RMCG

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Potato stakeholder needs analysis and extension strategy development

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Hort Innovation Strategic levy investment | POTATO – FRESH FUND

This project has been funded by Hort Innovation using the fresh potato research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Hort Innovation Strategic levy investment | POTATO – PROCESSING FUND

This project has been funded by Hort Innovation using the processing potato research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Executive Summary

The objective of this project was to understand the communication and extension needs of the potato industry and develop a strategy and implementation plan that meets those needs.

This report combines the findings of a stakeholder needs analysis into a strategy and implementation plan for the delivery of new communication and extension approaches for the potato industry. Producers engaged readily in the consultation phase of the project. They identified skills and knowledge gaps and reported a high level of aspiration to increase the productivity of their potato crops and stay up-to-date. This represents a significant opportunity for the Australian potato industry.

An Australian Potato Industry Development Program is proposed that aims to prioritise activities to deliver effective communication and extension for the industry. It focuses on resetting expectations and strengthening connections with all industry stakeholders, building on current industry led programs and communication channels.

The program provides direction for future investment into communications and extension that is aligned with the intended outcomes of the industry's Strategic Investment Plans (SIPs) 2017-2021 for potato growers (fresh, processed and seed) and the processing industry. Delivery of this Plan will assist industry in achieving the outcomes of the SIPs. It will ultimately result in an informed industry that has the necessary tools (technologies and management practices) and capacity (knowledge and skills) to manage on-farm risks from a potato production and biosecurity perspective and meet market requirements and consumer expectations.

The objective of the Australian Potato Industry Development Program is to enhance the adoption of innovation and technology in the potato industry through brokering research and development information and facilitating capacity building in the industry. This will be achieved by:

- Providing national co-ordination and leadership for the successful development and delivery of innovative 'work packages' to the potato industry
- Building industry partnerships and networks
- Delivering regionally specific activities.

The focus will be on improving knowledge and skills, and supporting practice change to achieve enhanced long-term sustainability and profitability of Australian potato businesses.

1 Introduction

1.1 BACKGROUND

1.1.1 NEED FOR A NEW APPROACH

The potato industry faces many challenges such as increasing production costs, pest and disease pressure, climate change and a need to be on top of regulatory issues and stay productive. A better and more targeted communication and extension (C&E) program could help producers manage these and other risks.

An effective C&E program that will meet the needs of industry requires an understanding of the current operating environment of the potato industry in Australia. Review of the industry profile, current challenges and opportunities, and national trends point towards some new technologies and practices being slow to be adopted on-farm. Reasons for this are varied with many likely contributors. Recognising the differing needs of each sector (processing, fresh and seed), and the diversity of business size, capacity and capability within the industry will be important for the design of a revitalised approach to delivering C&E. These differences need to be considered when extending and communicating research outcomes to potato businesses.

1.1.2 PURPOSE

RMCG were engaged to develop a strategy and implementation plan for the delivery of new communication and extension approaches for the potato industry. This strategy and implementation plan (the Plan) aims to prioritise activities to deliver effective communication and extension for the industry. The Plan focuses on resetting expectations and strengthening connections with all industry stakeholders, building on current industry led programs and communication channels.

The Plan provides direction for future investment into C&E that is aligned with the intended outcomes of the industry's Strategic Investment Plans (SIPs) 2017-2021 for potato growers (fresh, processed and seed) and the processing industry (as detailed in Table 1-1).

Table 1-1: Outcomes of the fresh, seed and processing SIPs

PROCESSING POTATO SIP	FRESH, SEED AND PROCESSING POTATO SIP
1. Industry has access to the world's best agronomic information and networks, resulting in increased productivity.	1. Industry profitability is improved by increasing the value of product sold on the domestic market.
2. Growers are serviced by professional agronomists with best practice potato expertise, resulting in improved industry skills and knowledge.	2. Export markets have grown resulting in increased average returns to growers.
3. Losses from pest and disease are reduced, resulting in improved quality and increased marketable yield.	3. Average yields have improved resulting in reduced cost of production.
4. Precision agriculture and related technologies/ systems become standard practice, resulting in reduced cost of production.	4. Increased innovation and agility in potato businesses has resulted in a sustainable industry that can adapt to highly dynamic markets.
5. Collaboration across the supply chain to achieve cultural change has resulted in improved economic sustainability.	

Delivery of this Plan will assist industry in achieving the outcomes of the SIPs. It will ultimately result in an informed industry that has the necessary tools (technologies and management practices) and capacity (knowledge and skills) to manage on-farm risks from a potato production and biosecurity perspective and meet market requirements and consumer expectations.

An overview of the production characteristics of the Australian potato industry is shown in Figure 1-1.

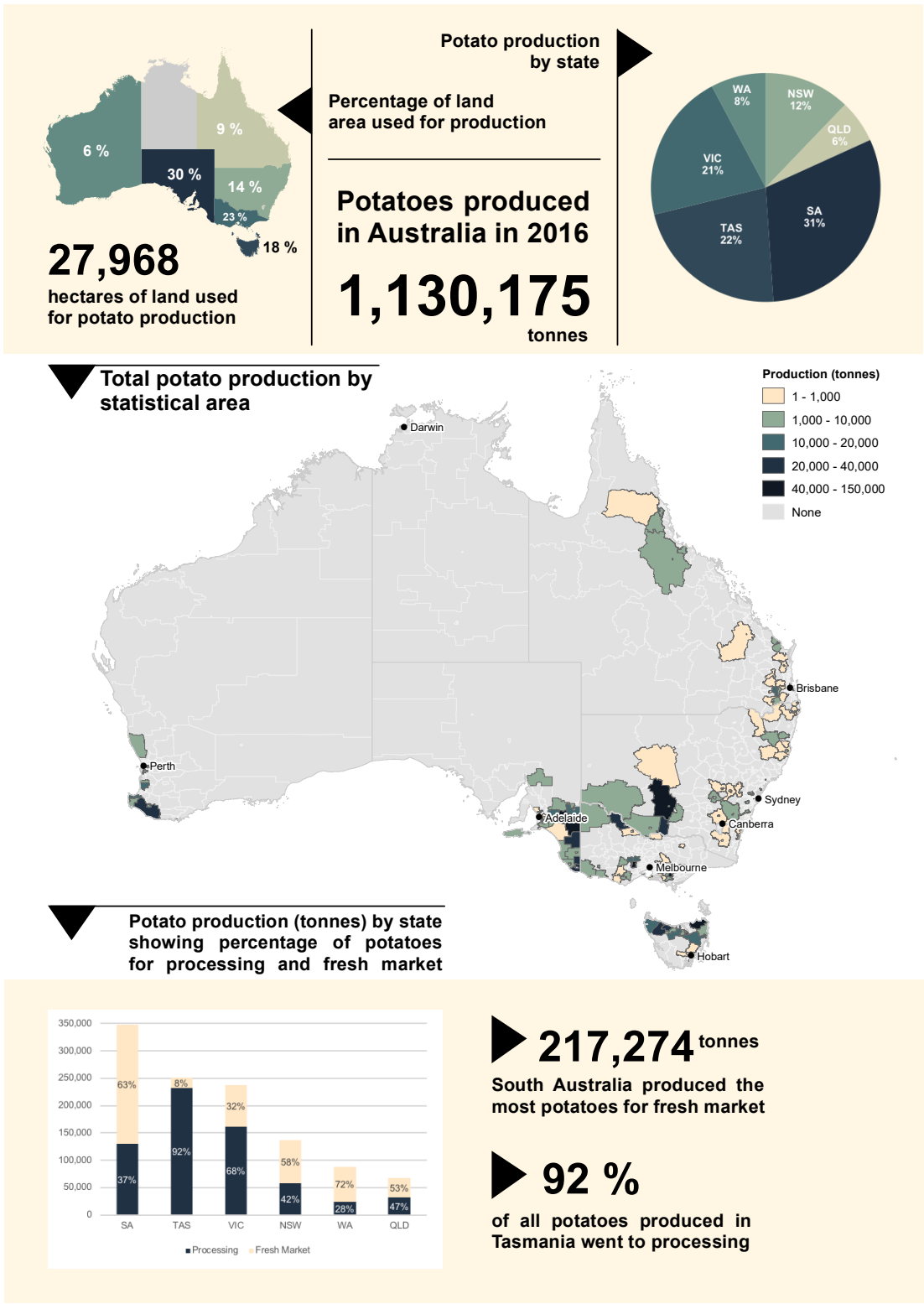

Figure 1-1: The Australian potato industry snapshot (2016 ABS)

2 Needs analysis

2.1 APPROACH

PURPOSE

As a forerunner to developing the strategy, the stakeholder needs analysis aimed to better understand:

- The characteristics and needs of the Australian fresh and processing potato industries
- The operating environment of the industry including regional differences and synergies
- Key influencers such as advisors, agronomists, peers, supply chain members, packers/processors
- How growers and their advisors currently receive information on new technologies and R&D outcomes
- Preferred methods of communication and active engagement in extension
- Barriers to adoption of R&D outcomes, change and opportunities to overcome them.

The needs analysis was guided by the following questions:

- What is the level of aspiration by producers to learn more, adopt improved practices and increase their crop performance?
- What is holding producers back?
- Who are producers listening to?
- What resources and information do potato producers and service providers need to improve decision making and both yield and quality of crops?
- What can levy funded programs do better to provide information and extension to potato businesses?

DOCUMENT REVIEW

A document review included a scan of past studies on the extension needs of the industry and previous program evaluations. The documents reviewed are listed in Appendix 1.

The previous levy funded extension program had challenges and was discontinued, and the recommendations of an independent evaluation of the current communications program included the need for[1]:

- A monitoring and evaluation plan to guide the collection of data about the progress towards the agreed outcomes of the project; the evaluation failed to engage with a wide enough cross section of producers to establish how useful and timely the content was to levy payers
- Consideration of broader industry extension programs and activities when designing future investment in communications activities, rather than independently.

STAKEHOLDER CONSULTATION

RMCG interviewed 26 industry members (including producers (13), advisors (4), buyers (5) and peak body representatives (4)) to identify key needs relating to communication and extension. The interview questions were designed to understand:

- The aspirations of producers to improve performance and increase knowledge and skills
- How producers and service providers receive information and learn
- Industry connection with, and feedback on, the current levy funded ‘comms’ program (and its value in communicating key messages and outcomes from R&D).

[1] Clear Horizon 2017 VG16066 Mid-tern evaluation of communication programs. Prepared for Hort Innovation.

Feedback was also collected from buyers and industry associations/peak bodies on how well they are connected with the levy funded programs and the effectiveness of the transfer of R&D outcomes to them and their contracted producers.

Two online surveys ran concurrently from mid-April 2019 for three weeks. The results from the surveys have been analysed and used in conjunction with the interview responses to inform the best approaches for future communication and extension of R&D within the Australian potato industry.

2.2 INTERVIEW FINDINGS

The main findings from the key informant interviews were:

PRODUCER ASPIRATION ON YIELD AND QUALITY GAINS

- Large majority of producers reported being reasonably (some very) satisfied with the yield and quality of potatoes grown but most acknowledged that there was some room for improvement.
- Managing yield was reported as a central profit driver for processing potato businesses.
- Seed quality and climate / weather were identified as the important influencing factors on crop performance.
- Their concern about prices received ('cost-price squeeze' mentioned a lot) was a significant driver to their aspirations to increase both yield and quality.
- Knowledge and skill levels were reported to be improving, and producers had reasonably high aspiration to learn more.

KEY INFLUENCERS FOR PRODUCERS

- The top three influencers were reported as buyers (processors and/or supermarkets including their field officers), family members and local agronomists / consultant advisors.
- Buyers were reported to have the greatest influence. For fresh market producers it was about having the right processes and systems in place to meet quality parameters and consumer expectations (delivering a safe product to supermarkets). For processing producers, it was explained in the context of processors driving production levels. Processors were also reported to be providing extensive extension and communication services to their contracted producers.
- Larger growers were found to be becoming good at solving their own problems through trialling of new varieties and practices and pursuing the most up-to-date information on growing technologies.

MAIN BUSINESS FOCUS

Producers were asked about their main business focus and the top three areas identified were:

1. Growing side – agronomic practices (irrigation, planting, timing of interventions / inputs, soil testing) in conjunction with seed quality and handling
2. Managing costs to retain margins
3. A high concern about water security in a drying climate - availability and quality (especially in SA).

CHALLENGES/BARRIERS TO IMPROVING PERFORMANCE

A wide range of responses were heard, but prevailing themes were:

- Managing costs of production e.g. electricity prices, storage, labour costs (new Hort award) combined with prices received for their product
- Issues around growing - access to good quality seed at the right time, soil management difficulties, coping with extreme weather events
- Labour sourcing and people management was also identified as a challenge.

These responses closely matched their main business focus areas.

Also, fresh market producers found meeting the quality expectations of supermarkets and the amount of waste to be challenging and processing producers were focused on yield.

Agronomist advisors and buyers reported that the planning and execution of management interventions (timing, planting density/spacing, watering) were of prime importance and that mistakes were driving a lot of poor crop outcomes (coupled with extreme or unseasonal weather events).

HOW PRODUCERS RECEIVE INFORMATION

Producers reported receiving a lot of information through a wide range of channels. The sources included growers' associations/peak industry bodies, value chain industry updates, AUSVEG (newsletter and magazine), VegNET, and local and global merchandise companies. Reported issues with current communication methods and information sources included:

- Difficulties with sorting what is most important for them
- Choosing to ignore a lot of emailed information; especially when overloaded
- Producers doing a lot of their own research using the internet (essentially, googling); not always sure of what information to trust; they valued independence.

MOST ENGAGING/USEFUL COMMUNICATION APPROACHES

Preferred ways of receiving information included:

- Peer to peer learning and conversations
- Delivered learning through activities in the paddock
- One-on-one advice
- Self-learning: own research and accessing information from internet via industry e-news links and 'googling'
- Hard copy publications such as Potatoes Australia Magazine were still valued
- Social media; particularly for younger producers.

In general, producers were aware of the levy funded communications program outputs and valued them.

Processor field officers reported that they were not actively engaged with or promoting levy funded R&D outcomes to their contracted producers.

EXTENSION APPROACHES AND ACTIVITIES

The extension approaches identified to be of most value were:

- On-farm activities with peers such as demonstrations, field days, visiting trial sites, focus farms
- One-on-one advice from processor field officers, local agronomists (merchandise reps and independent)
- Discussion with peers.

Competition between producers was mentioned as a barrier to better co-operation and fully sharing of knowledge and skills on practices.

They reported that they were most interested in attending extension activities (listening to experts/inspecting trials) at key times of the year or growing season.

Producers and other stakeholders wanted to see more resourcing of:

- Regional trials and research on varieties
- Farm based trialling and demonstration of new tools and techniques (e.g. PreDicta PT in conjunction with soil mapping was mentioned)
- Regional trials on efficacy of different weed and pest / disease management practices (including chemical use).

A lack of knowledgeable and experienced advisors in some regions was also mentioned.

2.3 ONLINE SURVEY FINDINGS

The main findings of the two surveys are highlighted in this section and the segmented quantitative results are detailed in a set of tables in Appendix 2.

2.3.1 SERVICE PROVIDER SURVEY

The service provider survey comprised 20 questions and focused on:

- Crop performance and producer aspiration
- Important developments or innovations in recent past and their adoption
- Skills and knowledge gaps
- Extension needs and preferred communication approaches

The majority of questions were open ended and unprompted, so the analysis is mostly qualitative, identifying the most common themes and ideas mentioned.

Respondent characteristics

A total of 18 service providers responded to the on-line survey. The majority were processor field officers and other advisors (consultant and sales agronomists) operating in Tasmania, South Australia and New South Wales. Respondents operated across a wide range of the main potato growing areas in the eastern seaboard, south eastern Australia and south west WA.

Crop performance and producer aspiration

Service providers reported a range in potato crop performance and producer aspiration to improve, from moderate to exceptionally high. The scope for increased productivity was reported as more variable ranging from very little opportunity (crops were almost at their peak) to a lot of potential for increases.

The factors mostly limiting improved performance on farms were reported to be:

- Soil condition, rotations and irrigation management
- Disease and pest issues
- Seed management (storage) and quality
- Water availability and quality

Other constraining factors were identified as:

- Cost of production pressures
- Availability suitable land, fresh paddocks
- Labour – access to, cost, skills and knowledge

The most important developments or innovations in potato growing over the past decade were reported as:

- Machinery, bulk handling and accompanying technologies
- Varietal development
- Improved seed handling and growing (e.g. use of PreDicta Pt)
- Irrigation management improvements
- Nutrition and fungicide programs

Levels of adoption of new practices and technologies was reported as variable with most respondents seeing plenty of scope for improvement and increased adoption. The main factors affecting adoption were reported as:

- Cost versus risk pressures and need to see evidence of the benefits
- Attitudes, beliefs, habits and skills
- Access to capital – money to invest, suitable land, water and plant

Skills and knowledge gaps

Respondents reported similar skills and knowledge gaps for themselves, their staff and producers, including:

- Potato seed production and storage, crop storage post-harvest (fresh)
- IPM cultural practices
- Identification and management of diseases
- Crop nutrition and irrigation understanding and management
- Technology including 'precision Ag'

The most valuable support services (for service providers) were identified as:

- Access to independent expertise with good technical knowledge
- Training days
- Crop scouting knowledge and tools
- Up-to-date information

Extension and communication approaches

There was no firm consensus on the need for a new extension program. Just over half of service providers felt that a 'new extension program or approach for producers was needed'. No one answered 'no, it wasn't needed' and the remaining respondents were 'unsure'.

Suggestions on what industry could be doing better with extension included providing support for:

- Access to international experts and independent advice
- Understanding markets and end user requirements and products (all sectors)
- Suitable training opportunities in a range of specialist knowledge and skill areas

Service providers mostly used on-line sources of information such as email newsletter, accessing international publications, doing web searches and several mentioned the value of USA based websites and Facebook pages that they use and follow. They also liked to receive information during producer meetings, field day and conferences. The Potatoes Australia magazine and seed industry updates were rated as the most useful Australian industry communications.

Conclusions

A wide range of responses were gathered from a relatively small sample of service providers (18). Service providers reported a range in potato crop performance and producer aspiration to improve, from moderate to exceptionally high. The scope for increased productivity was reported as more variable ranging from very little opportunity (crops were almost at their peak) to a lot of potential for increases. Adoption of new practices and technologies was also reported as variable with most respondents seeing plenty of scope for improvement and increased adoption.

A range of skills gaps were identified and notably, there was a lot of overlap between producers and service providers' staff. Opinions on the need for a new extension program or approach were mixed with just over half suggesting there was a need and the remainder unsure.

2.3.2 PRODUCER SURVEY

The producer survey comprised 20 questions and focused on:

- Crop performance and aspiration
- Current challenges
- Skills and knowledge gaps
- Important developments in recent past
- Factors assisting adoption of innovations
- Extension needs and preferred communication approaches

The survey comprised a mix of quantitative (rated responses) and open ended or unprompted questions. The analysis is both quantitative and qualitative, identifying the most common themes and ideas mentioned.

Respondent characteristics

A total of 89 producers completed the on-line survey. They mostly operated across potato growing areas in south eastern Australia and the majority of potato growing regions were represented (Figure 2-2, over page). The majority grew processing (87%) and the remaining fresh (13%) and one third of all producers grew seed potatoes. Most respondents farmed in Tasmania, Victoria and South Australia with only a few responding from NSW, Qld and WA, consistent with the main potato growing areas in Australia (Figure 2-1).

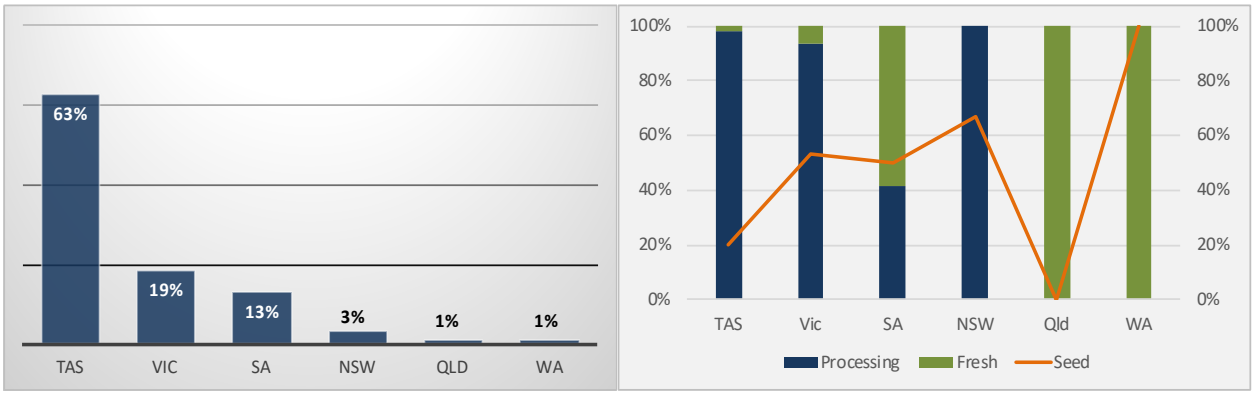

Figure 2-1: Producer location and potato sector

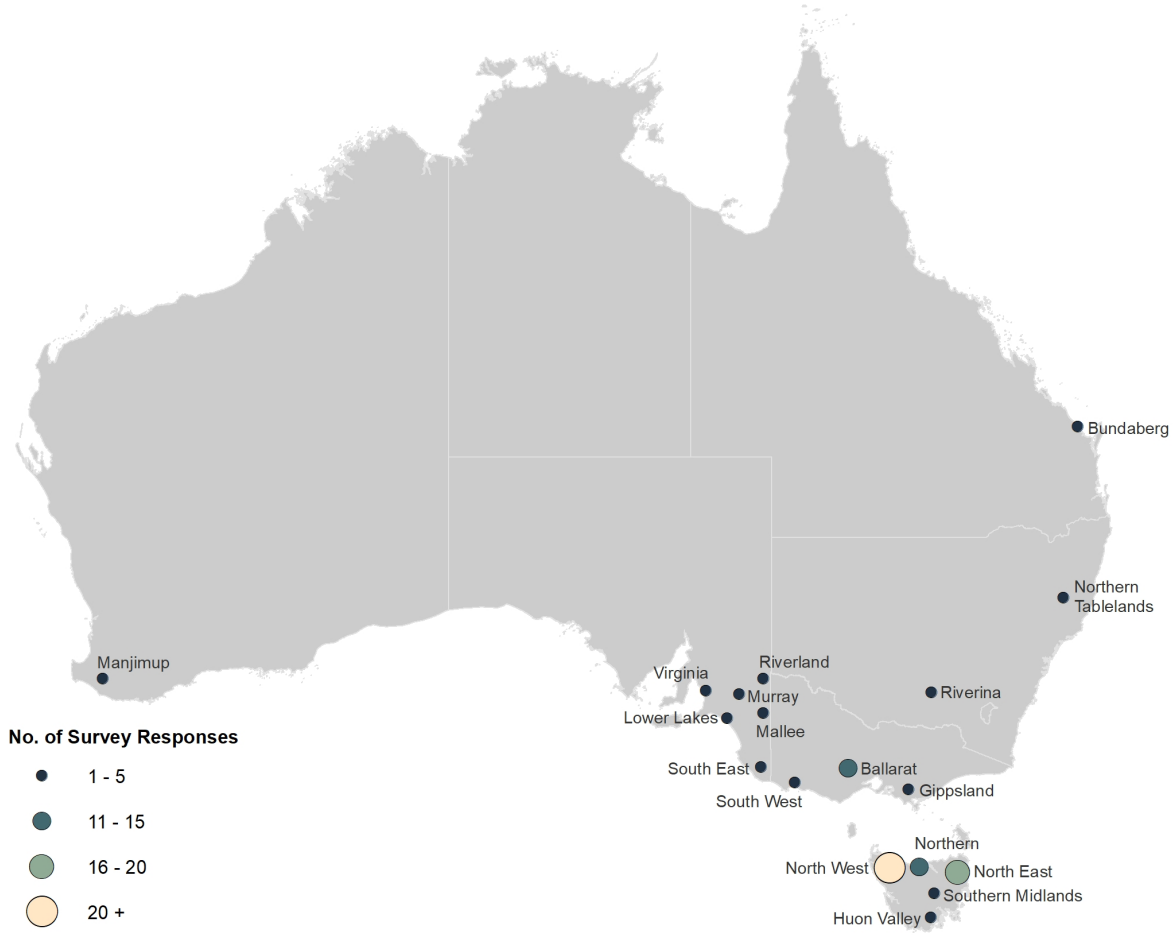

Figure 2-2: Location of responses

A spread of farm sizes was achieved in the sample and the area of potatoes grown ranged from relatively small (between 1 and 50 ha) to more than 1000 hectares (Figure 2-3). The farms growing the largest areas of potatoes were in South Australia, consistent with the potato farming demographic in Australia.

The majority of respondents were aged between 30 and 49 years with only a small minority (5%) younger than 30 years.

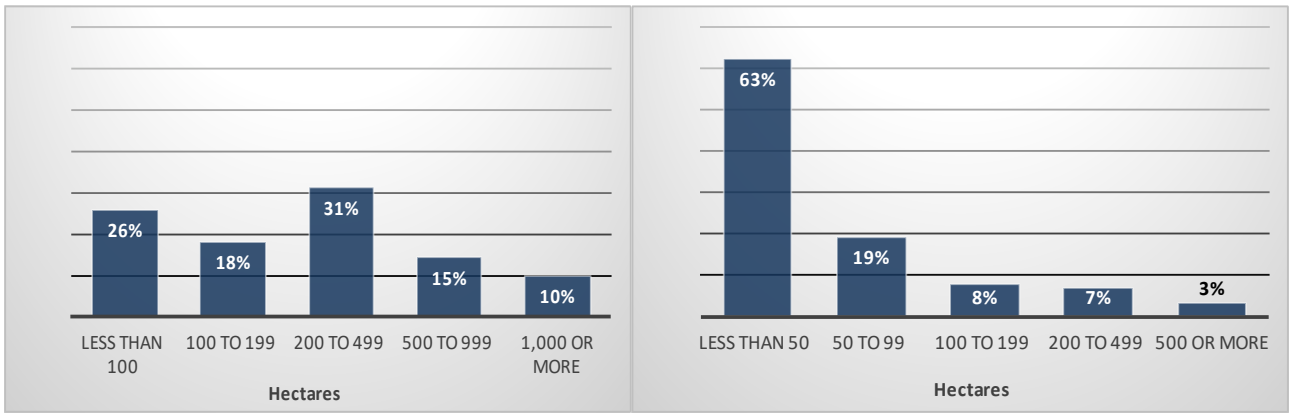

Figure 2-3: Farm area and annual potato crop area (hectares)

It is concluded that the on-line survey achieved a very strong response overall and a reasonably representative sample of farm businesses in the main potato production areas by region and sector; notwithstanding the low response for the smaller potato growing states of WA, Qld and NSW.

PRODUCER ASPIRATION

KEY MESSAGE

The findings of the consultation present a significant opportunity for the Australian potato industry:

- Producers want to increase the productivity of their potato crops.
- Producers are open to new ideas once they have seen clear evidence of their effectiveness.
- They also want to stay up-to-date and like to experiment and be innovative.

The goal of potato producers is to achieve an optimal and sustainable level of production (in tonnes/ha) and have a profitable business. To operate a successful business, producers will need to optimise their productivity and profit while minimising their exposure to risk and uncertainty as best they can.

This study found that the large majority of producers were not fully satisfied with the performance of their crops and aspired to improved productivity. Some producers reported having plans in place that aim to substantially increase the productivity of their crops, while one third of producers were satisfied with the productivity of their crop and / or considered that it was at or near its peak (Figure 2-4).

Of note, fresh, seed potato and Victorian producers were less likely to be satisfied with their current level of productivity. No South Australian producers felt that the productivity of their farm was at its peak.

A majority of producers also reported that they tended to experiment and had a willingness to try new ideas once they had seen the evidence of a relative advantage (Figure 2-5).

Of note, fresh potato and South Australian producers were more likely to describe themselves as innovative, wanting to experiment and stay up-to-date.

With a large majority of producers aiming for increased productivity and having a willingness to try new things, this presents an opportunity for a new extension program that could capitalise on these aspirations.

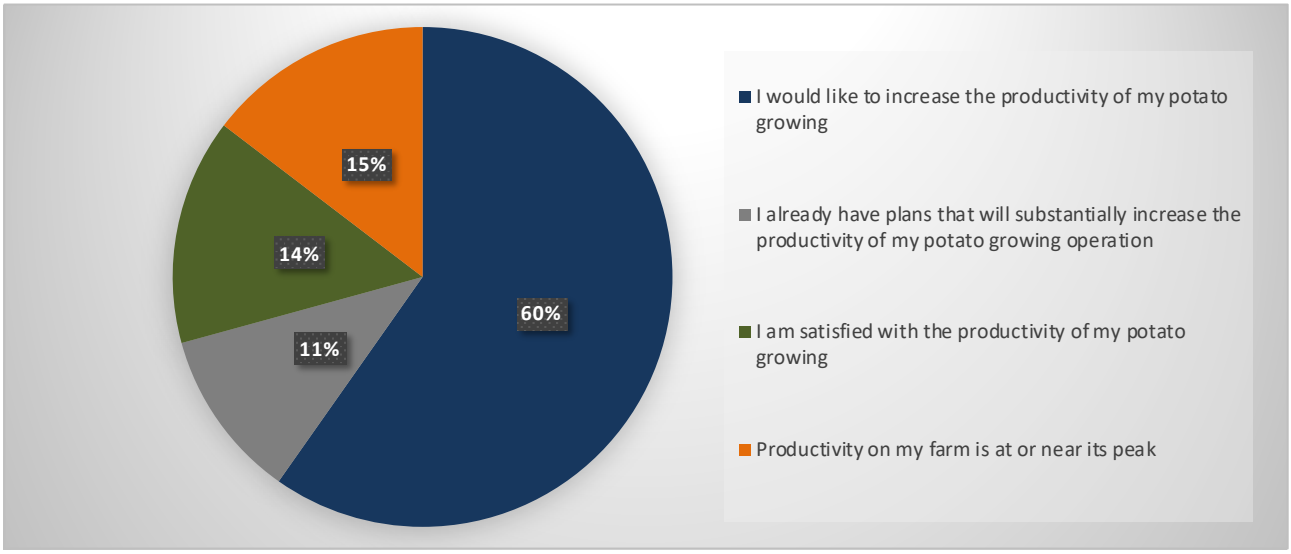

Figure 2-4: Potato producer aspirations to increase productivity

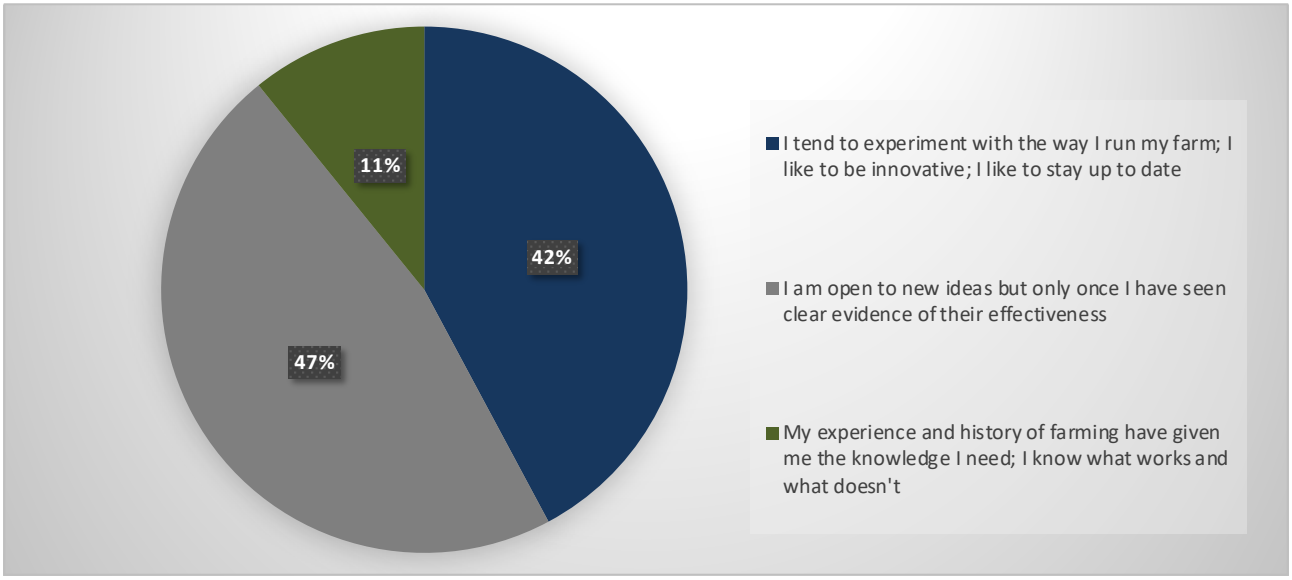

Figure 2-5: Approach to farming – experimentation, innovation and risk

MAIN CHALLENGES IN POTATO GROWING

KEY MESSAGE

The main challenges for the Australian potato industry are:

- Increasing costs pf production and tighter margins
- Persistent pest and disease pressures, and biosecurity risk
- Enough land, soil and water resources and their continued sustainable use

In response to an open question on 'the main challenges for your potato business', the responses were as follows (in order of importance assessed by frequency of mention):

- Increasing costs of production and tightening margins
- Pest and disease pressures
- Crop rotations and finding 'fresh' ground (especially for seed producers)
- Water availability and quality
- Intake scheduling at harvest and storage issues (especially for processing producers)
- Seasonal variability and extreme weather events
- Access to good quality seed and productive / disease resistant varieties
- Crop and soil management (nutrition, irrigation, yield variability, drainage)

Producers were also asked to rate the extent that a list of issues / challenges were holding back productivity in their business. The results are shown in Figure 2-6. There was good consistency with the responses to the previous unprompted question with the addition of 'managing time and labour resources' ranked as a key challenge to productivity.

There was a high level of consistency between potato sectors and states in rating issues. Of note, Victorian producers were more concerned about the impact of crop management, pest and disease, and weed pressure, and managing their time and labour resources, on productivity. Fresh potato producers were less concerned about managing seasonal challenges and variability and more concerned about quality management.

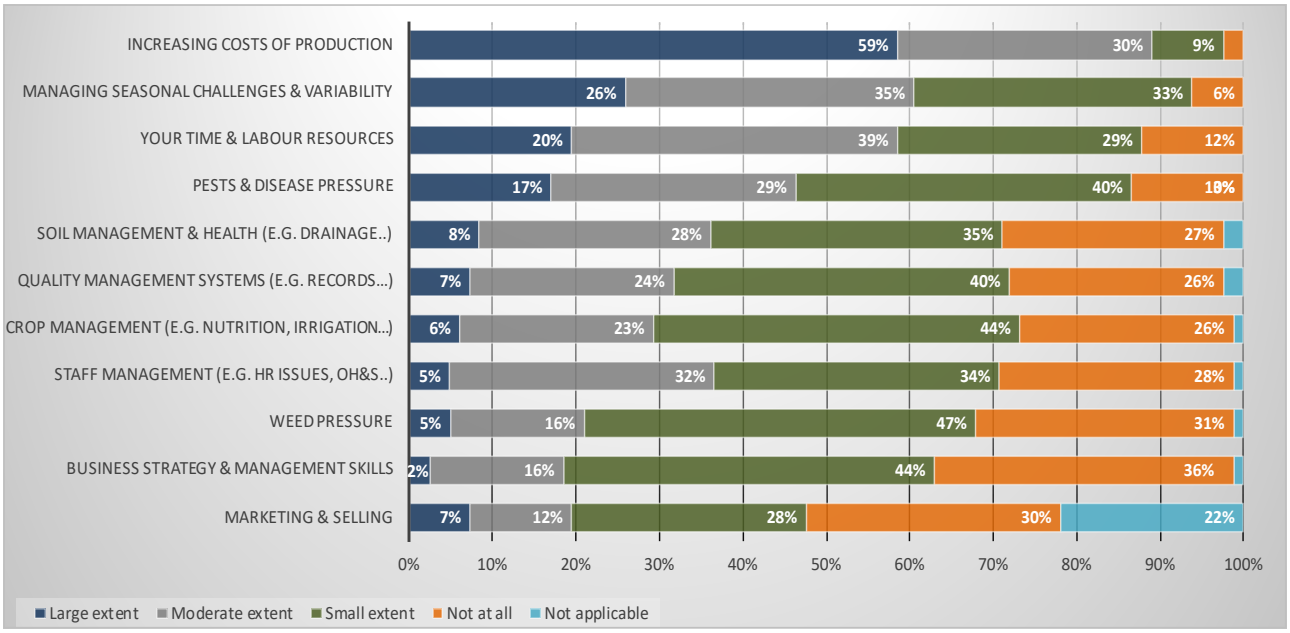

Figure 2-6: Ranking of rated issues and challenges by producers

While both producers and service providers mentioned many of the same challenges, there were some clear differences. Producers were more likely to nominate bio-physical and economic challenges as the most important and advisors were more likely to nominate knowledge and / or skills gaps in the areas of soil, rotations and irrigation management, and seed management and quality, for example. Still, producers were interested in increasing their skills and knowledge, as outlined in the next section.

SKILLS AND KNOWLEDGE GAPS

KEY MESSAGE

The main skills and knowledge gaps in Australian potato businesses are:

- Agronomy, soils, irrigation – management, plant nutrition, soil borne and other diseases, soil health
- Technology – application on farm, machinery (digital data)
- Staff – their skills and motivation
- Varieties and seed – knowledge, storage, handling

The skills and knowledge gaps of service providers (and their staff) were found to be similar to producers'; there was a lot of overlap between these two groups.

In response to an open question on 'the biggest skills or knowledge gaps in your business (for you and your staff)', gaps to do with the growing side of the business (agronomy, soils and irrigation), integration of technology on farm and into business decision making, and matters to do with staff skills and their knowledge / motivation were the most prominent. A large majority of responses fell into 7 categories (with some overlap) and their relative importance is shown in Figure 2-7.

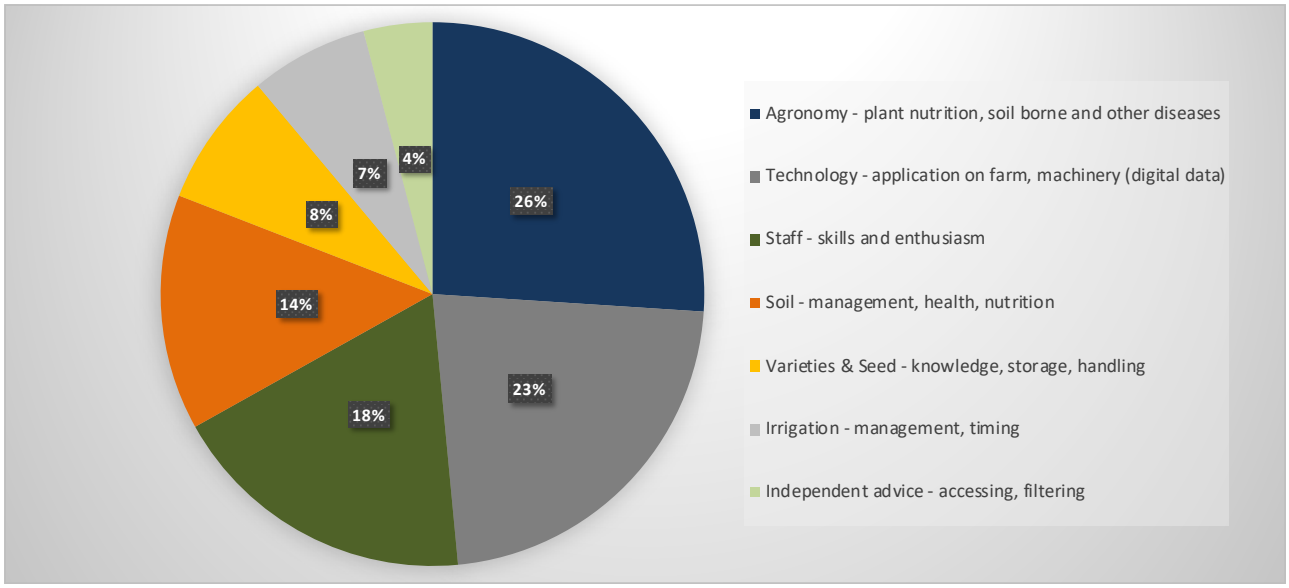

Figure 2-7: Relative importance of skills and knowledge gaps in potato businesses

INNOVATION AND PRACTICES

KEY MESSAGE

There have been considerable developments in practices in the Australian potato industry. Of greatest importance were:

- Irrigation, its management and infrastructure upgrades
- Agronomic improvements, especially IPM, soil management and rotations
- Integration of technology - better machinery, GPS guidance
- Advisors have been very influential and helped producers innovate
- Producers have helped themselves through their own research and trialling practices

Producers felt that the most significant developments in practices i.e. that have made the most difference to their businesses were related to irrigation, its management, the infrastructure and water availability. Noting the disproportionate response from Tasmanian producers which would have influenced this finding. This was closely followed by developments in agronomy (IPM, soil management and rotations).

A large majority of responses fell into 6 categories (with some overlap) and their relative importance is shown in Figure 2-8. Advisors (agronomists, consultants, field officers) have played an important role in helping producers innovate. The value of advice from other growers and family members was also prominent in response to 'who or what helped you innovate'? Producers own research ('keeping up-to-date on local and overseas practices') and trialling practices was also a large response.

Others innovated because of 'necessity' to stay in business and keep up with new technologies. Industry based R&D was also acknowledged as important by some respondents.

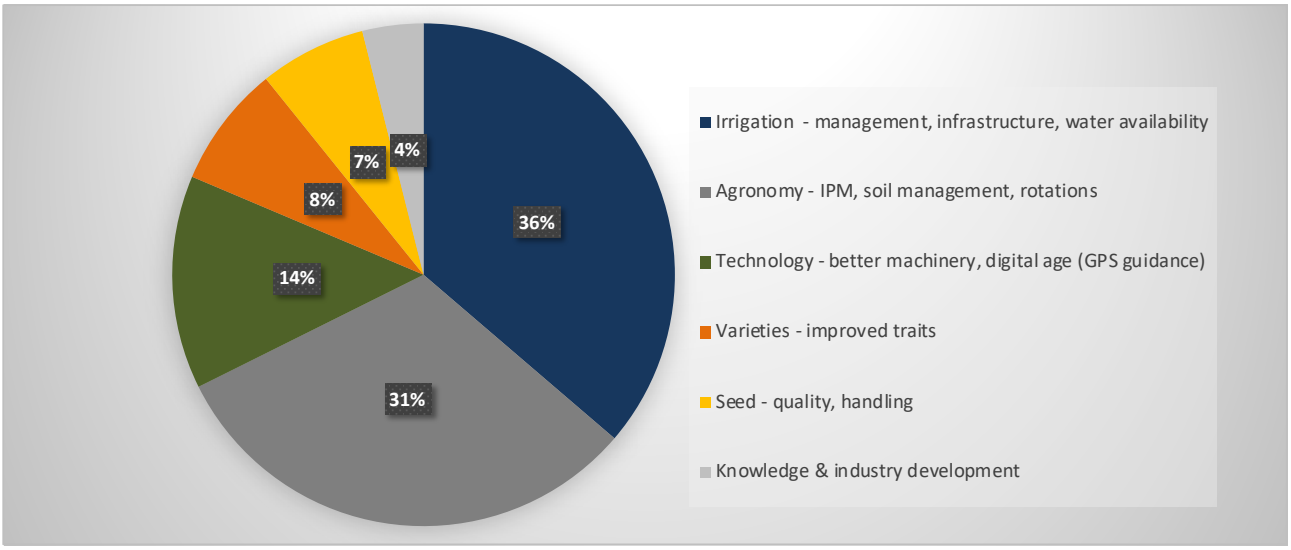

Figure 2-8: Most significant developments in the Australian potato industry over past decade

INFORMATION SOURCES

KEY MESSAGE

Information sources and what industry can do:

- Producers prefer to receive information face-to-face at group-based activities and continue to value hard copy information formats.
- Own research using online resources is also a preferred method of learning and keeping up-to-date.
- Only a small proportion of producers are regular users of social media.
- Almost one third of producers prefer to access information and learn from a one-on-one paid advisor.
- Only a minority of producers rate the current industry communications as highly useful.

Producers prefer to receive information at face-to-face event or group-based activities and continue to value hard copy information formats. Producers are also receiving a lot of information from electronic sources (websites, YouTube, E-newsletters, social media) however more producers preferred face-to-face interactions involving other producers and hard copy formats (Figure 2-9). Of note, only one quarter of producers are regular users of social media. Unsurprisingly, respondents younger than 30 years were significantly higher users of social media.

The most preferred methods of learning (Figure 2-10) were identified and ranked as followed (highest to lowest):

- One-on-one advice (field officers, agronomists/reps), also from peers and other farmers, hands on / paddock based (field days, demos, trials)
- Own research online
- Fact sheets / ute guides
- Discussion groups, training workshops (when topic warrants it)
- One-on-one paid advisor, video / podcasts and least preferred was online webinars

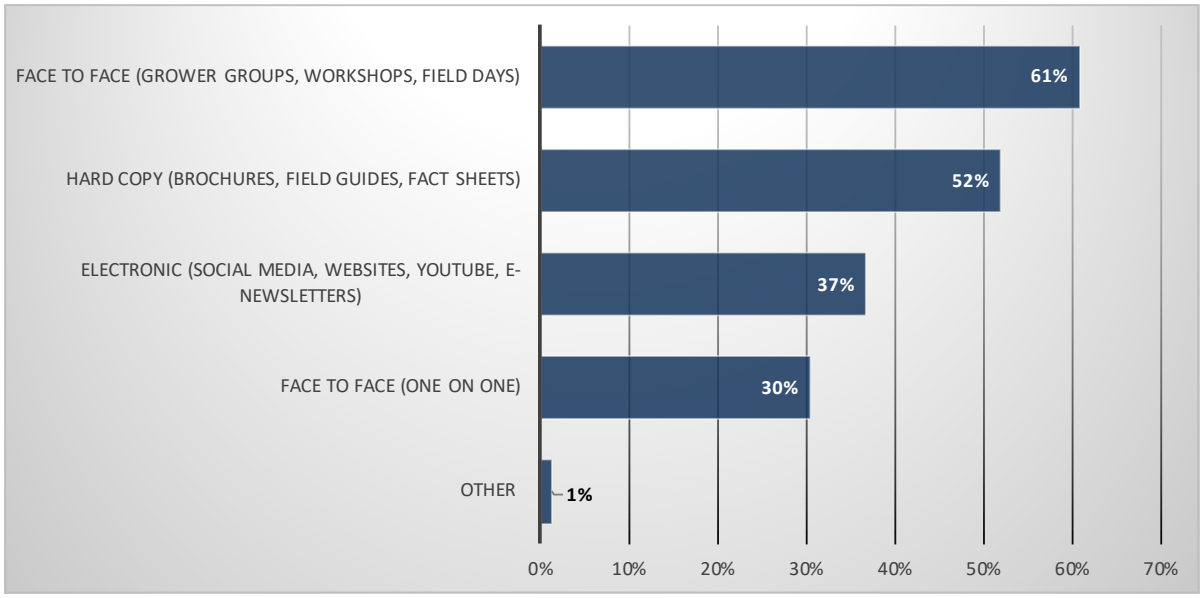

Figure 2-9: Most preferred form of receiving information

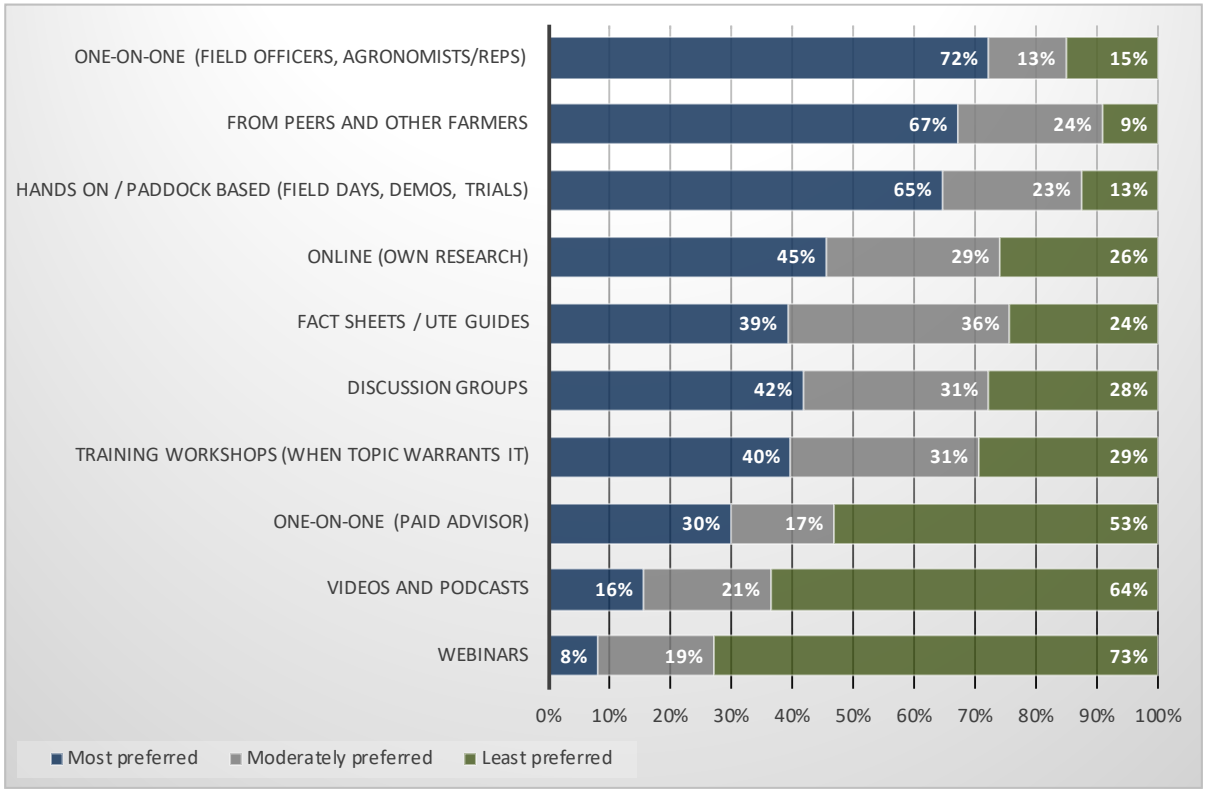

Figure 2-10: Most preferred methods of learning

Producers were asked to rate the level of usefulness of current communications from industry sources**.**

A majority of producers rated all nominated industry sources as at least ‘somewhat useful’. The Potatoes Australia magazine and processor and seed industry updates were rated as most useful. Only a minority of producers (between 14 and 28%) rated the current communications as ‘very useful’ (Figure 2-11).

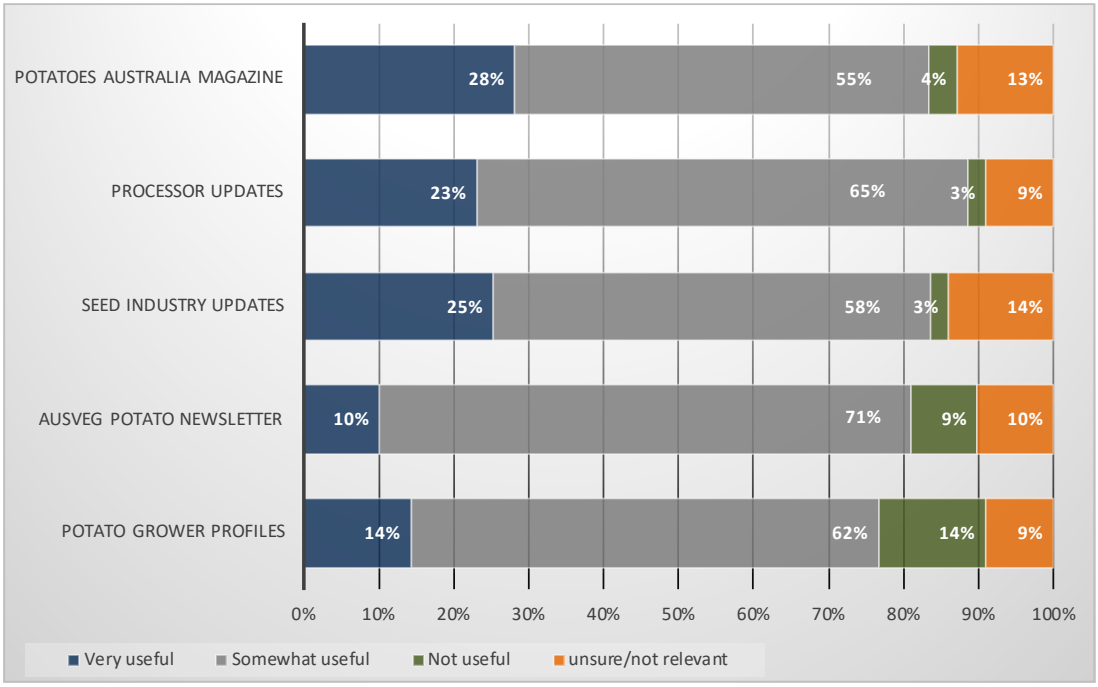

Figure 2-11: Feedback on current AUSVEG delivered potato communications

FUTURE EXTENSION

KEY MESSAGE

There is uncertainty about the need for and shape of a new extension program:

- One third of producers want to see a new program funded and up and running and half are unsure about the need.
- Opinion varies between states and sectors.
- Any new program needs to have input and agreement from producers.
- It needs to be high quality and targeted for different regions and sectors.
- More experienced and knowledgeable service providers are needed to make it work.

Producers were uncertain about the need for a new extension program or approach in their industry. One third felt that there was a need for a new program and almost half were unsure.

Of note, fresh potato producers were more supportive of a new approach being needed, and South Australian producers were the most uncertain of the need. Producers in the minor potato growing states were more certain that it was needed (noting the very small sample size) (Figure 2-12).

Responses to the final survey question on 'what could industry be doing better with extension' were varied and therefore difficult to collate and report on.

Suggestions in the responses included:

- *"Make sure any new program has input and agreement from producers"*
- Adopt a united or national response, using standardised approaches to biosecurity risk management (e.g. TPP)
- Run differentiated programs according to producer needs in different regions and sectors, including on-farm or field-based activities
- More clearly identify best practice i.e. "*what are the best growers doing*?"
- Deliver only high-quality information and extension i.e. 'less is more'
- More exposure to national and international issues highlighting opportunities to improve performance
- More experienced and knowledgeable service providers needed.

No one suggested the explicit need for improved extension of and messaging on R&D outcomes.

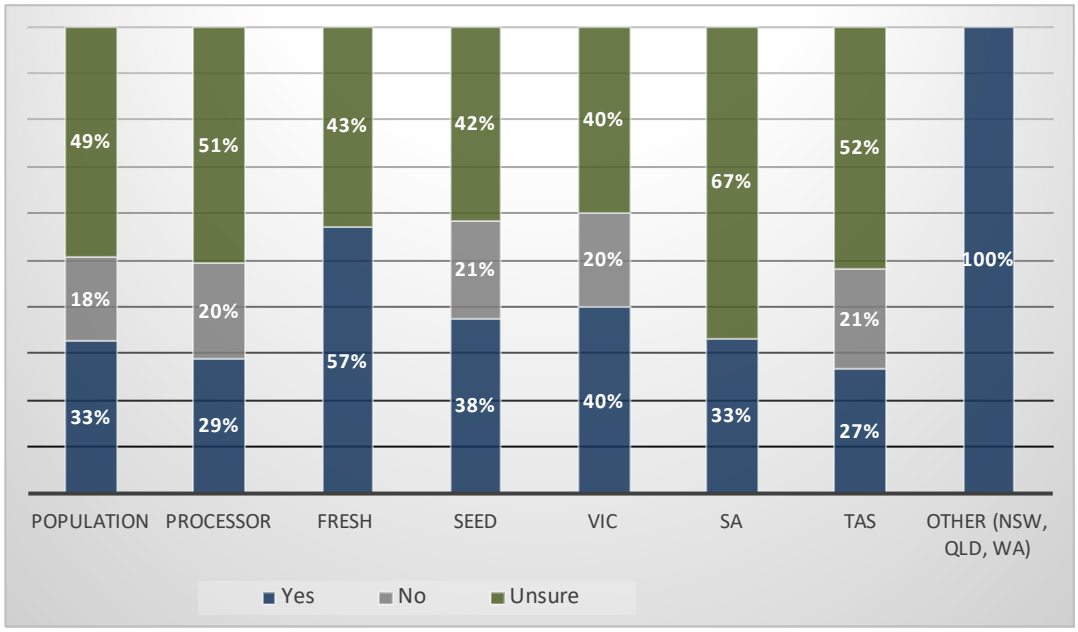

Figure 2-12: Need for a new extension program (or approach) for the Australian potato industry

2.4 CURRENT POSITION AND FUTURE INFLUENCES

The analysis of the consultation feedback and online surveys highlighted relevant issues in relation to communication and extension needs.

A SWOT (strengths, weaknesses, opportunities and threats) analysis has helped set a base for the Plan. The SWOT considers the current position (strengths and weaknesses) and the future influences (opportunities and threats) - for both the potato industry and communication and extension (C&E).

CURRENT POSITION

The needs analysis highlighted some key strengths and weaknesses, and opportunities and threats for the potato industry in relating to C&E. These are listed in Table 2-1 and 2-2, respectively.

Table 2-1: Strengths and weaknesses of the potato industry and C&E

STRENGTHS	
Industry	**Communication & Extension**
▪ Producers want to increase the productivity of their crops ▪ Industry is open to new ideas and ready to adopt new practices and technologies	▪ Increasing numbers of private providers of advice and extension ▪ Good base knowledge bank and skills base within service providers cohort with a keenness to improve ▪ Extension is also a way of identifying R&D gaps
WEAKNESSES / LIMITATIONS	
Industry	**Communication & Extension**
Declining domestic consumption of potatoes Competitiveness between industry sectors and some non-collaborative culture Persistent pest and disease problems Inconsistent seed quality across growing regions	▪ Low industry understanding of consumer needs ▪ Weak linkages between the research community and industry ▪ Lack of regional co-ordination of extension activities and events in some jurisdictions ▪ Only moderate engagement of producers and service providers with current communications program

FUTURE INFLUENCES

Table 2-2: Opportunities and threats to the potato industry and C&E

OPPORTUNITIES	
Industry	**Communication & Extension**
▪ Developing stronger and more diverse export markets for potatoes ▪ Technology advances that will improve practices e.g. precision Ag, IPM, resistance protection ▪ Growing influence of younger producers with more education ▪ Skills and knowledge gaps are identified ▪ Producers want to stay up to date and like to experiment and innovate	▪ Upskilling advisors and strengthening extension capacity in regional Australia ▪ Better targeted application of agronomy skills (to needs of different sectors) ▪ Improved advice and extension of R&D outcomes delivered through established industry stakeholders ▪ Producers want to receive information at group based activities as well as one-on-one advice ▪ Stronger linkages between research community and industry ▪ Increasing collaboration and leveraging between stakeholder organisations
THREATS	
Industry	**Communication & Extension**
Increasing costs of production and tighter margins High cost of production compared with export market competitors Fragmented and a continued lack of industry cohesion Supply of suitable land and water and their continued sustainable use Biosecurity risk and disease incursions Climate change, continued access to reliable water sources	▪ Inconsistent and / or lack of independent specialist advice ▪ Competitiveness and non-sharing of advice and ideas ▪ Inconsistent messaging and responses between regions and states ▪ Lack of involvement from the whole of industry ▪ Continued lack of engagement with levy funded C&E

The analysis of the current position and future threats has highlighted a number of opportunities and areas for improvement in relation to delivery of C&E for the potato industry.

These include:

- Upskilling advisors and strengthening extension capacity in regional Australia
- Better targeted application of agronomy skills (to the needs of different sectors)
- Improved advice and extension on R&D outcomes delivered through established industry stakeholders
- Strengthened linkages between research community and industry
- Increasing collaboration and leveraging between stakeholder organisations.

COMMUNICATION AND EXTENSION RELATED STRATEGIES IN THE SIPS

The strategic investment planning (SIP) process also identified key strategies (30) for the potato industry on communication, grower and advisor development, and extension needs. These are outlined in Table 2-3**.**

The recommended communication and extension projects and approaches outlined in the following Potato Industry Development Program align with the strategies within the SIPs and will assist in the achievement of their desired five year outcomes.

Table 2-3: SIP process: Key communication and extension strategies

POTATO GROWER	PROCESSING
1. Improve industry engagement with a revised communication program	1. Compile a database of knowledge sources from local and overseas centres of excellence.
2. Introduce Next Gen leadership development program, including internships and scholarships for growers, farm managers, scientists and advisors (in collaboration with processing SIP)	2. Run subject specific professional training workshops for consulting agronomists (consider accreditation scheme).
3. Develop an IT self-assessment benchmarking tool	3. 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’).
4. Develop an online knowledge database for growers that translates the latest research into practical information	4. Establish a social media network facilitated by industry experts and professional advisors within the processing potato community (ensure adequate funding to maintain).
5. Run subject-specific professional development workshops for consulting agronomists (jointly with processing program)	5. Develop soil management resource kit with practical and cost-effective tools.
6. Leverage the potato extension program into establishing regional grower development groups	6. Develop a calendar of coordinated program of regional field days and/ or trials, specifically for processing growers (in cooperation with industry suppliers).
7. Integrate precision ag, integrated pest management (IPM) and soil health as core elements of the potato extension program.	7. 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.
8. Establish an appropriate prioritised regional extension program to address pest and disease challenges/threats.	8. Encourage use of PreDicta Pt, a DNA based soil testing service.
9. Support industry-wide efforts to improve the performance of certified seed across the supply chain	9. Establish appropriate, prioritised extension programs for highly rated pest and diseases.

POTATO GROWER	PROCESSING
	10. Support wider industry efforts to increase the quality of certified seed throughout the supply chain in order for it to be fit-for-purpose.
	11. Include integrated pest management (IPM) as a core subject area in the regional field days program.
	12. Run regional 'future farming' workshops as part of proposed extension projects.
	13. Ensure industry is engaged with other Hort Innovation precision agriculture programs such as robotics at University of Sydney.
	14. Identify blockers to commercial adoption of precision agricultural systems and other technologies then initiate priority projects in response.
	15. Establish potato precision agriculture Community of Practice or information resource.
	16. Provide scholarships for agribusiness professional development courses
	17. Introduce Next Gen program including overseas study, mentoring, internships, and basic business skills for growers, scientists and advisors
	18. Initiate project to identify and communicate alternative business models to growers
	19. Initiate and communicate self- assessment tool for web-based benchmarking on yield and cost such as the University of Idaho web-based tool
	20. Build a processing potato-specific information digital database
	21. Initiate extension program in natural resource management, best practice land use and sustainability

CURRENT R&D COMMUNICATIONS

R&D outcomes are presently communicated to industry via the Potato Industry Communications Program delivered by AUSVEG. This program aims to grow awareness and on-farm adoption of the results of levy-funded projects for the Australian potato industry, encouraging Australian growers to take advantage of R&D results and innovate in their businesses.

The program includes:

- Potatoes Australia magazine (bimonthly)
- Weekly (e-newsletter) Update
- Social media posting (Twitter)
- 12 media releases and 3 YouTube videos per year
- Potato Grower Success Stories (annual)

The previous levy funded extension program ended prematurely, in 2017.

3 Australian Potato Industry Development Program (The Plan)

3.1 PROGRAM DRIVER

This Plan has been developed in response to a project brief from Horticulture Innovation Australia Limited (Hort Innovation) to understand the communication and extension needs of the potato industry and develop a strategy and implementation plan that meets those needs. The objective of the Plan is to enhance the adoption of innovation and technology in the Australian potato industry through brokering research and development (R&D) information and facilitating capacity building in the industry. This will be achieved by:

- Providing national co-ordination and leadership for the successful development and delivery of innovative 'work packages' to the potato industry
- Building industry partnerships and networks
- Delivering regionally specific activities.

The focus will be on improving knowledge and skills, and supporting practice change to achieve enhanced long-term sustainability and profitability of Australian potato businesses.

3.2 PURPOSE AND STRUCTURE OF THIS PLAN

The purpose of this plan is to outline how the **Australian Potato Industry Development Program** could be delivered and includes:

- Program logic and monitoring, evaluation, reporting and improvement (MERI) framework (section 3.3)
- Opportunities for collaboration (stakeholder engagement) (section 3.4)
- Program design (including program approach, program governance and structure) (section 3.5)
- Specific activities (including national coordination, regional delivery and communications) (section 3.6).

This plan describes what success looks like, how to measure it and what key activities will be undertaken with different target audiences.

3.3 PROGRAM LOGIC

The program logic forms the high-level framework for the Project Plan and governs the subsequent MERI framework. This includes considering the hierarchy and connection between:

- **Vision**: aligned to Australian Potato Industry Strategic Investment Plan
- **Long-term outcomes** (3-10 years): what the project will contribute to after completion
- **Project outcomes** (1-3 years): within the sphere of influence and measurement of the project timeframe, these include:
  1. **Evidence of increased capacity of producers to manage risks and improve production.** This will be achieved by attention to:
  - Increasing the application of practical research findings by supporting producers and their advisors to implement R&D outcomes on farm (especially pest and disease management)
  - Better understanding seed handling

- Managing risks to avoid poor performing crops by adopting good agronomic management practices (irrigation, soil management and nutrition etc) and 'planning right' to ensure the right things are happening at the right time.
- Increased resource use efficiency and productivity on farm
- Business strategy and understanding profit drivers.

2. **Evidence of rebuilt trust and increased collaboration between all industry participants**. This will be achieved by attention to:

- Rebuilding regional connections and relationships amongst producers and industry personal; strengthening existing regional industry networks
- Building grower belief in the practical value of the potato industry R&D program
- Increased leadership and providing opportunities to celebrate success; championing the next generation.

- **Activities**: that will be undertaken annually
- **Foundational activities**: that will underpin and inform the implementation of annual activities.

The program logic for the **Australian Potato Industry Development Program** is outlined in Figure 3-1.

3.3.1 MERI FRAMEWORK

Key evaluation questions

The key evaluation questions (KEQs) for evaluating the performance of the strategy are arranged by five key themes in accordance with best practice evaluation:

- Impact: What has changed or is different as a result of the industry development undertaken, either positive or negative? e.g. extent of change to knowledge, skills, attitudes, management practices or businesses/organisations (operational or economic)
- Effectiveness: To what extent were the planned industry development activities achieved?
- Appropriateness: To what extent did the activities and the way they were undertaken align with stakeholder needs and expectations? To what extent has the innovation being tested contributed useful information to address the objectives? Which innovation practices or technology employed did not contribute to / deliver on outcomes? And why?
- Efficiency: To what extent did the project achieve the desired result within budget and timeframes?
- Legacy and sustainability: To what extent will the project have a lasting impact on the capacity of the Australian potato industry? What, if any, lessons have been learned that could improve the success of future projects?

A detailed MERI framework outlining activities, desired outcomes (short and longer term) and suggested monitoring approaches and suitable measures is provided in Appendix 3.

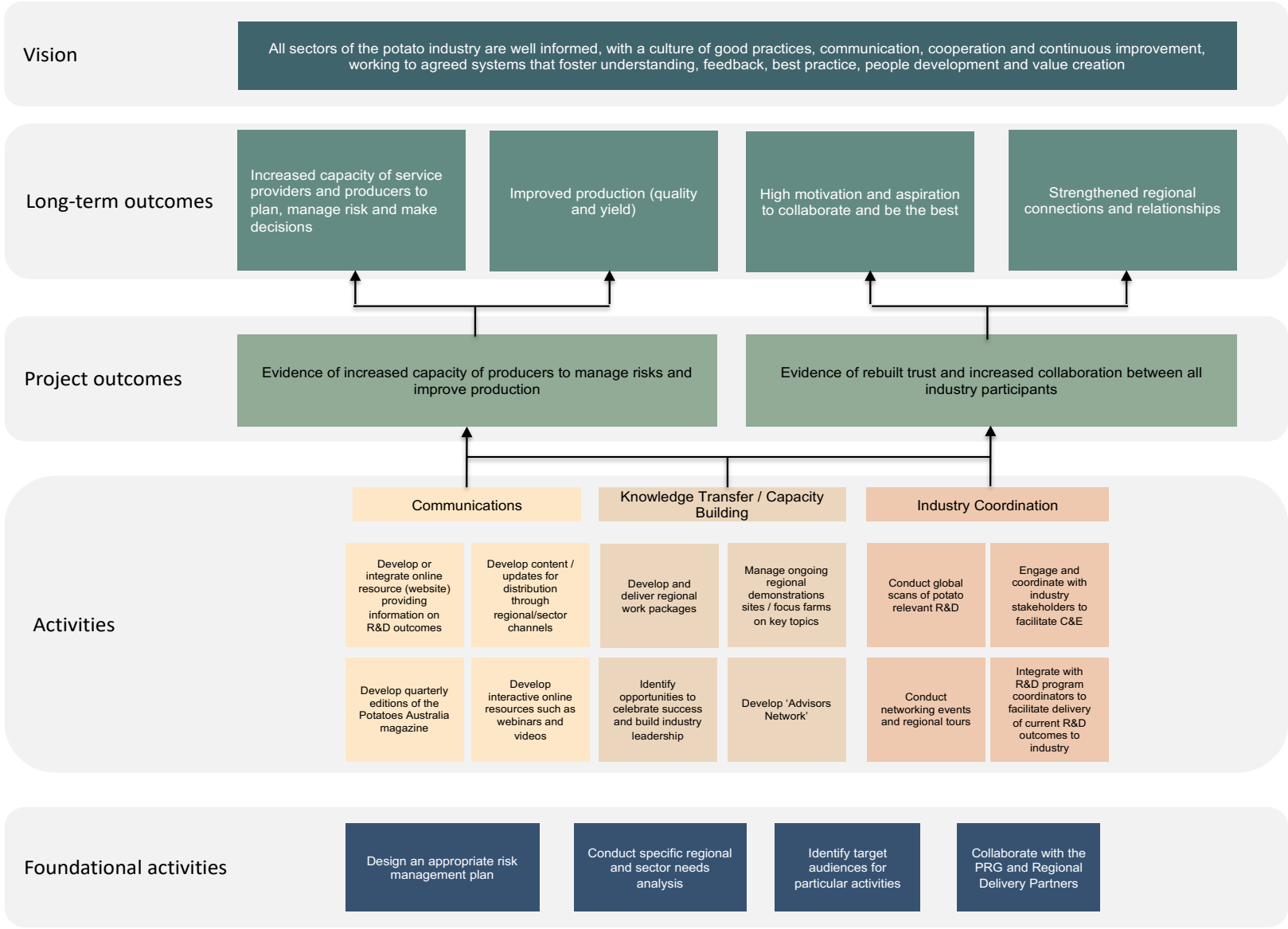

Figure 3-1: Program logic

3.4 COLLABORATION (STAKEHOLDER ENGAGEMENT)

3.4.1 OVERVIEW

A key focus for the Plan is providing all potato growers with the same opportunity to access information. The best way to achieve this is to engage with national and regional stakeholder bodies as well as other key stakeholders / groups operating in each region e.g. agronomists, advisors, NRM groups, grower groups, and activities being conducted by vegetable industry projects.

The Plan acknowledges the diversity in regional, sector and business needs, and provides a program that builds on existing business to business, industry association and other relationships. The key stakeholder groups for this project include:

- Processing potato growers
- Fresh potato growers
- Seed potato growers
- Advisors and extension providers
- Industry associations
- Researchers
- Supply chain participants (including buyers).

These stakeholder groups are discussed and analysed further below.

3.4.2 PROCESSING POTATO INDUSTRY

The potato processing 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. 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.

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[2].

The key contact for the potato processing sector is Anne Ramsay, Executive Officer of the PPAA. The Industry Development Program will work together with the PPAA to inform the delivery of work packages and the relevance of R&D communication to the processing industry.

3.4.3 FRESH POTATO INDUSTRY

Fresh potatoes are mostly distributed through retail outlets and a large majority through supermarkets (70%). Central wholesale markets are now only a secondary supply channel with most produce sold under contractual arrangements directly with supermarkets. Supermarket dominance has led to mass industry consolidation and fewer and larger highly vertically integrated potato businesses in the washed sector. While potatoes remain an Australian staple with an 87% 'household penetration', the net consumption per capita is falling[3].

The production of seed potatoes is included within the 'fresh industry' and there are a number of seed certification authorities, including:

- AuSPICA, an independent provider of Seed Potato Certification and other services to the Australian Potato Industry. AuSPICA is the authority responsible for the seed potato certification schemes in Victoria, South Australia and Northern New South Wales (Guyra).
- The Tasmanian Institute of Agriculture manages the Tasmanian Certified Seed Potato Scheme, which is a form of quality control for seed potatoes.
- DDLS Seed Testing and Certification is responsible for administering the industry seed potato production schemes in Western Australia.

3.4.4 INDUSTRY ASSOCIATIONS

Industry associations are critical to the success of the Plan. The Industry Development Program will engage with peak industry bodies to ensure that the activities and outcomes of the project are communicated with the broader industry. There are also a number of regional associations which represent the interests of potato growers in their area. These include:

- Seed Potatoes Victoria (Victoria)
- AUSVEG (Victoria, SA)
- Crookwell Potato Association Inc (NSW)
- WA Potatoes (WA)
- Atherton Tablelands growers.
- Potatoes SA
- Processing Growers Associations

Industry associations will be engaged in the program through regional delivery partners and the national coordinator.

[2] Potato – Processing Strategic Investment Plan 2017 - 2021

[3] Hort Innovation, Potato Grower SIP 2017-21

Other members of the potato industry that the Industry Development Program will engage include:

- Individual farm businesses
- Fresh buyers: Woolworths, Coles, other
- Quality teams / category management team – major retailers
- Plant Health Australia
- Seed certification authorities
- Other service providers – resellers and independent agronomists.

Producers are faced with an overload of general production information via written media and events. More targeted engagement with specific groups on topics where the interest is greatest, with a practical or operational benefit, will be the aim of the new Plan, rather than delivering general information and technology transfer events.

3.4.5 ADVISORS AND EXTENSION PROVIDERS

The Australian potato industry is well supported by a range of service providers which include independent agronomists, agronomists working within resellers and field officers (based within processing companies). These service providers work in a regular and ongoing capacity with potato producers and are a vital conduit and communicator of R&D outcomes. The needs analysis identified that service providers were viewed by industry as very influential in helping producers innovate.

Advisors (consultant agronomists / resellers) are important for providing decision-making support to producers on the growing side of potato businesses especially for soil fertility (fertiliser requirements) and chemical usage for pest and disease management. They are often used to confirm a decision or to get a second opinion.

There are others advising producers, such as researchers, IPM consultants, agribusiness advisors and extension specialists. These providers also provide an important opportunity to assist producers in adopting new techniques and tools. The needs analysis highlighted the importance to producers of having independent expertise to provide support. The Industry Development Program will seek to use trusted advisors currently working with producers and provide support and upskilling to this group so that they can support their network effectively.

3.4.6 RESEARCH AND DEVELOPMENT PROGRAM

The potato industry is currently investing in a range of research and development (R&D) to meet the needs of industry, as guided by the industry's Strategic Investment Plans (SIPs). The majority of projects have a focus on pest and disease management as outlined in Table 3-1.

Table 3-1: R&D on pest and disease of relevance to the Australian potato industry

PROJECT	R&D PROVIDER
Coordination of the potato pest and disease R&D program	RMCG
Extension of the PreDicta Pt diagnostic service	South Australia Research and Development Institute (SARDI)
Review of the national biosecurity plan and development of a biosecurity manual for potato producers	Plant Health Australia (PHA)
Coordination of the national Tomato Potato Psyllid (TPP) program	AUSVEG
Diagnostic capability to detect *Candidatus Liberibacter solanacearum* (CLso)	DEDTJR
Developing and implementing a high throughput diagnostic test for *Candidatus Liberibacter solanacearum* (CLso)	SARDI

PROJECT	R&D PROVIDER
Surveillance of TPP in the Eastern States and South Australia	University of Tasmania
Mechanisms and manipulation of resistance to powdery scab in potato roots	Tasmanian Institute of Agriculture (TIA)
Extension of Integrated Pest Management (IPM) in the potato industry	IPM Technologies
Generation of data for pesticide applications in horticulture crops 2018	Peracto
Potato industry minor use program	Hort Innovation
Navigating the wealth of soil health information and identification of opportunities	TIA

Other recent or current R&D occurring in the potato industry includes:

- Review and survey of Australian potato seed quality and handling practices delivered by AgAims
- Impact of groundwater quality on the management of centre-pivot grown potato crops delivered by Serve-Ag.

Internationally, there are a wide range of research areas of interest and programs that will assist the Australian potato industry to meet its R&D priorities, for example, New Zealand and Australia have collaborated on projects investigating *Spongospora* and TPP.

The Australian Potato Industry Development Program will engage and liaise regularly with the coordinators of the pest and disease R&D program to ensure that the key outcomes from this program are communicated and extended to industry on a regular and ongoing basis.

3.5 PROGRAM DESIGN

3.5.1 APPROACH

Recent models for adoption advocate that the motivation to adopt R&D and innovation will depend on the differing needs and circumstances (i.e. social/cultural context) of growers. Differences in circumstance mean that growers will adopt the same innovation for different reasons. In some cases, growers will not adopt an innovation because they perceive that the particular innovation will not meet their needs better than their current practices or pose a business risk. This suggests that there are different reasons for why all growers in an industry do not adopt an innovation or react to the same delivery methods.

It is therefore critical that we understand the farming context and the potential incentives for individuals within certain contexts to adopt a management practice and/or technology. Provided, there is an understanding of the key drivers and barriers for a particular issue, it will be possible to tailor capacity building programs and tools to the needs of the individual business.

The needs analysis conducted for the Australian potato industry identified:

- Growers' expectations and aspirations
- The financial context for potato production decision-making
- Skills and knowledge gaps for service providers and producers
- The most effective ways to engage potato growers operating within different sectors
- Valued information sources and preferred methods of learning.

This information (provided in detail in Section 2 (Needs analysis section)) was used to design a capacity building program for the Australian potato industry.

3.5.2 PROGRAM STRUCTURE

A capacity building program for the Australian potato industry should be delivered using a national coordinator who focuses on improving cohesion and collaboration within the potato industry. Having a national coordinator who can provide oversight will help to minimise 'silos' and increase efficiencies by making sure lessons learnt in one region can be implemented in other areas. Similarly, opportunities identified in one region could also be applied elsewhere. Having a national coordinator will help to leverage regional activities and make sure that effort isn't duplicated.

The national coordinator will work in partnership with regional delivery partners who, using their regional understanding and industry expertise, will facilitate the delivery of activities on the ground. Working with regional deliverers will ensure that:

- Nationally available information is properly converted into relevant regional or industry specific packages utilising appropriate delivery formats
- The wide diversity of grower communities and geographic regions is tailored for, and the actual or perceived competition or synergies between regions, is understood and considered in the delivery approach.

KEY MESSAGE

Use existing people on the ground

- no 'parachuting' experts into regions 'wearing suits'

- people chosen need to be effective

Ideally the regional deliverers will have worked in the potato industry previously and have a depth of understanding of the key issues facing producers in that particular region. This understanding and experience will be used to inform the development and delivery of the work packages. Regional delivery partners could be agronomists, field officers or anyone in the industry who can meet the objectives of the program. It is likely that the right 'type' of regional delivery partner will differ from region to region and between sectors. Getting the right people delivering on the ground will be vital to the success of the industry development program and effort and time should be put into the start of the program to make sure the right person is identified and engaged. There may also be opportunity to integrate with other industry development programs (such as vegetables) where the same person could be used across both industry programs where there are part time roles. This could work well in states such as Tasmania and Western Australia where producers might grow both crops but not work as well in other potato production areas.

Expertise and independence were both highlighted during the needs analysis as important/required features of the regional delivery partners.

Regional delivery partners could be based in the major production regions (possible VIC, SA and TAS) and provide services predominately in these regions but travel to deliver activities in other states if required.

Illustration of the proposed approach for the design and delivery of the Australian potato industry development program is provided in Figure 3-2.

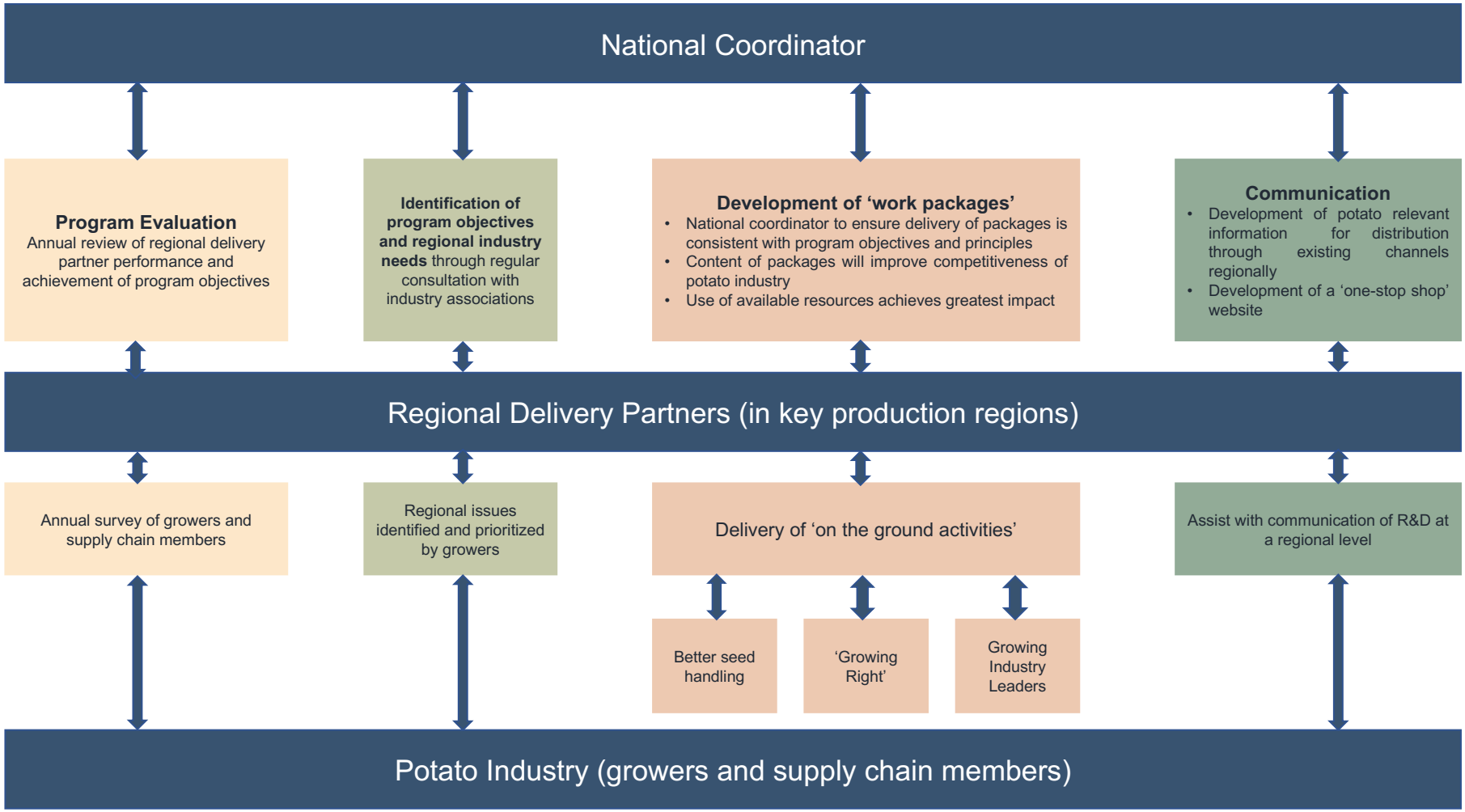

Figure 3-2: Approach for Australian Potato Industry Development Program

3.5.3 PROGRAM GOVERNANCE

The governance arrangements for the Australian Potato Industry Development Program is outlined in Figure 3-3.

KEY MESSAGE

Deliver regionally but co-ordinate nationally.

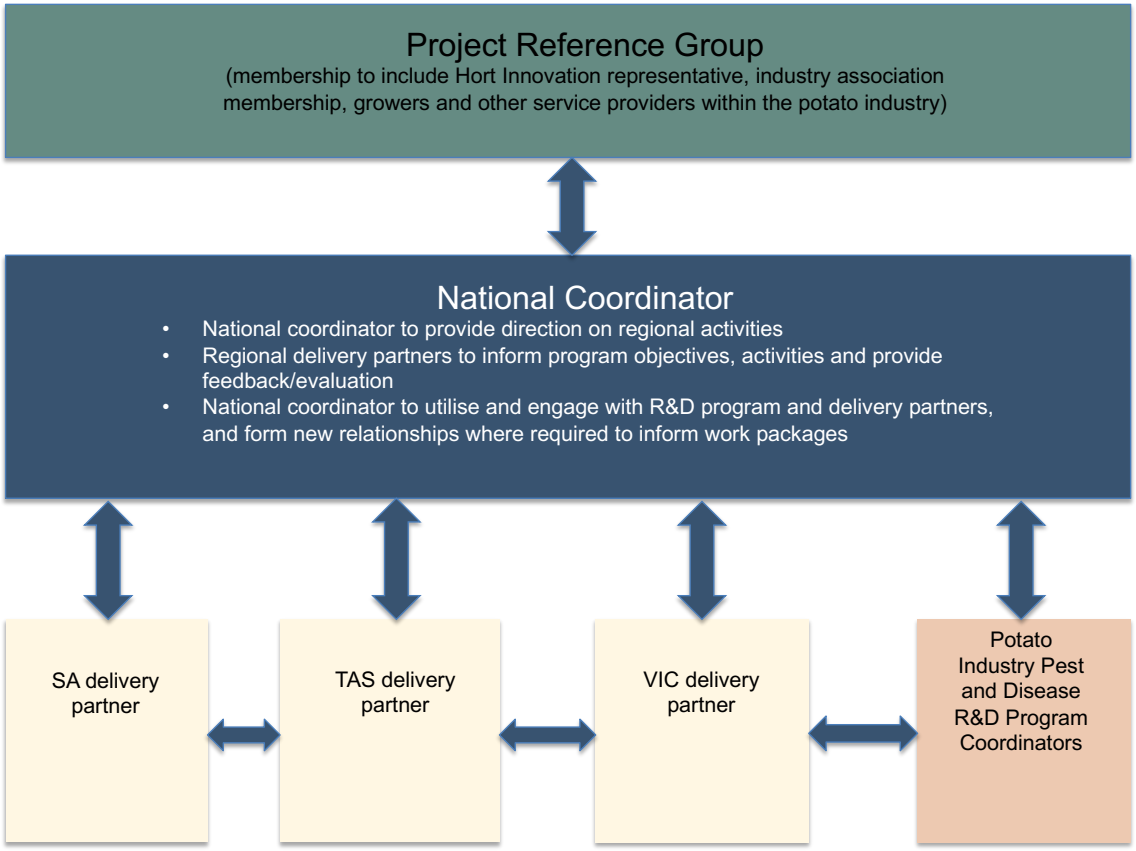

Figure 3-3: Program governance

3.6 SPECIFIC ACTIVITIES

The Australian Potato Industry Development Program should build on, and not replicate, the success of existing vegetable extension activities while addressing the gaps and opportunities identified in this study. Gaps include knowledge and skills of; potato seed production and storage, crop storage post-harvest (fresh), IPM cultural practices, identification and management of diseases, crop nutrition and irrigation understanding and management, and technologies including 'Precision Ag'. This will be most effectively addressed through a combination of regionally-based group extension activities including on-farm demonstration and targeted high quality training. The program should be producer and supply chain driven and should engage directly with supply chain representatives, advisors and re-sellers.

The following section outlines the specific activities to be conducted within the Australian Potato Industry Development program. The range of activities can be broadly grouped into:

Industry coordination – these are activities that provide a framework for improving coordination and cohesiveness within the Australian potato industry and include the development of an industry champion program and a service provider network. The national coordinator will have an important role here to 'build bridges' and look for opportunities to integrate activities wherever possible. They will also identify relevant R&D information at a national and international level that is relevant for the potato industry and tailor this information (in conjunction with the regional delivery partners) so that it becomes regionally targeted.

Knowledge transfer – these are topic specific activities and events to address particular needs and/or issues within industry. These activities have been loosely categorised as three work packages focussed on:

- Improving seed quality through better handling and storage
- 'Growing Right' by focussing on better production planning and management
- Growing industry leaders (through championing of success stories and building industry capacity).

Communications – these activities are focused on informing industry on events, issues and the latest research and development.

3.6.1 INDUSTRY COORDINATION

KEY MESSAGE

Focus on building industry cohesion and collaboration

- champion your leaders

- upskill service providers and growers

The new program will fit with and not undermine existing vegetable industry programs. It will be producer and service provider led and provide up-skilling opportunities for both.

The framework and activities conducted by the national coordinator in conjunction with the regional delivery partners to improve industry coordination, will also facilitate the delivery of the 'work packages'.

Learning from leading producers

The project team will develop relationships with leading/progressive producers who are implementing/trialling new techniques on their farm, which demonstrate best practice management. These producers/farms (to be referred to as 'demonstration farms') will also be targeted based on their willingness to share information and work with the project team.

The main potato growing regions will be used to guide project delivery. It is anticipated that demonstration sites in the main production regions of Victoria, SA and Victoria would be established. Specific topics which may be addressed on the demonstration farms could include:

- Innovative quality assurance and supply chain management
- Best practice IPM and soil health management
- New production practices
- Integration of new digital technologies ('precision ag').

The demonstration farms will be used for field days, case studies and 'stories of success'. Where appropriate these 'demonstration farms' will be used in the delivery of the regional 'work packages' such as 'Growing Right' and 'Better Seed Handling'.

Develop an 'Advisors Network'

The project team will seek to establish an Advisors Network based on the concept of a 'Community of Practice' for the Australian potato industry.

"Communities of practice are groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly."[4]

Communities of practice are usually characterised by:

- The domain (the common area of interest), in this case the development of the Australian potato industry

[4] Etienne Wenger. Communities of practice: a brief introduction.

- The community (these are industry members, who in pursuing their interest in the domain (potato industry) engage in joint activities and discussions, help each other, and share information). They build relationships that enable them to learn from each other.
- The practice (members of a community of practice are practitioners). They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems. This takes time and sustained interaction.

The project team will invite key practitioners within the potato industry (members who are regularly working with, and advising producers, such as researchers, agronomists, processor field officers, IPM consultants, agribusiness advisors) to join the community of practice. Developing the community will rely on establishing links and contacts with the broad range of advisors in the industry.

KEY MESSAGE

Leverage resources from other industries

- don't' want to 'reinvent the wheel'

The team will collaborate with the regional delivers and other state industry bodies to establish this network.

A community of practice provides a forum to enable members to share and learn from each other. Due to the geographic spread of the potato industry this will include both online tools (such as a website, webinars, skype meetings) and in the key regional production areas within Victoria, SA and Tasmania the team will also conduct face to face activities on issues/topics of interest to the community. A key focus of the Advisors Network is to up-skill this group both from peer to peer learning and experiences, but also through targeted delivery of forums and workshops based on the work package topics and others as required.

Industry analysis

Although the industry needs analysis provided a solid base to develop the plan for the Industry Development Program it is likely that the design and delivery of the work packages would benefit from further regional and sector needs analysis to ensure that the activities are targeted and tailored to specific groups. This analysis would be done in conjunction with the regional delivery partners. The analysis would also include an assessment of the capacity and willingness of potential regional delivery partners to assist with delivery and how much additional support from the national coordinator may be required.

Industry collaboration

The national coordinator would be largely responsible for engaging with the key influencers i.e. trusted organisations (including government research and others) and groups in each region/industry segment to assist with regional communication and delivery of activities and events.

Collaboration with Potato Industry Pest and Disease R&D Program

The national coordinator would be responsible for working in partnership with the potato industry pest and disease R&D program coordinator to ensure that levy funded research outcomes are captured and conveyed to industry and that researchers are included in regional events and activities.

International R&D Awareness

The national coordinator would be responsible for maintaining a global scan of potato relevant research and development and using this information to design and deliver the work packages and also ensuring that new technology and practices are communicated to industry.

3.6.2 KNOWLEDGE TRANSFER

To assist industry in addressing particular issues it is recommended that the Industry Development Program, via the regional deliverers, design and deliver regionally specific 'work packages' or 'short courses' focussing on better seed handling, improved risk management through adoption of best management practices, and improving industry collaboration (through growing industry leaders).

KEY MESSAGE

Start small and work up

- evaluate and only keep delivering 'packages' that producers want.

The work packages will be designed to facilitate peer learning and meet the needs of both producers and service providers, with the aim that service providers (such as agronomists and field officers) will then impart knowledge gained to the producers they regularly work with and who may not be able to attend. The needs analysis showed that both producers and service providers had similar skills and knowledge gaps. Encouraging a mix of attendees will promote sharing of stories, better 'side by side' learning and address key knowledge gaps.

Each work package must also include a budgeted monitoring and evaluation (M&E) component to guide the project and check whether objectives are met via monitoring key indicators to ensure there is quantifiable value to industry. This allows adjustments and adaptive decisions to be made while the project is running over the three-year period.

1. Better seed handling

This work package will focus on the technology and principles that will assist industry to handle and store seed better resulting in improved seed quality. A key reference for developing the work package will be the recent review of seed handling practices by Philp Horticultural Services[5].

The delivery of the work package will include 'in-field' activities such as an on-site audit of storage facilities and handling techniques. This will be done with permission on a volunteer business with a group to share stories and lessons learnt. The on-site learning will be backed up by follow-up activities and material including case studies of local and international experience using videos, fact sheets or webinars. If deemed suitable, 'demonstration farms' have been identified as part of the 'learning from leading growers' and these will be used for on-site audits.

Opportunities to more fully integrate the seed sector with other sectors of the industry will also be sought to improve industry cohesiveness.

2. 'Growing Right'

This work package will focus on assisting producers to improve profit margins through better production management. The focus for delivery of this package may differ between regions and sectors depending on the specific skill gaps and requirements. The work package could range from a 'back to basics' focus for those looking to improve their management of key agronomic components such as irrigation, nutrition, pest and disease management and scheduling through to those looking to innovate and introduce agri-tech components to help them produce better potatoes.

The work package will focus on how producers can reduce risk in potato production to improve sustainability and profitability. This will include show casing and improving industry awareness of the technologies and management practices that identify, quantify and reduce risks in potato production systems (such as soil mapping, soil testing and record management) in addition to covering the 'basics' of good agronomic practice. Activities within the work package will include 'on-farm' demonstrations and discussion groups which include 'champion growers'. The on-site learning will be backed up by follow-up activities and material including case studies of local and international experience using videos, fact sheets or webinars.

Where possible and appropriate, activities will be delivered to both producers and service providers (agronomists, field staff, re-sellers) to up-skill both groups.

[5] Hort Innovation project PT16000 – A report on the literature review investigation potato seed quality and handling and its impact on potato production. Phip (Horticultural Services) and O'Brien (AgAims)

3. Growing Industry Leaders

A key outcome of the needs analysis was a desire to see improved industry collaboration and 'friendliness'. While the national coordinator will build a framework to improve industry collaboration and coordination this work package will focus specifically on building industry capacity. The greatest strength of any industry is its people and this work package seeks to celebrate the success stories of the potato industry and build industry engagement. This will be achieved by:

- Running activities (such as forums and field days) on topics of interest to the 'Advisors Network'
- Running courses designed to develop personal, business and industry skills for members of the potato industry. These courses could be based on a model used in the vegetable industry such as such as the the Growing Leaders Program[6]. Course content will be developed in conjunction with the potato industry to identify specific needs but could include developing effective ways of handling conflict, improving communication, managing efficient meetings, building high performance teams, managing change and media awareness.
- Celebrating success by communicating 'good news' stories through a range of mediums (online, hard copy) and developing a series of industry awards to be announced at a national industry event.

4. Work package Principles

Where possible work packages will be delivered:

- To a range of industry stakeholders (producers from all sectors), service providers (independent, re-seller, field officers) and other supply chain members such as pack houses to promote peer-to-peer learning and improve industry understanding and cohesion.
- Design of work packages will occur at a national level using the most current information with technical expertise but tailored to suit regional needs.
- Regional delivery partners will be used to facilitate delivery at a local level to provide a 'trusted' source of information and to increase regional engagement.
- All work packages will incorporate on-farm and hands-on activities to improve engagement and learning outcomes. These activities will be followed up with additional activities and course material to allow for reflection and integration of practices on attendee's own farms.

3.6.3 COMMUNICATION ACTIVITIES

Communication is central for the Industry Development Program to improve awareness, knowledge, adoption and information exchange between producers and other industry stakeholders. It is therefore essential to communicate with people about topics that interest them on platforms where they already seek information.

The Program (national coordinator working in conjunction with a communication specialist) will develop content on potato R&D of relevance to the potato industry that will be disseminated to industry members using current regional and sector specific associations. Communication activities are discussed in more detail below but could include:

- Regular updates on issues and topics of interest via an e-newsletter. This content will be provided to regional and sector specific associations for them to distribute to their networks using existing channels.
- Nationally focussed website which links to other relevant websites, and provides resources and the latest R&D updates for the potato industry. Alternatively, there is the opportunity to link in and leverage existing content specific websites such as www.soilhealth.com.au
- Quarterly, hard copy magazine such as Potatoes Australia
- Development of case studies ('stories of success') based on activities of leading/innovative producers within the potato industry.

[6] AUSVEG Leadership and training: https://ausveg.com.au/resources/leadership-training/

Further detail is provided below on:

- Target audiences and outcomes
- Mode, tools and purpose.

Target audiences and outcomes

The target audiences for project communications include the main stakeholder groups outlined in Section 3.4. A desired outcome from communicating with each group is outlined below.

Table 3-2: Target audiences and outcomes

GROUP	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Potato producers					Improved awareness, knowledge and adoption
Advisors and extension providers				Improved decision-making and provision of advice	
Industry associations			Increased co-hosting of events and co-branding of resources		
Researchers		Increased collaboration to develop information products and run training events			
Supply chain participants		Increased access to technical information and advice			
Funding bodies (Hort Innovation and federal government)	Increased information about return on investment				

Mode, tools and purpose

It is recommended that communication to the potato industry involves a mix of face-to-face delivery by the regional delivery partners, as well as online, and both soft and hard copy resources. The potato industry currently has a number of state and sector-based communication channels. It is important that this program uses these existing channels as much as possible to avoid duplication and ensure that information is being communicated in a fit-for-purpose way. The different tools and purpose within each of these modes are outlined in Table 3-3.

Table 3-3: Mode, tools and purpose

MODE	TOOL	PURPOSE
Face-to-face	Regional demonstration farms/case studies	To showcase changes in practices from leading producers, host events, and/or understand the costs and benefits of change in practices
	Master classes/short courses	To collaborate and discuss cutting edge knowledge in an immersive and self-directed learning environment
Online	Website	To centrally house all project resources, events, updates, latest practices and technologies Aust and overseas, and other information (e.g. YouTube videos). This could be developed as a new website or there is the opportunity to link and leverage with existing websites (such as www.soilwealth.com.au)
	Facebook (if appropriate) – combine all social media and link in with other industries	To promote and provide updates on regional activities, information and events and provide a forum for discussion (found to be significantly more used by younger producers)
	Twitter (if appropriate)	To provide regular information and updates on project resources, events, demonstration sites, and other relevant industry information
Hard and soft copy	'Stories of success'	Case studies of leading producers to be distributed in hard copy and also housed online as a soft copy.
	Articles and publications	To provide information on specific topics and/or project updates to industry. This could be distributed as a quarterly edition of a hardcopy magazine such as Potatoes Australia and also housed online in the website.
	E-newsletter content	To provide regular regional updates on issues of relevance and R&D outcomes to national and state-based association contact databases. This content will be provided to regional and sector specific associations for them to distribute to their networks or it could take the form of a targeted and tailored e-newsletter sent out by the national coordinator (it was found that only a minority of producers find the e-newsletter in its current form 'very useful')

Appendix 1: Documents reviewed

PROJECT NUMBER	TITLE	DATE	AUTHOR
	Strategic		
	Processing potato Strategic Investment Plan (SIP)	2017 - 2021	
	Fresh potato SIP	2017 - 2021	
PT07037	Scoping Phase 2 Processing Potato R&D Program	2009	Hugo LeMessurier Pyksis Pty Ltd
	Technical		
PT16003	Navigating the wealth of soil health information and identification of opportunities recommendations	2018	Robert Tegg TIA
PT16000	A report on the literature review investigating potato seed quality and handling and its impact on potato production	2018	Philp (Hort. Services) and O'Brien (AgAims)
	Program & project reports		
PT11004	Potato Industry Extension Program (Final Report)	2016	Richard Mulcahy AUSVEG
PT09039	Parent Project for Aust. Potato Research (APRP2) Program (Final Report)	2015	Frank Stagnitti
PT17002	P3 Potato Pest and Disease Program	2018 – 2021	Kristen Stirling and Doris Blaesing (RMCG)
	Independent review & evaluation		
PT15003	Independent review of potato extension project	2015	Clear Horizons
VG16066	Mid-term Evaluation of communication programs	2017	Clear Horizons
	Vegetable R&D review 2006 - 2018	2018	Goldwater, App. Hort Research
	Extension & training needs		
PT13013	A review of knowledge gaps and compilation of R and D outputs from the Australian Potato Research Programs	2015	Kevin Clayton Greene
PT08029	Processed Potato Industry Development Needs Assessment	2010	John Johnston Pyksis Pty Ltd
PT04016	Potato processor R7D program	2010	Iain Kirkwood UniTas

Appendix 2: Online producer survey results tables

Q21. In which State is your farm located?

Answer Choices	Overall		Grow seed potatoes		Potato Crop	
	Percent	Count	Yes	No	Processor	Fresh
Vic	19%	17	31%	13%	20%	9%
NSW	3%	3	7%	2%	3%	0%
Qld	1%	1	0%	2%	0%	9%
WA	1%	1	3%	0%	0%	9%
SA	13%	12	21%	10%	7%	64%
TAS	63%	57	38%	73%	71%	9%
	Answered	**91**				

Q22. Where best describes the area(s) you farm? Specify potato growing district(s) **Qualitative**

Q23. Which potato crops do you mainly grow?

Answer Choices	Overall		Grow seed potatoes		State					
	Percent	Count	Yes	No	Vic	NSW	Qld	WA	SA	TAS
Processor	87%	75	85%	88%	94%	100%	0%	0%	42%	98%
Fresh	13%	11	15%	12%	6%	0%	100%	100%	58%	2%
	Answered	**86**								

Q24. Do you grow seed potatoes?

Answer Choices	Overall		Potato Crop		State					
	Percent	Count	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Yes	33%	29	29%	36%	53%	67%	0%	100%	50%	20%
No	67%	60	71%	64%	47%	33%	100%	0%	50%	80%
	Answered	**89**								

Q25. In total, how many hectares do you farm?

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Less than 100 hectares	26%	23	24%	27%	23%	45%	18%	67%	100%	0%	25%	25%
100 to 199 hectares	18%	16	3%	25%	21%	0%	24%	33%	0%	0%	0%	20%
200 to 499 hectares	31%	28	45%	25%	33%	27%	35%	0%	0%	100%	25%	33%
500 to 999 hectares	15%	13	14%	15%	15%	0%	24%	0%	0%	0%	0%	16%
1,000 hectares or more	10%	9	14%	8%	8%	27%	0%	0%	0%	0%	50%	5%
	Answered	**89**										

Q26. What is your annual area (ha) of potato production?	**Qualitative**											

Q27. Which of the following best describes your age group?

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Under 30	4%	4	7%	3%	5%	0%	6%	0%	0%	0%	0%	5%
30 to 49 years	52%	46	62%	47%	57%	27%	71%	67%	0%	0%	58%	45%
50 or over	44%	39	31%	50%	37%	73%	24%	33%	100%	100%	42%	49%
	Answered	**89**										

Q28. Typically, how often would you attend a potato industry based extension activity (e.g. field day, forum, discussion group, training workshop)

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Never	13%	12	17%	12%	13%	18%	12%	0%	0%	0%	25%	13%
Once a year	55%	49	41%	62%	53%	64%	71%	33%	100%	0%	42%	55%
2-4 times per year	27%	24	34%	23%	28%	18%	18%	67%	0%	100%	25%	27%
More than 4 times per year	4%	4	7%	3%	5%	0%	0%	0%	0%	0%	8%	5%
Comments (optional)		4										
	Answered	**89**										

Q29. Which of the following statements best describes your level of aspiration to increase the performance of your farm? (select one)

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
I would like to increase the productivity of my potato growing	60%	49	59%	60%	59%	75%	71%	0%	0%	100%	80%	54%
I already have plans that will substantially increase the productivity of my potato growing operation	11%	9	11%	11%	13%	0%	6%	0%	0%	0%	10%	13%
I am satisfied with the productivity of my potato growing	15%	12	4%	20%	14%	25%	6%	0%	100%	0%	10%	17%
Productivity on my farm is at or near its peak	15%	12	26%	9%	14%	0%	18%	100%	0%	0%	0%	15%
Comments (optional)		4										
	Answered	**82**										

Q30. Which of the following statements best describes you and your approach to farming? (choose the best answer for you)

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
I tend to experiment with the way I run my farm; I like to be innovative; I like to stay up to date	42.17%	35	44.44%	41.07%	38.89%	75.00%	#####	######	#####	0.00%	70.00%	#####
I am open to new ideas but only once I have seen clear evidence of their effectiveness	46.99%	39	44.44%	48.21%	52.78%	12.50%	#####	0.00%	0.00%	######	20.00%	#####
My experience and history of farming have given me the knowledge I need; I know what works and what doesn't	10.84%	9	11.11%	10.71%	8.33%	12.50%	#####	0.00%	0.00%	0.00%	10.00%	#####
Comments (optional)		2										
	Answered	**83**										

Q31. What are the main challenges for your potato growing enterprise?

Qualitative

Q32. - Overall - To what extent are the following issues / challenges holding back productivity in your business?

	To a large extent	ate extent	small extent	Not at all	ot applicable
Soil management and health (e.g. drainage, salinity, structure…)	8.43%	27.71%	34.94%	26.51%	2.41%
Crop management (e.g. nutrition, irrigation…)	6.10%	23.17%	43.90%	25.61%	1.22%
Pests and disease pressure	17.07%	29.27%	40.24%	13.41%	0.00%
Weed pressure	4.94%	16.05%	46.91%	30.86%	1.23%
Business strategy and management skills	2.47%	16.05%	44.44%	35.80%	1.23%
Increasing costs of production	58.54%	30.49%	8.54%	2.44%	0.00%
Marketing and selling	7.32%	12.20%	28.05%	30.49%	21.95%
Quality management systems (e.g. record keeping, handling, storage…)	7.32%	24.39%	40.24%	25.61%	2.44%
Your time and labour resources	19.51%	39.02%	29.27%	12.20%	0.00%
Staff management (e.g. HR issues, OH&S..)	4.88%	31.71%	34.15%	28.05%	1.22%
Managing seasonal challenges and variability	25.93%	34.57%	33.33%	6.17%	0.00%
Comments (optional)					
				Answered	**83**

Q32. - Segmented - To what extent are the following issues / challenges holding back productivity in your business?

Soil management and health (e.g. drainage, salinity, structure...)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	8%	7	15%	5%	7%	13%	12%	0%	0%	0%	10%	8%
To a moderate extent	28%	23	26%	29%	26%	50%	29%	0%	0%	100%	50%	23%
To a small extent	35%	29	33%	36%	39%	0%	41%	0%	0%	0%	10%	40%
Not at all	27%	22	22%	29%	25%	38%	12%	100%	100%	0%	30%	28%
Not applicable	2%	2	4%	2%	3%	0%	6%	0%	0%	0%	0%	2%

Crop management (e.g. nutrition, irrigation...)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	6%	5	7%	5%	6%	13%	24%	0%	0%	0%	0%	2%
To a moderate extent	23%	19	30%	20%	21%	25%	12%	100%	0%	0%	50%	21%
To a small extent	44%	36	48%	42%	45%	38%	59%	0%	0%	100%	40%	40%
Not at all	26%	21	11%	33%	27%	25%	0%	0%	100%	0%	10%	37%
Not applicable	1%	1	4%	0%	1%	0%	6%	0%	0%	0%	0%	0%

Pests and disease pressure	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	17%	14	15%	18%	18%	13%	41%	0%	0%	0%	0%	13%
To a moderate extent	29%	24	33%	27%	27%	38%	29%	0%	0%	100%	40%	27%
To a small extent	40%	33	37%	42%	39%	50%	24%	100%	100%	0%	60%	40%
Not at all	13%	11	15%	13%	15%	0%	6%	0%	0%	0%	0%	19%
Not applicable	0%	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Weed pressure	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	5%	4	0%	7%	6%	0%	18%	0%	0%	0%	0%	2%
To a moderate extent	16%	13	15%	17%	19%	0%	12%	0%	0%	0%	20%	18%
To a small extent	47%	38	48%	46%	43%	63%	35%	100%	0%	100%	70%	45%
Not at all	31%	25	33%	30%	33%	25%	29%	0%	100%	0%	10%	35%
Not applicable	1%	1	4%	0%	0%	13%	6%	0%	0%	0%	0%	0%

Business strategy and management skills	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	2%	2	4%	2%	1%	0%	6%	0%	0%	0%	0%	2%
To a moderate extent	16%	13	15%	16%	13%	50%	25%	0%	0%	100%	30%	10%
To a small extent	44%	36	54%	40%	44%	38%	50%	100%	0%	0%	70%	38%
Not at all	36%	29	27%	40%	40%	13%	19%	0%	100%	0%	0%	48%
Not applicable	1%	1	0%	2%	1%	0%	0%	0%	0%	0%	0%	2%

Increasing costs of production	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	59%	48	59%	58%	58%	63%	71%	100%	0%	100%	70%	52%
To a moderate extent	30%	25	33%	29%	31%	25%	24%	0%	0%	0%	30%	35%
To a small extent	9%	7	4%	11%	8%	13%	0%	0%	100%	0%	0%	12%
Not at all	2%	2	4%	2%	3%	0%	6%	0%	0%	0%	0%	2%
Not applicable	0%	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Marketing and selling	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	7%	6	4%	9%	7%	13%	18%	0%	0%	0%	10%	4%
To a moderate extent	12%	10	19%	9%	11%	25%	29%	0%	100%	100%	10%	4%
To a small extent	28%	23	30%	27%	25%	38%	35%	0%	0%	0%	50%	23%
Not at all	30%	25	41%	25%	32%	13%	18%	100%	0%	0%	20%	37%
Not applicable	22%	18	7%	29%	24%	13%	0%	0%	0%	0%	10%	33%

Quality management systems (e.g. record keeping, handling, storage…)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	7%	6	4%	9%	7%	13%	6%	0%	0%	0%	10%	8%
To a moderate extent	24%	20	26%	24%	20%	63%	18%	0%	100%	100%	30%	23%
To a small extent	40%	33	44%	38%	42%	13%	53%	100%	0%	0%	50%	35%
Not at all	26%	21	22%	27%	28%	13%	18%	0%	0%	0%	10%	33%
Not applicable	2%	2	4%	2%	3%	0%	6%	0%	0%	0%	0%	2%

Your time and labour resources	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	20%	16	22%	18%	18%	25%	35%	100%	0%	0%	20%	13%
To a moderate extent	39%	32	41%	38%	39%	38%	29%	0%	0%	100%	40%	42%
To a small extent	29%	24	30%	29%	28%	38%	29%	0%	100%	0%	40%	27%
Not at all	12%	10	7%	15%	14%	0%	6%	0%	0%	0%	0%	17%
Not applicable	0%	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Staff management (e.g. HR issues, OH&S..)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	5%	4	11%	2%	6%	0%	12%	0%	0%	0%	0%	4%
To a moderate extent	32%	26	33%	31%	27%	63%	35%	100%	100%	100%	40%	25%
To a small extent	34%	28	37%	33%	37%	13%	35%	0%	0%	0%	30%	37%
Not at all	28%	23	19%	33%	30%	25%	18%	0%	0%	0%	30%	33%
Not applicable	1%	1	0%	2%	1%	0%	0%	0%	0%	0%	0%	2%

Managing seasonal challenges and variability	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	26%	21	19%	30%	28%	0%	24%	0%	0%	0%	11%	31%
To a moderate extent	35%	28	41%	31%	34%	43%	35%	100%	0%	0%	44%	33%
To a small extent	33%	27	37%	31%	31%	57%	41%	0%	100%	100%	44%	27%
Not at all	6%	5	4%	7%	7%	0%	0%	0%	0%	0%	0%	10%
Not applicable	0%	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Answered	**83**											

Q33. What are the biggest skills or knowledge gaps in your business (for you or your staff)?	**Qualitative**
Q34. When you think about developments in potato growing over the last 10 years, what new practices or approaches have made the most difference to your business?	**Qualitative**
Q35. Who or what helped you innovate?	**Qualitative**

Q36. Overall - How useful do you find the following industry communications?

	Not useful	Somewha	Very useful	unsure/no	Total
AUSVEG potato newsletter	9%	71%	10%	10%	79
Potatoes Australia magazine	4%	55%	28%	13%	78
Potato grower profiles	14%	62%	14%	9%	77
Processor updates	3%	65%	23%	9%	78
Seed industry updates	3%	58%	25%	14%	79
Please specify other industry communications that you value					8
				Answered	**79**

Q36. Segmented - How useful do you find the following industry communications?

AUSVEG potato newsletter	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Not useful	9%	7	13%	7%	10%	0%	13%	0%	0%	0%	0%	10%
Somewhat useful	71%	56	63%	75%	70%	86%	60%	0%	100%	100%	78%	73%
Very useful	10%	8	13%	9%	9%	14%	7%	100%	0%	0%	22%	8%
unsure/not relevant	10%	8	13%	9%	12%	0%	20%	0%	0%	0%	0%	10%

Potatoes Australia magazine	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Not useful	4%	3	4%	4%	4%	0%	7%	0%	0%	0%	0%	4%
Somewhat useful	55%	43	63%	52%	57%	43%	67%	0%	0%	0%	56%	55%
Very useful	28%	22	25%	30%	24%	57%	27%	100%	100%	100%	44%	22%
unsure/not relevant	13%	10	8%	15%	15%	0%	0%	0%	0%	0%	0%	20%

Potato grower profiles	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Not useful	14%	11	25%	9%	10%	57%	36%	0%	100%	100%	11%	6%
Somewhat useful	62%	48	54%	66%	64%	43%	57%	0%	0%	0%	78%	65%
Very useful	14%	11	17%	13%	15%	0%	7%	100%	0%	0%	11%	16%
unsure/not relevant	9%	7	4%	11%	10%	0%	0%	0%	0%	0%	0%	14%

Processor updates	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Not useful	3%	2	4%	2%	1%	14%	7%	0%	0%	0%	11%	0%
Somewhat useful	65%	51	67%	65%	68%	57%	60%	0%	0%	100%	56%	71%
Very useful	23%	18	21%	24%	24%	14%	33%	0%	0%	0%	33%	20%
unsure/not relevant	9%	7	8%	9%	7%	14%	0%	100%	100%	0%	0%	10%

Seed industry updates	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Not useful	2.5%	2	4%	2%	3%	0%	7%	0%	0%	0%	0%	2%
Somewhat useful	58.2%	46	42%	65%	64%	29%	53%	0%	0%	100%	44%	63%
Very useful	25.3%	20	46%	16%	19%	57%	33%	100%	100%	0%	44%	17%
unsure/not relevant	13.9%	11	8%	16%	14%	14%	7%	0%	0%	0%	11%	17%

Q37. In what form do you prefer to receive information? (Select your top 2)

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Face to face (one on one)	30%	24	29%	31%	32%	14%	33%	0%	0%	0%	22%	33%
Face to face (grower groups, workshops, field days)	61%	48	63%	60%	59%	71%	60%	100%	0%	100%	67%	60%
Hard copy (brochures, field guides, fact sheets)	52%	41	58%	49%	51%	71%	47%	0%	100%	100%	56%	52%
Electronic (social media, websites, YouTube, E-newsletters)	37%	29	25%	42%	38%	43%	40%	0%	100%	0%	56%	33%
Other (please specify)	1%	1	4%	0%	0%	0%	0%	0%	0%	0%	0%	2%
	Answered	**79**										

Q38. Do you use social media to receive and share information related to your business?

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
To a large extent	1%	1	0%	2%	1%	0%	0%	0%	0%	0%	0%	2%
To a moderate extent	24%	19	29%	22%	26%	0%	27%	100%	0%	0%	11%	25%
To a small extent	35%	28	38%	35%	35%	43%	27%	0%	0%	100%	44%	37%
Not at all	39%	31	33%	42%	38%	57%	47%	0%	100%	0%	44%	37%
	Answered	**79**										

	To a large extent		To a moderate extent		To a small extent		Not at all		Total	
Segmented by age group:	Percent		Percent		Percent		Percent		Percent	
Under 30	0%	0	100%	3	0%	0	0%	0	4%	3
30 to 49 years	0%	0	29%	11	32%	12	39%	15	48%	38
50 or over	3%	1	13%	5	42%	16	42%	16	48%	38
Total	1%	1	24%	19	35%	28	39%	31	100%	79
	Answered	**79**								

Q39. Overall - What are your preferred methods of learning? (Where 1 is least preferred and 5 is most preferred)

	1	2	3	4	5
One-on-one (paid advisor)	26%	27%	17%	16%	14%
One-on-one (field officers, agronomists/reps)	4%	11%	13%	32%	41%
From peers and other farmers	1%	8%	24%	39%	28%
Hands on / in the paddock (field days, demonstrations, trials)	3%	10%	23%	34%	30%
Discussion groups	13%	15%	31%	25%	17%
Training workshops (when the topic warrants it)	10%	19%	31%	24%	15%
Fact sheets / ute guides	7%	18%	36%	26%	14%
Online (own research)	9%	17%	29%	29%	17%
Webinars	54%	19%	19%	5%	3%
Videos and podcasts	34%	30%	21%	8%	8%
Other (please specify)					
				Answered	**79**

Q39. Segmented - What are your preferred methods of learning? (Where 1 is least preferred and 5 is most preferred)

One-on-one (paid advisor)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	26%	20	8%	34%	28%	17%	7%	0%	100%	0%	0%	35%
2	27%	21	46%	19%	24%	50%	33%	0%	0%	100%	63%	20%
3	17%	13	21%	15%	19%	0%	20%	0%	0%	0%	25%	16%
4	16%	12	8%	19%	15%	17%	20%	100%	0%	0%	13%	14%
5	14%	11	17%	13%	15%	17%	20%	0%	0%	0%	0%	16%

One-on-one (field officers, agronomists/reps)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	4%	3	4%	4%	4%	0%	13%	0%	0%	0%	0%	2%
2	11%	9	21%	7%	12%	14%	13%	0%	0%	100%	0%	12%
3	13%	10	13%	13%	13%	14%	7%	0%	100%	0%	33%	10%
4	32%	25	33%	31%	30%	14%	27%	100%	0%	0%	22%	35%
5	41%	32	29%	45%	41%	57%	40%	0%	0%	0%	44%	42%

From peers and other farmers	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	1%	1	0%	2%	1%	0%	0%	0%	0%	0%	0%	2%
2	8%	6	8%	8%	9%	0%	13%	0%	0%	0%	13%	6%
3	24%	18	29%	21%	21%	50%	13%	0%	100%	100%	25%	24%
4	39%	30	38%	40%	42%	17%	33%	0%	0%	0%	50%	42%
5	28%	21	25%	29%	27%	33%	40%	100%	0%	0%	13%	26%

Hands on / in the paddock (field days, demonstrations, trials)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	3%	2	4%	2%	3%	0%	0%	0%	0%	0%	0%	4%
2	10%	8	4%	13%	12%	0%	7%	0%	0%	0%	0%	13%
3	23%	18	21%	24%	23%	29%	33%	0%	100%	100%	22%	17%
4	34%	27	33%	35%	32%	43%	33%	0%	0%	0%	56%	33%
5	30%	24	38%	27%	30%	29%	27%	100%	0%	0%	22%	33%

Discussion groups	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	13%	9	4%	16%	11%	33%	0%	0%	100%	0%	13%	15%
2	15%	11	17%	14%	17%	0%	23%	0%	0%	0%	13%	15%
3	31%	22	39%	27%	27%	50%	15%	100%	0%	100%	50%	29%
4	25%	18	22%	27%	28%	0%	38%	0%	0%	0%	25%	23%
5	17%	12	17%	16%	17%	17%	23%	0%	0%	0%	0%	19%

Training workshops (when the topic warrants it)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	10%	8	4%	13%	10%	14%	0%	0%	0%	0%	11%	13%
2	19%	15	17%	20%	22%	0%	21%	0%	0%	0%	11%	21%
3	31%	24	33%	30%	28%	43%	43%	0%	100%	100%	44%	23%
4	24%	19	25%	24%	26%	0%	21%	100%	0%	0%	0%	29%
5	15%	12	21%	13%	13%	43%	14%	0%	0%	0%	33%	13%

Fact sheets / ute guides	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	7%	5	5%	8%	6%	17%	8%	0%	0%	0%	13%	6%
2	18%	13	9%	21%	20%	0%	31%	0%	0%	0%	0%	18%
3	36%	27	41%	35%	36%	50%	38%	0%	0%	100%	25%	38%
4	26%	19	36%	21%	24%	17%	15%	100%	0%	0%	50%	24%
5	14%	10	9%	15%	14%	17%	8%	0%	100%	0%	13%	14%

Online (own research)	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	9%	7	0%	13%	9%	14%	0%	0%	0%	0%	11%	12%
2	17%	13	21%	15%	15%	14%	20%	0%	0%	100%	11%	16%
3	29%	22	29%	28%	33%	0%	27%	0%	0%	0%	11%	34%
4	29%	22	25%	30%	30%	29%	20%	0%	0%	0%	44%	30%
5	17%	13	25%	13%	13%	43%	33%	100%	100%	0%	22%	8%

Webinars	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	54%	40	54%	54%	55%	67%	54%	0%	100%	0%	38%	58%
2	19%	14	17%	20%	17%	17%	23%	0%	0%	100%	0%	20%
3	19%	14	25%	16%	18%	17%	15%	100%	0%	0%	50%	14%
4	5%	4	4%	6%	6%	0%	8%	0%	0%	0%	13%	4%
5	3%	2	0%	4%	3%	0%	0%	0%	0%	0%	0%	4%

Videos and podcasts	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
1	34%	26	26%	37%	31%	71%	21%	0%	0%	100%	33%	37%
2	30%	23	43%	24%	33%	0%	43%	0%	0%	0%	44%	25%
3	21%	16	22%	20%	18%	29%	29%	100%	100%	0%	22%	16%
4	8%	6	9%	7%	9%	0%	0%	0%	0%	0%	0%	12%
5	8%	6	0%	11%	9%	0%	7%	0%	0%	0%	0%	10%

Q40. Do you think that a new extension program or approach for potato producers is needed?

Answer Choices	Overall		Grow seed potatoes		Potato Crop		State					
	Percent	Count	Yes	No	Processor	Fresh	Vic	NSW	Qld	WA	SA	TAS
Yes	33%	26	38%	31%	29%	57%	40%	100%	100%	100%	33%	27%
No	18%	14	21%	16%	20%	0%	20%	0%	0%	0%	0%	21%
Unsure	49%	39	42%	53%	51%	43%	40%	0%	0%	0%	67%	52%
Comments (optional)		6										
	Answered	**79**										

Q41. If yes, what could industry be doing better with extension? **Qualitative**

Appendix 3 MERI framework

The monitoring evaluation and reporting process is imbedded in the project as part of the continuous improvement cycle undertaken by the project team. This is guided by the overarching program logic. The MERI framework is outlined below. This aligns the evaluation level and question with the associated sub-questions, monitoring data, and evaluation and reporting requirements. Annual evaluations will inform work planning.

LEVEL	OUTCOME / ACTIVITY	KEY EVALUATION QUESTION	MONITORING	EVALUATION AND REPORTING
Long-term outcomes (3-10 years)	▪ Increased capacity of service providers and producers to plan, manage risk and make decisions ▪ Improved production (quality and yield) ▪ High motivation and aspiration to collaborate and be the best ▪ Strengthened regional connections and relationships ▪ Rebuilt trust and increased collaboration between all industry participants	**Legacy and sustainability:** To what extent will the project have a lasting impact on the operating environment of the Australian potato industry? What, if any, lessons have been learned that could improve the success of future projects?	Type and extent of adoption of knowledge and skills, practices and technology contributing to increased production efficiency at the industry scale (demonstrated production efficiency) Surveys (annual and after training sessions, discussion groups, field days, workshops and other events)	Final project report and collation of monitoring and evaluation data Based on three project outcomes (1-3 years)
Project outcomes (1-3 years)	1. Improved industry awareness, knowledge and collaboration thorugh delivery of 'on ground' development activities including: ▪ Better seed handling ▪ 'Growing Right' ▪ Growing Industry Leaders	**Impact:** What has changed or is different as a result of the potato industry development program, either positive or negative? e.g. extent of change to knowledge, skills, attitudes, management practices, technology adoption, industry cohesion or businesses/organisations (operational or economic)	Change in awareness, knowledge, attitudes, capacity and decision making of growers Changes in advice given to growers and used Appropriateness and effectiveness of practices and technologies for potato production	Surveys (pre/post), interviews and/or case studies annually Assessment of decision making tools or processes used **Focus:** growers and advisors
	2. Increased adoption of potato research and changes to on-farm decision-making and practices		Use of risk based economic information and industry analysis Change in decision-making and management practices by growers (number of growers, total area of adopted farms) Adoption of technology and efficiencies (number of growers, total area of adopted farms)	Surveys (pre/post), interviews and/or case studies **Focus:** growers and advisors
	3. Increased opportunities for information exchange, networking and learning between growers and other industry members		Type and extent of two-way information exchange e.g. between growers and other stakeholders (number of learning opportunities) Participation in information exchange opportunities (number of growers/stakeholders attending discussion groups, workshops etc.) Changes in knowledge, skills and management practices as a result of peer learning and information exchange	Surveys (pre/post), interviews and/or case studies annually **Focus:** growers, advisors and other industry stakeholders
Activities (annual)	Develop or integrate online resource (website) providing information on R&D outcomes		Number and type of participants utilising the online resource	Website analytics Website material

LEVEL	OUTCOME / ACTIVITY	KEY EVALUATION QUESTION	MONITORING	EVALUATION AND REPORTING
	Develop content / updates for distribution though regional / sector channels	**Effectiveness:** To what extent were the planned industry development activities achieved?	Number and type of growers and stakeholders receiving information products Number and type of information products	Number of recipients Number of products Communication & engagement material
	Develop quarterly editions of the Potatoes Australia magazine		Number and type of communication updates	Number of updates Location of updates Communication & engagement material
	Facilitate learning from leading growers e.g. 'stories of success' and case studies		Number and type of 'stories of success' and/or case studies	Number of communications Location of communications Communication & engagement material
	Develop and deliver regional training packages		Number and type of participants engaged and undertaking training	Attendance records Location and type of training Training material
	Develop and deliver master classes and/or discussion groups		Number and type of participants in master classes and/or discussion groups	Attendance records Location of events Event material
	Manage ongoing regional demonstrations sites / focus farms on key topics		Number and type of events Number and type of event participants	Location of events Attendance records Event material
	Facilitate a community of practice to share ideas, lead change and provide feedback on the efficacy of the project e.g. Develop 'Advisors Network'		Number and type of participants contributing to 'community of practice'	Communication & engagement material Number of participants
Foundational activities/ inputs	▪ Develop an appropriate program logic and work plan ▪ Design an appropriate risk management plan ▪ Design an appropriate communication and consultation plan ▪ Conduct data gathering and analysis to identify and understand industry needs ▪ Identify target audiences for particular activities ▪ Collaborate with the Project Reference Group and Delivery Partners ▪ Undertake annual program evaluation	**Appropriateness:** To what extent did the activities and the way they were undertaken align with stakeholder needs and expectations? To what extent has the innovation being tested contributed useful information to address the objectives? Which innovation practices or technology employed did not contribute to / deliver on outcomes? And why? **Efficiency:** To what extent did the project achieve the desired result within budget and timeframes?	Completion of program logic and initial work plan Completion of risk management plan Completion of communication and consultation plan Completion of needs analysis Number and composition of relevant target groups identified Number of meetings with Project Reference Group (PRG) and Delivery Partners (DPs) and use of advice provided Type and extent of contribution from PRG and DPs Completion of annual evaluations and updated work plans	Program management reporting to project team, PRG, DPs and HIA Program design reporting to project team, PRG, DPs and HIA Baseline needs analysis desktop review Identification of target audience

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