Potato – processing

STRATEGIC INVESTMENT PLAN

2017-2021

Hort Innovation
Strategic levy investment

POTATO – PROCESSING FUND

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Introduction

This Strategic Investment Plan (SIP) is the roadmap that helps guide Hort Innovation's oversight and management of individual levy industry investment programs. The SIP lays the foundation for decision making in levy investments and represents the balanced interest of the particular industry from which the levy is collected. The very important function of the SIP is to make sure that levy investment decisions align with industry priorities.

Hort Innovation is the not-for-profit, grower-owned research and development (R&D) and marketing company for Australia's $9 billion horticulture Industry.

As part of the role Hort Innovation plays as the industry services body for Australian horticulture, the organisation is tasked by the Australian Government with working alongside industry to produce a strategic plan for investment of levies in industry R&D and marketing activities.

Each individual levy industry investment strategy also speaks to the future growth and sustainability of the Australian horticulture industry as a whole. The SIPs are produced under the umbrella of the Hort Innovation Strategic Plan, which takes a whole-of-industry view in setting its direction, as it considers broader agriculture government priorities for the advancement of Australian horticulture.

The process of preparing this SIP was managed by Hort Innovation and facilitated in partnership with Industry Representative Bodies and Strategic Investment Advisory Panels (SIAPs). Independent consultants were engaged to run the consultation process, to gather the advice from stakeholders impartially and produce a plan against which each levy paying industry can be confident of its strategic intent.

Hort Innovation has valued the support, advice, time and commitment of all stakeholders that contributed to producing this SIP, especially processing potato growers.

The processing potato SIP

Owners of processing potatoes – the person who owns the potatoes when processing begins – in the processing potato industry pay levies to the Department of Agriculture and Water Resources (DAWR), who is responsible for the collection, administration and disbursement of levies and charges on behalf of Australian agricultural industries.

Agricultural levies and charges are imposed on primary producers by government at the request of industry to collectively fund research and development (R&D), marketing, biosecurity and residue testing programs.

The levy rate on processing potato is 50 cents per tonne.[1] Hort Innovation manages the processing potato levy funds proportion directed to R&D (49 cents per tonne). Separately, Plant Health Australia (PHA) manages plant health programs (1 cent per tonne). In 2015/16, total processing potato R&D levy receipts were approximately $405,000.

Hort Innovation has developed this SIP to assist in strategically investing the collected processing potato levy funds in the priority areas identified and agreed by the industry. The ability to deliver on all the articulated strategies (and investments) in an impactful manner will be determined by the ability of the statutory levy to provide the resources to do so.

This plan represents the Australian processing potato industry's collective view of its R&D needs over the next five years (2017 to 2021). This plan has been developed in consultation with Australian processing potato levy payers through a synthesis of direct consultation with research providers and industry thought leaders and two workshop sessions with Hort Innovation's processing potato Strategic Investment Advisory Panel (SIAP). The stakeholders consulted are listed in ***Appendix 1***.

The processing potato SIAP has responsibility for providing strategic investment advice to Hort Innovation. Both Hort Innovation and the panel will be guided by the strategic investment priorities identified within this plan. For more information on the processing potato SIAP constituency please visit Hort Innovation's website at www.horticulture.com.au.

Market failure considerations

The intent of the R&D levy funding program is to invest in areas where there is market failure or under-investment by private businesses because they cannot capture all of the benefit gained from such investment, such as investing in structural change or where there is a public benefit beyond commercial advantage to individuals. Economists term this as 'externalities'. As such, the focus in this SIP is on pre-competitive R&D. At the request of the SIAP, this SIP focuses on on-farm production and productivity issues and does not deal with supply chain, product innovation and other factors beyond the farm-gate.

1 http://www.agriculture.gov.au/ag-farm-food/levies/rates/potato

Potato – processing

STRATEGIC INVESTMENT PLAN 2017-2021 AT A GLANCE

POTENTIAL IMPACT OF THIS PLAN

$12 Million

Based on an estimated investment of $3.59 million over the next five years.

Major opportunities

- To take advantage of the world's best scientific knowledge in potato agronomy and pest and disease management
- The growing demand for potato products in nearby South-East Asian markets
- The potential to leverage Australia's horticultural levy system to grow skills.

Major challenges

- Biosecurity incursion especially psyllid
- Global oversupply and dumping in the Australian market eroding prices
- Appreciation of the Australian dollar which will drive imports
- Decreased consumption due to greater awareness of health risks
- Higher input costs in all categories relative to competing countries
- Lower and more variable yield than competitors
- Lack of economies of scale and capital utilisation
- Some resistance by growers to better position themselves for the developing global realities of the sector
- Inconsistency in the quality of agronomic advice
- Business and whole-of-farm management skills
- Lack of profitability constraining re-investment.

OUTCOMES	STRATEGIES
Industry has access to the world's best agronomic information and networks, resulting in increased productivity	Compile a database of knowledge sources from local and overseas centres of excellence
	Assist our research community to establish/tap into global virtual scientific community on potato research
	Identify gaps where the global science does not cover Australian specific issues or challenges
	Initiate projects to fill any gaps identified in the previous strategy
	Introduce annual visiting fellow program
Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge	Run subject specific professional training workshops for consulting agronomists (consider accreditation scheme)
	Supply advisors with information and materials that simplify and summarise the science in a format that growers can relate to (so-called 'muddy boots science')
	Establish a social media network facilitated by industry experts and professional advisors within the processing potato community (ensure adequate funding to maintain)
	Develop soil management resource kit with practical and cost-effective tools
	Develop a calendar of coordinated program of regional field days and/or trials, specifically for processing growers (in cooperation with industry suppliers)
	Develop Skype or web-based advisory platforms/tools so growers located in remote areas also have access to visiting experts and any industry training on offer

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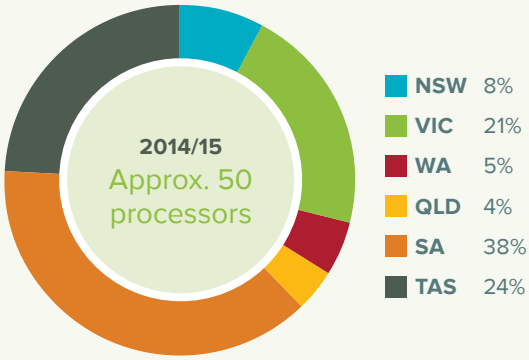
AT A GLANCE

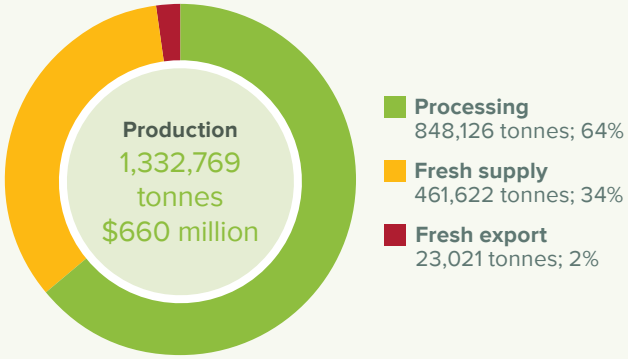
OUTCOMES	STRATEGIES
Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield	Encourage use of PreDicta Pt, a DNA based soil testing service, and support R&D to extend application to pink rot and Potato cyst nematode (PCN)
	Establish appropriate, prioritised R&D and extension programs for highly rated pest and diseases
	Expand pest trapping program and develop national response plan and biosecurity manual for pysllid and other threats (as per Tasmania)
	Support wider industry efforts to increase the quality of certified seed throughout the supply chain in order for it to be fit-for-purpose
	Initiate project with chemical companies to gain a better understanding of chemical efficacy and compatibility of active ingredients
	Include integrated pest management (IPM) as a core subject area in the regional field days program
	Review current soil surveillance systems

OUTCOMES	STRATEGIES
Precision agriculture and related technologies/ systems become standard practice, resulting in reduced cost of production	Run regional 'future farming' workshops as part of proposed extension projects
	Ensure industry is engaged with other Hort Innovation precision agriculture programs such as robotics at University of Sydney
	Identify blockers to commercial adoption of precision agricultural systems and other technologies then initiate priority projects in response
	Establish potato precision agriculture Community of Practice or information resource
Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability	Provide scholarships for agribusiness professional development courses
	Introduce Next Gen program including overseas study, mentoring, internships, and basic business skills for growers, scientists and advisors
	Initiate project to identify and communicate alternative business models to growers
	Initiate and communicate self-assessment tool for web-based benchmarking on yield and cost such as the University of Idaho web-based tool
	Build a processing potato-specific information digital database
	Initiate extension program in natural resource management, best practice land use and sustainability

Industry size and production distribution



Potato supply chain and value 2014/15



SECTION ONE

1 Context

The Australian processing potato industry

Crossover with the fresh potato SIP

There is a high degree of crossover between the processing potato SIP and the fresh potato SIP. Both plans essentially focus on on-farm productivity and management, meaning that the performance issues and the strategic responses in both plans are very similar, and in some cases, identical. Therefore, it is envisaged that where there are similar projects, there be cross-sectoral investment and joint oversight of the projects.

Industry overview

The processing potato industry includes French fry and related fried products; potato snacks such as crisps and other value-added products; and dry potatoes and ready-to-serve potato products. Levies are applied to the industry: 90 per cent of levies are accounted for by French fry and related fried products and crisping potatoes. The Potato Processing Association of Australia (PPAA) records indicate that there are 49 registered processors, with Simplot Australia; McCain Foods Australia; Smiths (PepsiCo); and Snack Brands Australia being the largest organisations.

Production across the supply chain

There is a lack of detailed and accurate data on the processing potato sector. Virtually all production data relating to potatoes covers the entire category and does not break down to processing sub-category. Industry has access to better quality intelligence, but for reasons of commercial confidentiality it is not publicly available. The best available estimates used in this plan have been compiled in collaboration with the SIAP members and the PPAA, as well as seeking expert opinion from industry networks.

The PPAA estimates the total production of processing potatoes to be at around 840,000 tonnes. This includes 540,000 tonnes of varieties for frozen processing, and 240,000 tonnes for crisping. It is estimated that a further 30,000 to 40,000 tonnes of crisping potatoes are exported. Field production volume is believed to be relatively flat. While the number of growers has declined, the average tonnage per grower has increased due to industry rationalisation, largely driven by a trend for processors to reduce suppliers.

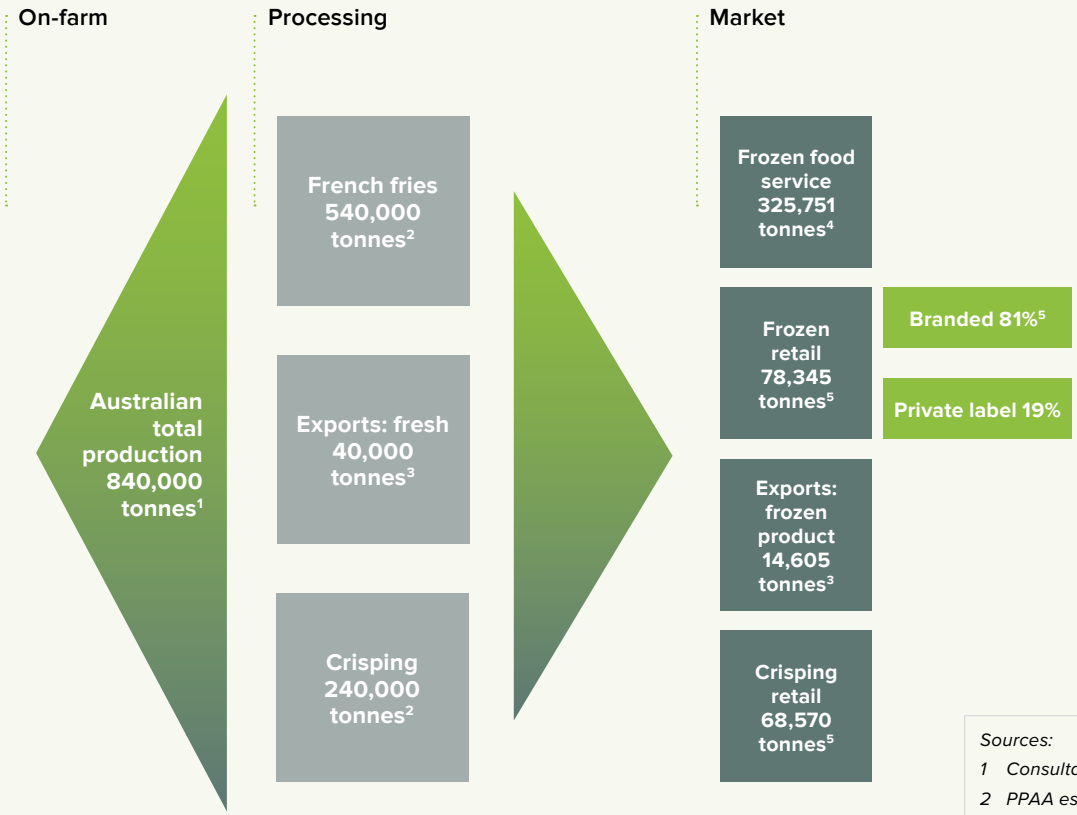
Simplot Australia and McCain Foods Australia are the two main producers of French fries in Australia. Product grown in Tasmania by Simplot Australia is supplied to their factory at Ulverstone whilst McCain Foods Australia has processing facilities at Smithton in Tasmania and Ballarat in Victoria. In addition to local sourcing, product for McCain Foods Australia is also procured from the Penola region in South Australia and Riverina in New South Wales.

There are around five significant crisping processing factories located throughout Australia. These are mostly along east coast locations in Sydney, Brisbane, Adelaide and a smaller facility in the Yarra Valley. Because it is less desirable to store crisping potatoes, they are sourced from a wide geographic growing area nationwide and have an extended growing season as crisping processors need to source freshly harvested potatoes year round.

The vast majority of processing potatoes procured by the major processors are sourced on an annual contract basis, subject to yearly price negotiations.

In addition to the major processors noted above, a growing number of smaller-scale regional processors are emerging that service small and gourmet quick service restaurant (QSR) chains and independent outlets. A number of these are located within traditional potato growing areas such as Gembrook in Victoria and Manjimup in Western Australia and have emerged as growers who have vertically integrated their operations.

Figure 1: Processing potato production snapshot



Sources:

1 *Consultant/PPAA estimate, 2016*
2 *PPAA estimate, 2015*
3 *Fresh Intelligence, 2016*
4 *Calculated by MCKINNA et al based on Freshlogic data from Hort Innovation (2016)*
5 *Retailworld Annual Report, 2015*

Conversion rates: French fries 2:1. Crisping: 3.5:1.

Channel percentages calculated from Australian Horticulture Statistics Handbook 2014/15.

Estimates and analysis by consultants in collaboration with PPAA.

Note: due to the use of different data sources, the above figures do not reconcile and as such are indicative only.

Cost of production

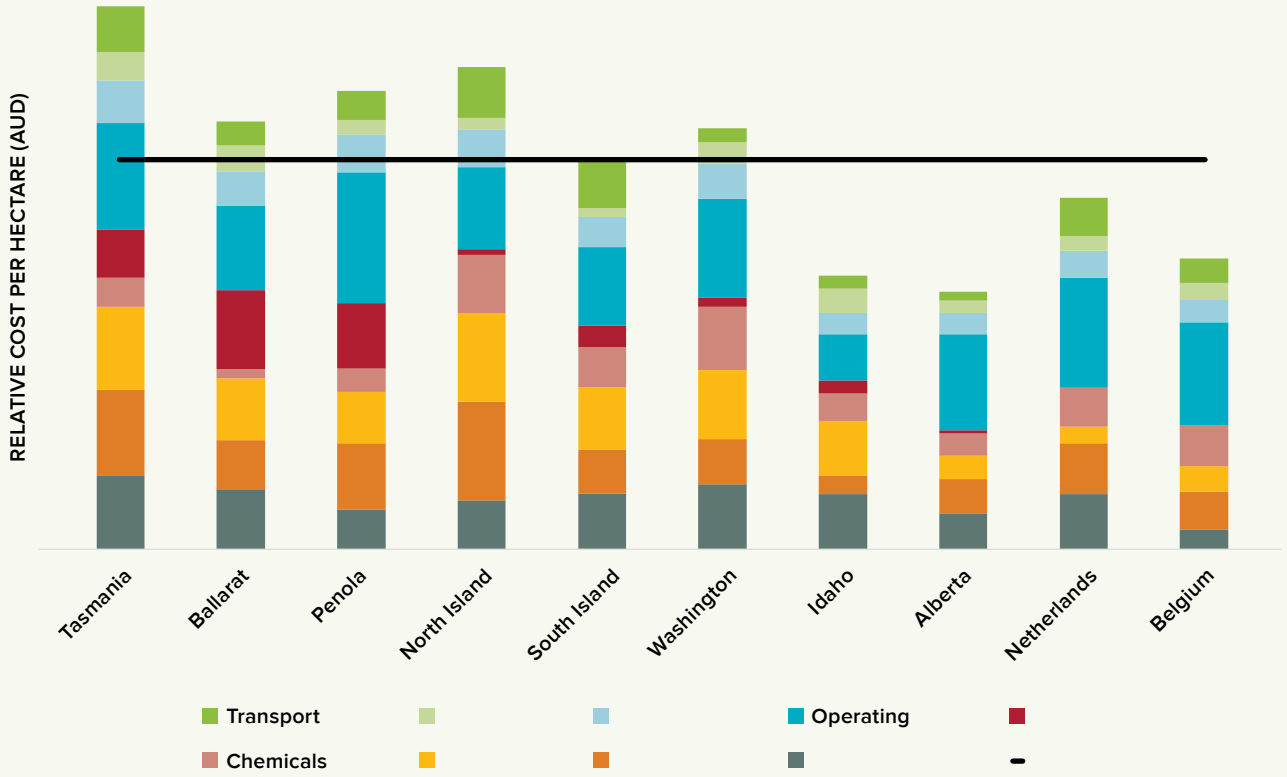
Processors' internal benchmarking indicates that Australia's average cost of potato production is up to 50 per cent higher than the United States and Europe. As the major processors are part of multinational businesses, they are benchmarked against their counterparts globally, and are therefore able to report that the cost of raw processing potatoes is higher in Australia than in most other plants. It is important to note that the supply situation in China differs to other markets as there is a shortage of raw potatoes – it is more cost-effective to import finished product from the United States. Various studies have also been conducted in Australia on the cost of processing potatoes. ***Table 1*** outlines relative cost differences.

Table 1: Average processor price *(Source: Mark Heap, Simplot, 2016)*

Country	Processor price USD	Comments
USA	(160 to 170) 208	Typical, but with some open market variation
India	147 to 190	Open market extremely volatile and frozen processors must contract 100 per cent
China	230 to 300	Prices vary depending on end market. Mostly grown to contract. QSR raw potatoes are in short supply so growers are paid a premium. Grower input costs are higher due to the greater need for chemicals.
Europe	176	Extremely volatile, depending on weather during growing season. A large volume of non-contract, open market influence
Australia	230 to 250	All contracted, price varies a little according to tuber quality

Figure 2: Relative processing costs: global comparison

(ABS (2015) and ABARES (2014) Australian vegetable growing farms: An economic survey, 2012–13)



**Notes:*

Actual costs have been removed from this graph for reasons of commercial confidentiality.

The calculation includes depreciation and finance costs. Costs were originally calculated at USD 0.74.

Reproduced with the permission of McCain Foods Australia.

A global benchmarking study by commissioned by McCain Foods Australia in 2011 shows that Australia has higher costs in almost every cost component of processing potato production. Although this study is now outdated, the relativities will not have changed.

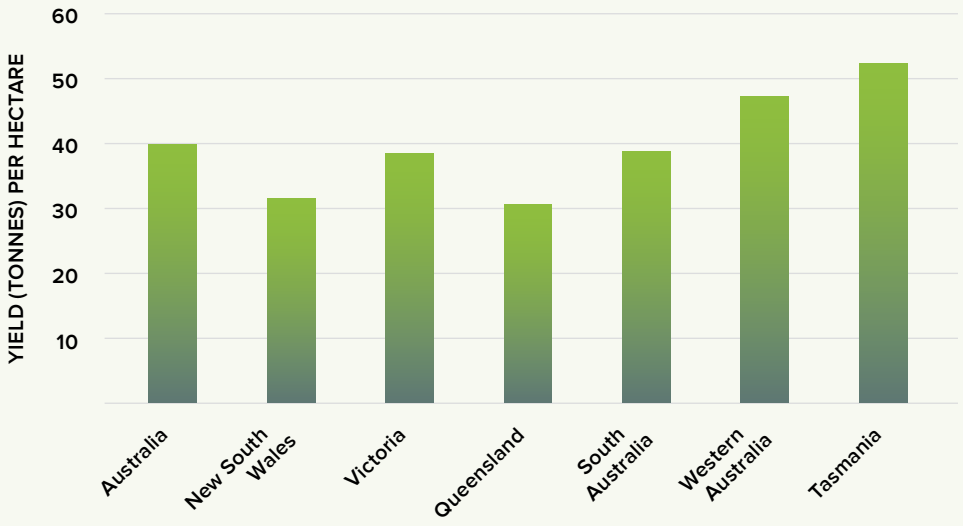
There are a number of factors contributing to Australia's higher cost of production and this is explained in ***Table 2***:

Table 2: Contributors to the high cost of potato production in Australia

Cost area	Issue
Labour	Australia's labour costs are more than double those of competitor countries when penalty rates and flow-on costs are included. Furthermore, the smaller scale of potato production results in lower rates of labour productivity.
Yield	Although Australia's best growers are achieving yields similar to the best growers overseas, the average is considerably less and varies greatly seasonally, regionally and even within paddocks.
Input cost	Australia has substantially higher input costs that is largely due to scale and the amount of competition in key areas such as chemicals, fertiliser, fuel and equipment.
Seed	Seed accounts for 20 per cent of cost of production but has a huge bearing on yield. 80 per cent of processing growers are using certified seed. Seed cost is higher than other countries and availability is often an issue due to seasonal conditions.
Scale	Australian average acreage is smaller than New Zealand, United States and Canada. The economies of scale in potato production are substantial, particularly with equipment utilisation and the ability to justify the biggest and best technology.
Farming models	In Europe, small-scale disadvantage can be offset by farming models such as use of contractors, machinery collectives, collective farming and cheaper land. Australian growers are reluctant to adopt alternative business models.
Geography	A large proportion of processing potatoes are grown in areas of undulating hills such as Tasmania and Ballarat which are subject to high rainfall that limit the ability to use large-scale equipment, therefore, slowing the speed of operation.

Figure 3: Potato yields per hectare by state 2013/14

(Source: ABS (2015) and ABARES (2014) Australian vegetable growing farms. An economic survey 2012-13. Haydn Vale research report 2014/15.)



Processing potato yields

As noted in ***Table 2***, with some exceptions, Australian yields are lower on average than other producing nations. The Australian Bureau of Statistics (ABS) data does not separate yields by type of potato or production use, therefore, the data below includes ware potatoes, French fry and crisping potatoes, all of which have differing benchmarks.

Australian potato yields vary considerably by region, season, time of year, grower and also, across a particular paddock. Overall yields are highest in Tasmania as a result of the better growing conditions and the fact that the state's growers predominantly produce for frozen processing. The varieties used in frozen production have higher yields than fresh or crisping potatoes. Official average yield for all potatoes (ware and processing) in 2013/14 was 40 tonnes per hectare, but some Tasmanian and Ballarat growers are achieving 60 to 70 tonnes per hectare and higher. The average yield is around 55 tonnes per hectare for frozen processing potatoes, which is significantly lower then the performance of North America and New Zealand. Crisping growers tend to achieve a lower average yield of 40 tonnes per hectare which is due to the cultivars; the quality that is required for the crisping process; the wide range of country where they are grown; their requirement to be grown year-round; and that there is a wider use of in-ground storage.

The key factors impacting yield variability include:

- Soil health and types
- Quality of seed
- Pest and disease load
- Fertiliser management
- Water management
- Access to agronomic expertise
- Grower skill
- Weather and climate change.

Processors indicate that there is a major opportunity to lift average yield in processing potato production in Australia, particularly, by reducing yield variability through better management practices.

Market overview: French fries

Total consumption of potatoes in Australia is in long-term decline, however, processing potatoes that are grown for frozen products are increasing in share, largely because of the convenience and appeal of the QSR offering.

Frozen potato product categories are extremely price sensitive and highly competitive. This results from them being primarily sold through QSRs and supermarkets. However, market growth is twice the rate in value growth than in volume growth, indicating a shift from commodity fries to higher value specialty products such as coated products and wedges. Private label product accounts for 19 per cent of retail share and is increasing at the expense of branded product.

The QSRs are dominated by McDonalds and Yum! Brands Inc. As these global organisations employ exacting standards and tender for supply of French fries regularly, Australian companies must be price competitive at a global level. French fries can be easily and cost-effectively sourced by sea-freight, and it can often be cheaper for organisations to source frozen products from overseas, rather from within Australia. The predominant supply companies for these QSR organisations in Australia are Simplot and McCain Foods Australia. Both have processing facilities globally and frequently source product from the most cost-effective country to fulfil Australian contracts.

Numerous smaller producers from Europe are gaining market share at the lower end of the fast food market, such as fish and chip shops and small, independent hamburger chains. As a result, import share of total frozen potato products is growing whilst exports are relatively flat. Australia is facing strong competition on the domestic French fry market from imports from New Zealand, North America and Europe.

Table 3: Frozen potato domestic retail market

(Source: Retailworld, 2014)

Potato (frozen) value/volume	
Grocery value	$224.6m
Value change	+ 3.2 per cent
Grocery volume	61,184 tonnes
Volume change	+ 1.6 per cent

Potato (frozen) segment percentage share		
	Value	Volume
French fries	39.1%	48.3%
Specialty fries	35.9%	30.9%
Potato specialties	25.0%	20.8%

Potato (frozen) corporate percentage share		
	Value	Volume
Simplot	39.1%	32.7%
McCain Foods Australia	38.7%	34.8%
Private label	19.3%	31.3%
Others	2.9%	1.2%

Despite the consumer shift to higher value specialty products, private label still accounts for 31 per cent of sales volume, exemplifying the price competitiveness in this category. Although much of the private label product is imported, the two major Australian retailers are consciously shifting more private label contracts to domestic suppliers because of consumer pressure and in light of low Australian dollar forecasts. Even with the recent pressure on supermarkets to support 'Australian grown', it does not apply to frozen potato categories to the same extent as frozen vegetables.

Market overview: crisping category

The crisping category is highly competitive even though it has low exposure to import replacement. As the product is lightweight but very bulky, crisps are costly to transport. As a result, most snack products, except specialty snacks, are produced in close proximity to where they are consumed.

The snack market is growing strongly both in terms of volume and value. Potato snacks are predominantly retailed through supermarket and route trade channels such as petrol stations, convenience stores and cafés. Speciality snacks make up a significant proportion of the market – these include products like Kellogg's Pringles. Kellogg's holds more than 10 per cent market share but does not process in Australia.

Domestic market overview: potato snacks

Table 4: Salty snacks domestic retail market

(Source: Retailworld 2014.)

Salty snacks (potato)	
Grocery value	$524.4 million
Value change	+12 per cent
Grocery volume	33,495.9 tonnes
Volume change	+9.9 per cent

Salty snacks (potato) corporate percentage share		
	Value	Volume
PepsiCo	53.2%	52.2%
Snack Brands Australia	29.5%	30.2%
Kellogg's	10.1%	8.9%
Private label	6.8%	8.6%
Others	0.3%	0.2%

Note: The data does not include route trade channels that are a significant channel for snack products.

Figure 4: Global markets – potato products total imports and exports by value 1997 to 2016

(Source: ABS data via Global Trade Atlas. Analysis: Fresh Intelligence analysis, 2016)

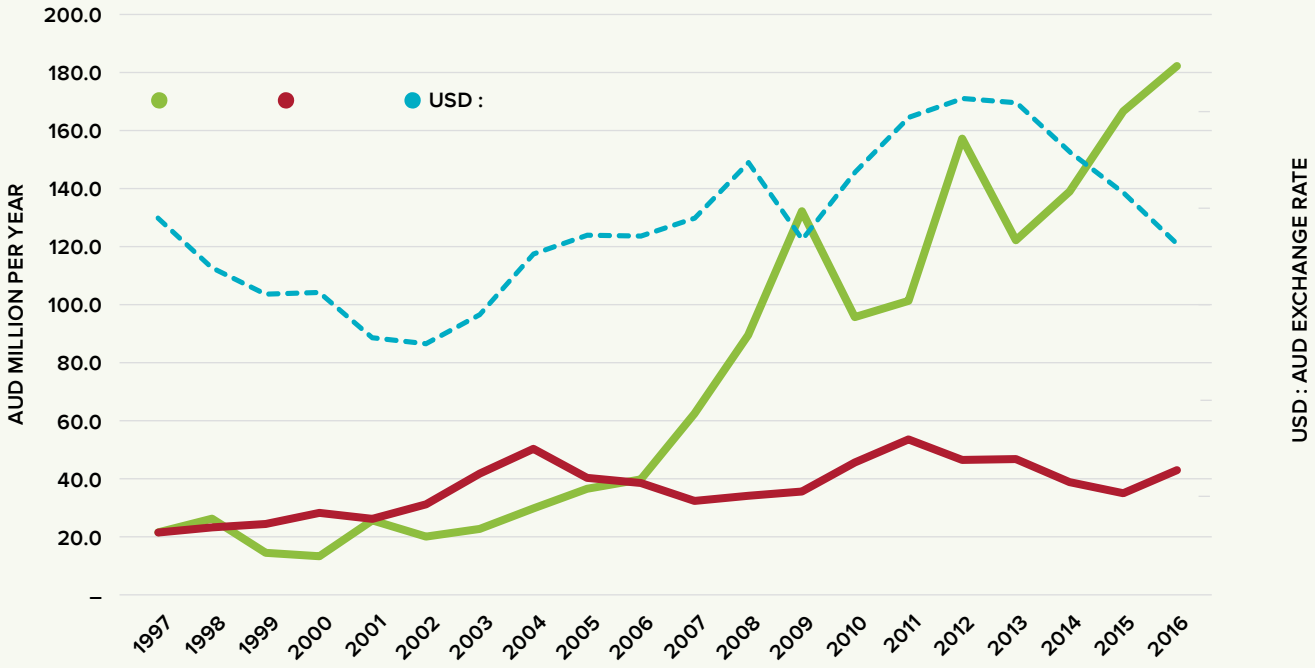
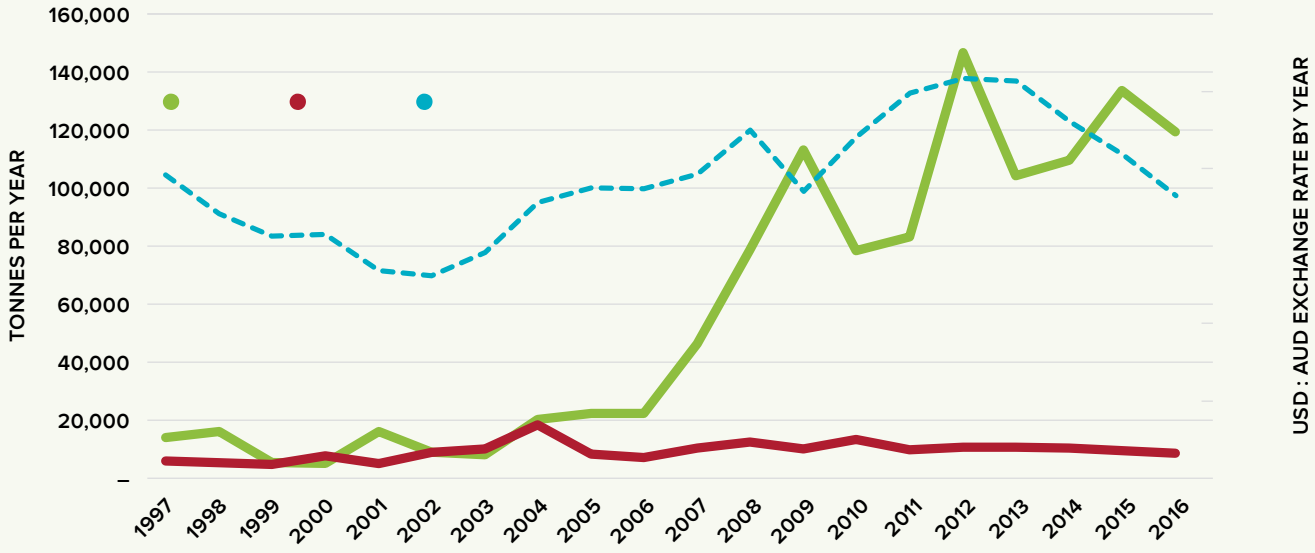


Figure 5: Global markets – export vs import frozen prepared potato product (French fries) – USD

(Source: ABS data via Global Trade Atlas. Analysis: Fresh Intelligence analysis, 2016)



Salty snacks that are produced by well-known and trusted brands hold a much larger market share than private label.

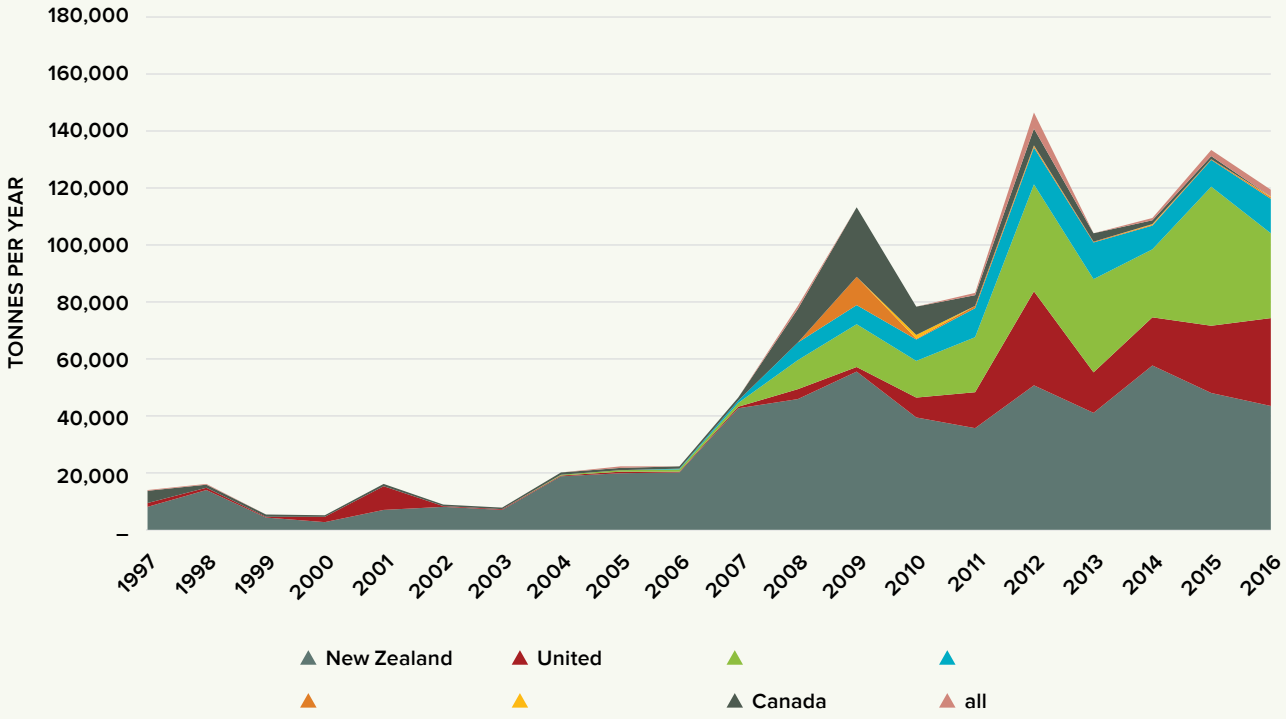
As the majority of potato snack products are retailed through supermarkets and retail channels, and there is an upward trend in supermarket growth and value, a higher rate of value growth can be gained by trading up to higher value, specialty products.

Total imports of potato products have increased steadily over the last 20 years, while exports have remained relatively static. Volumes are sensitive to exchange rates and this is indicated by blue dotted line in the ***Figure 4***.

Snack product import is highly sensitive depending on the global supply situation and exchange rate. In times of oversupply, exporting countries are known to 'dump' product on some markets at low prices.

Figure 6: Global markets – frozen prepared potato product (French fries) imports by supplier 1997 to 2016

(Source: ABS data via Global Trade Atlas; Fresh Intelligence analysis, 2016)



Australian trade in frozen potato products

Australia has been an importer of frozen potato products since 2006. Imports are increasing strongly whilst Australian exports are declining. New Zealand is Australia's largest supplier of imports, followed by the United States and Europe. Oversupply in Europe can often lead to dumping of low-cost frozen products on the Australian market. Strategic investment by the Belgian government in frozen food processing has created a powerhouse in frozen categories – many smaller processors who are more agile than the major processors can capitalise on niche markets in Australia relatively easily with a lower cost product.

Australia has strong levels in local manufacture of potato snacks, however, imports are also significant. Much of the specialty product (such as Pringles) are manufactured offshore. The low volume of imports, in terms of tonnage, is misleading, as most potato snacks are low weight.

Import volumes predominantly reflect inter-company trading strategies of multi-national processors and exchange rate fluctuations.

Import levels of crisping potatoes peaked in 2013 when the Australian dollar was above parity.

Situation summary

The data analysis highlights the following key points:

1. The frozen processing potato sector is showing modest growth and the crisping potato sector is demonstrating strong growth.
2. Despite overall market growth, Australian market share is relatively flat because imports are growing. The frozen processing potato sector is losing market share to imports from New Zealand, North America and European producers who are cheaper. However, the crisping processing potato sector has less exposure to import competition because of high freight costs and short shelf life of the products. As crisping products are usually retail products, they cannot be as easily dumped on export markets in the way that frozen products can be.
3. Australia has a substantially higher cost (per hectare and per tonne) of processing potatoes because of:
   - **Lower average yield**
   - **Higher input costs**
   - **A smaller scale**
   - **Lower capital utilisation**
   - **More difficult growing conditions**
   - **High labour costs.**
4. With limited prospects to lower costs, R&D strategic focus needs to be on increasing yield per hectare and placing emphasis on consistency in yield across properties and within fields.
5. Realistically, as Australia's cost disadvantage, opportunities to increase exports are limited (except for near Pacific neighbours for ware potatoes and Asia for crisping potatoes), the focus of the strategy in this respect, must be on protecting the domestic market from import replacements.

Figure 7: Export vs import volume non-frozen potato product (crisping) – USD

(Source: ABS data via Global Trade Atlas; Fresh Intelligence analysis, 2016)

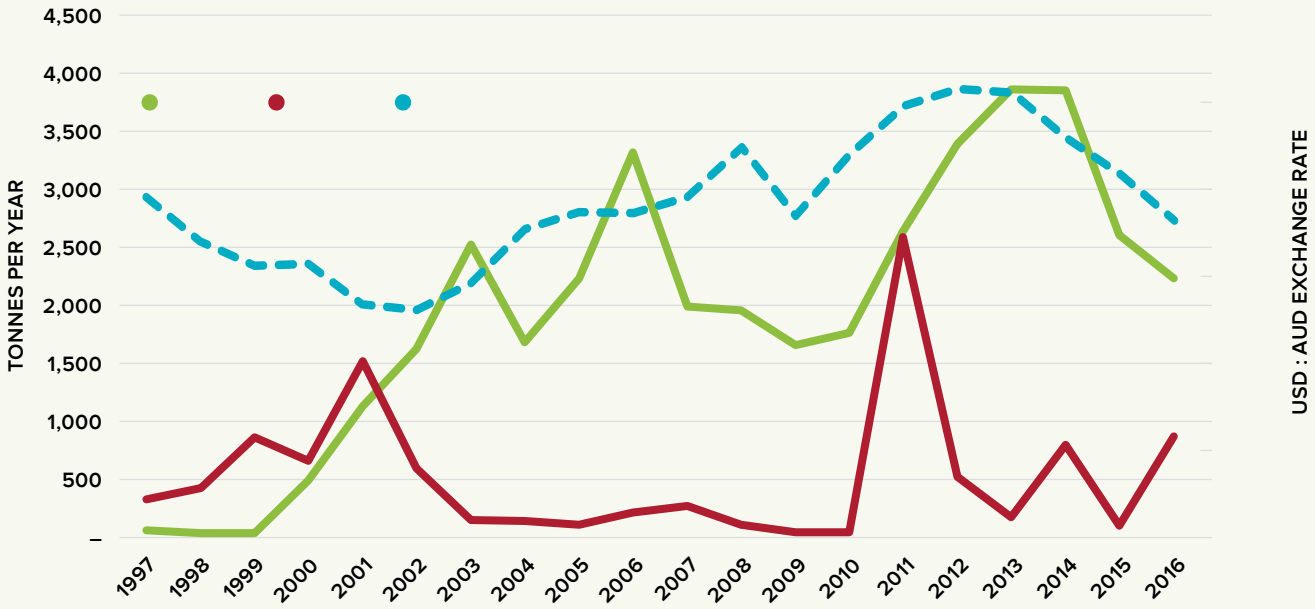
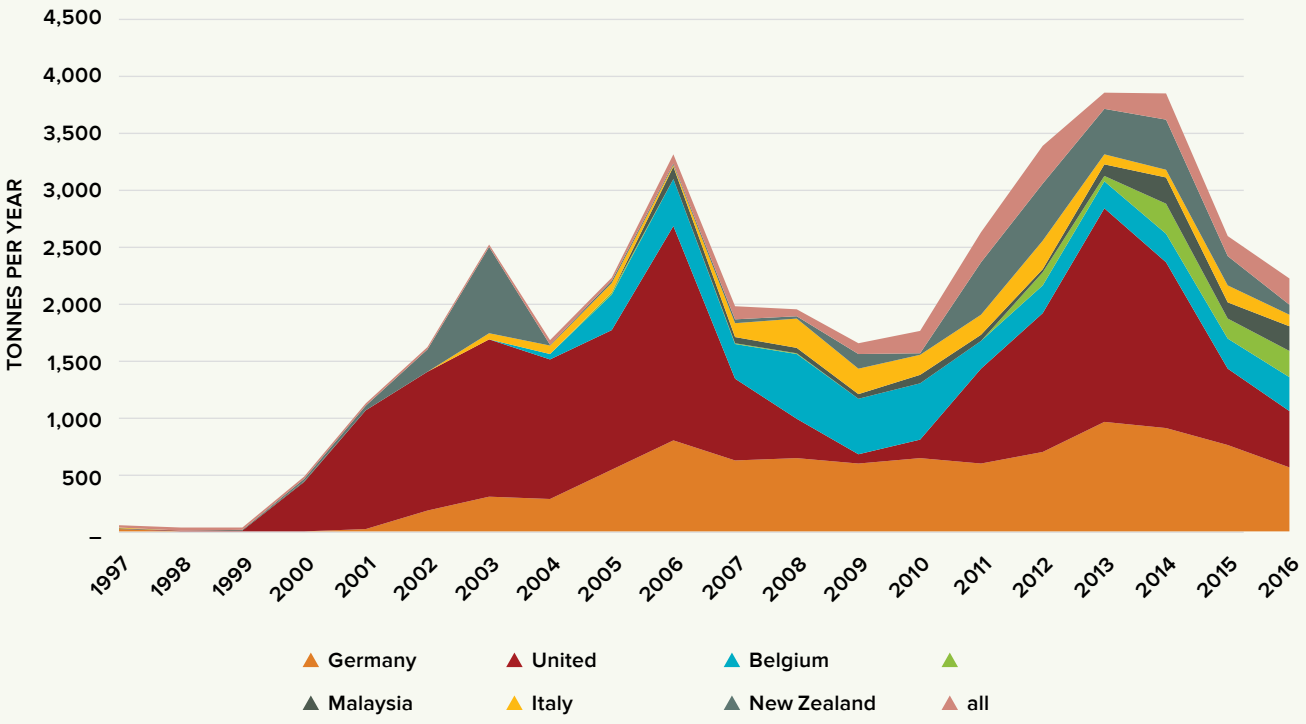


Figure 8: Non-frozen potato product (crisping) imports by supplier 1997 to 2016

(Source: ABS data via Global Trade Atlas; Fresh Intelligence analysis, 2016)



Environmental scan

The purpose of the environmental scan is to identify the factors in the external operating environment that could impact the industry in terms of both opportunities and risks. The analysis is based on a PESTEL framework that systematically reviews the external market forces through Political, Economic, Social, Technological, Environmental and Legal lenses.

Political impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Domestic regulation		
Backpacker tax	Potential impact on casual labour supply	Higher labour costs
Review of horticulture award	Increased penalty rates	Higher labour costs
Food labelling	Nutrition or country of origin labelling	Reduced consumption of potato products Potential to drive demand for Australian food
2. Global geopolitics		
South China Sea tension	Disruption to world trade resulting in displaced product exported to receptive markets	Cheap imports of potato products would undermine industry profitability
Brexit	Depreciation of English pound	
United States elections	Growing protectionism in trade	

Economic impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Domestic economy delicately balanced		
High levels of household debt	Reduction in consumer spending	Erosion of industry profitability at every level of the supply chain Greater fluctuation in global exchange rates impacting import/ export trade
Increasing current account deficit	Strong likelihood that Australia's AAA credit rating will be downgraded	
Housing market bubble	Shift to lower value products	
Economy not responding to low interest rates	If central banks change strategy and increase interest rates, the cost of borrowing will increase and credit become harder to secure	
Heavy reliance on Chinese economy	Shifts in the Chinese economy could drive the USD upwards and the Australian dollar downwards	
2. Rising costs		
Rising costs of doing business	Difficult to pass on price increases in current environment	Reduced profitability and viability of farming businesses
3. US economy is recovering		
Employment rate rising	USD likely to appreciate	AUD likely to depreciate again which will deter US imports The cost of US machinery and parts will rise
GDP growth improving	Increased local demand	Less exports
Increased business confidence	Greater investment in capacity	More exports to Australia at lower prices
4. European economy is faltering		
Major economies in Europe delicately balanced	Further devaluation of Euro	Depreciation against AUD will drive imports
5. Food deflation		
Food prices have declined in real terms in most categories: • **Global oversupply** • **Supermarket power** • **Impact of cheap imports** • **Growth of private label**	Returns to food companies at every level of the supply chain are not keeping up with cost, causing declining profitability	Loss of growers
6. Supermarket dynamic		
Dominance of Coles and Woolworths is under threat from Aldi, Costco and new entrants	Aggressive price war	Increased downward pressure on selling prices
Increasing trading terms	Processors remain under significant trading pressure	Reduced margin and profitability means less ability to invest in brands and increased private label
Growth of private label	Erosion of brand loyalty and brand power	Increased imports Less brand loyalty

Economic impacts *(continued)*

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
7. Concentration among global agribusiness supply/ technology companies		
Recent merger and acquisitions: • **Bayer and Monsanto** • **Dow and DuPont** • **China National Chem Corp and Syngenta**	Inputs and technology will become more expensive and availability more restricted Shift from chemicals to genetics to control pest and disease	Higher import costs Australia may get secondary access to latest technology
8. Sea freight rationalisation		
Overcapacity in global sea freight has led to bankruptcy amongst shipping companies such as Hanjin	Rationalisation within the sea freight sector Increased shipping costs	Increased freight costs will deter imports Exports less competitive

Social impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Social licence		
Changed community attitudes empowered by social media are demanding more accountability from corporate Australia	Greater accountability required in: • Use of chemicals • Labour practices • Workplace safety • Food miles Environmental sustainability	Adverse social media reaction can be potentially extremely damaging
2. Provenance		
Consumers are interested in where their food comes from: **Where it was grown; where was it made; who grew and made it; and how**	Pressure for more detailed food labelling Pressure for increased whole-of-chain traceability Growth of organics	Added cost and regulation burden Increased support for Australian grown
Increasing trading terms		Reduced profitability the supply chain means less ability to invest in brands
Growth of private label	Erosion of brand loyalty and brand power	Increased imports Less brand loyalty
3. Declining national health		
Australia is in the middle of a health epidemic: • **Obesity** • **Type 2 diabetes** • **Cardiovascular disease** • **Increased cancer rates**	Increasing pressure by governments to change lifestyle and eating habits because of the spiralling health costs	Increased pressure against heavily processed, high-fat and high-sugar foods
Publicity around acrylamide has the potential to widen awareness	Dangers associated with bowel cancer become more widely publicised	Fried potato products are strongly associated with poor health like soft drinks

Technological impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Emerging technologies		
Game changing technologies: • **Sensing** • **Big data** • **Robotics** • **Drones** • **Radio frequency identification (RFID)** • **Near infrared spectroscopy (NIR)** **Smart packaging**	Will drive efficiency and speed of change	Opportunity for Australia to improve its global competitiveness by reducing labour cost or increasing productivity and yield Failure to keep up with technology will increase import threat
2. Disruptive technologies		
IT is allowing the entry of disruptive technologies: • **Smartphone connectivity** • **Direct-to-consumer and B2B**	Disruption to traditional business models Increased competition Regulators cannot keep up with the pace of change	Increased competition Greater scrutiny and accountability

Environmental impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Climate change		
Less reliable rainfall	More reliance on irrigation	Higher cost
Higher temperatures	More crop failures Changed pest and disease profile	Higher risk of issues like psyllid Need for heat resistant varieties
More extreme weather events	More catastrophic crop failures	Increase in isolated summer storms with heavy rain/hail/wind could result in crop damage
2. Water cost and availability		
Impacts of climate change: • **Less run-off** • **Environmental water buy-backs** • **Lowering of underground water table** • **Declining water quality** • **Stricter CMA regulations**	Restricted water availability Higher cost of water	In some catchments water may be too expensive for growing potatoes

Legal impacts

FACTOR	IMPLICATIONS	RISK/OPPORTUNITY
1. Increased red tape		
Increased red tape and compliance burden: • **Public pressure** • **Political correctness** • **Social accountability**	Increased cost of doing business	Threat to viability of marginal agribusinesses Reduces Australia's competitiveness
2. Food labelling regulations		
Tighter food labelling and consumer protection regulations	Stricter regulations and accountability on food labelling from government	Declining purchase of retail processing potato products because of health warnings on packs

Strategic risk

The following strategic risks to industry have been identified, together with the required R&D response. The impact of climate change and the threat of psyllid incursions have been identified as the most serious risks, requiring priority attention in this SIP.

STRATEGIC RISK FACTOR	R&D RESPONSE
Reduced consumption of processing potato	• Improve eating quality
Short- and long-term risks associated with climate change	• Improve farm management skills • Address through variety selection
Biosecurity incursion	• Monitoring program • Risk plan
Loss of growers due to unprofitability	• Improve global competitiveness
Dumping of cheap products in the domestic market	• Improve global competiveness
Appreciation of the Australian dollar	• Improve global competiveness

Operating environment

The processing potato industry SWOT analysis	
Strengths	• A core group of growers who have a willingness and capability to improve yield by adopting the latest technology • State-of-the-art processing facilities that can compete with the best in the world • Good growing conditions well located relative to processing facilities • Best practice seed quality certification program • Access to quality science and research capability • Global reputation for safe food with integrity in supply chain.
Weaknesses	• Higher input costs in all categories relative to competing countries • Lower and more variable yield than competitors • Lack of economies of scale and capital utilisation • Some resistance by growers to better position themselves for the developing global realities of the sector • Inconsistency in the quality of agronomic advice • Business and whole-of-farm management skills • Lack of profitability constraining re-investment.
Opportunities	• To take advantage of the world's best scientific knowledge in potato agronomy and pests and disease management • The growing demand for potato products in nearby South-East Asian markets • The potential to leverage Australia's horticultural levy system to grow skills.
Threats	• Biosecurity incursion especially psyllid • Global oversupply and dumping in the Australian market eroding prices • Appreciation of the Australian dollar which will drive imports • Decreased consumption due to greater awareness of health risks.

The strategic importance of improving yield

Realistically Australia will never be the lowest cost producer of processing potatoes because of high input costs, particularly labour. The best chance of remaining viable and reducing the import threat is by improving yield, which will substantially lower production cost per tonne. There is a limited ability to reduce unit cost of inputs.

A 15 per cent improvement in average yield of processing potatoes for French fry production could reduce the processor contract price from around $320 per tonne to $275 per tonne, whilst maintaining grower margins. This would make Australia competitive with New Zealand and more resilient to imports from the United States and Europe.

Yield improvement of this magnitude, which is achievable, will be critical in maintaining the economic viability of the Australian frozen processing potato industry. If Australia lags behind its competition in agronomic performance, it will be under threat from more imports.

Although the issue of global competitiveness is less critical for snacking products (because of freight economics and reduced shelf life) similar yield improvements off a lower base will improve the prosperity of the industry and possibly make Australia competitive in South-East Asia.

Yield growth must not be at the expense of potato quality or it will be counterproductive.

Performance issues

Following a process of filtering the previous strategic analysis, the following factors have been identified and confirmed with the SIAP as being the most critical performance issues facing the processing potato industry and as such, have formed the strategic response in the SIP:

1. Australia's **low global competitiveness** in French fries
2. The growing **threat of imports**
3. Australia's **high cost of production** for processing potatoes relative to competitors due to:
    - **Yield (particularly variability of yield)**
    - **Labour**
    - **High input costs**
    - **Scale and capital utilisation**
    - **Pest and disease pressures**
    - **Soil health**
    - **Seed quality**
4. The **inconsistency of agronomic advice** nationwide
5. The **biosecurity threat** particularly from psyllid implications
6. **Industry cohesion**:
    - **Grower understanding of the global market and the need to change**
    - **Second tier processors developing niche markets**
7. Future **competition for land** suitable for potatoes
8. Grower **skill and professionalism**.

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SECTION TWO

Processing potato industry outcomes

Industry outcomes

For reasons explained in the above analysis, the strategic imperative of the R&D investment needs to be on improving Australia's competitiveness, with a focus on driving up productivity/yield whilst maintaining quality. Therefore, the intent of this SIP and its outcomes is to create a sustainable, globally competitive processing potato industry, which is profitable at every level of the supply chain.

OUTCOME 1

Industry has access to the world's best agronomic information and networks, resulting in increased productivity

- The Australian processing potato industry is a global, trade-exposed industry. It must become globally competitive to be sustainable. Therefore, it must have access to the world's best scientific knowledge
- Other leading producers are the United States, Canada, the European Union and New Zealand. Although there are regional nuances, generally the issues and challenges are the same
- Realistically, most of the scientific challenges are being addressed somewhere else in the world
- Collectively these countries are spending millions each year on R&D. With much larger industries and substantially larger research budgets they have far greater scientific resources. Much of this information and knowledge is accessible within the scientific community
- It is essential that the Australian industry establish networks and communication channels to tap into this scientific resource and knowledge base.

OUTCOME 2

Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge

- Given Australia's high input cost, it is critical that producers focus on increasing yield. Although the best producers are achieving world's best yields, there is a high level of variability across growers from season to season and within each paddock
- A critical factor in building average yields is to make sure that processing growers have access to the best possible information from around the world
- Growers main source of information is from consulting agronomists including processing company, chemical and fertiliser suppliers or paid consultants. It is therefore essential that consulting agronomists have access to the best information
- Soil health is now recognised as a particular issue that needs to be high on the agenda
- Seed quality has also proven to be a major contributor to yield variability.

OUTCOME 3

Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield

- A large part of the reduced and variable yield problem is due to persistent pests and disease issues, which vary by region and season. They also limit which markets growers can trade into for biosecurity reasons. It is therefore critical that the industry has adequate responses to those that pose the biggest challenges.
- Continued work is needed on the pest and disease challenges prioritised in PPAA member survey:
  - **Powdery Scab**
  - **Pink rot**
  - **Potato virus Y**
  - **Rhizoctonia**
  - **Sclerotinia**
  - **Tomato spotted wilt**
- Soil health has been identified as a major contributor to reduced yield and the PreDicta Pt has proven to be a powerful diagnostic tool. This tool now needs to be expanded to cover other bacteria and geographic areas (and potentially viruses). Its application to PCN could provide important evidence for area freedom
- Current soil surveillance systems also need reviewing
- Tank mix interaction between chemicals and compatibility of active ingredients requires more work and consultation with chemical companies.
- Psyllid (resulting in Zebra Chip) poses a serious threat to both the French fry and crisping sectors. Trapping programs must be continued, plus there needs to be a response plan in case of incursion
- IPM has proven to be a powerful and cost-effective tool in pest and disease control, which is not used as widely as it could be. Relying on agronomists to transfer this particular knowledge maybe problematic when many are incentivised to sell chemicals, so multiple communication strategies will be required.

OUTCOME 4

Precision agriculture and related technologies /systems become standard practice, resulting in reduced cost of production

- Precision agriculture and other technologies offer potential to improve efficiency and lower overall cost of production. There is a suite of technologies that could make a powerful contribution to improved productivity in the processing potato sector including:
  - **Soil mapping (EM 38) and strategic sampling**
  - **Yield mapping**
  - **Crop sensing**
  - **Variable rate irrigation**
  - **Variable fertiliser application**
- Although the technology has been around for many years, and most new equipment has precision agriculture technology, it has not been adopted to anywhere near its full potential for a number of reasons:
  - **Compatibility between various hardware and software applications**
  - **Some equipment is not commercially proven or ready**
  - **Lack of support services for equipment**
  - **Grower knowledge, attitude and confidence in new technology.**

OUTCOME 5

Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability

- The processing potato industry is arguably the most globally exposed of any horticultural industry and its long-term sustainability is conditional upon being responsive to change and keeping up with world's best practice
- The return on investment in R&D and extension will not be maximised unless there is a willingness to change and adopt new ideas
- All players in the supply chain need to understand the realities of global competition and the need to take a partnership approach to creating a sustainable industry. In the past relationships have been adversarial, hampering industry's ability to respond to the realities of global trade in processing potatoes
- Sustainability must embrace triple bottom line values – environmental, economic and social
- Productivity gains will not only come from technology and pest and disease management but also new business models and other ideas that have been proven overseas
- A lack of business and financial management skill by growers is a limiting factor to business improvement. Many growers lack skill sets in areas such as cost/benefit analysis and some do not know their cost of production or return on investment.

3

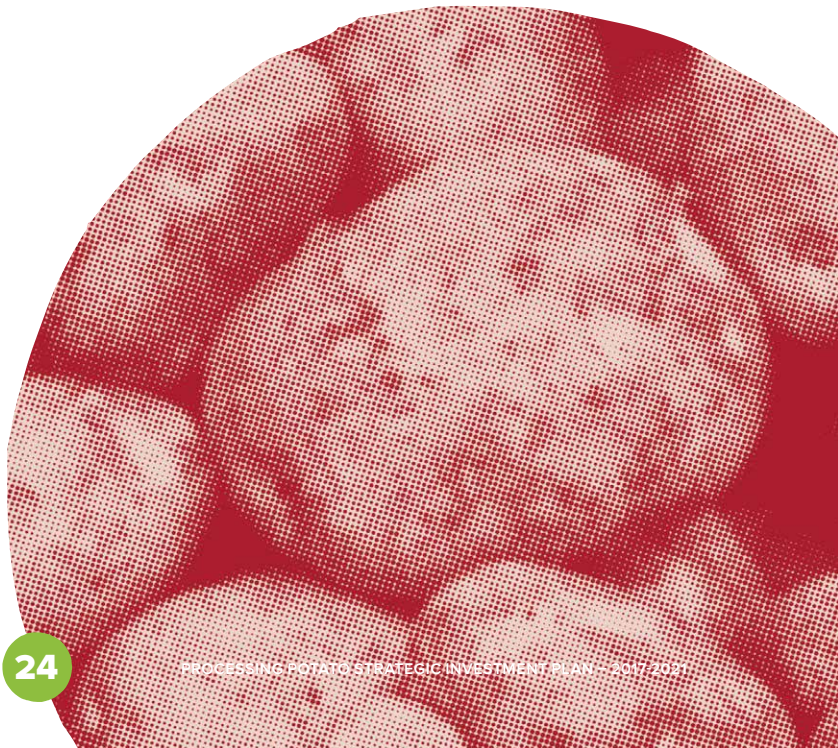
SECTION THREE

Processing potato industry priorities

Industry investment priorities

The processing potato industry aspires to create a sustainable, globally competitive potato processing industry that is profitable at every level of the supply chain. The main objective of this SIP is to provide a roadmap that helps guide Hort Innovation's oversight and management of the processing potato industry R&D levy program. The ability to deliver on all the articulated strategies (and investments) in an impactful manner will be determined by the ability of the statutory levy to provide the resources to do so.

OUTCOME 1 – Industry has access to the world's best agronomic information and networks, resulting in increased productivity	
STRATEGIES	**POSSIBLE DELIVERABLES**
1.1 Compile a database of knowledge sources from local and overseas centres of excellence	1. Completion of global data base resource that identifies all knowledge sources of potato production globally 2. Establishment of a global virtual community of practice 3. Completion of gap analysis with recommendations for R&D investment 4. Facilitation of tour by one visiting fellow per year based on an identified research/knowledge gap
1.2 Assist our research community to establish/ tap into global virtual scientific community on potato research	
1.3 Identify gaps where the global science does not cover Australian specific issues or challenges	
1.4 Initiate projects to fill any gaps identified in 1.3	
1.5 Introduce annual visiting fellow program	



OUTCOME 2 – Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge	
STRATEGIES	**POSSIBLE DELIVERABLES**
2.1 Run subject specific professional training workshops for consulting agronomists (consider accreditation scheme)	1. Annual R&D workshop and/or field day series based on identified R&D and training adoption gaps 2. Delivery of a set of educative tools for distribution by agronomists that simplify recent research for growers 3. A social media platform serving as a Community of Practice 4. Development of a soil management resource kit 5. Development of online communication tool for remote growers to access events, for example, webinars
2.2 Supply advisors with information and materials that simplify and summarise the science in a format that growers can relate to (so-called 'muddy boots science')	
2.3 Establish a social media network facilitated by industry experts and professional advisors within the processing potato community (ensure adequate funding to maintain)	
2.4 Develop soil management resource kit with practical and cost-effective tools	
2.5 Develop a calendar of coordinated program of regional field days and/or trials, specifically for processing growers (in cooperation with industry suppliers)	
2.6 Develop Skype- or web-based advisory platforms/tools so growers located in remote areas also have access to visiting experts and any industry training on offer	

OUTCOME 3 – Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield	
STRATEGIES	**POSSIBLE DELIVERABLES**
3.1 Encourage use of PreDicta Pt and support R&D to extend application to pink rot and PCN	1. PreDicta Pt is made available in all regions for pink rot and PCN 2. An updated national response plan and biosecurity manual 3. Pathway for wider industry contribution to certified seed projects 4. Information packages on chemical compatibility and tank interaction 5. IPM information packages and presentations 6. Review report with R&D recommendations on current soil surveillance systems
3.2 Establish appropriate, prioritised R&D and extension programs for highly rated pest and diseases including: • Powdery scab • Pink rot • Potato virus Y • Rhizoctonia	
3.3 Expand pest trapping program and develop national response plan and biosecurity manual for pysllid and other threats (as per Tasmania)	
3.4 Support wider industry efforts to increase the quality of certified seed throughout the supply chain in order for it to be fit-for-purpose	
3.5 Initiate project with chemical companies to gain a better understanding of chemical efficacy and compatibility of active ingredients	
3.6 Integrate IPM as a core subject area in the regional field days program	
3.7 Review current soil surveillance systems	

OUTCOME 4 – Precision agriculture and related technologies /systems become standard practice, resulting in reduced cost of production	
STRATEGIES	**POSSIBLE DELIVERABLES**
4.1 Run regional 'future farming' workshops as part of proposed extension projects	1. Future farming workshops 2. Precision agriculture extension materials and workshops 3. Precision agriculture adoption gap analysis and extension strategy 4. Virtual community network or resource for precision agriculture
4.2 Ensure industry is engaged with other Hort Innovation precision agriculture programs, for example, robotics at the University of Sydney	
4.3 Identify blockers to commercial adoption of precision agricultural systems and other technologies then initiate priority projects in response	
4.4 Establish potato precision agriculture Community of Practice or information resource	

OUTCOME 5 – Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability	
STRATEGIES	**POSSIBLE DELIVERABLES**
5.1 Provide scholarships for agribusiness professional development courses	1. 10 scholarships per year 2. Next Gen or similar program 3. Adoption of new business models such as machinery collectives, rotation specialisation 4. Development of a self-assessment benchmarking tool 5. Database and digital communications strategy 6. NRM extension project
5.2 Introduce Next Gen program including overseas study, mentoring, internships, and basic business skills for growers, scientists and advisors	
5.3 Initiate project to identify and communicate alternative business models to growers	
5.4 Initiate and communicate self-assessment tool for web-based benchmarking on yield and cost, for example, University of Idaho web-based tool	
5.5 Build a processing potato specific information digital database	
5.6 Initiate extension program in NRM, best practice land use and sustainability	

Aligning to Hort Innovation investment priorities

In establishing investment priorities, Hort Innovation analysed both historical and current levy and co-investment portfolios and priorities. From this analysis we identified 11 cross-sectoral investment themes. We consolidated these themes further and considered their alignment with the Australian Government's Rural RD&E Priorities and National Science and Research Priorities, to arrive at five investment priorities outlined in ***Figure 9***. ***Figure 9*** also shows how each cross-sectoral investment theme relates to the five investment priorities.

Figure 9: Hort Innovation's investment priorities

The alignment of the processing potato SIP outcomes to the Hort Innovation priorities and as a consequence the Australian Government's Rural RD&E Priorities and National Science and Research Priorities is shown in ***Table 5***.

Table 5: Alignment of the processing potato SIP outcomes to the Hort Innovation priorities

Hort Innovation investment priorities	Processing potato SIP outcomes
Support Industry efficiency and sustainability	**Outcome 3:** Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield **Outcome 5:** Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability
Improve productivity of the supply chain	**Outcome 1:** Industry has access to the world's best agronomic information and networks, resulting in increased productivity
Grow the horticulture value chain capacity	**Outcome 2:** Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge **Outcome 4:** Precision agriculture and related technologies/ systems become standard practice, resulting in reduced cost of production
Drive long-term domestic and export growth	
Lead strategically to enhance the development of the Australian horticulture industry through operational excellence	Enabler

4

SECTION FOUR

Processing potato industry monitoring and evaluation

Processing potato SIP monitoring, evaluation and reporting

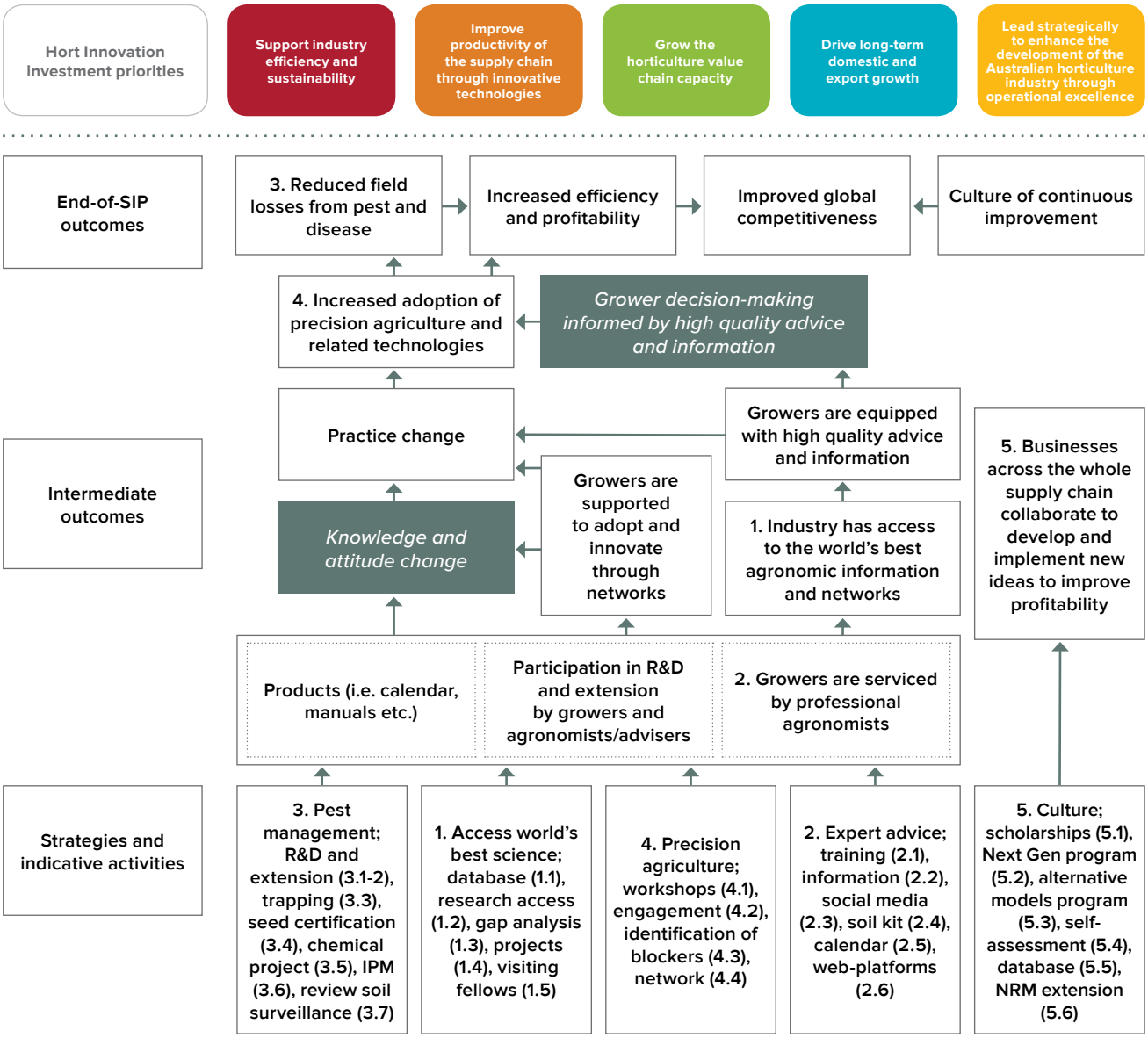
A SIP program logic and monitoring and evaluation (M&E) plan has been developed for the processing potato SIP. These are informed by the Hort Innovation Organisational Evaluation Framework. The logic maps a series of expected consequences of SIP investment. The M&E plan shows the performance measures that will be measured to demonstrate progress against the SIP and what data will be collected. Progress against the SIP will be reported in Hort Innovation publications and at industry Strategic Investment Advisory Panel meetings.

The SIP outcomes and strategies will be used to inform investments in individual projects to deliver on the SIP. The results of M&E will be used to reflect on the results of investments and in decision-making. Hort Innovation will facilitate the regular review of SIPs to ensure they remain relevant to industry.

Processing potato SIP logic

An indicative processing potato SIP program logic is shown below in ***Figure 10***. The logic is based on the Hort Innovation SIP logic hierarchy (***Appendix 4***). The shaded boxes are not fully explicit in the strategy but necessary conditions for the achievement of expected outcomes.

Figure 10: Processing potato SIP logic



Processing potato SIP M&E plan

The processing potato M&E plan is shown in ***Table 6***. The table includes key performance indicators (KPIs) and data collection methods both at a macro/industry (trend) level and at more specific SIP level/s.

Table 6: Monitoring and evaluation plan for the processing potato SIP

Outcome	Strategies	KPIs	Data collection methods and sources
OUTCOME 1: Industry has access to the world's best agronomic information and networks resulting in increased productivity	1.1 Compile a database of knowledge sources from local and overseas centres of excellence 1.2 Assist our research community to establish/ tap into global virtual scientific community on potato research 1.3 Identify gaps where the global science does not cover Australian specific issues or challenges 1.4 Initiate projects to fill any gaps identified in 1.3 1.5 Introduce annual visiting fellow program	1. Completion of global data base resource that identifies all knowledge sources of potato production globally 2. Completion of gap analysis and response 3. Visit to Australia by one visiting fellow per year 4. Number of scientific products/resources made available 5. Reach of products/ resources	• Project records/ documentation • Synthesis of outputs • Grower survey
OUTCOME 2: Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge	2.1 Run subject specific professional training workshops for consulting agronomists (consider accreditation scheme) 2.2 Supply advisors with information and materials that simplify and summarise the science in a format that growers can relate to (so-called 'muddy boots science') 2.3 Establish a social media network facilitated by industry experts and professional advisors within the processing potato community (ensure adequate funding to maintain) 2.4 Develop soil management resource kit with practical and affordable tools 2.5 Develop a calendar of coordinated program of regional field days/trials, specifically for processing growers (in cooperation with industry suppliers) 2.6 Develop Skype- or web-based advisory platforms/tools so growers located in remote areas also have access to visiting experts and any industry training on offer	1. Participation rates of 50 per cent of agronomists who work in processing potatoes for any extension/training event/materials targeted at agronomists 2. Participation levels of active agronomists in social media platform 3. Completion of soil management resource kit 4. Calendar of field based knowledge transfer events/number of events 5. Evidence of increased knowledge/practice change on-farm	• Project records/ documentation • Knowledge transfer event evaluation (feedback forms) • Grower interviews/ survey • Adviser interviews/ survey • Social media tracking & analysis (Google Analytics)

Outcome	Strategies	KPIs	Data collection methods and sources
OUTCOME 3: Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield	3.1 Encourage use of PreDicta Pt and support R&D to extend application to pink rot and PCN 3.2 Establish appropriate, prioritised R&D and extension programs for highly rated pest and diseases including: • Powdery scab • Pink rot • Potato virus Y • Rhizoctonia 3.3 Expand pest trapping program and develop national response plan and biosecurity manual for pysllid and other threats (as per Tasmania) 3.4 Support wider industry efforts to increase the quality of certified seed throughout the supply chain in order for it to be fit-for-purpose 3.5 Initiate project with chemical companies to gain a better understanding of chemical efficacy and compatibility of active ingredients 3.6 Integrate IPM as a core subject area in the regional field days program 3.7 Review current soil surveillance systems	1. Evidence of an increase in usage rate of PreDicta Pt by processing growers, with a target of 75 per cent of production base 2. PreDicta Pt is made available in all regions for pink rot and PCN 3. Evidence of an increase in marketable yields due to improved pest and disease practices, with a target of five per cent 4. Delivery of an updated national response plan and biosecurity manual 5. Delivery of information to industry on chemical compatibility and tank interaction 6. Adoption rate of IPM improves by five per cent of growers/production base	• Project records/ documentation • Synthesis of outputs • Grower interviews/ survey
OUTCOME 4: Precision agriculture and related technologies /systems become standard practice, resulting in reduced cost of production	4.1 Run regional 'future farming' workshops as part of proposed extension projects 4.2 Ensure industry is engaged with other Hort Innovation precision agriculture programs such as robotics at the University of Sydney 4.3 Identify blockers to commercial adoption of precision agricultural systems and other technologies then initiate priority projects in response 4.4 Establish a precision agriculture virtual community or information resource for potatoes	1. Number of future farming workshops per year/ region 2. Industry adoption of precision agriculture technology (number of growers/per cent of production base) 3. Completion of precision agriculture adoption gap analysis 4. Community of Practice or extension resources for precision agriculture	• Project records/ documentation • Synthesis of outputs extension event evaluation (feedback forms) • Grower interviews/ survey • Adviser interviews/ survey

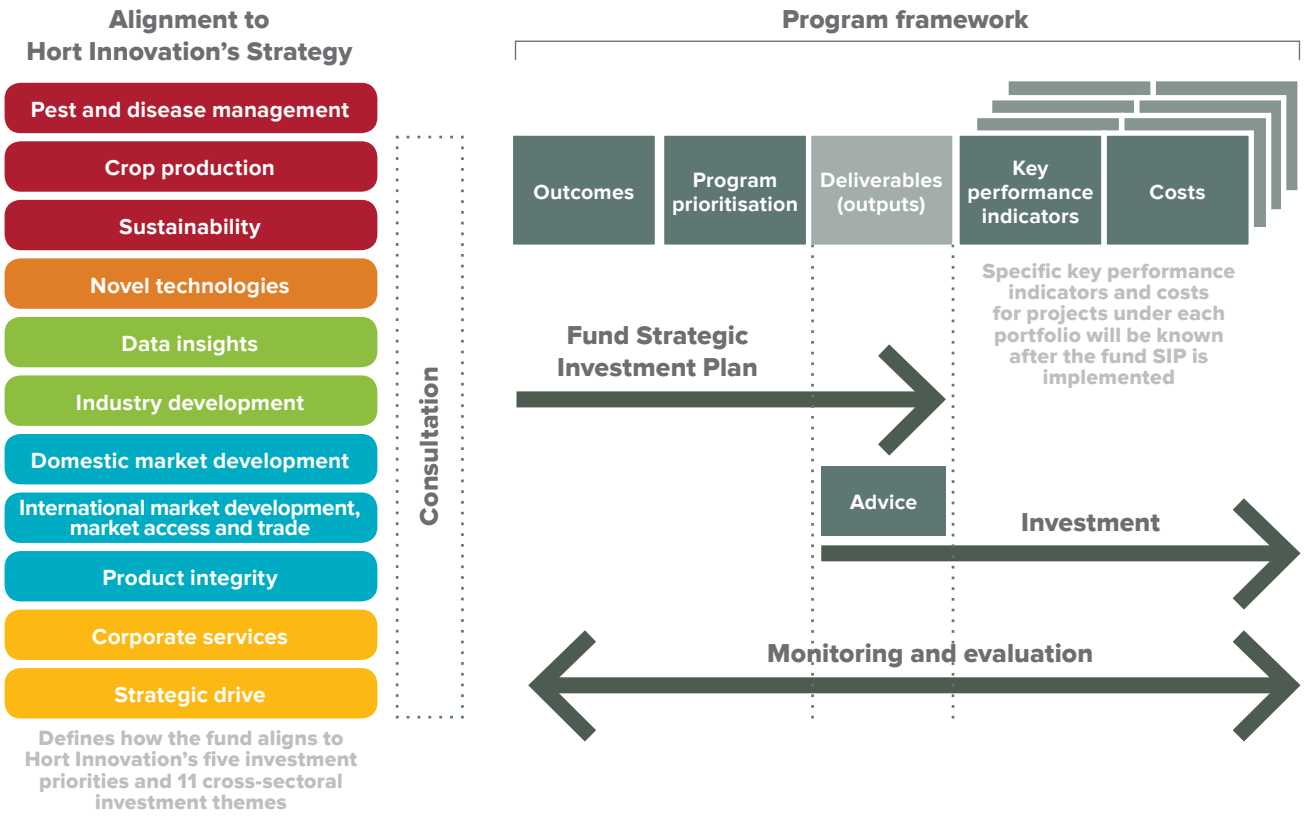
Outcome	Strategies	KPIs	Data collection methods and sources
OUTCOME 5: Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability	5.1 Provide scholarships for agribusiness professional development courses 5.2 Introduce Next Gen program including overseas study, mentoring, internships, basic business skills for growers, scientists and advisors 5.3 Initiate project to identify and communicate alternative business models to growers 5.4 Initiate and communicate self-assessment tool for web-based benchmarking on yield and cost, for example, University of Idaho web-based tool 5.5 Build a processing potato specific digital information database 5.6 Initiate extension program in NRM, best practice land use and sustainability	1. A Next Gen or similar program implemented 2. Self-assessment benchmarking tool developed with evidence of utilisation of the tool by growers 3. Online database of processing potato specific information 4. NRM and best practice extension project	• Benchmarking data • Project records/ documentation • Synthesis of outputs • Grower interviews/ survey • Adviser interviews/ survey

Reporting

The program framework in ***Figure 11*** is the mechanism that links Hort Innovation's strategy and investment priorities to the investment process through the industry SIP. SIPs assist Hort Innovation to prioritise and implement the specific industry research, development and extension (RD&E) and marketing programs.

Hort Innovation will use dynamic reporting against our monitoring and evaluation framework to report on investment progress. The contribution of investments to each industry outcome will be reported regularly, including through industry Annual Reports, Hort Innovation's Annual Report and Hort Innovation's Annual Operating Plan.

Figure 11: Hort Innovation's program framework



SECTION FIVE

Impact assessment

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An independent assessment of the potential economic impacts from investment into the processing potato SIP indicated a positive return on investment for the industry (*Figure 12*). The anticipated investment of $3.59 million over the next five years in R&D and extension activities is expected to generate $8.26 million in net benefits for processors, and $3.98 million in net benefits for growers. A total net benefit of $12.24 million is expected, representing a benefit cost ratio of 3.41 times to the industry.

The assessment draws from a wide range of available data sources, and projects economic impacts over a 15-year period starting from 2016/17. A five per cent discount rate has been applied and all values are adjusted for inflation and presented in 2016/17 dollar terms. The assessment takes a highly conservative approach and the presented figures have been adjusted to account for risks associated with achieving research outputs, expected adoption and impacts.

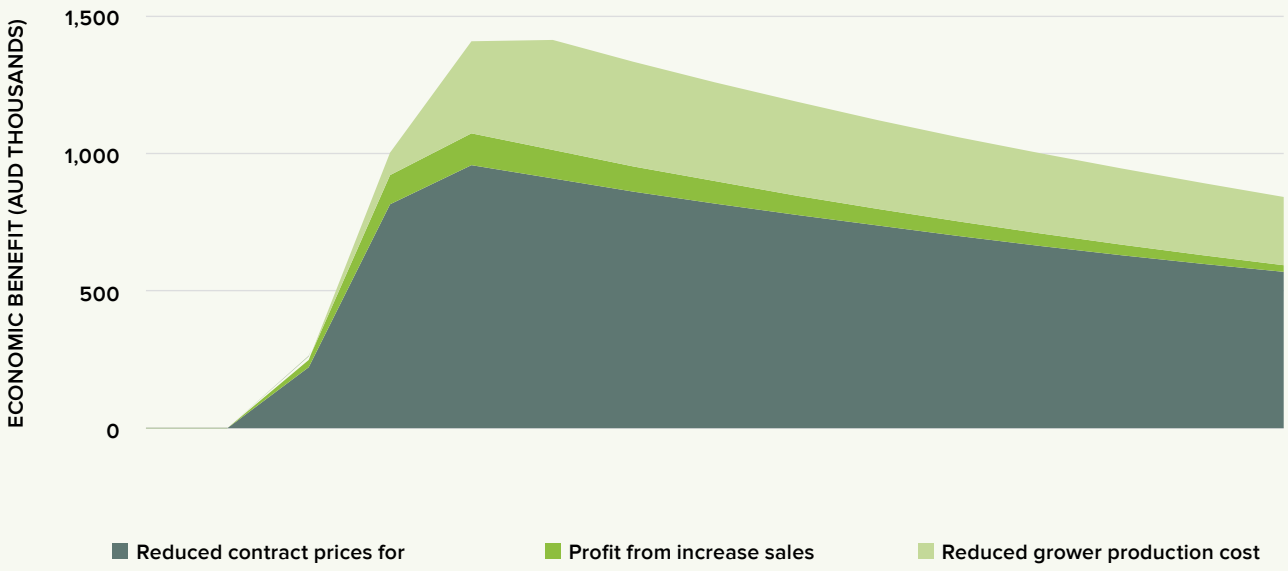
The SIP logic is focused towards end-of-strategy outcomes of improved global competitiveness and increased efficiency and profitability.

Outcomes 1 and 2 are intended to improve dissemination of agronomic advice and global best practice, resulting in practice changes that lead to Outcome 3. This line of SIP research funding is intended to reduce the yield gap by reducing field losses from pest and disease. The resultant improved yield from these outcomes will drive a more globally competitive domestic industry to the benefit of both growers and processors.

Outcome 4 is focused on reduction of costs through the use of new technologies on-farm by growers, resulting in increased efficiency and profitability for growers.

In addition, Outcome 5 is intended to foster a collaborative approach along the processing potato supply chain resulting in an end-of-strategy outcome of a culture of continuous improvement within the industry.

Figure 12: Economic benefit from investment in the SIP



The following table provides a summary of the intermediate and end-of-strategy outcomes identified in the SIP logic, with associated impacts. An approximate fund allocation, net economic benefits towards each outcome and the benefit cost ratio is also provided.

Table 7: Overview of impacts assessed and alignment with SIP targets

Intermediate outcome	End-of-strategy outcomes	Impacts	Anticipated five year SIP investment	Net benefits (15 years)	Benefit cost ratio
(1) Better access to agronomic information and networks (2) Growers serviced by professional agronomists (3) Losses from pest and disease reduced	Improved global competitiveness	Improved average yield enables reduced prices for processors sourcing domestically in AUD	$2,693,268	$8,255,742	3.35
		Improved average yield results in increased production and (profitable) sales volume for growers		$755,364	
(4) Increased use of precision agriculture and related tech	Increased efficiency and profitability	Cost savings in production for growers	$897,756	$3,225,338	3.59
(5) Collaboration across the supply chain	Culture of continuous improvement	Helps to drive quantified impacts	Incorporated in above	N/A	N/A
		All impacts	**$3,591,025**	**$12,236,444**	**3.41**

The quantified impacts associated with Outcomes 1 to 3 include:

- Reduced contract pricing between processors and growers, resulting in a saving for processors. Reduced prices have no impact on grower absolute profitability during the projected period, due to yield improvements driving cost reductions
- Increased production due to yield improvement is sold to processors resulting in increased profits for growers.

Yield improvements may be driven through potential adoption of a variety of existing and new products and processes, including increased use of soil health measurement, chemical improvements and IPM. Improved access to agronomic advice and dissemination of better practice modes through the formation of information sharing networks will form a key part of reducing yield loss and variability due to pests and disease.

The quantified Impact from Outcome 4:

- Reduced cost of production due to reduced input cost for growers, modelled on reductions in the costs attributable to water and fertilisers for processing potato growers due to a conservative increase in adoption of precision agriculture.

Precision agriculture is an existing technology that has been underutilised. R&D and extension will facilitate this increase in uptake by improving product offering compatibility and support, and improving grower knowledge.

Outcome 5 was not a quantified impact:

- The end-of-strategy outcome of a culture of continuous improvement will be a key qualitative goal in driving practice changes aforementioned that will enable the delivery of quantified impacts, however, it was not considered in isolation as generating a net economic benefit. Thus, no quantified impact is associated directly with this intermediate outcome.

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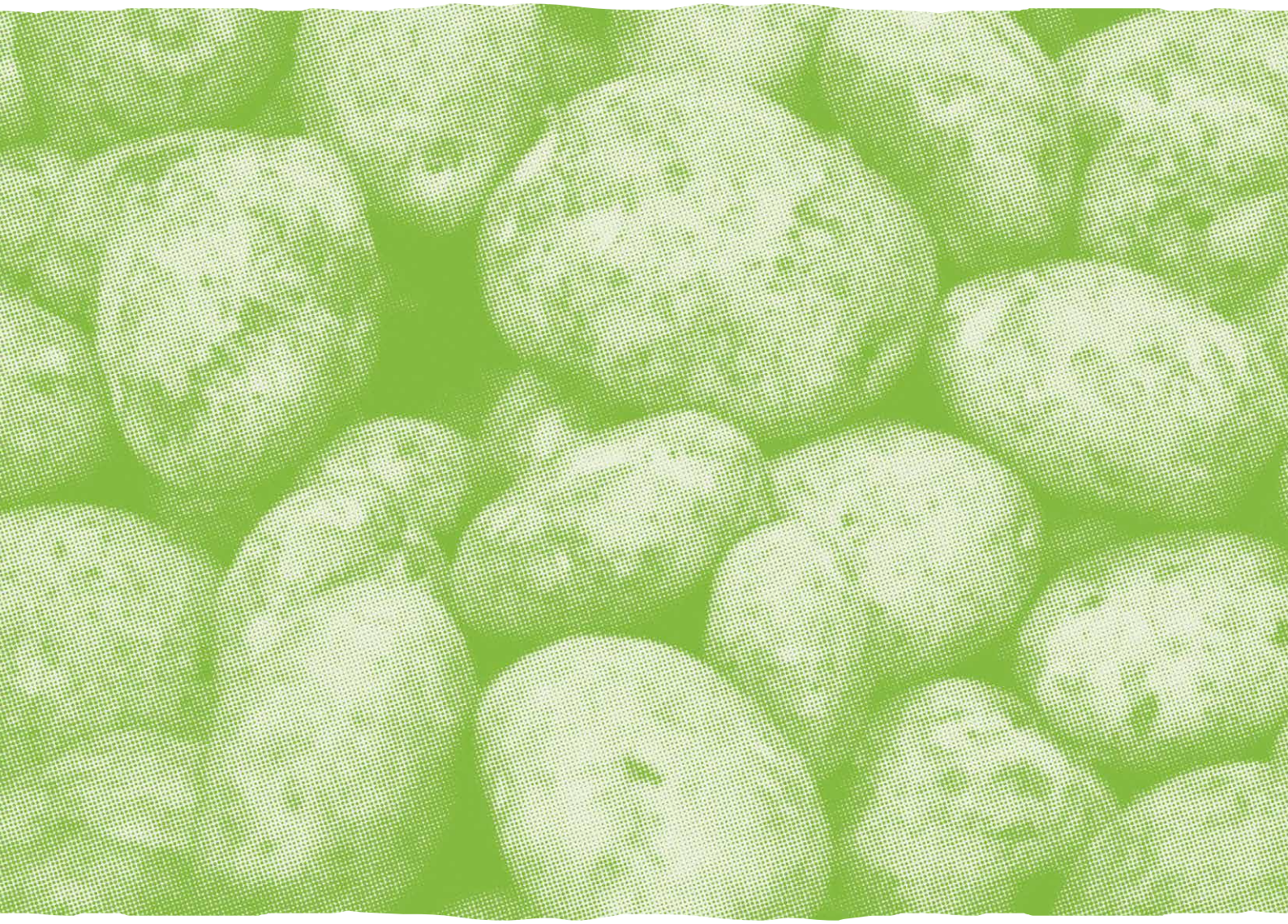
SECTION SIX

Risk management

The purpose of this risk section is to highlight any unique or specific risks that qualify the SIP. This is not intended to be an exhaustive risk review of the industry risks which in part are considered in the SWOT. This is also not reflective of the general investment risks which will be considered in the project investment process.

No significant or specific risks were found that may qualify this SIP, however, there is a risk of a lost opportunity to leverage industry R&D funds more effectively, if this SIP is not effectively aligned with the fresh potato SIP.



APPENDIX 1: Process to develop this SIP

This process for the development of this SIP was as follows:

1. A presentation was prepared to outline a suggested approach to the SIP and to stimulate discussion on the key external factors impacting the industry
2. A workshop was held with the SIAP to approve the project approach and consultation reach
3. Interviews were conducted with the suggested stakeholders
4. A draft SIP was prepared for consideration by the SIAP
5. The draft SIP was presented for testing and discussion with the SIAP in a second workshop session
6. SIAP members provided additional feedback to the draft SIP over the following week
7. The presentation version of the SIP was forwarded to Hort Innovation for feedback
8. The SIAP was converted into the Hort Innovation template.

APPENDIX 2: Consultation and validation

In addition to a wide body of consultation with processing potato growers during the development of the related fresh potato SIP, the following individuals provided direct input during the development of this plan and their assistance is gratefully acknowledged.

Name	Organisation
Anne Ramsay	Potato Processing Association of Australia
Paul Horne	IPM Technologies
Paul McBeth	Marvel Packers
Josh Opas	McCain Foods Australia
Daniel Grayling	McCain Foods Australia
Tony Gietzel	PepsiCo
Brett Pemberton	PepsiCo
Kathy Ophel Keller	SA Research & Development Institute
Steven Lapidge	SA Research & Development Institute
Mark Heap	Simplot Australia
Peter Hardman	Simplot Australia
Frank Mulcahy	Simplot Australia
Angus Galloway	Simplot Australia
Allan Smith	Snack Brands Australia
Michael Hicks	Snack Brands Australia
Calum Wilson	Tasmanian Institute of Agriculture
Nigel Crump	Victorian Certified Seed Potato Association

APPENDIX 3:
Reference documents

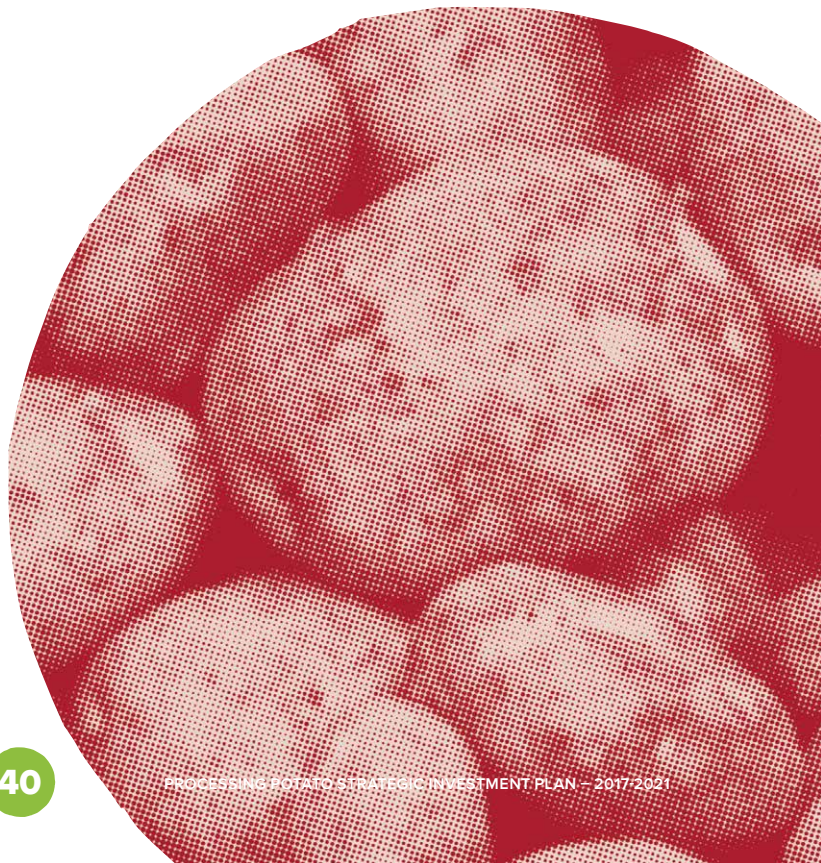
Title	Author
A review of knowledge gaps and compilation of R&D outputs from the Australian Potato Research Programs, 2015	Kevin Clayton-Greene
Victorian Potato Industry Strategic Plan 2015 – 2020	ViCSPA, Victorian State Government
Australian processing potato industry Strategic Investment Plan 2012 – 2017	Potato Processing Association Australia, AUSVEG, HAL
Adoption of variable rate technology in Queensland's intensive vegetable production systems – June 2016	Queensland Government
Australian Horticulture Statistics Handbook, 2014/15	Hort Innovation, Freshlogic
Australian Bureau of Statistics	
Australian Bureau of Agricultural Resource Economics	
Australian vegetable growing farms. An economic survey 2012-13.	Haydn Vale Research 2014/15
Global Trade Atlas, 2016	
McCain Foods global benchmarking study, 2011	McKINNA et al
Retailworld Annual Report, 2015	Retailworld
Australian vegetable growing farms: An economic survey, 2011–12 and 2012–13, ABARES Research report 14.1 prepared for Horticulture Australia Limited, Canberra, February. CC BY 3.0.	Valle, H, Caboche, T & Lubulwa, M 2014

Notes on additional sources:

1. Fresh Intelligence was commissioned to conduct additional analysis for this SIP drawing from a combination of the above sources.
2. Industry estimates derived during the SIP workshop and from individual SIAP members have been used in the absence of hard data.

APPENDIX 4:
Logic hierarchy

Vision			To grow the future of Australia's horticulture industries			Common for all Investment
Mission	Increased profitability of Australia's horticulture industries		Increased productivity of Australia's horticulture industries		Increased global competitiveness of Australia's horticulture industries	
Hort Innovation end-of-strategy outcomes	**Support industry efficiency and sustainability**	**Improve productivity of the supply chain**	**Grow the horticulture value chain capacity**	**Drive long-term domestic and export growth**	**Lead strategically**	
End-of-SIP outcomes	*The industry-specific outcomes of the SIP. The final desired result of SIP investment but may be achieved after the SIP time-frame. SIP investment may be just one contributing factor to the achievement of these outcomes. For example, incremental productivity, profitability and competitiveness improvements stimulated through R&D, changes in consumer awareness, marketing campaign reach and influence and increased recognition of Australian horticulture products.*					SIP specific
SIP intermediate outcomes	*Short- to medium-term changes brought about through the SIP, which will support the achievement of end-of-SIP outcomes. For example, practice changes, adoption, changes in grower knowledge, attitudes, skills and aspirations (KASA) and marketing reach.*					
SIP activities and outputs	*What is directly delivered by the SIP (R&D, extension and marketing activities and outputs, for example, products and services, and events and engagement) across the 11 horticulture cross-sectoral investment themes: Pest and Disease Management, Crop Production, Sustainability Improvements, Novel Technologies, Data Insights,Industry Development, Product Integrity, International Market Development, Market Access and Trade, Domestic Market Development, Strategic Drive and Corporate Services.*					
Foundational activities	*Preliminary or preparatory activities that are conducted before and during SIP delivery. Includes industry processes, infrastructure and resources that enable the SIP to be developed and delivered. Includes SIP planning, consultation, advisory meetings etc.*					



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