food chain McDonalds. Simplot and McDonalds share an extremely close business relationship, with the chain purchasing 50 per cent of the factory's potato chips. This equates to approximately 600 million pounds of potato chips per month. The Caldwell factory supplies McDonalds' restaurants in California, Florida, Arizona and the American Mid-west.

The sheer size, capacity and volumes of the Caldwell facility put the Australian industry into perspective. It is difficult to imagine how it could be possible to compete with such volumes of product, should the Americans ever consider sending potato chips to Australia. Cynically, it is possible to assume that the reason American potatoes are not exported to Australia is because the Australian market is so small it does not warrant the attention of US suppliers. This theory cannot be backed up in practice, given the current prevalence of European potatoes in Australia.

It could be concluded, however, that should American potatoes be exported to Australia, the enormous competition between European and American distributors would be so colossal that the Australian domestic industry would suffer immensely.

Payments to growers:

The tour questioned what the financial arrangements between the processor and growers were. Similar to those in Australia, Simplot growers are paid per tonne, but they are also paid a bonus based on the quality they are delivering. Independent quality tests are conducted by the United States Department of Agriculture, creating an incentive-based system for growers to strive for better results for higher payment, while also assisting Simplot, who can process more chips.

It is unknown whether there are incentive systems in place in Australia that are similar to those of Simplot in the United States. It would be worthwhile investigating the feasibility of such schemes in Australia, as it is evident from the US experience that they benefit both growers and processors.

Tour of Simplot Caldwell factory:

The group was provided with a tour of the Caldwell factory. No photos were permitted in or outside the factory. Much of the factory operated similarly to the processing plants here in Australia, using water channels and flumes to move potatoes around the plants.

The repercussions of the 9/11 attacks of 2001 were also present at the factory. Gates, fences and razor wire surrounded entrances to secure the factory from threats – domestic or otherwise.

The main driver for Simplot's factory was a commitment to using technology to make efficiency gains. In what was referred to as the "cutting room", is an enormous machine that uses optical sensors to cut out marks or undesirable parts of potato chips. This process is performed automatically and removes any defects found in the chip. This machine replaced the jobs of 200 people at the factory and resulted in massive productivity gains. While the automation of the factory is an incremental process Simplot's goal appears to be a fully automated factory requiring little to no involvement of people.

As in Australian potato processing factories, much of the sorting and grading processes are similar, with little notable difference in equipment. The Simplot plant uses Odenberg separators, as well as Heat and Control baggers and weighers, which are all available in Australia.

Similarly, after the products have been bagged and boxed, a team of food scientists in a lab check the product for moisture, defects and sizing variations outside of statistical norms. These samples are checked every 20 minutes.

The Simplot USA factory has implemented the "6 Sigma" program, as has its Australian counterpart. The program is designed to improve manufacturing processes by identifying and removing the cause of defects or errors.

Simplot Grandview Farms:

After the factory tour, the tour group was met by Mr Matthew Clements who guided the group around the Grandview Farms sites. Jack Simplot, founder of J.R. Simplot Co., was an adept businessman who sought to vertically integrate his potato businesses with other ventures. With an entrepreneurial eye, Jack saw that the potatoes from his factory produced a significant amount of waste potato that could not be used for anything useful or sold to

people. To make use of the waste from the potato processing factory, Simplot started feeding the waste to cattle and started Grandview Farms.

Grandview possesses 100,000 head of cattle that consume the waste potato produced by Simplot's factories – an effective method of reusing waste and converting it into a profitable venture for the company. The manure produced from the cattle is then used to fertilise the potato fields. This example of a vertically integrated system demonstrated the advantages of running an integrated business and the benefits of diversifying income streams. According to Matthew, the cattle manure saves their potato operations around \$80,000 per year in fertiliser.

While not the core of Simplot's business, having other income streams helps to protect the business by spreading risk across several areas. This is a tactic that should be employed by Australian businesses wherever possible.



Grandview Farms view from their website

Potato fields:

The guide took the group to a potato field nearby to discuss local practices. In this part of Idaho, crops are irrigated every three days for eight hours with water supplied from local dams. This Simplot property is 2,000 acres in size, but privately Simplot owns a total of approximately 5,000 acres.

From touring farms, it was clear that the general approach to pest management in the US is to spray as much as necessary to remove any threats from crops. Given that the size of most potato fields rival those of broad acre wheat crops in Australia, integrated pest management (IPM) was said to be a difficult practice to manage. Americans have also had enormous issues with the Colorado potato beetle, although growers currently have good access to chemistry to keep beetle populations under control.

Participants asked about the impact of Tomato-potato psyllid (TPP) in the region. Simplot's field representatives said that growers would spend US\$80 - \$150 per acre managing the psyllid threat on average. Fields are grown in 34 inch rows, sprayed with insecticides and herbicides from the air and fertilised with centre pivots. Most of the centre pivots use 'shoulders' to reach the corners of the fields but are universally loathed by American growers as the cause for more than half of their irrigation issues.

Simplot's farmers were following the examples set by corn growers in Nebraska or Kansas where a larger emphasis is placed on mapping yields and identifying different zones for soil

types and nutrient needs. This information assists Simplot's growers to decide how much fertiliser to apply with their variable rate equipment. As a result, growers are able to more effectively manage applications while maximising yields by focusing on areas that are more in need of assistance.

Employment terms:

One of the great advantages of American agriculture is the significantly lower wages paid per hour. On farm labour is awarded around US\$13 per hour, including a 30 per cent tax. Many of the employees were employed on contract with Simplot or directly with growers. It could be assumed that Simplot is able to invest more in plant machinery or other capital acquisitions due to having to pay lower wages.

A novel idea presented during the farm visit was the direct employment of farmers by Simplot. Our guide was a direct employee of Simplot and earned a wage from the company to manage its farms in Grandview. According to Matthew, being directly employed by the company had its advantages. He wasn't personally exposed if crops failed for reasons outside of his control, and being employed by a large company provided Matthew with better job security than if he was working alone and supplying Simplot. Given the current concerns of Australian processing growers, this could potentially be a solution.



Growers in a potato field in Idaho

Day 3 – Monday 23 July

Agenda for the day:

- 8.00am Tour of major Simplot potato growers
- 9.00am Stop in Hammet to visit FDC Farms – Rangers and Burbank fields
- 10.00am Leave Hammet and travel to Jerome
- 11.00am Arrive in Jerome to visit CSC Farms – Shepody fields

12.00pm	Travel to Twin Falls
12.15pm	Lunch in Twin Falls
1.45pm	Travel to Kimberly
2.00pm	Tour of Idaho Potato Research Center

Sailor Creek Farms:

The tour continued, with Simplot chaperoning the group to some of its non-employee growers. The first stop was with Mr Mark Noble and his property, Sailor Creek Farms. The scale of the property was enormous, with the operation spreading over several postcodes. The immediate area toured by participants grew 5,000 acres of potatoes and 14,000 were grown in another paddock nearby. Like other farms in Idaho, Sailor Creek is a multi-cropping operation that spreads business risk by also growing lucerne, mint, wheat and other crops. These rotations also help to keep soil healthy and manage pests.

In total, Sailor Creek is a mixed cropping operation producing on approximately 4,000 acres of land located on top of a mesa near Snake River. Snake River is Idaho's major source of water for irrigation. Purchased originally by Mr Noble's father in the 1960s, the vast expanse of unused land on the mesa was being sold extremely cheaply as it lacked access to water, despite its close proximity to the river. The reason for this was due to the enormous pressure and pipes required to pump water up the 600 foot incline to the farms. A method of tapping into the river source was developed and the once barren land became very profitable. Today, the farm uses six 1,250 horsepower engines to irrigate 4,000 acres of crop on the mesa.

Water access:

Water licences in Idaho are extremely different to Australia. In Idaho, water licences are approved on a first in, best dressed basis. The licences for Sailor Creek were purchased in the 1960s as the farm was being developed, which means that it would be one of the last farms to have its water access limited in the event of restrictions.

Labour challenges:

All of the farms visited in the United States shared similar concerns about labour with Australia. While labour is much more affordable in the US, Americans have issues convincing people to take up employment on farm. In response, the United States Department of Agriculture (USDA), in conjunction with the US Citizenship and Immigration Service, developed the H-2A Temporary Agricultural Workers program to address this and the issue of illegal labour on farms.

The program provides a way of sourcing labour in the event that a local supply cannot be found. The condition for the H-2A program is that the employer must extensively advertise in all local mediums to the point that they can satisfy local authorities that no American citizen is willing to do the job and a worker must be imported. To protect employment conditions in the US, the foreign worker must be employed in US conditions. The program also assists

farmers with sourcing labour for seasonal shortages or temporary agricultural roles that do not offer long-term employment.

All of the growers that the tour group met with in the United States were using the program and found it helpful in securing good labour from overseas. One grower put forward the view that Americans were too lazy and would prefer an office job. The grower also said that there was a flaw in the program that if a US citizen applies for the job, they must employ them instead of being able to use foreign labour. This is the case even if the US citizen is less efficient, a poor performer or not suited for the role.

University of Idaho Potato Research Center:

New storage methods

The afternoon was spent at the University of Idaho's Potato Research Center in Kimberly. In Australia, potato processors store potatoes on site at processing factories. However, the norm is reversed in the US, with growers storing their own potatoes on farm and selling them as needed. The Potato Research Center aims to help growers store their potatoes for as long as possible and minimise wastage while in storage. In addition, the Center also conducts disease and pest management research. Recently, the Center has investigated plant growth regulators, sprout inhibitor treatments and disease and storage management techniques.

As potato growers tend to store produce for between six and nine months, the Center has directed its focus towards the management of potatoes in storage. The Center is currently demonstrating new temperature management options, including storage room temperature regulation units that inform growers of any abnormal fluctuations to temperature by SMS. The Center has found that the savings made in electricity costs means that the units can pay for themselves in two to three years.

Participants stated that potato storage is a luxury in Australia because of the costs associated, but it may perhaps be possible to store potatoes long-term and sell them to processors when they are in need of supply.

Zebra Chip disease research

Potato and other Solanaceous crops in Idaho, like Washington State and Texas, are plagued by the Zebra Chip disease complex, as well as TPP. The psyllid was discovered in Idaho in 2011 and it has massively damaged the local industry. Researchers at the Center reported that even with a light infection, the chips burn and are unsellable. Across Idaho, growers reported that they were spending upwards of US\$200 an acre on management.

The Center is also researching other non-chemical solutions to manage the psyllid. One option that has demonstrated some promise is the use of 'crop-oils' to cover potato plants and stop the psyllid from biting into the leaf and stem cuticles. This barrier interrupts how the insect feeds on the potato plant and spreads *Liberibacter*, the pathogen associated with Zebra Chip disease. This research, however, is still in its infancy and has not been tested for its efficacy.

The spread of the TPP is causing major trade issues for Idaho and Washington State potato growers. Because growers are unable to ensure that potato shipments for export do not contain psyllids, market access to Taiwan and South Korea has been significantly impacted.



Uncooked and Cooked Zebra Chip infected potatoes

Extension activities

The University of Idaho has set up research centres across the entire state of Idaho to extend what has been learnt to local farmers. Additionally, an advisory group comprising growers exists to provide feedback on how they are performing. The Center hosts workshops with agronomists to talk about new techniques and they also produce hard copy materials which are also distributed digitally through its website. The Center also sends out electronic 'early warning' alerts to growers warning them of psyllid or any other insect/disease outbreaks by text message.

The tour questioned what other innovative practices the Center engaged in to get messages out to growers. The Center admitted that there were no silver bullets and that it was about maintaining a constant dialogue with the growing community.

On farm diagnostic kits

On farm diagnostic kits are another key tool that the Center has been investigating for potato growers. These plastic pallets work much like a pregnancy test, testing the potato's plant tissue for specific pathogens and diseases. The Center is currently evaluating the kits for consistency, however, there are many growers in both the US and Europe who are already using them as a cheaper alternative to laboratory diagnostic testing. The tests can test for common issues such as Potato virus Y (PVY), Common and Powdery scab and *Liberibacter*.

Kostka Farms/Triple Ace Inc:

The last farm visit for the day was the property of Mr Russell Patterson, the largest Simplot grower in the region of Twin Falls. Similar in scale to the farm visited earlier in the day, Kostka Farms also faces similar production issues. Like Sailor Creek Farms, Mr Patterson grows multiple crops, including barley for Coors brewing company, potatoes for Simplot, hay and wheat.

According to Mr Patterson, growers in Idaho were set to suffer in the coming season after McDonalds was repeatedly reported in the *Wall Street Journal* as performing less than expected. Mr Patterson's view was that this would result in McDonalds approaching Simplot for cheaper potato chips and the price cut would be passed on to growers.

While affected by psyllids, Twin Falls is currently free of any that are 'hot'. This refers to psyllids that are infected with *Liberibacter*. Local growers have implemented an extremely stringent process on obtaining seed to ensure that no infected seed potatoes enter the region. Part of this process involves the Idaho Department of Agriculture certifying all seed.



Aircraft hangars storing potatoes

Grower insurance:

Tour participants asked Mr Patterson how the property was insured in the event of weather damage or other 'acts of God'. In Idaho, 'catastrophic insurance' policies are available. Through the US Farm Bill, the government covers 25 per cent of the damage premium and the grower pays the rest of the excess with the caveat being that there must be a square mile of damage to the property. Additionally, there is also 'revenue insurance' that growers can take out with a private insurer.

The insurance program is unfortunately open to rorting. Instead of storing potatoes like other growers, this farmer kept pushing large volumes of potatoes through pack houses at US\$1/kg during harsh times. The grower manipulated his insurance agreement to claim for lost revenue at what the regular price for potatoes should have been. After five years, the insurance company became aware of his tactics and stopped insuring him, which caused him to eventually declare bankruptcy.

Potato storage:

Kostka Farms are a major benefactor in potato storage technology and have engaged with the University of Idaho Potato Research Center to get the most out of R&D and employ cutting-edge technology to save money and increase profit margins. After the initial investment in new technology, it pays for itself fairly quickly, adding additional profit to the farm.



Potatoes being taken out of storage

Amalgamation of properties:

Kostka Farms has aggressively expanded in the local area and Mr Patterson uses his farm's equity to keep purchasing his neighbours. While still a family owned farm that he started 20 years ago, his view is that you need to be big to survive. "Efficiency is king and scale is survival," he said.

The growers that the tour met with in Idaho were examples of how scale can be used to advantage. Whenever a property or competitor puts land on the market, Mr Patterson uses his reserve cash to make offers and pay more than market price for the land. The result is that he is able to expand gradually and build a massive farm large enough to withstand any unfavourable conditions thrown at him. This has also led him to be in a position to continually purchase new equipment, such as tractors and harvesters. The advantage of this is that each year's new model machinery gives him small productivity gains that over time become significant. Previous years' models are sold to neighbours who happily purchase them because they are still relatively new, while Patterson continues to make productivity gains.

While this sort of approach to machinery and property is not easily available to all growers, the practices in the US should at least encourage potato levy payers to think creatively and be clever with how they run their business.

Day 4 – Wednesday 24 July

Agenda for the day:

8.00am	Travel to Grant 4-D Farms
8.30am	Visit Grant 4-D Farms
9.00am	Leave for American Falls
10.30am	Visit Will Rowe Farms
12.00pm	Lunch in Aberdeen
1.30pm	Visit Coma Farms
2.00pm	Leave for Salt Lake City
5.00pm	Arrive in Salt Lake City

4D farms:

The tour today visited to Mike Larson at 4D farms. Similar to Russel Patterson the day before, Larson grows 7,000 acres of potatoes and then 25,000 to 30,000 acres of production of other crops including barley for Coors beer and wheat.

The general theme from the farm visit was consistent with the other properties visited so far. Scale is important and to grow the business to a size that it is capable of withstanding adverse market conditions as well as diversifying income streams to spread risk. Larson said that his property started with 1,300 acres and has grown at approximately 17 per cent each year. Their main issue facing them was in skills, particularly finding younger people willing to take over the operations which have caused some of the consolidation in the area. Many of the farms have an aging workforce and cannot retire without selling their business.

Will Rowe farms:

The tour then visited Will Rowe farms. This property had a machine shop and an enormous mechanical facility to keep their operation running. The farm hires a team of mechanics to keep harvesters running and maintaining equipment and is a cheaper employment option in place of outsourcing repairs. This sort of business is only viable at a minimum level of scale. Will Rowe operate 57 ten wheeler trucks as well as 10 semi-trailers, which is a large enough scale to justify specialised employment of staff.

Day 5 Thursday 25 July:

Agenda for the Day:

5:30am	Depart for Salt Lake City Airport
5:50am	Arrive at Salt Lake City Airport

7:30am - 8:58am	Salt Lake City Int'l to Denver
10:55am - 4:31pm	Denver Int'l
8:20pm - 10:49pm	Montreal Int'l
10:49pm	Fredericton Airport Arrive
	Charter pick up

This day of the tour was set aside for travel.

Day 6 Friday 26 July:

Agenda for the Day:

	Plant Propagation Centre, Fredericton
9:00am	
	Potato Research Centre, Agriculture and Agri-food Canada
10:00am	
	Agricultural Certification Services Laboratory (ACS)
11:00am	
Afternoon	A.L Pray & Son Potato Co. Ltd – Farm Visit
5:00pm	Return

Fredericton Plant Propagation Centre:

The tour was met at the Centre by Dr Khalil Al-Mughrabi from Potatoes New Brunswick at the Fredericton Plant Propagation Centre. Started in 1983 the centre provides disease tested tissue culture plants as micro tubers directly to growers with all potatoes that go through the region being tested here. Additionally, the centre also operates the Canadian Potato Variety



Repository. Currently they store 425 different varieties with 15-20 new varieties being added each year. The repository is the biggest collection in North America after a site in the United States. The objective behind the repository is to allow the rapid introduction of new potato varieties in the event that growers require new varieties to use in the event of disease outbreaks.

Seed Certification and Virus Management:

The centre prides itself on producing quality micro tubers and has never had an impure seed quality issue before. Formally the site was completely funded as a public collection of potato varieties to ensure there was varietal supply to meet growers needs. Today, due to governmental funding cuts and the advent of intellectual property in potatoes, the centre now hosts a mix of public and private varieties in storage using both government and private funds.

The potato industry in New Brunswick is an enormous industry and a major employer for the local area. It is critical to the local economy and as a result, local government takes the protection of potato growers seriously. Local policy initiatives such as the *Potato Disease Eradication Act* established in the USA and Canada enforces standards to try and control virus levels in potatoes and other biosecurity and production issues. Furthermore through the policy local growers can be fined or taken to court for not complying with the strict biosecurity requirements. This is policed through enforcement teams which issue court orders to comply with the Act. While growers consider this to be over the top and 'police like' in nature the Act gets results and has effectively suppressed viruses in the area and ensures the future of the industry and those that depend on it.

Assisting Farmers with weather predictability:

Most of the potato growers on the East Coast of Canada don't have irrigation systems on their properties because of the substantial annual rainfall. Given that rainfall is unpredictable and uncontrollable, the local governments have invested significantly into weather prediction systems. In the region there are 35 weather observation stations and when conditions prime for certain viruses or diseases growers will get text messages informing them of issues likely to break out in the local area.

Potato Research Centre:

The next site visited was the Potato Research Centre¹, a short drive from the plant propagation centre. This site works in tandem with the propagation centre to breed new varieties for growers as well as assist them in being more productive and providing performance information to growers. The Centre has developed the Total Potato Production System (ToPPS) where at the end of every season field officers collect data from growers to

¹ <http://www.agr.gc.ca/eng/science-and-innovation/research-centres/atlantic-provinces/potato-research-centre/?id=1180622499704>

get indications about how the region is performing. By digging 10ft strips of earth it is possible to measure virus issues, rain quantities and measure those against yield performance. This is done to serve the industry as best as possible to ensure they remain internationally competitive.

Mineral Oils and the Potato Psyllid:

Growers on the tour asked about the Tomato Potato Psyllid and the effect it was having on the local area. The centre confirmed that psyllids are in the area but none of them are 'hot' (infected with Liberibacter, the bacterium that causes the Zebra Chip disease). There is a small population of psyllids but not in large numbers. There is currently a prevention program in place run through cooperation between Potatoes New Brunswick and local government to test all seed for Liberibacter before transporting it around the state or seed shipments coming from outside of the region. Processors such as McCain also recognise the threat and are also looking for Liberibacter in the region. Local growers have started experimenting with 'Mineral Oils', following suit of the Americans who use them as a deterrent for the Psyllid in conjunction with heavy spray programs to try and manage the pest.

A.L Pray & Son Potato Co. Ltd – Farm Visit:

The afternoon was spent visiting local business; A.L Pray & Son Potato Co. Ltd and its operator Mr Stephen Pray. Canada's climate like Australia has advantages and disadvantages and its own challenges to its production costs. Given the large amount of rain the area has there are no irrigation costs but conversely they spray a crop approximately 15 times to manage fungus issues. Additionally to assist with drainage and to stop soil runoff beds are placed horizontally against the hill with walls of soil placed periodically to protect against erosion.

When asked about price for potatoes Pray stated that they receive at least \$3,000 per acre but would prefer \$3,500. They negotiate this price with their processor but have a keen awareness of potato prices around the world and through the United States which dictate the price in Canada. This market intelligence helps them when they negotiate future contracts.



The Tour at A.L Pray & Son

Day 7 Saturday 27 July

Agenda for the day:

10:00am	Borden Inspection Station
10:30am	MWM Farms
11:30am	Seed producer for export
12:00pm	Lunch
1:00pm	Early generation production facility
2:00pm	Cavendish Farms - research plots
3:00pm	McCain processing grower
4:00pm	Depart for Fredericton

Prince Edward Island PEI Potato Board:

Day 7 of the tour involved a visit to Prince Edward Island (PEI). Similarly to New Brunswick, potatoes are an enormous contributor to the local economy with the industry worth approximately one billion dollars². PEI is the largest potato producing province in Canada and produces approximately 25 per cent of Canada's potatoes. PEI has a local potato growers association (PEI Potato Board) that levies growers based on their production volumes.

Borden Inspection Facility:

Given PEI is an island, like Australia it has a very strong natural biosecurity barrier. Empty trucks entering the island that are bound for farms are inspected for biosecurity contaminants and the inspection site is based around disinfestation. Many of the younger growers disagree with the stringent biosecurity controls because few of them were alive or old enough to remember the beef industry that was on the island which crashed overnight after an outbreak of mad cow disease destroying the industry.

Every truck carrying potatoes leaving the island is also inspected for quality with approximately 5 bags of potatoes per load being inspected. Trucks with shipments are uncommonly turned back but the association is determined to protect the island's potato brand and don't want to see it diminished.

MWM farms

In the morning the tour visited MWM farms, a local farm run by owner, Bernie Webster, where participants had the opportunity to learn about production techniques in the area. Of

² <http://www.peipotato.org/potato-industry>

particular interest were the storage practices, as instead of using pipes they used slips in the ground to ventilate the potatoes. While achieving better air distribution, the owner is still working out how to clean his storage well.

Export seed producer

Later in the morning, the group visited seed producers Peter Gregg and Donald Satver who export mainly to the Venezuelan market. Both producers said they aimed for 68mm potatoes due to customer preference and were concerned about bruising due to the transport supply chains and the week long period it takes to land their potato seed in Venezuela. Like Australia, Canadian farmers face challenges from increasing OH&S regulation, with their bag sizes having to be reduced from 50kg to 25kg due to regulation of maximum weight limits. In regards to the cost-effectiveness of exporting, surprisingly, producers from Holland are able to achieve better freight rates to the Caribbean than Canadian producers (despite a longer distance) because any containers sent there come back with imported bananas.

Cavendish Farms

In the afternoon, the tour visited trial plots run by potato processor Cavendish Farms. The company is a large investor in R&D and focuses on production issues such as fertilizer use, seed trials, late blight and nematode controls to ensure strong yields from their contract growers and consistent supply to their facilities. Cavendish Farms is the fourth largest processing company in North America, with 90 contracted growers, and is constantly reviewing the seed used for production in ongoing trials. The company has completed over 2,000 trials to evaluate which varieties produce the best yields and disease resistance. Trials are paid for by Cavendish Farms as part of the company's commitment to the local industry and the research has had numerous benefits for their growers, such as investments in irrigated agriculture which have resulted in a 15 to 20 per cent better yield for some of their growers. The company also has a hands-on role in extension activities, ensuring that the latest R&D is communicated and used by its growers.

Tour participants had the opportunity to see a number of other facilities run by Cavendish Farms, including a bio-gas generator which uses potato waste generated in the region to produce cheap power to run their facilities. In the tour of Cavendish Farms, of particular interest was the use of insulated concrete forms (a block with 2 inches of insulation and filled with concrete) to keep stores cool and better regulate temperature.

McCain Grower

The final visit for the day was to a grower for McCain, who faced similar challenges and growing conditions as other growers visited in Canada and employed production techniques already viewed at previous sites.

Day 8 Sunday 28 July

Today was a day to travel from Fredericton to Quebec City. Upon arrival the tour had the remainder of the day to see the local attractions.

Day 9 Monday 29 July

Agenda for the day:

8:15am - 5:00pm PAA Conference

The tour attended the first day of the Potato Association of America's 97th annual meeting. The conference was focused on bacterial diseases in potatoes and the days delegate program looked into new technical measures to predict diseases or yield complications.

While much of the days conference was technical rather than practical to on farm usage the tour was eager to see the presentations on Zebra Chip and Potato Virus Y. Unfortunately the Potato Virus Y speaker was a last minute apology, however, the Zebra Chip specialist was present.

Presentation by Joseph Munyaneza – Yakima Agricultural Research Laboratory, Washington USA, Zebra Chip Disease – A global threat to the Potato Industry.

Dr Munyaneza, is employed by the United States Department of Agriculture (USDA) in Washington State USA, an area, like Idaho, contaminated with Psyllids carrying the Liberibacter (LSO). The presentation provided a global overview of the issue and how other nations are preparing for the pest. According to Dr Munyaneza an indicator of how serious this pest is being taken, the Europeans were making preparations for the pest to reach continental Europe and this should be an indication of how the seriously the global potato community needs to take this threat.

The presentation drew upon new research that was emerging that varieties of carrots used in Sweden and Norway could also be hosts to the Psyllid as well as tobacco plants. In addition to this, additional research was also showing that onions and leeks could also be affected too. Worryingly, researchers have now identified four genetic variants of the Liberibacter and that they still know little about each variant.

The presentation went on to discuss control methods for LSO which, so far, were limited to a growers ability to control Psyllid numbers in crops. With a lack of effective chemical controls available to growers, some farmers had resorted to using leaf blowers as a means of sucking Psyllid nymphs off the undersides of potato plants. This is obviously not a workable solution, particularly in large fields but was an illustration of the desperation the industry is resorting to in order to manage the issue.

The US potato industry is also trying to develop IPM programs for the Psyllid as well as LSO resistant varieties. The time lines for breeding resistant varieties would be very long. Upon discovery of a resistant variety the process would take another 3-4 years to commercialise them.

Right: PAA conference attendees get into the spirit.



Day 10 Monday 30 July

Today the tour departed Quebec and returned to Australia.

Tour Participant Feedback

Day 2

Tour participant rating: Good to Excellent.

“The Simplot factory tour was excellent...they did a great job showing us right through the plant and explained every step in great detail.”

“Very interesting to see how Simplot use all of their by-products – cow manure as fertiliser and waste potatoes as food starch and stock feed. I feel our farm could benefit substantially from a similar set-up to make our farm more profitable.”

“It was interesting to see how Simplot integrate cropping and manufacturing with feedlot and fertiliser production, which obviously reduces costs.”

“The scale of the operation was jaw-dropping.”

Day 3

Tour participant rating: Good to Excellent.

“Corporate style farming on a huge scale. Incredible amounts of irrigation infrastructure.”

“I was impressed by the storage shed technology as potatoes had been stored for 10 months and were still without shoots.”

“Today was even better than yesterday... 1,500 acres of spuds which was all watered by solid set irrigation.”

“Fumigating through irrigation is something that we do not do [in Australia]. I will do a small trial this season to compare on costs and effectiveness.”

Day 4

Tour participant rating: Good to Excellent.

“Learnt about variable frequency drive fans in cool stores, something that could help us become more energy efficient.”

“4D Farms was also a real eye-opener and was awesome to see the 70 trucks and all the machinery at the farm.”

“Very good to see how they make their storage sheds. Maybe in Australia there will be a push to do the same thing.”

Day 6

Tour participant rating: Good to Excellent.

“Was good to see and have explained the propagation of mini-tubers.”

“The discussions with the seed grower were interesting in that we find ourselves under the same pressures financially.”

“Good to learn about the measures that are taken to protect seed crops, like the 35 weather stations that give farmers warning when weather conditions are favouring blight.”

Day 7

Tour participant rating: Good to Excellent.

“Good to see how PEI runs its own biosecurity – it is obviously very important to them.”

“Learnt that [on PEI] they spray potatoes at 50 per cent and then on for 10-14 days thereafter.”

“The potato crop was managed in an excellent manner enabling their seed to be sold in 30 countries.”

“Interesting that Cavendish Farms but in a biogas plant that uses leftover potato waste to help power the factory.”

Day 9 and 10

Tour participant rating: Good to Excellent.

“It was really good to go to the conference and discuss issues like zebra chip and potato storage.”

“Learnt about different ways to control common scab – over here fertilisers with high sulphur are a help in stopping common scab.”

“Bit disappointed that the PVY talk was cancelled...but some valuable information towards bio-GM and controls and viruses arising from the dreaded Zebra Chip.”

“Found that they are working on most of the same issues that we face in Australia.”

“Found a new fertilizer that I would like to trial in WA.”

“Particularly found the aeroponics discussion interesting, as we have spoken about developing our own setup.”

Overall Tour Comments

“Fantastic initiative by AUSVEG to run this tour and a big congratulation on a well-run, educational tour.”

“Our tour guide did a very commendable job throughout the tour...overall a very enjoyable tour.”

“I was glad to be selected to come on this trip and have gotten a lot out of all our stops along the way.”

“I’d like to thank AUSVEG and the committee for the opportunity.”

“The size of the group was about right with a good mix of young, older and different sectors of our industry.”

Recommendations

- The Australian potato industry should investigate the American H-2A program and conduct a comparative analysis with the Pacific seasonal workers scheme to identify gaps. Consideration should be given to sourcing workers from Asia and not limiting the program to the Pacific Islands.
- To assist growers during periods of over supply the industry should investigate options for on-site storage of potatoes in a similar manner to the storage methods used in the United States.
- The potato industry should consider investing in developing materials to demonstrate to potato growers the advantages of multi-cropping as a way of spreading risk in their business. Additionally industry should consider funding financial advice for growers either considering expansion or risk diversification.
- To capitalize on the US methods of large scale farming practices and new ways of conducting business the industry should look at establishing exchange programs with the industry contacts made in the United States so growers can learn how to grow and diversify farms. This would also assist the United States with a supply of skilled farm managers that they are currently lacking.
- United States farmers use mineral oils as a deterrent against Psyllids in potato crops. The Australian industry should consider research into these oils and their availability here in Australia as a measure of preparedness if the Psyllid ever reached Australia.
- Potato industry grower tours should be run every year and strong consideration should be given to visiting the United States and Canada as destinations.

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Tour participants

William Churchill	AUSVEG	Victoria
Patrick Fox	Grower	Western Australia
Simon Gallasch	Processor	South Australia
Matthew Grech	Grower	Victoria
Mark Hanrahan	Grower	Victoria
Thomas Kelly	Grower	New South Wales
Colin Lindsay	Grower	Tasmania
Daniel Maher	Grower	Victoria
Greg Murphy	Grower	Victoria
Kain Richardson	Grower	Victoria
David Scott	Grower	Victoria