

Scoping Phase 2 of the Processing Potato Research and Development (PPR and D) Program

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Pyksis Pty Ltd

Project Number: PT07037

PT07037

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Final Report

PT07037 - Scoping Phase 2 Processing Potato R&D Program

*Undertaken on Behalf of Horticulture
Australia Limited (HAL)*

Pyksis Pty Ltd (www.pyksis.com)

1 May 2009



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APRP2 SCOPING FINAL REPORT – MAY 2008

1. EXECUTIVE SUMMARY



Pyksis was engaged by Horticulture Australia Limited (HAL) to conduct a project to scope Phase Two of the Australian Potato Research Program (APRP), formerly known as the Processing Potato Research & Development project (PPR&D1). APRP2 is scheduled to run from June 2009 to June 2014.

The scoping project involved a review of relevant aspects of the global processed potato industry, including an independent market research report to identify priority research areas for the Australian Processed Potato Industry. The areas identified through that market research were, in order of priority, as follows:

- Disease Mitigation
- Farming Practices
- Reduced Input costs
- Climate Change
- New Cultivars

Under a tender process, open to Australian and International organisations, 60 proposed projects covering 28 potential research areas were submitted by respondent research and industry organisations. A round table meeting, aimed at promoting effective collaboration, was held with all tender respondents. From this process a total of 12 research project proposals, incorporating 25 sub-projects, were developed and submitted to the Processing Potato Industry Advisory Committee (PPIAC) for funding consideration. The proposals were initially reviewed by the PPIAC and the following projects have been short-listed for APRP2.

Subprogram	Project Number	Project Title
1. Soilborne Disease	PT09019	Tuber borne inoculum & seed potato health /storage
	PT09023	Diagnostic tests for soil-borne pathogens
	PT09029	Enhancing the understanding of Verticillium
	PT09031	Managing the nematode threat
2. Soil Health	PT09021	Compost injection to improve soil health
	PT09026	Soil Health/disease mitigation
	MT09040	Controlled traffic farming techniques
3. Insect Pests & Viruses	PT09004	Potato Psyllid control within an IPM strategy
	PT09022	Field management of TSWV
	PT09027	IPM to manage key potato insect pests
4. New Cultivars	PT09028	New cultivars



This proposed APRP2 Plan addresses the industry strategic plan, HAL principles of program governance and details recommendations for the management structure of APRP2. In addition, a process for the transfer of knowledge resulting from the proposed APRP2 plan was discussed, taking into consideration the current HAL Industry Development Needs Analysis Program (IDNA).

The suggested principles of governance and management have been summarised in Section 6 of this report, together with recommendations for roles and duty statements of staff who will be required to provide those services.

Importantly, the proposed governance and management structure (refer to Diagram 3 in Section 6) interrelates the knowledge transfer and communications needs of the IDNA, along with key responsibilities for their effective discharge. The structure proposed for APRP2 also avoids the potential for conflict of interest for the appointed CEO/Director; a situation that was a concern for APRP1.

From a financial viewpoint, the proposed programs have a budget of approximately \$24.9m, requiring a contribution from HAL of approximately \$6m. The PPIAC has reviewed the proposed Projects and requested revisions to a number of projects. As such, the final APRP2 Program value and individual projects will not be known until a full proposal is received and approved by the HAL Board.

Pyksis is recommending that HAL manages the APRP2 in a manner that enables it to leverage its contribution through a research institution that can attract a thirty percent (30%) uplift through the Research Infrastructure Block Grant scheme (RIBG), as was the case for APRP1. This will allow a further amount of approximately \$1.8m over five years to be attracted to the project. With the corporate and management structure as recommended in Diagram 3, however, the potential for conflict of interest can be avoided, while obtaining the benefits of the RIBG.

2. INTRODUCTION

In Australia the Potato Industry is the largest vegetable crop with a gross value of \$480 million (2004), approximately 1.31 million tonnes, of which processing potatoes represented approximately 56% of production. The Processed Potato Industry is divided into frozen and crisping potato segments, with two major multinational processing companies in each segment.

The Australian Processing Potato Industry is perceived as providing high quality, safe, green and clean product from local sources. With a longer growing season than the northern hemisphere, the industry has the capability to reliably supply processing companies in most non-drought years.

However, the industry is hampered by the rising costs of production inputs, scarcity of land and water, and competition from other crops. Further difficulties include increasing prices of supply chain inputs, fewer growers, low prices for end products, competition from low cost imports (primarily French Fries from New Zealand and Europe), low sustainability and the impact of diseases.^{1,2}

¹ Australian Processing Potato Industry Strategic Plan 2006 -2011, 20 November 2006.



As part of its overall strategy to remain competitive in today's global market, the Australian potato industry (fresh and processed potato segments) developed the Australian Potato Research program (APRP) in association with HAL, to increase the long-term viability and sustainability of the industry.

The APRP first stage (APRP1) was established by the PPIAC with funding from industry R&D levies, matched by the Commonwealth Government and institutional contributions, to continue until June 2009. APRP1 is administered by management supplied by the Tasmanian Institute of Agriculture Research (TIAR).

The industry wishes to continue and strengthen the APRP concept beyond June 2009, through the establishment and conduct of the second stage development program (APRP2) from 2009 to 2014. The extended program will incorporate a broader scope, focusing on industry problems and opportunities to improve Australia's competitive position in the global market.

3. PROJECT BACKGROUND

During the course of this project a number of milestone reports have been submitted to HAL as follows;

- *'Interim Report'*: Pyksis Pty Ltd, dated March 2008.
- *'Update Report'*: Pyksis Pty Ltd, dated May 2008.
- *'Proposal for Management Organisation'*: Pyksis Pty Ltd, dated April 2009

This report should be read in conjunction with those previous reports, which provide an in-depth overview of the program, the Pyksis consultants, program methodology and reporting requirements.

It should be noted that the views and recommendations presented by Pyksis in this report are proposals for consideration by the PPIAC and should not be considered as final.

3.1. Achieving the Processed Potato Strategic Plan

When considering Australia's competitiveness, key issues for the industry identified via market research that may be addressed through research and development, included disease mitigation, new or improved varieties, reduced use of fertilizers and chemicals, sustainable water use, production and supply chain efficiencies, crop management, consumer health awareness and climate change.

As such, the key areas of focus for APRP2 in relation to the Processing Potato Strategic plan were as follows:

² *'Update Report'*: Pyksis, dated May 2008



Table 1 – Key Areas of Focus for APRP2

Strategic goal	Strategic Imperative
2. Improving industry competitiveness	2.1 Use R&D to build better businesses 2.2 Encourage a focus on Whole of Chain productivity Improvement 2.3 Enhance Environmental Sustainability 2.4 Improve our ability to respond to disease & pest threats
3. Improved industry communication and information systems	3.1 Build Collaboration within the supply chain 3.2 Deliver industry information requirements 3.3 Encourage the use of improved communication technologies

3.2. Project Objectives

The primary objectives of the scoping project were to:

- Identify current and future needs of the Processed Potato Industry.
- Identify priority research areas focused on sustainability and competitiveness.
- Identify how best to access national and international collaborative R&D projects and technologies.
- Prepare a project plan for APRP2 for approval and implementation.

3.3. Program Description

The key deliverables of this project were to develop an APRP2 program and project plan:

- **APRP2 Program** - A program that focuses on the needs of the Processed Potato Industry incorporating consideration of the industry strategic plan. To achieve this end, take into account the existing Australian strengths and areas of excellence in potato research and development, existing and potential international collaborations, as well as the successes and or gaps in the current APRP1 program and the effectiveness of knowledge transfer from APRP1.
- **APRP2 project plan** – This final report includes a review of the processed potato landscape and an APRP2 project plan incorporating R&D project proposals, budget estimates and timelines.

To achieve these deliverables an eight stage process was adopted by Pyksis as follows:

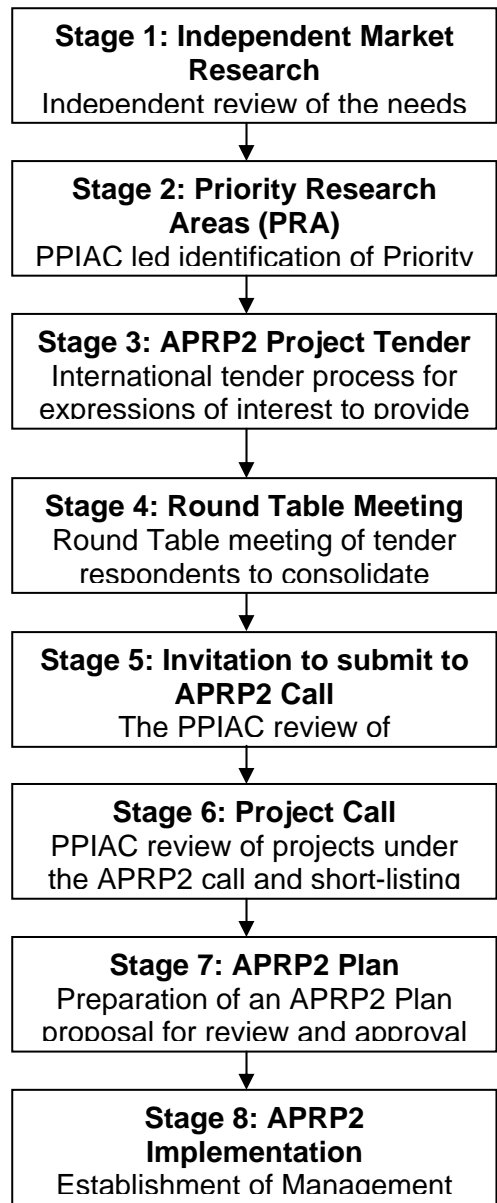


Diagram 1:
Scoping APRP2

3.3.1. Independent market research

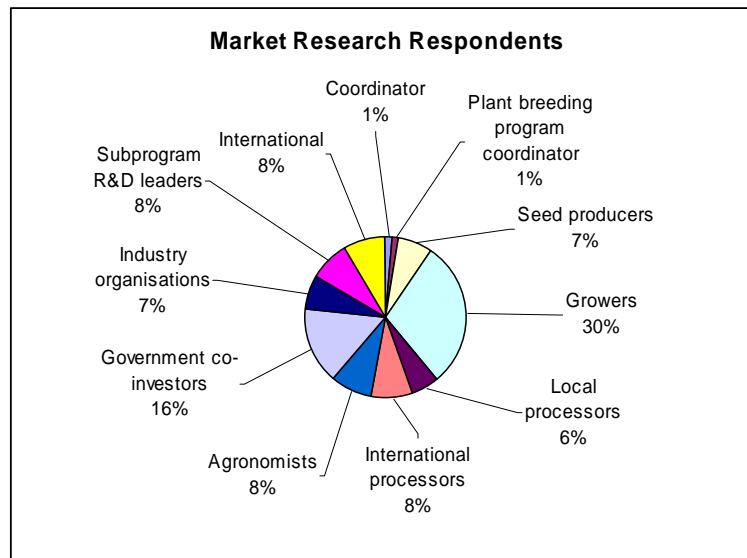
To establish the needs of the Australian Processed Potato industry, Pyksis engaged an independent market research organisation to conduct a stakeholder needs assessment. The primary goals of this project were to identify:

- Key local and international issues and trends impacting on the APRP1 and APRP2 programs
- The perceived relevance and effectiveness of APRP1 among target stakeholders
- Target stakeholders’ priorities and expectations of APRP2



The market research program involved consultation with 72 industry stakeholders from 11 stakeholder groups using focus group, face-to-face and telephone interview methods.

Diagram 2: Market Research Stakeholders



The market research brief was forwarded to the PPIAC and can be found in the Pyksis *'Update Report'*: Dated May 2008.

3.3.2. Australia's R&D capability

Australia's processed potato research strengths were reviewed on the basis of Australian and international researcher opinions, market research and a desktop review of research areas being addressed by international groups.

The key strengths of Australian processed potato research were:

- The collaborative nature of the research,
- Industry commitment to a long-term view on research,
- Soil health,
- DNA based disease diagnostics,
- The effectiveness of a consolidated and focused processed potato research program.

A key requirement for APRP2 was to promote and support the attraction and retention of potato researchers for the long-term benefit of the Australian potato industry.

Although the APRP1 program currently involves five Australian and two international Universities and/or government organisations, the market research indicated that the APRP2 program could incorporate a broader research and development group. This was achieved using the tendering process to include an additional eight Australian



organisations, University, government and private organisations and two International organisations being involved in the expressions of interest in APRP2.

Further in-depth analysis of Australia's R&D capacity can be found in the Pyksis *'Update Report'*, dated May 2008.

3.3.3. APRP1 Program Review

The APRP1 program has established a strong foundation for collaborative research and development within the Australian processed potato industry. Market research conducted with stakeholder groups identified:

- **Key successes:** of the program being advances in disease mitigation, specifically development of the DNA probes, increased collaboration and information sharing.
- **Key shortcomings:** of the program were lack of inclusivity, effectiveness of internal program management and communication, lack of effective extension communication and lack of tangible results with application for the levy payers - growers and processors.³

Given the focus of APRP1 in disease management and productivity and the time necessary for results to be achieved, any tangible successes arising within three and a half years of establishment of a new program would need to be seen as a credit to the APRP1 program and the people involved.

The lack of an effective extension program, notwithstanding the excellent efforts by some sub-group leaders, has been a major barrier to meeting the expectations of stakeholders.⁴

A number of lessons have been learned during the APRP1 program and are incorporated in the APRP2 plan. These include:

- Focusing on programs that address strategic industry needs.
- Expanding industry inclusivity.
- Establishing realistic expectations and outcomes for programs.
- Ensuring that programs remain focused.
- Reviewing and streamlining the existing management structure, procedures and processes.
- Expanding international collaborations.
- Ensuring effective communication and extension of applied technologies.

³ Research and Development is, by its nature, a long-term proposition. Although the DNA probes work is seen by many stakeholders to have been the key tangible outcome to date, it is too early to say that there will not be further successes from ongoing programs.

⁴ The program is still ongoing and as such many of the research programs have not reached a stage of having developed outcomes suitable for extension. This weakness has been acknowledged by HAL and is being addressed by the Industry Development Program (IDNP) being established by HAL which will form an integral part of the APRP2 program extension process.



- Establishing program metrics, accountability, routine critical review and mechanisms for change.
- Expanding the available funding sources.

3.3.4. Priority Research Areas

The primary goal of the APRP program is to focus on strategic and/or applied research programs that have the potential to increase the size of the Australian processed potato market and ensure the industry continues to be competitive. A number of Research Areas were identified during the market research.

- **Economic Sustainability:** The ability to remain cost competitive in a global market.
- **Environmental Sustainability:** The ability to maintain competitive production in an environmentally sustainable manner.
- **Industry Adoption:** Development of effective extension programs for research outcomes (PPR&D1 and APRP)
- **Industry Expertise:** Retention of potato industry expertise including next generation growers and researchers.
- **Market Growth:** Expansion of the market for Australian processed potato products into new export markets and innovative healthy product development and market awareness.

The research areas identified by the market research were reviewed using a gap analysis, incorporating consideration of the Processing Potato Strategic Plan, and PRA recommendations for the APRP2 program forwarded to the PPIAC. As a result of this process the PPIAC identified the following Priority Research Areas:

Table 2 – Key Research Areas of Focus for the APRP2

Industry Need	Research Goal	Potential APRP2 Research areas	Fit with the Strategic Plan
Economic Sustainability	Reduce Input Costs	Water use Fertilizer Energy (fuel) Mini-tubers production Soil conservation	2.1, 2.2, 2.3
	Disease Mitigation	Clean seeds Nematodes Chemical use Water use DNA Diagnostics	2.1, 2.3, 2.4
	New Cultivars	Drought resistance Potato Genetics Yield Potato Genome	1.2, 2.1, 2.3, 2.4, 3.1



Environmental Sustainability	Climate Change	Carbon footprint Transport Storage	2.1, 2.2, 2.3, 3.1, 3.2
Industry Need	Research Goal	Potential APRP2 Research areas	Fit with the Strategic Plan
Industry Adoption	Farming Practices	Irrigation Crop management New technologies Potato calculator	2.1, 2.2, 2.3, 2.4
	Extension	Communicate APRP1 & APRP2 results	2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3

Further in-depth analysis of the Priority Research Areas can be found in the Pyksis 'Update Report' dated May 2008.

4. APRP2 FINANCIAL SUMMARY

The following financial summary has prepared using information provided by HAL and/or best estimates from Pyksis and as such should only be used as a guide.

4.1. Sources of APRP2 Funds

As with the PPR&D1 program, HAL-matched levy funding, VC funds and government co-investment will be required to provide the base funding for the program.

Table 3: Source of APRP2 Funds

Source	5 Year Budget (\$'000)
HAL Levy funds ⁵	\$5,975
Research Infrastructure Block Grant (RIBG) ⁶	\$1,793
Estimated Total	\$7,768

In addition to these funds further cash funding is proposed under Voluntary Contributions (VCs) from interested organisations on a project-by-project basis. The research organisations involved in the APRP2 program also contribute significant in-kind support for the program.

4.1.1. Research Infrastructure Block Grant (RIBG)

The RIBG is a Commonwealth grant available to Higher Education Provider (HEP) organisations e.g. Universities, that provides uplift on external R&D funding from Organisations (including HAL) that are listed on the Australian competitive funding register. The current APRP1 process of contracting the University of Tasmania to

⁵ Based on AIP budget with estimate of \$1.2 million for 2013/2014 consistent with previous 3 years

⁶ Funding to be used for the management of the APRP2 including the engagement of a Management Organisation.



manage the program allowed the University to access an additional uplift of 30% on HAL funds received for the program, in arrears.

Based on the current budget, the RIBG grant would be expected to total approximately \$1.8 million over the five years of the APRP2 of approximately \$380,000 per year, annualised over 5 years.

Funds from the RIBG may be used by the HEP for the following purposes relevant to the APRP2:

“2.4.3 salaries of research support staff (including research assistants; accounting and administrative staff; and technicians) employed to provide general support activity in a given area (e.g. a research assistant providing support for a number of research projects but not a research assistant dedicated to a particular project);

2.4.4. provide for travel costs to allow participation in international consortia ⁷”

As such, it is recommended that an HEP be contracted by HAL to administer the APRP2 and that any additional funds from the RIBG be available to fund a Management Organisation (MO) for APRP2, contracted to the HEP, or employed by the HEP, as well as providing financial compensation for the costs incurred by the HEP from administration of APRP2.

4.2. Proposed APRP2 Budget

The total budget for the 12 projects as proposed for the APRP2 program was approximately \$24.9 million, as summarised below, and a detailed budget is provided in Appendix 1.

Table 4 – APRP2 Budget using Proposal as received under the HAL call

Funding Source	Total
Levy	\$9,295
VC	\$9,952
In-kind	\$5,645
Total	\$24,892

Following the March PPIAC meeting the Proposals were reviewed and a revised Levy budget was produced, reducing the anticipated Levy expenditure against projects to \$4.5 million. This budget is detailed in Appendix 2.

7

http://www.dest.gov.au/sectors/research_sector/programmes_funding/general_funding/research_infrastructure/research_infrastructure_block_grants_scheme.htm



4.3. Management Budget

The budget for the management of APRP2 is estimated to be up to \$350,000 per annum, as outlined in the following simplified budget, and is expected to be within the expected RIBG uplift from the receipt of HAL funds by the Management Organisation.

Table 5 – Annual APRP2 Management Budget estimate

Staff	Annual Expenditure
CEO / DIRECTOR	\$100,000
IDO *	\$75,000
Administrator *	\$35,000
Sub-total	\$210,000
Operating Expenses	
Travel	\$60,000
Office space	\$25,000
Communications	\$15,000
Annual Meeting	\$25,000
Contingency	\$15,000
Sub-total	\$140,000
Total	<u>\$350,000</u>
* Includes on-costs	

Depending on the MO identified, there may be opportunities to reduce the office and communications operating expenses by leveraging facilities provided the MO.

4.4. Additional sources of Funding

New Australian and international funding may be available for research around the key areas of sustainability, environment and international collaboration. During the course of the market research project, a range of potential additional funding sources for APRP2 were identified.

Table 5 – Potential Funding Sources

Country	Funding Body
Australia	Landcare, ACIAR, EWAL, Water Australia
USA	USDA
UK	BPC, DEFRA, RERAD, BBSRG
Canada	ACAFF, CAFI
NZ	C&FR, FRS



International opportunities for collaborative research would need to ensure that programs further the interests of the local potato industry in each country. Co-funding has already been leveraged under the APRP1 program and is also incorporated into a number of APRP2 research proposals.

The current Program Director is also investigating the potential to leverage significant funds under the Australian Cooperative Research Centre program (CRC).

5. APRP2 GOVERNANCE

In 2006 HAL conducted an industry development review process providing an approved set of principles governing all HAL programs.⁸ This APRP2 proposal has been prepared with consideration of these principles, as follows;

- alignment with the industry strategic plan and needs of stakeholders
- ability to apply specialist expertise
- contestability
- transparency and accountability
- requirements for management and administration by HAL and IAC, and
- opportunity for innovation and integration of services.

5.1. Principles of Levy Investment

When considering the investment of levy monies in the APRP2 program and the management of levy funded programs, the overarching principles that drive HAL levy investment have been taken into account.

1. Benefit must be returned back to the levy payers
2. HAL Board is the responsible party for all investment decisions made
3. Investments are ideally aligned with the strategic plan or the plan altered to accommodate these areas

Ultimate responsibility for the APRP program rests with the HAL Board and, as such, changes to the APRP program may require approval of the HAL Board. It should be noted that, to date, the HAL Board has supported all changes requested by the IAC and as such, would be expected to continue to view any future changes for the APRP program with an open mind.

5.2. APRP2 Evaluation

During the course of APRP1 annual reviews of the program were conducted by a number of independent groups focusing on the management and/or science/research aspects of the program. Although these reviews provided useful information about the progress of APRP1, identifying areas of success and shortcomings, many participants considered that there were too many reviews during the course of the program.

⁸ “Strategic Review of Industry Development Services in Horticulture“ (AH05017)



Pyksis proposes that annual reviews still be conducted by independent organisations at the end of each financial year on either the management **or** the science, alternating each year. Given the long-term nature of research programs there would be more value, in the opinion of Pyksis, in conducting a science review in years 2 and 4, when the programs have been able to progress and in years 1, 3 and 5 for the management aspects of APRP2.

Table 6: Proposed APRP2 Reviews

	09/10	10/11	11/12	12/13	13/14
Management	X		X		X
Science		X		X	

5.3. APRP2 Sub-Program reporting

As with the APRP1, Pyksis proposes that a quarterly update report be prepared for each sub-program and circulated to HAL, the PPIAC, and the Research Organisations following the review by the MO. Update reports should incorporate a discussion of the progress of each sub-program against milestones and budget to enable management decisions to be made in a timely manner.

The structure of the reporting process should be defined once both the MO has been engaged and the final sub-programs approved by HAL.

6. APRP2 MANAGEMENT

The following suggestions have arisen from the participation of Pyksis in reviewing the current APRP1 program for the processed potato industry and drafting the strategy for the superseding APRP2 program (as detailed in previous reports^{2, 9}).

These suggestions set out what Pyksis believes will assist in instituting improvements for program management and governance.

6.1. Management Structure

The suggested new structure is analogous to a corporate structure where:

- HAL fills the role of shareholder (and overall manager)
- PPIAC fills the role of the Board, including Chair
- Program Director fills the role of the CEO
- Researchers fill the role of the production units

This arrangement will require certain adjustments in the way the PPIAC sees itself and its role, but should provide the benefits of clarification and streamlining in its operation.

⁹ 'Proposal for Management Organisation': Pyksis Pty Ltd, Dated April 2009



6.2. Status Quo

The existing practice of providing the APRP management via an external Management Organisation (MO) is considered to be beneficial to the APRP2. As with the existing APRP1 program, it is recommended that the MO be a Higher Education Provider (HEP) organisation that is able to claim the Research Infrastructure Block Grants (RIBG) to leverage the \$0.30 uplift on HAL Levy funds to pay, *inter alia*, for the APRP2 management.

Consistent with the current APRP1 arrangements, Pyksis suggests:

- Consistent with HAL preferences, one Head Agreement to be established between HAL and the selected MO. All HAL funds to be paid directly to the MO, in a similar manner to the existing arrangements under APRP1, against completed milestones.
- The MO to be responsible for the subcontracting of all Research Organisations (RO) which provide HAL-approved research sub-group programs and to be responsible for approvals to pay all program costs
- HAL to contract all APRP2 management and staff, through a back-to-back agreement with the MO, where the MO provides the agreed funding through HAL.
- Research sub-group leaders report to their RO.
- The APRP2 Director reports directly to HAL.
- The APRP2 management staff, contracted by HAL, report directly to the APRP2 CEO / Director.

6.3. APRP2 Management

The management of the APRP2 program must be independent of the MO as actual or perceived conflicts have been raised as an issue for the current APRP1 program where the MO has also acted as an RO. Recommended changes for the APRP2 staffing arrangements are as follows;

- The CEO / Director role should be filled by an individual capable of championing the APRP2 program and with sufficient experience and seniority to provide strategic direction and strong management for the APRP2.
- The CEO / Director role is expected to be part-time, although consideration may be given to a full time role during the start of the APRP2. It is considered that 50% of the CEO / Director's time will be spent on Strategic / funding activities and 50% on operations.
- To achieve independence of the APRP2 management, the CEO / Director appointment must be made by HAL and the position must report directly to HAL.
- The CEO / Director should set role descriptions for APRP2 management staff
- APRP2 management staff should be appointed by the CEO / Director and report directly to the CEO / Director.
- The CEO / Director should provide the main link between HAL / PPIAC and the MO and ROs and be responsible for dispute resolution.



- The CEO / Director should conduct research sub-group reviews and implement appropriate Key Performance Indicators (KPI) to manage the progress of the sub-group programs and to provide effective reporting to HAL and the PPIAC.

6.4. Research Organisations

As with the APRP, the ROs should continue to remain responsible for ensuring that the MO contractual obligations to HAL for the sub-group programs are achieved.

A number of additional changes are recommended to ensure that this is achieved for the APRP2:

- Sub-group Program Leaders (SGPLs) must be made accountable for meeting the contractual obligations to HAL.
- SGPLs should have a reporting obligation to the CEO / Director on a regular basis, in relation to the HAL obligations, in addition to reporting to the RO.
- Consistent APRP2 Role Descriptions should be established for the SGPLs to ensure roles are understood
- All SGPLs should establish performance KPIs including and incorporating fiscal reporting and responsibility.
- All sub-group programs should include research milestones including go/no-go milestone reviews to provide a means for the CEO / Director and PPIAC to review project funding against milestone progress.
- Proposals for project variations should be submitted to the CEO / Director for review and proposal to the PPIAC for recommendation to HAL.

6.5. Advisory Oversight

A number of oversight committees were established under the APRP1 Program including the Program Advisory Committee (AC), comprising RO representatives and APRP management, and the Technical Operations Committee (TOC), comprising SGPLs and APRP management. It is recommended the role of committees be revised under APRP2;

A: Technical Operations Committee

- TOC to remain a regular, quarterly, progress meeting between all the SGPLs, the APRP2 management (CEO / Director, IDO) and a member(s) of the PPIAC.
- Organisation of the TOC to be conducted and managed by the APRP2 management staff (Agendas, minutes and facilities) and facilitated by the CEO / Director.
- Agendas and minutes of meetings to be circulated to SGPLs, Advisory Committee members and PPIAC members for review and comment.
- Advisory Committee and PPIAC members may request agenda items via the Director



B: Advisory Committee

- The AC should remain, consisting of the RO representatives, CEO / Director and a PPIAC member(s), as a forum to resolve issues that cannot otherwise be settled by the TOC.
- Technical Meetings convened only when called by Director and should not be considered regular meetings.
- AC representatives are welcome to attend any TOC meeting as an observer.

6.6. Operations

A number of operational recommendations are being proposed to improve the overall management of the APRP2 and to streamline processes within the APRP2.

A: APRP2 Communication and Extension

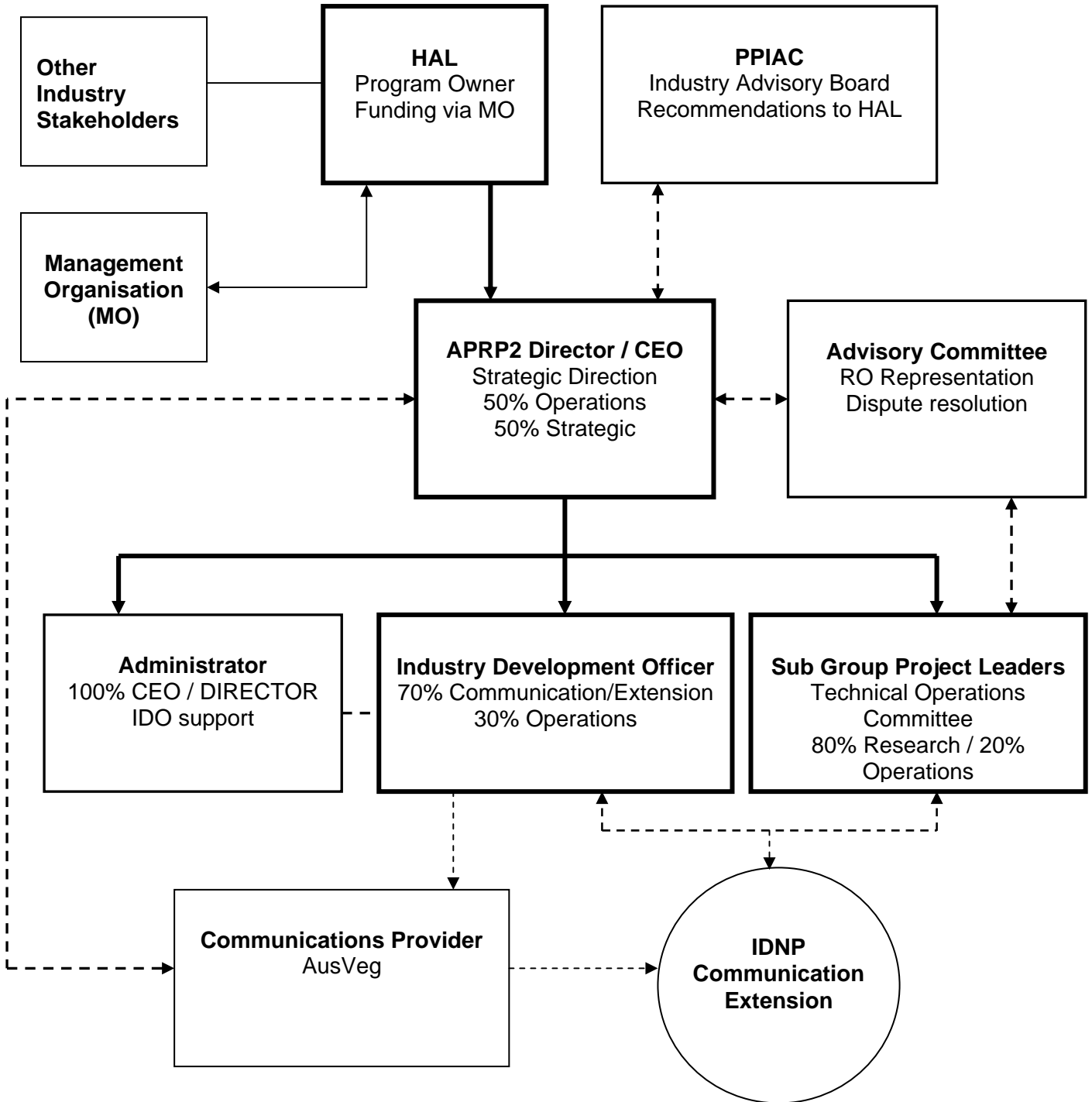
- An integrated Industry extension and communication program must be established in association with APRP2 to promote good uptake of research outcomes by the levy payers and the industry. It is recognised that HAL has established an Industry Needs Development Program to achieve this end.
- A full time Industry Development Officer (IDO) position should be established, reporting to the CEO / Director, with a focus on:
 - Industry extension / communication activities involving the SGPLs and the Communications Provider (AusVeg) (70%)
 - Operational support for the CEO / Director (30%)
- An annual APRP2 researcher conference should be established to allow researchers from all sub groups to meet and discuss projects and potential collaborations. It may be useful to make this conference open to international attendees to increase the visibility of the APRP2 and to identify additional collaboration opportunities.

B: APRP2 Processes

- Standardise and simplify processes across the APRP2 organisations, standard processes/templates should be established and used by the management staff, SGPLs, MO, RO and CP e.g. RO contracts, international R&D contracts, IP management, CDA, MTA, R&D program variations etc.
- It is expected that some of these documents and processes exist within HAL processes/templates and may be used. However, the CEO / DIRECTOR should review the current systems and templates, develop new processes where appropriate and establish a procedures manual for the Program.



Diagram 3: Proposed APRP2 Program Structure





6.7. APRP2 Stakeholders

For these recommendations to be achieved it is important to identify the APRP2 stakeholders and to understand their roles within the program. The following table summarises the APRP2 stakeholders.

APRP2 Key Stakeholders

Stakeholder	Role
Processing potato Growers and Processors	<ul style="list-style-type: none"> Levy payers Beneficiaries of outcomes from the research and development conducted under APRP2, via extension and communication activities.
Horticulture Australia Limited (HAL)	<ul style="list-style-type: none"> Program Owner with overall management responsibility Levy and matching funding contributor Appoints & manages APRP2 Director / CEO / DIRECTOR APRP2 Director / CEO / DIRECTOR reports to HAL
Management Organisation (MO)	<ul style="list-style-type: none"> A Higher Education Provider able to receive Federal RIB Grant funding. Contracted by HAL to provide research and development services to the Processing Potato levy payers. Recipient of all HAL funds, levy and Commonwealth matched funding. Sub-contracts RO's to provide HAL and PPIAC approved research sub group programs. Sub-contracts APRP2 Management staff (dependent on model adopted) Fiscal responsibility for the APRP2 management costs including contractors, staff, offices, travel and other expenses.
PPIAC	<ul style="list-style-type: none"> Strategic industry advisory role Regular meetings with HAL and APRP2 Management APRP2 recommendations to HAL
CEO / DIRECTOR	<ul style="list-style-type: none"> Program manager / Champion role - Experienced commercial business manager - Strategic and operations responsibilities Management responsibilities - APRP2 recommendations to HAL / PPIAC - Fiscal - IDO - Administrator - Research SGPLs monitoring Regular Technical Group meetings involving - SGPLs, IDO and ROs that wish to attend



Stakeholder	Role
Industry Development Officer (IDO)	<ul style="list-style-type: none"> • Reports to CEO / DIRECTOR • Commercial communications / extension experience • Day to day management of the IDNP program • Communication role linking research and extension - Research leaders - Industry - Communications Provider (CP) - Development / implementation / management of effective extension and communications programs with CP and SGPLs • Operations role - Supporting the CEO / DIRECTOR in day to day management - Developing effective CP activities
Administrator	<ul style="list-style-type: none"> • Reports to CEO / DIRECTOR • Administrative support to CEO / DIRECTOR and IDO - Organisation of regular meetings - Meeting agenda, papers and minutes - Day to day secretarial support for CEO / DIRECTOR - Support IDO extension activities - Support CP in provision of significant meetings
Sub-Group Project Leaders (SGPLs)	<ul style="list-style-type: none"> • Project Research leaders • Dual reporting - Employed by and report to RO - APRP2 CEO / DIRECTOR for contractual obligations to HAL • Research project management 80% - Contractual and fiscal obligations to HAL - Day to day management of research programs • Extension / communication 20% - Develop and implement programs with IDO - Support communications activities via CP
Advisory Committee (AC)	<ul style="list-style-type: none"> • Research Organisation (RO) representatives • Appointed by ROs • Role - Oversight in Technical Group meeting activities • Dispute resolution through CEO / DIRECTOR
Communications Provider (CP)	<ul style="list-style-type: none"> • Communications manager e.g. AusVeg • Responsible for implementation of APRP2 communications - Industry Publications e.g. Potatoes Australia - Creation of extension materials in collaboration with IDO - Website Management - Industry database management - Organisation of major functions • Works directly with and receives direction from - CEO / DIRECTOR - IDO



6.8. Role Descriptions for APRP2 Management

APRP2 is a large and complex program involving many stakeholders. In order for the APRP2 management to discharge their roles effectively, they will require role descriptions to ensure that responsibilities, reporting and the overall level of communications (both up and down the organisation “tree”) are clearly defined.

Role descriptions have been defined for the key APRP2 management groups and can be found in a previous report⁹;

- Appendix 2: CEO / DIRECTOR
- Appendix 3: IDO
- Appendix 4: Administrator
- Appendix 5: Sub-Group Leaders

It will also be important to establish terms of Reference for each of the Committees once the program has been established.

It would be preferable to allow the Director to be involved in the establishment of the Program i.e. enter into contract prior to initiating the Program, in the same way as a CEO / Director needs to take “ownership” of the Strategic Plan for an organisation, if he/she is to effectively implement it.

It is recommended that finalisation of the CEO / Director Role description and advertising the position be acted upon in the near future to ensure that sufficient time is available to identify an appropriate candidate.

7. INDUSTRY ADOPTION

An area of some concern amongst stakeholder groups when considering the APRP1 program was the issue of Industry Adoption.

There was reportedly some confusion between communication and extension activities. While industry extension must necessarily involve effective communications, it is not simply a case of communications solely. Effective industry extension enables content (in this case, results of development programs) to be transferred, understood and, importantly, adopted by the industry stakeholders.

Effective industry extension is a mix of “Know-how” and “Show-how” being communicated to each sub-set of the Stakeholder groups. And, following, these activities, for the sub-groups to effectively adopt the recommended procedures and products for their and the industry’s benefits.

In order for this to take place, the nature of the sub-groups that are targeted for extension needs to be understood. In this the “Agricultural Change Model” is an important guide.

The early adopters and the early followers will always be driven, by their internal imperatives, to adopt the latest technologies and practices where they recognise that they will confer benefits for their businesses.



However, for a wider adoption and for benefits to flow to the bulk of the industry, the barriers to adoption by the later followers need to be identified and understood and strategies to overcome these barriers developed and implemented.

Much can be gained through interaction with the extension activities of other agricultural and pastoral industries which also face similar difficulties in delivering industry extension to conservative constituents. Some of those effective strategies can be translated for use in the APRP program.

“Closer to home” the major potato processors are being increasingly effective in their industry extension activities through better understanding of the main drivers for their supply-chain companies and a combined use of “smart technology transfer” methodologies and incentives.

Some of the tactics that have been used effectively included:

- Word of mouth
- Targeted publications (magazines, journals and newsletters)
- Electronic and print communications
- Field days
- Use of recognised industry experts

One of the key points of understanding that influences the industry extension is the “personality make-up” of the target sub-groups. In this, Myers Briggs Type Indicators (MBTIs), or similar psychometrics, are very useful as building blocks.

A key participant in ensuring the effectiveness of this process is the proposed Industry Development Officer (IDO), whose suggested job description is summarised in Appendix 3 of Attachment 3.

As can be seen from Diagram 3, the IDO coordinates both industry extension and communications activities to maximise the effectiveness of the extension strategy.

In the opinion of Pyksis, the IDO will need to work closely within the support structure as portrayed in Diagram 3, while spending a good deal of time in the field in conducting effective extension processes.

More detailed information on the IDNA and recommendations that have arisen from the study by Pyksis are presented in a separate report which will be tabled in May, 2009.

Pyksis Pty Ltd **May 2009**

Attachments:

Attachment 1 – ‘*Interim Report*’: Pyksis Pty Ltd, dated March 2008

Attachment 2 – ‘*Update Report*’: Pyksis Pty Ltd, dated May 2008

Attachment 3 - ‘*Proposal for Management Organisation*’: Pyksis Pty Ltd, dated April, 2009



Appendix 1: ARP2 Program Budget Proposals as received under the HAL Call

APRP2 Program Budget

APRP2 Budget summary using Proposals as received under the HAL Call

HAL Levy funding under APRP2 proposals	09/10	10/11	11/12	12/13	13/14	5 Year Total
MT09040 Controlled traffic farming techniques	112	52	46	48	105	363
PT09004 Control of Potato Psyllid within an IPM strategy Tuber borne inoculum & seed potato health /storage	0	0	0	0	0	0
PT09019 /storage	228	165	182	69	63	707
PT09021 Compost injection to improve soil health	38	22	0	0	0	60
PT09022 Field management of TSWV	10	0	0	0	0	10
PT09023 Diagnostic tests for soilborne pathogens	0	0	0	258	385	643
PT09026 Soil Health/disease mitigation program	2,837	0	0	0	709	3,546
PT09027 IPM Strategies	97	86	97	86	207	573
PT09028 New Cultivars	246	392	404	416	445	1,903
PT09029 Enhancing the understanding of Verticillium	30	60	90	0	0	180
PT09031 Managing the nematode threat	146	452	712	0	0	1,310
Total HAL Levy Funds proposed	3,744	1,229	1,531	877	1,914	9,295
VC Funding under APRP2 proposals						
MT09040 Controlled traffic farming techniques	64	39	38	27	63	231
PT09004 Control of Potato Psyllid within an IPM strategy	153	154	81	77	0	465
PT09021 Compost injection to improve soil health	10	5	0	0	0	15
PT09023 Diagnostic tests for soilborne pathogens	618	822	980	468	0	2,888
PT09026 Soil Health/disease mitigation program	2,984	0	0	0	747	3,731
PT09028 New Cultivars	0	604	620	638	672	2,534
PT09031 Managing the nematode threat	44	44	0	0	0	88
Total VC Funds	3,873	1,668	1,719	1,210	1,482	9,952
Total proposed funds under HAL management	7,617	2,897	3,250	2,087	3,396	19,247
In-kind funds under APRP2 proposals						
SARDI						2,538
VICDPI						547
TIAR						2,289
QLDDPIF						107
DAFWA						164
Total In-kind funds						5,645
Total APRP2 Program under research proposals						24,892
HAL APRP2 Levy budget	1,433	1,261	1,145	1,220	916	
<i>Levy Fund Surplus / deficit</i>	<i>-2,311</i>	<i>32</i>	<i>-386</i>	<i>343</i>	<i>-998</i>	<i>-3,320</i>

Appendix 2: Initial ARP2 Program Budget following PPIAC review

APRP2 Program Budget

APRP2 Budget summary following initial PPIAC review

PPIAC Recommended APRP2 funding		09/10	10/11	11/12	12/13	13/14	PPIAC 5 Year Total	Proposal 5 Year Total	Difference
MT09040	Controlled traffic farming techniques	100	20	0	60	20	200	363	-163
PT09004 *	Control of Potato Psyllid within an IPM strategy	0	0	0	0	0	0	0	0
PT09019	Tuber borne inoculum & seed potato health /storage	140	100	52	85	23	400	707	-307
PT09021 *	Compost injection to improve soil health	0	0	0	0	0	0	60	-60
PT09022	Field management of TSWV	10	0	0	0	0	10	10	0
PT09023 *	Diagnostic tests for soilborne pathogens	0	0	0	307	336	643	643	0
PT09026 *	Soil Health/disease mitigation program	546	442	323	617	387	2,315	3,546	-1,231
PT09027	IPM Strategies	0	40	20	60	40	160	573	-413
PT09028 *	New Cultivars	0	0	0	0	0	0	1,903	-1,903
PT09029	Enhancing the understanding of Verticillium	30	40	20	0	0	90	180	-90
PT09031	Managing the nematode threat	73	226	356	0	0	655	1,310	-655
Total HAL Levy Funds proposed		\$899	\$868	\$771	\$1,129	\$806	\$4,473	\$9,295	-\$4,822
HAL APRP2 Levy budget		1,433	1,261	1,145	1,220	916			
Budgeted Levy Fund Surplus / deficit		\$534	\$393	\$374	\$91	\$110	\$1,502		

* Incorporates PPIAC recommended VC funded project / sub-projects

Appendix 3: APRP2 Sub-Programs

SUBPROGRAM 1 – SOILBORNE DISEASE			
PT09019	<p>Title</p> <p>The importance of tuber borne inoculum on the health of seed potatoes and on the storability of processing potatoes</p>	<p>Description</p> <p>This project will determine the influence of varying levels of tuber borne DNA, of a select range of pathogens. The data gathered by this program will be used to investigate the opportunity of using DNA diagnostics as tools in the Seed Potato Certification Scheme and to investigate whether DNA diagnostics can be used in order to provide a measure of the suitability of commercial crops for long term storage</p> <p>Outcomes</p> <ul style="list-style-type: none"> • More efficient method for measuring seed disease loading and risk associated with planting a seed line in a paddock of known soil disease loading. • Improved seed certification system and more accurate measure of seed quality • Reduced losses from storage pathogens • Improved tuber storage management based on determined levels of pathogen. • Longer storage life of tubers • Higher quality potatoes 	Part Funding
PT09023	<p>Title</p> <p>Diagnostic tests for soilborne pathogens</p>	<p>Description</p> <p>The objective of this work is to build on previous research on diagnostic tools and to determine if tests to quantify pathogens in soil are useful risk management tools for growers. This project will be undertaken in Australia but will integrate with programs being undertaken in the United Kingdom, New Zealand and South Africa.</p> <p>Outcomes</p> <ul style="list-style-type: none"> • Delivery of DNA tests for soil-borne pathogens to potato growers to make informed decisions about paddock selection • Delivery of information on key factors driving development of soil borne disease to potato growers 	Full funding for last two years

PT09029	<p>Title</p> <p>Enhancing the understanding of <i>Verticillium</i> spp. in Australian potato production</p>	<p>Description</p> <p>Potato early dying (PED) syndrome is caused by the fungus <i>Verticillium</i> in some cases, in synergy with a root lesion nematode. The disease has been increasing in significance in Australia over the past 10 years and has the potential to be one of the industries worst soilborne disease problems (with yield losses of 50%)</p> <p>Outcomes</p> <ul style="list-style-type: none"> ● Increased understanding of the biology of <i>Verticillium</i> spp. in Australia ● Identification of potato cultivars that have high resistance to PED ● Development of disease management options for PED in Australia leading to reduced disease incidence and improved yields ● Avoid the reliance on broad-spectrum soil fumigants to manage PED in Australia 	Part Funding
PT09031	<p>Title</p> <p>Managing the nematode threat</p>	<p>Description</p> <p>Root knot nematode (<i>Meloidogyne</i> spp.) has been estimated to cause losses of \$12M annually (Stirling et al. 1992) and in recent years has been the predominant cause of rejection of seed crops from certification in some States (i.e. Tasmania). Chemical options for control of nematodes in vegetable crops are becoming limited so nematode control is likely to become more reliant on management strategies which minimise chemical control.</p> <p>Outcomes</p> <ul style="list-style-type: none"> ● Improved yield and quality of potato and more consistent crop performance. ● Reduced reliance on chemical control methods. ● Better security for the potato industry in the face of reduced availability of chemical options for control of nematodes. ● Development of more sustainable methods of managing nematodes. ● Increased awareness of nematodes and non chemical options for management. ● Provision of options for nematode control for growers with soils exhibiting enhanced biodegradation to fumigants and nematicides. ● Improved diagnostic services for management of root knot nematode. ● Development of improved pre-plant tests for root knot nematodes. 	Part Funding

		<ul style="list-style-type: none"> • Increased nematological training for the industry. • Development of more sustainable and profitable potato production practices 	
SUBPROGRAM 2 – SOIL HEALTH			
PT09021	Title Compost injection to improve soil health	Description A one year scoping project to evaluate the use of strategic compost placement, using innovative compost injection equipment to deliver good quality compost into the potato root zone, suppress soilborne disease, minimise the rate of compost needed and improve soil and plant health, potato quality and yield. Outcomes <ul style="list-style-type: none"> • A decision as to whether further work on compost incorporation for disease suppression. • Provide growers access to information on the impact of compost on soil health and potato production and to use this information to manage soil borne disease with reduced fungicides • Feedback to the composting industry will provide a realistic perspective of the value of their product and indicate if further product development is needed 	Full VC Funding
PT09026	Title Soil Health/disease mitigation program	Description This program is an integrated research strategy targeting soil health and disease mitigation for potatoes aimed to understanding the relationships between soil-factors (physical, chemical and biological) that influence pathogen populations, disease incidence and severity and develop integrated disease control strategies based on this knowledge Outcomes <ul style="list-style-type: none"> • Reduction in the incidence and severity of the major soilborne diseases of potato in Australia • Qualitative benchmarking system for soil health that will enhance production (yield and quality) and sustainable soil health management • Effective use of rotational crops (green manures, biofumigation and pasture species) to manage soilborne diseases of potato and improve yield. • Soil nutrient thresholds to reduce incidence and severity of common scab and powdery scab • Increased understanding of the influences of soil moisture etc on disease development of 	

	<p>common scab and powdery scab leading to an integrated disease management strategy</p> <ul style="list-style-type: none"> • Capture diagnostic capabilities for bacterial wilt developed overseas to monitor irrigation water and reduce the spread and occurrence of bacterial wilt in Australia • Sustainable production via understanding and management of “healthy” soils, • Identification of novel disease management strategies • Facilitation of the next generation of researchers 	
	<p>Sub Project 1a - Microbial soil health The discovery of potato endophytes and their potential for disease suppression in Australian potato production</p>	Part Funding
	<p>Sub Project 2b - Soil amendments/ameliorants for soil health The effective management of green manure, biofumigation and pasture crops to improve potato yield and quality</p>	Review for potential Levy and or VC funding
	<p>Sub Project 2c - Soil amendments/ameliorants for soil health Evaluation of foliar application of sub-lethal concentrations of 2,4-D (and other auxins) as a potential management option for common scab of potato</p>	Part Funding
	<p>Sub Project 3a - Soil health management Understanding the interaction of irrigation management with other soil properties (physical, chemical and biological) on powdery and common scab</p>	Review for potential Levy and or VC funding
	<p>Sub Project 3b - Soil health management Determine the significance of the potato root infection caused by <i>Spongospora subterranea</i> on potato yields</p>	Review for potential Levy and or VC funding
	<p>Sub Project 3c - Soil health management Development of a soil health evaluation system for Australian potato production to facilitate improvements in soil and plant health leading to improved production and quality</p>	Review for potential Levy and or VC funding

		<p>Sub Project 3 - Soil health management Monitoring the bacterial wilt pathogen (<i>Ralstonia solanacearum</i>) in irrigation water to identify effective catchment management strategies to control this disease of potato</p>	Full Funding
MT09040	<p>Title Development and demonstration of controlled traffic farming techniques for production of potatoes and other vegetables</p>	<p>Description Controlled traffic farming (CTF) keeps all paddock traffic in the same wheel tracks year after year, thereby separating compacted traffic zones from the soil used for growing crops. This offers many potential benefits, including reduced soil erosion, improved soil structure and soil organic matter, improved water use efficiency and crop productivity, reduced energy and fertiliser use and improved timeliness of cropping operations.</p> <p>Outcomes</p> <ul style="list-style-type: none"> • Increased interest and awareness, acceptance and recognition of the adoption of CTF in the industry • Adoption of CTF by growers and contractors. 	Part Funding
SUBPROGRAM 3 – INSECT PESTS AND VIRUSES			
PT09004	<p>Title Control of Potato Psyllid within an IPM strategy</p>	<p>Description Potato Psyllid is an insect pest that causes significant potato crop losses in the USA and New Zealand and for which there is no "soft" insecticide. In New Zealand, the occurrence of potato psyllid destroyed IPM in many crops where minimal insecticide use had been practiced. If potato psyllid reaches Australia and broad-spectrum insecticides are used against it then it will destroy the IPM control of other pests in Australia such as aphids and potato moth. This project proposes assessing in New Zealand the biological control potential of species from Australia to develop IPM strategy options prior to the pest arriving in Australia.</p> <p>Outcomes</p> <ul style="list-style-type: none"> • Strategy to deal with potato psyllid in Australian potato crops compatible with existing IPM. • Provide an option for growers other than insecticides. • Avoiding a foreseeable problem that would cause significant losses • Avoid increasing use of insecticide 	Full VC Funding

PT09022	Title Field management of TSWV in potato using push:pull systems (decoy cropping), and inoculum management	Description Tomato spotted wilt virus (TSWV) is a sporadic but devastating pathogen of potato for which there are no effective management control options. Regions worst affected by TSWV are typically irrigated crops surrounded by bare or drying vegetation. These green crops are “magnets” for migrating thrips carrying TSWV from dying source plants This project proposes a push:pull approach to disease control to effectively reduce disease through avoidance of virus-carrying thrips vectors. Deterrents (compounds that thrips dislike but that do not necessarily kill them) could also be applied to the potato crop to “push” thrips out adding efficacy. Such an approach has worked successfully in other cropping systems. Outcomes <ul style="list-style-type: none"> • A field management system for control of TSWV based on disease avoidance • Knowledge of major TSWV sources and potential to enhance management through inoculum reduction or avoidance 	Part Funding
PT09027	Title Delivering cost-effective and better targeted IPM to manage key insect pests of potatoes	Description Delivering cost-effective and better targeted IPM to manage Potato tuber moth (PTM) and the white-fringed weevil (WFW) Outcomes <ul style="list-style-type: none"> • Improved IPM of potato crops by decreasing the incidence of 'calendar' and 'insurance' sprays of broad-spectrum insecticides against PTM and WFW • Improved IPM of potato crops by increasing options for the use of softer insecticides (eg Bt and spinosad) against PTM and WFW. • Address current knowledge gaps in the role root volatiles play in host-plant finding by larval stages of the WFW 	Part Funding
SUBPROGRAM 4 – NEW CULTIVARS			
PT09028	Title New Cultivars	Description This project has a number of research areas under a common theme of potato pre-breeding physiology and genetics with five Sub-projects proposed.	

		<p>Outcomes</p> <ul style="list-style-type: none"> Improved screening techniques and parents will improve the breeding program's ability to produce cultivars that have the characteristics needed by the potato industry, including better drought tolerance and/or disease resistance 	
		<p>Sub Project 1 - Microbial soil health The identification of drought tolerant traits in potatoes and understanding the genetics behind these traits</p>	Further review required
		<p>Sub Project 2 - Soil amendments/ameliorants for soil health Genetic investigation of resistance to Common scab, TSWV and PCN</p>	Further review required
		<p>Sub Project 3 - Soil amendments/ameliorants for soil health Investigation of the genetics of extreme resistance to Common scab</p>	Further review required
		<p>Sub Project 4 - Soil health management Investigate the movement of TSWV within resistant and susceptible potato plants</p>	Further review required
		<p>Sub Project 5 - Soil health management Disease resistance screening for TSWV, PVY, Common scab and Powdery scab</p>	Further review required

Update Report

Scoping Phase 2 Processing Potato R&D Program

*Undertaken on Behalf of Horticulture
Australia Limited*

Pyksis Pty Ltd (www.pyksis.com)

May 2008



pyksis

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UPDATE REPORT – MAY 2008

1. EXECUTIVE SUMMARY



Pyksis has been engaged by Horticulture Australia Limited (HAL) to conduct a project to scope phase two of the Australian Potato Research Program (APRP2), formerly known as the Processing Potato Research & Development project (PPR&D2), from June 2009 – June 2014.

The project is scheduled to run through to October 2008 and incorporates an independent market research program, which has now been completed.

The APRP2 will address the industry strategic plan and priority research areas with research project proposals graded by priorities, budgets and timelines; plus recommendations for management structure and knowledge transfer required to achieve the plan. These latter aspects are to be conducted, taking into consideration the HAL Industry Development Needs Assessment Process, which is reproduced in this report as Appendix 1.

2. BACKGROUND

As part of its overall strategy to remain competitive in today's global market, the Australian potato industry (fresh and processed potato segments) developed the APRP in association with HAL to increase the long-term viability and sustainability of the industry.

The PPR&D1 was established by the Processing Potato Industry Advisory Committee (PPIAC) with funding from industry R&D levies, matched by the Commonwealth government and institutional contributions, to continue until June 2009. The program is administered by management supplied by the Tasmanian Institute of Agriculture Research (TIAR).

The industry wishes to continue and strengthen the APRP concept beyond June 2009, through establishment of the APRP2 from 2009 to 2014. The extended program will incorporate a broader scope, focusing on industry problems and opportunities to improve Australia's competitive position in the global market.

3. SCOPING PROGRAM

The first milestone of this project has been completed and a report has been submitted to Horticulture Australia;

- '*Interim Report*': Dated March 2008.

This report should be read in conjunction with the previous report, which provides an in-depth overview of the program, the Pyksis consultants, program methodology and reporting requirements.



3.1. Project Objectives

The primary objectives of the project are to:

- Identify current and future needs of the Processed Potato Industry.
- Identify priority research areas focused on sustainability and competitiveness.
- Identify how best to access national and international collaborative R&D projects and technologies.
- Prepare a project plan for the APRP2 for approval and implementation.

3.2. Activities Since Last Report

Key activities conducted since the last report include attendance at the March PPIAC meeting and the completion of an independent national and international market research survey of the Processed Potato Industry.

3.2.1. PPIAC meeting attendance

Pyksis attended the two-day PPIAC meeting held at Melbourne airport from March 19 – 20. An overview of the APRP2 project was presented to the PPIAC, market research interviews were conducted and a number of the PPIAC meeting sessions were attended including the sub-program research updates.

3.2.2. Independent market research report

To establish the needs of the Australian Processed Potato industry, Pyksis engaged an independent market research organisation to conduct a stakeholder needs assessment. The primary goals of this project were to identify:

- Key local and international issues and trends impacting on the PPR&D1 and APRP2 programs.
- The perceived relevance and effectiveness of PPR&D1 amongst target stakeholders.
- Target stakeholders' priorities and expectations of the APRP2.

4. INDEPENDENT MARKET RESEARCH REPORT

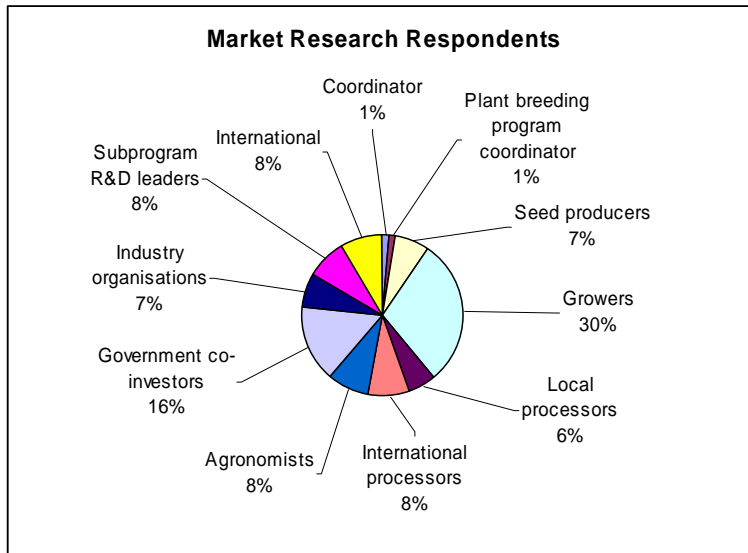
The results of the independent Market Research commissioned by Pyksis have been received and the detailed report can be found in Appendix 2 of this Update Report.

4.1. Respondents

Pyksis identified key stakeholders within the Processing Potato industry through industry consultation. A representative sample of 72 respondents was interviewed from 11 stakeholder groups within the processed potato industry, in Australia and internationally.



Diagram 1 – Market Research Respondents



4.2. PPR&D1 Program

The PPR&D1 program has focused primarily on disease management and, to a lesser extent, productivity. Stakeholder expectations of the PPR&D1 program were mixed; with researchers and government organisations being the closest to the programs and having the highest expectations.

A number of groups, specifically the seed producers, agronomists and processors had much lower expectations of the program, probably due to the low level of inclusion of some of these groups in the program. Levy funds are directed to the benefit of the levy payer and since these groups are not levy payers they were not included in the PPR&D1 program. However one of the successes of the PPR&D1 program is that there is now interest from these groups regarding involvement in PPR&D2.

For those stakeholders with the lowest expectations, the key program outcomes were the communication to industry of the PPR&D1-derived technologies, followed by adoption into farm practice and positive impact on the industry, in order of priorities.

The key successes of the program have included advances in disease mitigation, specifically development of the DNA probes, increased collaboration and information sharing. The key shortcomings of the program were lack of inclusivity, poor internal management and communication, lack of effective extension communication and lack of tangible results with application for growers and processors.

Research and development is, by its nature, a long-term proposition. The PPR&D1 program established a strong foundation for collaborative research and development within the Australian processed potato industry. Although the DNA probes work is seen

by many stakeholders to have been the key tangible outcome to date, it is too early to say that there will not be further successes from ongoing programs.



The lack of an effective extension program, notwithstanding the efforts by some sub-group leaders, has been a major barrier to meeting the expectations of stakeholders. It should be noted, however, that the program has only been running for four of its five scheduled years and, as such, many of the research programs have not reached the stage of having developed outcomes suitable for extension. In addition, the lack of an effective extension program, which is common to the commissioned work programs in general, has been acknowledged by HAL. It is being addressed through the Industry Development Needs Assessment (IDNA) initiative (refer to Appendix 1 for a summary of the suggested process). The IDNA process is being customised by HAL to form an integral part of the APRP2 program extension process.

Given the focus of PPR&D1 in disease management and productivity, any tangible successes arising within three and a half years of establishment of a new program must be seen as a credit to the program and the people involved.

4.2.1. Lessons Learned

A number of lessons have been learned from the PPR&D1 program and should be addressed in the APRP2. These include:

- Focusing on programs that address strategic industry needs.
- Expanding industry inclusivity.
- Establishing realistic expectations and outcomes for programs.
- Ensuring that programs remain focused.
- Reviewing and streamlining the existing management structure, procedures and processes.
- Expanding international collaborations.
- Ensuring effective communication and extension of applied technologies.
- Establishing program metrics, accountability, routine critical review and mechanisms for change.
- Expanding the available funding sources.

5. PRIORITY RESEARCH AREAS

The industry market research program has been used to identify the key Priority Research Areas (PRA) for the APRP2.

5.1. Factors Affecting the Australian Processing Potato Industry

The Australian Processing Potato Industry is perceived as providing high quality, safe, green and clean product from local sources. With a longer growing season than the northern hemisphere, the industry has the capability to reliably supply processing companies in most non-drought years.

However, the industry is hampered by the rising costs of production inputs, scarcity of land and water and competition from other crops. Further difficulties include increasing prices of supply chain inputs, fewer growers, low prices for end products, competition from low cost imports (primarily French Fries from New Zealand and Europe), low sustainability and the impact of diseases.



When considering Australia’s competitiveness, issues being faced by the industry that may be addressed through research and development, include disease mitigation, new or improved varieties, reduced use of fertilizers and chemicals, sustainable water use, production and supply chain efficiencies, crop management, consumer health awareness and climate change.

5.2. Proposed Priority Research Areas

The primary goal of the APRP program is to focus on strategic and/or applied research programs that have the potential to increase the size of the Australian processed potato market and ensure the industry continues to be competitive. A number of key PRAs were identified during the market research.

- **Economic Sustainability:** The ability to remain cost competitive in a global market.
- **Environmental Sustainability:** The ability to maintain competitive production in an environmentally sustainable manner.
- **Industry Adoption:** Development of effective extension programs for research outcomes (PPR&D1 and APRP)
- **Industry Expertise:** Retention of potato industry expertise including next generation growers and researchers.
- **Market Growth:** Expansion of the market for Australian processed potato products into new export markets and innovative healthy product development and market awareness.

5.3. Gap Analysis

A gap analysis comparison of the PPR&D program against the areas of research identified through market research has been prepared. A priority ranking, 1 being highest priority, has been assigned to each area based on responses from the market research and discussions with stakeholders and is outlined in Table 1 below.

Table 1 – Gap analysis PPR&D1 and APAR2

Industry Need	Research Goal	PPR&D1 Research areas	Potential APRP2 Research areas	Priority	Strategic Plan
Economic Sustainability	Reduce Input Costs		Water use Fertilizer Energy (fuel) Minitubers production Soil conservation	1	2.1, 2.2, 2.3
	Disease Mitigation	Powdery scab Common scab Rhizoctonia Nematodes Viruses (TSWV) DNA diagnostics Soil health Crop rotation Soil amendments	Clean seeds Nematodes Chemical use Water use DNA Diagnostics	1	2.1, 2.3, 2.4



Industry Need	Research Goal	PPR&D1 Research areas	Potential APRP2 Research areas	Priority	Strategic Plan
	New Cultivars	Breeding program Mutational disease resistance	Drought resistance Potato Genetics Yield Potato Genome	1	1.2, 2.1, 2.3, 2.4, 3.1
Environmental Sustainability	Climate Change		Carbon footprint Transport Storage	1	2.1, 2.2, 2.3, 3.1, 3.2
	Farming Practices	Soil amendments	Irrigation Crop management New technologies Potato calculator	1	2.1, 2.2, 2.3, 2.4
Industry Adoption	Extension		Communicate APAR & PPR&D1 results	1	2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3
Industry Expertise	Retention		Next generation growers Researchers	2	4.1, 4.2
Market Growth	Exports		Seed Varieties Farming practices	3	2.1, 2.2,
	Health		New products Health awareness	2	1.1, 1.2

6. APRP2 PROGRAM



The market research has shown that the expectations for the APRP2 program were similar to those for the PPR&D1 program, with researchers and growers having the highest expectations and agronomists, seed producers, industry organisations and processors having the lowest expectations.

The focus of the APRP2 program should encompass:

- completion of viable PPR&D1 programs
- extension of research knowledge through clear communication and development of practical tools for growers
- initiation of new programs that meet the key needs of the industry, including sustainability, efficiency and a strategic approach to leveraging international collaborations.



6.1. Sustainability

An overriding response from all respondents was the need for the processing potato industry to focus on both economic and environmental sustainability.

6.1.1. Economic Sustainability

Economic sustainability is essential to remaining competitive in the global market. The key areas of focus identified for the APRP2 program include:

- **Reduced Input Costs** – focusing primarily on research leading to ways of reducing water, fertiliser and energy (fuel) use, improved methods of minituber production and soil conservation to increase yields.
- **Disease Mitigation** – although a primary focus of the PPR&D1 program, disease plays a key role in the economic sustainability of the industry. Even though much research has been conducted already, there remains much more to be done before effective farm practice strategies can be achieved.
- **New cultivars** – the challenge is to gain better understanding of the underlying genetics and breeding of potato cultivars, which can be translated into the development of new cultivars with phenotypes that meet the characteristics of the processors, as well as meeting the sustainability needs of growers. Much of this research is conducted independently by processors and only research applicable to the whole industry should be considered for APRP2.

6.1.2. Environmental Sustainability

A focus on environmental sustainability is required to ensure production practices remain competitive in today's environmentally conscious marketplace. The key areas of focus identified for the APRP2 program include:

- **Climate Change** – is a key feature of today's global marketplace with governments, industry and consumers focusing on achieving sustainability in a changing environment. This is becoming more and more evident with consumers increasingly demanding 'green' products leading to companies such as major supermarket chains requesting carbon footprints from processors. The establishment of a carbon footprint for the processed potato industry would be expected to identify areas of inefficiency in the supply chain and where research may be used to improve grower production efficiencies as well as meet the demands being imposed on processors by their customers.
- **Farming Practices** – are powerful means of improving the sustainability of the industry and have a direct impact on the way growers manage their businesses competitively. Research into these areas and adoption of new technologies developed outside Australia e.g. the NZ developed Potato calculator, should be considered.



6.2. Industry Adoption

There is some confusion between communication and extension activities, which need to be considered as separate functions, within the PPR&D1 program. Communication activities should disseminate information about, facilitate communication within and raise awareness of the programs. Extension activities should focus on adoption of the outcomes of the research programs through transfer of practical knowledge to the levy payers.

The current focus of the PPR&D1 program is primarily on communication, with some limited extension activities. Communication under the APRP2 program should continue, with an additional need to focus on also establishing effective extension of research developed under the PPR&D1 and the APRP2 programs (refer also to Section 4.2).

6.2.1. Communication

Communication within the PPR&D1 program has focused on the Potatoes Australia magazine compiled by AusVeg, branding of the program and establishment of meetings between the participants in the PPR&D1 program. An annual conference has been proposed to increase the opportunities for expanded communication between the research groups and should be considered for the APRP2 program.

Communication is an essential aspect of the PPR&D1 program and should be continued into the APRP2 program.

6.2.2. Extension

Extension under the PPR&D1 program is considered by most stakeholders to be poorly established and a key limitation of the program. A number of reasons have been identified for this limitation, including:

- The research projects are not yet complete and, as such, there has been little opportunity for extension to occur.
- The original PPR&D1 program incorporated an extension sub-program. However, this program was never established.
- The role of extension was not clearly established within the program from the outset.
- Many researchers are not proficient at extension and presentations may be too scientific for the target audience e.g. growers.
- Some researchers do not consider extension part of their role in the program.

The process of extension is complex and requires the effective translation of strategic and applied research into practical outcomes that can be adopted by growers, agronomists and processors. A multi-pronged approach, typically utilising a variety of media, is required to ensure the information is provided to industry in formats that can be easily adopted by stakeholders.



The current extension methodologies being utilised under PPR&D1 are limited to the communications strategies outlined in Section 6.2.1 and some successful, but regional extension programs undertaken by a number of the sub-program leaders. Feedback received has identified that growers may respond to grower forums where knowledge sharing, best practice and practical information tools are available. In addition, stakeholder responses, when considering information sources to be used when identifying new technologies to implement, focused on:

- Word of mouth
- Publications (magazines, journals and newsletters)
- Industry sources
- Internet
- Field days
- Overseas travel

There are groups within the industry who already play a role in extension. However, these have not been fully engaged in the PPR&D1 program. This group includes the agronomists (private and processor), industry organisations and seed producers, all of whom should be included in an APRP2 extension program.

Extension has been identified by HAL as a weakness across a number of industry programs and as such HAL is establishing the IDNA process to address effective extension activities for each industry.

It is recommended that the outcomes of that program in the processed potato industry be evaluated as a basis for sub-program extension under the APRP2.

6.3. Industry Expertise

Any industry is only as good as the people who support it.

The processed potato industry is experiencing a reduction in the number of next generation growers and a limited supply of researchers, which over the long term, may cause significant problems for the ongoing viability of the industry.

Efforts should be made under the APRP2 to engage new researchers into the industry as well as providing opportunities for potato agronomists to support the extension programs.

6.4. Market Growth

An essential aspect of any vibrant industry is the need to maintain a strong growth in the market.

6.4.1. Health

Current health awareness amongst consumers is expected, by many respondents, to have a future impact on the consumption of French Fries and Crisps. Hence research into alternative products and or preparation methods may be applicable to APRP2.



Much of this research is conducted independently by processors and only research applicable to the whole industry should be considered for APRP2.

6.4.2. Export

Opportunities may exist to export Australia's clean seed, varieties and farming practices to countries establishing a processing potato industry, although consideration must be given, by so doing, that these actions have the potential to establish serious competition to the Australian industry.

6.5. APRP2 Management

Feedback was received from stakeholders regarding the existing management of the PPR&D1 program, raising areas to be addressed in the APRP2.

6.5.1. Management Structure

The existing management structure incorporates three independent Committees, PPIAC, Advisory (previously Steering) and Technical Operations, ensuring inclusion of all stakeholder groups and oversight for the program management.

The Co-ordinator role, funded and supported by TIAR, was originally a member of the Technical Operations Committee with a broad role of facilitating the effective flow of information between the stakeholder groups.

This role was to:

- provide a channel for external communication
- encourage collaboration between stakeholders and manage dispute resolution
- manage program reviews
- provide sub-program research oversight to ensure delivery against milestones
- support ongoing expansion and funding of the program both nationally and internationally
- provide an administrative function for program meetings.

The Davey and Maynard report (July 2007) identified an organic shift in the management structure with the Co-ordinator role becoming a central point of communication between all three Committees and a source of strategic guidance.

As a result, the demands on the role increased over and above a simpler administrative and reporting perspective, leading to an inability of the Co-ordinator to provide effective and timely communication between the groups.

This in turn has led to an inability to meet expectations and dissatisfaction with the administration and leadership of the program amongst various stakeholder groups. A range of issues, many of which were also raised in the Davey Maynard report, were raised again during the recent market research.

- Poor meeting planning and lack of timely reporting



- Duplication of effort
- Lack of strategic leadership
- Varied Stakeholder expectations of the role of the Co-ordinator
- Independence of the co-ordinator

Davies and Maynard recommended that the position be recognised as a broader role and that additional administrative support be provided.

During the March PPIAC meeting the role of the Co-ordinator was revised and the position was expanded to one of Program Director with additional administrative support. This change should provide the Program Director with an opportunity to improve areas of administration, including information flow to committees, timing of meetings and allow for additional strategic input by the Program Director.

The effectiveness of this change will be monitored for effectiveness when considering the APRP2 program.

It should be noted that any proposed changes to the management structure of the APRP program will require approval of the HAL board.

6.5.2. Management Structure Recommendations

Recommendations for improving the management of the APRP include:

A: Roles

- Establish a clear role description for the Research Director, initiated by the Research Director and reviewed by the committees, including responsibilities for aspects of strategic and operational management of the APRP program and delegation of appropriate authorities.
- Establish clear role descriptions for sub-program leaders.
- To ensure effective use of the committees within the APRP program, these management structures should be reviewed and terms of reference revised, to reflect the current management needs of the APRP program as discussed in 6.5.1.
- Give consideration to an independent Program Director position, unaffiliated with co-investor stakeholders, to provide a basis for the APRP2 to resolve perceived conflicts of interest.

B: Meetings

- Ensure committee meetings are focused on raising and resolving issues and opportunities with timeframes agreed for completion of actions and provision of minutes. Consider circulation of minutes between the PPIAC and Advisory committees.



- Program appropriate timing for meetings, Technical then Advisory then PPIAC, to ensure information from earlier committees meetings can be included in Agendas and working papers. By following this procedure, information should flow to the PPIAC in a timely manner enabling consideration of other committee requirements in APRP program decisions.
- Delegate the Research Director to be responsible for preparing meeting agendas and providing working papers at least 1 week before committee meetings, minutes and timely completion of actions.
- Include a financial reporting element in sub-program leader reports to the Technical committee to establish early identification of potential funding gaps within programs.

C: Contracts

- Establish standard agreements, with appropriate guidance documents for the use of these agreements, including template Terms Sheets incorporating any legislative and HAL requirements. These would be expected to assist in establishing expectations for contractual arrangements within the APRP program and when establishing national and international collaborative projects. These should include, but are not limited to, the following considerations:
 - Head Agreements with research providers
 - Confidential Disclosure Agreements
 - Materials Transfer Agreements
 - International Research Agreements.

Since the ultimate responsibility for the program rests with the HAL board, any proposed standard contracts will require approval of the HAL board.

D: New Research Projects

- Revise, with the approval of HAL, the new project application process to include applicability to the Strategic Plan and PRAs, intellectual property considerations, confirmation of contractual requirements for the project and clear go/no-go milestones.
- Request new project rounds at least once a year from industry stakeholders to provide regular opportunities for review of potential new projects for the APRP program.
- Ensure that IAC feedback from unsuccessful new project proposals provides timely and clear feedback on reasons for rejection of a proposed project.
- For proposals that are considered by the IAC to be of potential interest to the APRP program, but where the application is found lacking, the IAC (at its sole discretion) may provide feedback to the proposers identifying additional information and/or clarification of the project. This would provide one opportunity



for project proposers to resubmit a proposal, by responding to IAC comments, prior to a final IAC committee decision.

7. AUSTRALIA'S R&D CAPABILITY

Australia's processed potato research strengths were reviewed on the basis of Australian and international researcher opinions, market research and a desktop review of research areas being addressed by international groups.

The key strengths of Australian processed potato research identified by Australian researchers were the collaborative nature of the research and industry commitment to a long-term view on research.

Areas of Australian research excellence identified by both Australian and international researchers, were soil health and the DNA based disease diagnostics, developed as a result of the PPR&D1 program, which provided early confirmation of the potential of a consolidated and focused processed potato research program.

Five key Australian organisations were identified with a processed potato research focus:

- Department of Agriculture and Food (DAF - WA),
- Department of Primary Industries (DPI – Victoria),
- South Australian Research and Development Institute (SARDI),
- University of Queensland (Gatton Campus) and
- Tasmanian Institute of Agricultural Research (TIAR).

Surprisingly, neither DAF nor UQ have been involved in the PPR&D1 program to date.

In addition to those organisations listed above, there are a number of agronomy and seed producing organisations that currently conduct potato research in Australia and may wish to be included in the APRP2 program.

7.1. APRP2 Australian R&D

The PPR&D1 program involves five Australian and two international Universities and/or government organisations.

The market research has indicated that the APRP2 program should incorporate a broader research and development group, including agronomists (private and processor), seed producers and additional research organisations in WA (DAF), NSW and QLD (UQ).

A number of Australian agronomy groups are currently conducting research outside the PPR&D1 program, in areas of disease (common and powdery scab), crop protection, crop nutrition and sustainable water use, which might align with the PRAs.

A key requirement of APRP2 will involve addressing the need to attract and retain potato researchers for the long-term benefit of the Australian potato industry.



7.2. APRP2 International R&D Collaboration

Existing international collaborations under the PPR&D1 program include New Zealand and Canada, with closer ties being developed in the UK. Twenty-two international potato research groups across Canada (AAFC), New Zealand (NZ-CFR, HNZ), Peru (CIP), South Africa (ARC), UK (BPC, CUF, CSL, DEFRA, SAC, SASA, SCRI), Switzerland (ETH) and the USA (UI, UM, UM, UND, UO, UW, Penn State, USDA) were identified through the market research and discussions with stakeholders (see Market Research report in Appendix 2 for details).

Table 2 – International Potato Research Areas

Research Area	Country						
	PPR&D1	CAN	NZ	Peru	UK	USA	Swiss
Breeding	✓	✓	✓	✓	✓	✓	✓
Genetics	✓	✓	✓	✓	✓	✓	✓
Seed	✓		✓	✓	✓	✓	
Soil and irrigation	✓	✓	✓		✓	✓	
Farming practices	✓				✓	✓	
Harvesting			✓		✓	✓	
Water					✓	✓	
Climate change		✓	✓		✓	✓	✓
Disease and pests	✓	✓	✓	✓	✓	✓	✓
Storage					✓	✓	
Food science			✓	✓	✓	✓	
Sustainability					✓	✓	
Extension					✓	✓	
Marketing			✓	✓	✓	✓	

The USA and UK have developed strong extension programs for research outcomes in the processed potato industry, which may be leveraged in developing a robust Australian extension process.

Early stage discussions covering international potato industry issues have been initiated by representatives from research groups in Australia (APRP program Director), UK, NZ, South Africa, Canada and Peru, with the establishment of a semi-formal 'issues discussion group'.

Australia's expertise in DNA based disease diagnostic testing may provide leverage for international collaboration and or accessing existing international research.

A key consideration for effective industry and international cooperation will be a focus on non-competitive and/or public good research, which may include areas such as genetics and disease management. However, it is axiomatic that any HAL levy fund investment must be for the benefit of the Australian levy payers and not for private research, which may confer a competitive advantage to a particular party.



As with the Australian industry, much of the international processed potato research is privately funded by the major processing companies and, as such, is not publicly available.

7.3. APRP2 Funding

As with the PPR&D1 program, HAL-matched levy funding, VC funds and government co-investment will be required to provide the base funding for the program. New Australian and international funding may be available for research around the key PRAs of sustainability, environment and international collaboration.

Table 3 – Potential Funding Sources

Country	Funding Body
Australia	Landcare, ACIAR, EWAL, Water Australia
USA	USDA
UK	BPC, DEFRA, RERAD, BBSRG
Canada	ACAFF, CAFI
NZ	C&FR, FRS

International opportunities for collaborative research would need to ensure that programs further the interests of local potato industry in each country. Co-funding has already been leveraged under the PPR&D1 program, with collaborative Canadian and New Zealand projects.

To maximise APRP2 funding opportunities, new research programs should aim to be world leading with potential for strong international collaboration. The existing DNA probe sub-program is a good example of this and has the potential to leverage new funding and collaborative programs under the APRP2.

The Program Director is also investigating the potential to leverage significant funds under the Australian Cooperative Research Centre program. This program is currently under review by the Federal government. However, if the program is continued, the next round of applications would not be expected before early 2009, with start dates around 2010.

8. REPORTING

During the course of the program Pyksis will conduct regular reporting updates to the PPIAC and provide a final PPR&D2 proposal at the end of the project.

8.1. Update reporting

A series of updates have been provided by Pyksis including written reports and presentations to the PPIAC. Additional reporting dates are provided in the timelines, section 8.2 of this report.



8.2. Timelines

The timelines for completion of this project remain as proposed with key reporting milestones listed below:

Table 4 – Timelines for Completion of Scoping Study

	Output	Date	Status
1	Independent Market Research	March - April	Complete
2	Present to Advisory Committee	14 March	Complete
3	Distribute Interim Report	15 March	Complete
4	Present to PPIAC	19-20 March	Complete
5	Distribute Update Report	30 May	Complete
6	Update Report and presentation to PPIAC	4 August	
7	Distribute Draft Final Report	30 August	
8	Present Draft Final Report to PPIAC	6 October	
9	Final Report Distributed	30 October	
10	PPIAC review (if required)	1 December	

9. NEXT STEPS

From June through to the next update report on August 4 2008, Pyksis will focus on completion of Milestones 3 and 4 of the HAL agreement. The final Milestones 5 - 7 will be completed with the provision of the Final Report, due on October 30 2008.

It should be noted that the views and recommendations presented by Pyksis in this report are suggestions for consideration by the IAC and should not be considered as directions for adoption.

9.1. PRA Confirmation

The PRAs identified in this report have been proposed by Pyksis as a result of discussions and independent market research conducted with industry stakeholders. Input will be sought from industry stakeholders to confirm the relevance of the proposed PRAs and the proposed priorities.

9.2. APRP2 Research Programs

Following stakeholder confirmation of the PRAs for APRP2 Pyksis will, with input from industry stakeholders, identify national and international research providers and/or technologies that may be able to contribute to achieving industry outcomes for the PRAs under the APRP2.

This will require a review of research programs not funded under PPR&D1 for relevance to the PRAs and identification and development of new project proposals and budgets for the APRP2. Potential funding opportunities for APRP2 programs will also be investigated.



9.3. APRP2 Management Structure

The existing APRP management structure and effectiveness will be reviewed, with consideration given to stakeholder feedback and the needs of APRP2 research programs, with recommendations to assist the establishment of an effective management structure for APRP2.

9.4. Principles of Levy Investment

When considering the investment of levy monies in the APRP program and the management of levy funded programs, the overarching principles that drive HAL levy investment must be considered. These are that:

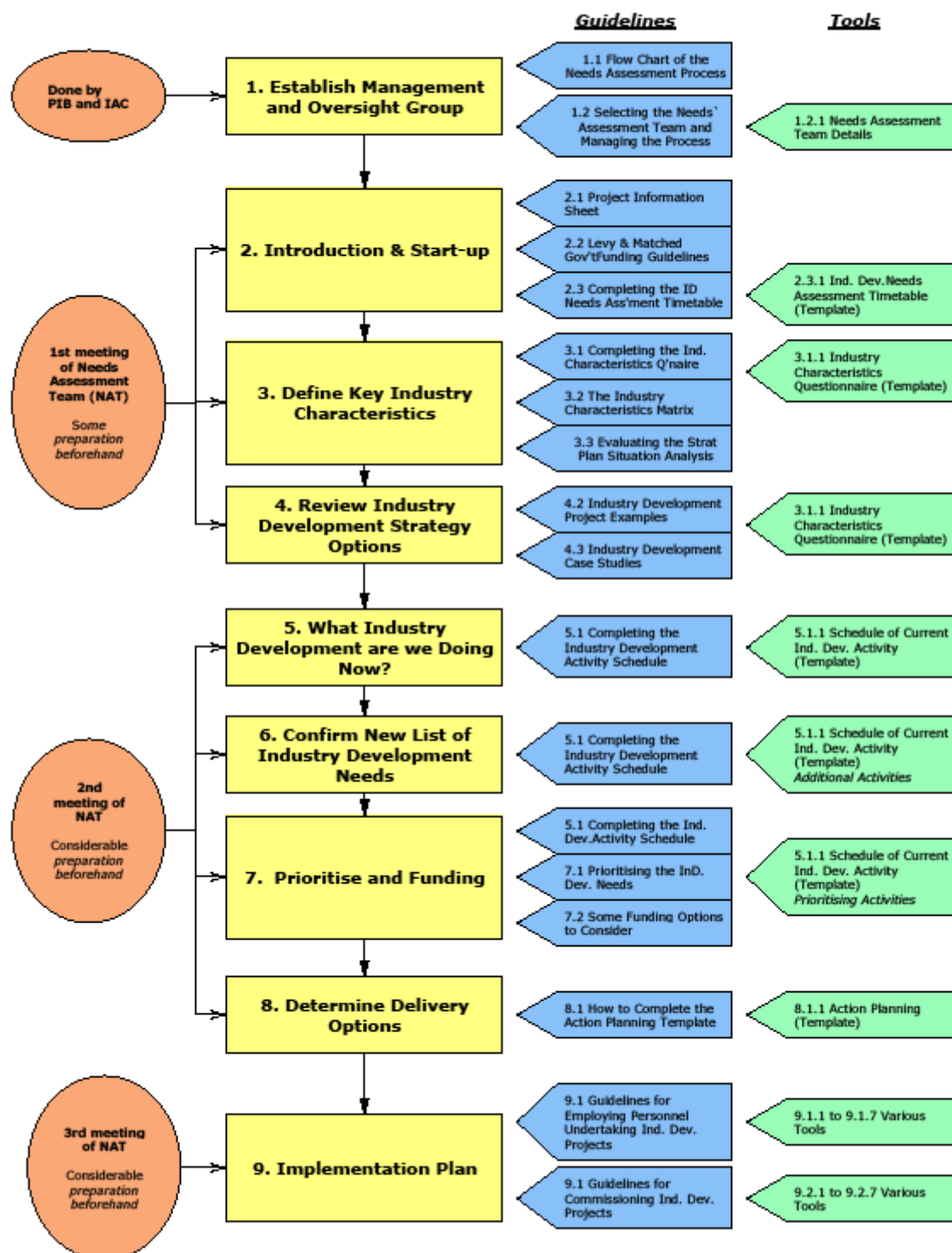
1. Benefits must be returned back to the levy payers
2. HAL Board is the responsible party for all investment decisions that need to be made
3. Investments are preferably aligned with the strategic plan, or the plan altered to accommodate these areas

Ultimate responsibility for the APRP program rests with the HAL Board. As such, any changes to the APRP program may require approval of the HAL board.

It should be noted that to date the HAL Board has reportedly supported all changes requested by the IAC. This is a situation that would be expected to continue with the Board willing to view any future requests for changes to the APRP program, with an open mind.

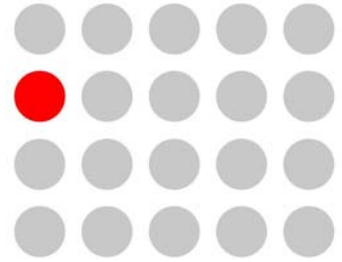
10. APPENDIX 1: HAL INDUSTRY DEVELOPMENT NEEDS ASSESSMENT PROCESS

Industry Development Needs Assessment Process



11. APPENDIX 2: INDEPENDENT MARKET RESEARCH REPORT

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Topic Processed Potato Research And Development Program

Report prepared for Pyksis on behalf of Horticulture Australia Limited (HAL)

Report prepared by Red Letter Information

Date 22 May 2008



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Appendix A – Quantitative Data

Appendix B – Structured Telephone Interviews

Appendix C – Semi-Structured Telephone Interviews And Focus Group



1 Executive Summary

Horticulture Australia Limited (HAL) is a national research, development and marketing organisation, and works in partnership with the horticulture sector to invest in programs that provide benefit to the Australian horticultural industry. HAL receives funding from levies imposed on growers and processors of potato products, and leverages these funds with matched government funding and other sources including commercial organisations, to conduct research and development (R&D) programs for the benefit and continual improvement of the processed potato industry.

The current Processed Potato Research and Development Program 1 (PPR&D1), recently renamed the Australian Potato Research Program (APRP), began in 2004 and is due to end in 2009. The industry wishes to conduct a further program, PPR&D2, over the next 5 years and has prepared a strategic plan, which includes several key items for consideration. Pyksis Pty Ltd (Pyksis), as part of its approach to fulfilling its brief from HAL, commissioned market research to scope an implementation for the PPR&D2 program, seeking input for the PPR&D2 from stakeholders in the processed potato industry. Red Letter Information (RLI) conducted the commissioned market research for Pyksis.

The objectives of the research were to identify the key local and international issues and trends impacting on the PPR&D1 and PPR&D2 programs, assess the perceived relevance and effectiveness of PPR&D1 among target stakeholders and establish the priorities and expectations for PPR&D2 among target stakeholders.

We conducted 66 telephone interviews with respondents from NSW, Queensland, South Australia, Tasmania, Victoria and Western Australia, and internationally based respondents from Canada, New Zealand, South Africa, the United Kingdom and the United States. This consisted of 33 structured telephone interviews and 33 semi-structured telephone interviews. We also conducted a focus group with a further 6 respondents from Arnott's, McCain Foods, Smiths, Safries and Simplot Australia, representing the international processors segment.

Key findings from the research are set out below:

Australian Processed Potato Industry

Issues And Trends

- Respondents across all segments highlighted increasing costs of critical inputs and sustainability as the main issues impacting on growers, who face the dual challenges of low-cost imports and comparatively more attractive local agricultural activities, as the cost of inputs and increasingly scarce resources escalate
- According to respondents, growers require appropriate cultivars and tools to help them develop sustainable practices
- Other respondents commented on health and obesity as impacting on the french fries segment of the industry, and the balance of respondents stressed the need to maintain the industry's efforts to mitigate disease

Research

- The coordinator (now the Program Director) and plant breeding program coordinator noted an increasing shift to reduction of carbon footprinting, irrigation management and scarcity of water, while subprogram R&D leaders identified increased collaboration and attention to soil health, as distinct from disease mitigation



Comparative Advantages And Disadvantages Of The Australian Industry

- Respondents nominated high quality, clean and green or safe products as the key advantages of the Australian processed potato industry (n=38 mentions), while high cost of production, low prices and import competition, and low sustainability are the main disadvantages (n=25, 19 and 13 mentions respectively)

Australian Processed Potato Research

- According to subprogram R&D leaders, the main strengths of Australian processed potato research are its collaborative nature and the industry's commitment to a long-term view
- The majority of respondents in the research program segments regard Australia as being internationally recognised for excellence in potato research. Consistent with feedback from internationally based respondents, several respondents identified disease diagnostics such as the DNA probe as the main area of recognition
- Respondents reported that research projects involving collaboration between Australian researchers and international researchers are mainly limited to Canada and New Zealand, although there is some collaboration with researchers in other countries such as the United Kingdom and Switzerland

Maintaining The Australian Industry's Competitiveness

- According to respondents, to remain competitive the Australian industry needs to develop new or improved varieties, implement production efficiencies, lower the cost of production and improve sustainability (n= 21, 15, 14 and 8 mentions respectively)
- Most respondents across all segments (86.9%) agreed there is a role for research and development to address these problems
- The largest groups of respondents nominated disease mitigation, new or improved varieties, less use of fertilizers or chemicals and sustainability as factors which could be addressed by research and development (n=19, 15, 9 and 9 mentions respectively)

PPR&D1

Expectations

- Only half of respondents said they had expectations of PPR&D1 (47.5%), while 34.4% did not, and 18.0% said they did not know. Significantly more seed producers, agronomists and processors did *not* have any expectations (80.0%, 66.7% and 60.0% respectively), reflecting lower levels of awareness among these groups
- The largest group of respondents said they expected PPR&D1 to address disease mitigation or deliver diagnostic tools (n=11 mentions), but others mentioned improved productivity or improved collaboration (n=6 and 5 mentions respectively)
- Of the 29 respondents who had expectations of the PPR&D1 program, 10 said the program mostly met their expectations and 7 said it met their expectations. Of the balance, 6 respondents respectively said they were neutral or the program mostly did not meet their expectations
- When asked to explain the extent to which PPR&D1 met their expectations, those who said the program met or mostly met their expectations commented on the potential for the techniques developed through PPR&D1 to be adopted by the industry in the near future. Most of those who said it did not meet their expectations said it would not be reasonable to expect all outcomes of the program to be reached so soon after its start

Relevance

- More than a third of respondents said PPR&D1 catered to the needs of the industry (42.6%), while 41.0% did not know and 16.4% said it did not cater to the industry's needs, reflecting relatively low levels of awareness of the program's outcomes to date



- When asked to comment on the extent to which PPR&D1 catered to the needs of the industry, those who responded favourably highlighted the benefits of a consolidated research program based on consultation with industry stakeholders. Those who responded unfavourably mentioned a lack of tangible results or poor communication of results as the main reasons for their concern

Successes And Shortfalls

- Respondents nominated disease mitigation, including the DNA probe and diagnostic tools, and collaboration and information sharing as the main successes of PPR&D1 (n=21 and 7 mentions respectively). The main shortfalls are lack of inclusiveness and poor communication, whether internally or with growers (n=8 and 10 mentions respectively)

Effectiveness Of Program Communication

- Around two-thirds of respondents (67.2%) said program managers did not communicate program outcomes clearly, while the remaining 32.8% said they did, highlighting the need for improved program communication
- Growers who provided negative feedback said they either had no awareness of program results or communication of the results did not address farm practice at a practical level, and some mentioned the variable quality of presentations delivered by program managers. Respondents from the government co-investor and subprogram R&D leader segments commented on friction between key groups and poor administration
- Suggestions for improving communication included professional branding for PPR&D1, a scorecard reporting system for industry stakeholders, especially growers, grower forums for sharing knowledge about best practice and practical information tools for growers

Impact

- Only a third of respondents (34.4%) said the program impacted on industry stakeholders, while the balance (65.6%) said it did not have an impact or they did not know (27.9% and 37.7% respectively)
- Consistent with their feedback on the extent to which PPR&D1 catered to the needs of the industry, respondents who said the program impacted on industry stakeholders commented on the benefits of information sharing and increased cooperation among growers, processors or state-based organisations



PPR&D2

Expectations

- Consistent with the relatively low levels of awareness of PPR&D1, just over half of respondents said they have expectations of PPR&D2 (55.7%), while the remaining 44.3% do not
- Respondents, especially growers, identified delivery of the PPR&D1 objectives as a key expectation, while others called for an extension of PPR&D1 objectives to address sustainability, production efficiency or a strategic approach to international collaboration

Priorities

- Consistent with their expectation of the delivery of PPR&D1 objectives, the largest group of respondents nominated disease mitigation and delivery of the DNA probe as priorities for PPR&D2 (n=26 mentions). Others nominated new or improved varieties (n=13 mentions) and smaller groups mentioned lower cost of production, improved communication improved water or fertilizer efficiency and sustainability (n=4, 4, 3 and 2 mentions respectively)

Level Of Involvement

- Apart from the current stakeholders in PPR&D1, whom most respondents accepted as appropriate for involvement in PPR&D2, a minority of respondents highlighted the need to balance involvement by state, encourage involvement of the retail trade and attract the best local and international researchers

Potential Programs That Should Be Funded By PPR&D2

- A minority of respondents mentioned research into nematodes, storage of potatoes, disease mitigation of seeds, impact of water use and climate change, and extension as areas of research that could be funded in PPR&D2

Sources Of New Funding

- Of the 11 government co-investors, 9 mentioned potential sources of new funding, mostly government agencies funding research on sustainability and the environment, particularly in relation to water management and conservation

New Technologies

- The largest group of respondents mentioned storage technology as a new technology that could be used in the Australian industry (n=5 mentions), followed by GPS on planters, variable rate farming or irrigation technologies and control traffic farming (n=3 mentions respectively). Others mentioned a variety of other technologies, such as hydroponic mini-tuber production systems and processed packing



Adoption Of New Technologies

- Most growers (n=15) reported they implemented new technologies in the last 5 years to increase their yield, specifically to address sustainability (including water conservation, use of fertilizer or soil conservation) or irrigation. Of these, only 3 respondents received assistance
- Consistent with their feedback on past adoption of new technologies, growers confirmed the most common reason for adopting new technologies in the future is increased yield, improved quality or reduced cost
- Of the 21 growers in the total sample, 9 plan to implement new technologies in the next 5 years. Of these respondents, 4 mentioned plans to implement new irrigation systems, one mentioned a new storage system and another mentioned technology such as satellite and GPS

Information Sources

- The majority of growers said they find out about new technologies via word of mouth, or from industry publications, while others learn about new technologies through the internet, overseas travel or agricultural field days

International Research Organisations

International Research

- The areas of research conducted vary from country to country, due to:
 - Differences in the ways that research and development is funded, managed and conducted
 - Variation in the areas that are considered of high importance to the potato industry
 - The level of development of the potato industry
 - Trends such as the growing impact of climate change and the need to develop sustainable agricultural systems
 - Increasing emphasis on healthy eating habits in the developed world
- In Canada, New Zealand and South Africa, research specific to the processed potato industry is largely conducted by the major processing companies, while research of a more general nature such as disease mitigation is conducted by public sector organisations

Australian Research

- Respondents provided mixed feedback on the extent to which Australia is recognised internationally for excellence in processed potato research, although most acknowledged the international standing of the soil health and disease diagnostics subprograms
- The respondent from the United Kingdom stressed the importance of building strong links between Australian research centres and processors to ensure the work on disease management complements the commercial research conducted by private companies



International Collaboration

- There is general interest in collaboration between countries on research and development among internationally based respondents, provided the aims of research project are in the interests of both countries, and the research will not lead to problems with intellectual property or competition:
- Respondents from Canada, New Zealand and the United Kingdom mentioned the potential for research and development programs to receive government or industry funding, provided the program would further the interests of the potato industry in the local country

Competitiveness

- Respondents from New Zealand, the United Kingdom and the United States said the potato industry in their country is stable and well established with strong links to research and development and innovation. Both respondents from Canada mentioned difficulties with storage of potatoes and the fragmented infrastructure in the country's processing industry excluding french fries
- The respondent from New Zealand mentioned the importance of identifying niche opportunities as a small producer in the global market

Trends

- Respondents mentioned increased awareness of sustainability and methods of dealing with climate change as an important area of current and future research, particularly in regard to water usage and use of fertilizers. They also mentioned trends in healthier eating habits and the need for healthier processed potato products

Technologies

- Respondents from New Zealand and the United Kingdom respectively mentioned the potato calculator developed by Crop & Food New Zealand and PCR diagnostic methods as technologies that could have application in the Australian industry. However, the respondent from the United States said it would be difficult to transfer technologies to Australia because they are proprietary to the major processing companies



2 Introduction

Background

Horticulture Australia Limited (HAL) is a national research, development and marketing organisation, and works in partnership with the horticulture sector to invest in programs that provide benefit to the Australian horticultural industry. HAL receives funding from levies imposed on growers and processors of potato products, and leverages these funds with matched government funding and other sources including commercial organisations, to conduct research and development (R&D) programs for the benefit and continual improvement of the processed potato industry.

The current Processed Potato Research and Development Program 1 (PPR&D1), began in 2004 and is due to end in 2009. The focus of this program revolves primarily around disease control and cropping practices.

The industry wishes to conduct a further program, PPR&D2, over the next 5 years and has prepared a strategic plan, which includes several key items of consideration.

Pyksis Pty Ltd (Pyksis), as part of its approach to fulfilling its brief from HAL, commissioned market research to scope an implementation for the PPR&D2 program, seeking input for the PPR&D2 from stakeholders in the processed potato industry. Red Letter Information (RLI) conducted the commissioned market research for Pyksis.

Research Objectives

The objectives of the research were to identify the key local and international issues and trends impacting on the PPR&D1 and PPR&D2 programs, assess the perceived relevance and effectiveness of PPR&D1 among target stakeholders and establish the priorities and expectations for PPR&D2 among target stakeholders.

Methodology

We conducted 66 telephone interviews with respondents from NSW, Queensland, South Australia, Tasmania, Victoria and Western Australia, and internationally based respondents from Canada, New Zealand, South Africa, the United Kingdom and the United States. This consisted of 33 structured telephone interviews and 33 semi-structured telephone interviews. We also conducted a focus group with a further 6 respondents from Arnott's, McCain Foods, Smiths, Safries and Simplot Australia, representing the international processors segment.



The total sample of 72 respondents by geography and segment is set out in the tables below:

Location	Structured Telephone Interviews	Semi-structured Telephone Interviews	Focus Group	Total
NSW	2	5		7
TAS	19	6		25
VIC	6	7		13
QLD	1			1
WA	1	4		5
SA	4	3		7
International		8		8
National (international processors focus group)			6	6
Total	33	33	6	72

Segment	Structured Telephone Interviews	Semi-structured Telephone Interviews	Focus Group	Total
Coordinator		1		1
Plant breeding program coordinator		1		1
Seed producers	5			5
Growers	18	3		21
Local processors	4			4
International processors			6	6
Agronomists	6			6
Government co-investors		11		11
Industry organisations		5		5
Subprogram R&D leaders		6		6
International		6		6
Total	33	33	6	72

Where appropriate, graphs are presented showing responses both for the total sample and by segment. When preparing the graphs, we counted the responses of international processors from the focus groups as one, because it was not possible to identify individuals from the transcript. We did not include the responses of international research respondents as they were asked a different set of questions.



Also, for the sake of clarity we did not specify responses from the coordinator and plant breeding program coordinator in the graphs (as sole respondents in each segment), but we coded and reported their responses in the total sample. Wherever results are presented as percentages, they are reported to one decimal place.

We note the use of numerous acronyms throughout this report. As most of them appear to be recognised brands in the industry, we have not expanded them in this report unless their meaning is not clear.



3 Results

3.1 Australian Processed Potato Industry

3.1.1 Issues And Trends

Respondents across all segments highlighted increasing costs of critical inputs and sustainability as the main issues impacting on growers in Australia. As a result, Australian growers face the dual challenges of low-cost imports and comparatively more attractive local agricultural activities, as the cost of inputs escalates and critical resources such as water, energy, viable land, capital and labour become increasingly scarce. A respondent from an international processor acknowledged his organisation is importing products from the United States and New Zealand because the company's growers cannot produce the required volume, and another suggested crop insurance and crop mortgaging as a potential remedy to mitigate risk for growers. Numerous respondents stressed the importance of developing appropriate cultivars and tools for growers to help them build sustainable practices. Other respondents commented on health and obesity as impacting on the french fries segment of the industry, while the balance of respondents stressed the need to maintain the industry's efforts to mitigate disease:

Economic Viability

- “Adoption of new technology. Also growers receiving a suitable price for their potatoes, the market puts undue pressure on the producers” (Agronomist)
- “I think definitely in Australia its cost of production. Definitely just being able to produce processed food competitively with all the imports coming in. We've seen a massive reduction in capability in Australia so I think that's probably the biggest issue. Absolutely, because we're just not cost effective so our capability has dropped because there's not as many factories and things like...Once you lose your infrastructure, it's very hard to obviously get that back without a huge investment” (Government co-investor)
- “Costs are rising, costs are our main worry, and water” (Grower)
- “High input of growing potatoes and what those costs could go to” (Grower)
- “Increased input costs and increased margins” (Grower)
- “Probably the main thing is price, if they become too uneconomic to grow - the biggest threat is cost, of labour, inputs and land prices” (Grower)
- “The biggest issue from a grower perspective is a dramatic increase in costs, no question of that. Fertilizer has been doubling or tripling over a couple of years, availability seems all right but a few questions are being asked. The same applies to chemicals but not quite such a significant price increase - near doubled in the last few months and availability of those chemicals is being questioned” (Grower)
- “I guess the biggest individual threat at the moment is the competition from overseas and Australia's ability to meet that competition given that we've got inherent costs in our society” (Grower)



- “The number one issues globally are going to be really input costs to growers and this is a worldwide phenomenon. Fertilizer has tripled almost in the last 5 years. You have a situation where we're putting in 10 calories of fossil fuel energy into agriculture production in the western world and getting one calorie back. That's certainly not sustainable. Those are one of the issues. Secondly, is the issue that, really, since the beginning of this high input agriculture, roots have never been a focus of research. Soils are so complicated to work on. Most scientists avoided it like the plague. It is something that we could never get a handle on and only now with molecular technologies do we have a chance of getting to where we need to be. So we need a bigger effort into better root systems and more aggressive plants. And there's been evidence in some countries that were not as rich as North America, Europe and Australia where they went to lower input agriculture and they have much more aggressive plants that need less herbicides and less chemical pesticides” (Subprogram R&D leader)
- “This is very much a layman's point of view because it's not my idea of speciality but I guess I see just more globalisation and greater potential for processed potato products from overseas to further increase their market share here in Australia and I see that putting pressure on local producers commensurately and particularly in my area of Tasmania where we have a lot of very small producers who would find economies of scale hard to achieve. You know, there's probably going to be significant readjustment in the industry in Tasmania as a result of that” (Subprogram R&D leader)

Sustainability

- “The energy side, the cost of oil, fertilizer, diesel for tractor, transportation of the finished product to market, the cost of production, irrigation - fertilizer is the main driver, there's a shortage of phosphate and potash in the world at the moment. Lack of skilled labour, lack of new agricultural land with supportive water infrastructure. Lack of funding for new varieties” (Grower)
- “Price squeeze at growers' end and water resources” (Agronomist)
- “Water availability - good quality of water in the right areas, we're competing with a lot of other uses for the water - that's the situation in Western Australia and probably eastern Australia as well” (Agronomist)
- “In the production side of things...the 2 main issues that are going to be facing the industry in NSW are access to irrigation water and energy costs. Now, NSW is probably more impacted by the access to irrigation water than production in a lot of the other states” (Government co-investor)
- “So because most of the potato production now in Australia is starting to move out into marginal areas where there is irrigation and where irrigation is going to become limited, you have to have material that uses less water. If you breed them in high rainfall areas and irrigate them, you're never going to be able to select for water use efficiency. Sustainability in that area and water is becoming so critical and the cost of fertilizer is becoming so critical” (Government co-investor)
- “Climate change” (Grower)
- “Globally it's water, worldwide that's the biggest factor, I have a little to do with Vietnam and they have water. Water - not only in Australia, it's worldwide - England, China” (Local processor)



- “I guess the issues with water would be at the forefront on most people's minds. I suppose for us varieties, and you know that's where there is the most potential for yield increases and as long as we can keep a good handle on our pest and diseases. It always is a concern and that's why I believe we need to get new varieties and increase our yields to actually increase productivity to combat some of these imports and stuff because if you stay stagnant they just beat you” (Industry organisation)
- “Well, domestically it's a case of, I think, farmers being here, from the ground up really, farmers being provided with tools to allow them to grow their potatoes more sustainably. We know they're starting to move away from chemicals, that sort of thing” (Government co-investor)
- “I guess the things that come to mind fairly rapidly are the risk that growers take in growing the crop, the cost of establishment and the risk involved in doing that is becoming a great concern to a lot of our growers. I guess, as a result of that, we need to look at it and I know it happens in the US and I'm not sure about other countries, but there's crop insurance and there's also crop mortgaging that we have to look at so we can keep our number of growers on board...A lot of people are considering their options deciding that potatoes don't cut it. The last 12 months. It's changed in comparison to alternative crops. That's the key. Potato crop is historically a cash crop, reasonably high margins relative to cereals and others but of course now, with the shortage of dairy products, the bio-fuels and the cereal price being a skyrocket then all of a sudden there's alternatives” (International processor)
- “On top of that I think there's a sustainability expectation from consumers about how our products are produced and how the resources that growers, how they're used and they're managed and increasingly where you've been asked to take back not only our carbon footprint from the point of view of the factory but all the way to the farm and when we start to try and do that, it's a scary exercise to understand the whole gambit of product being produced in the rural area being shipped to a manufacturing plant, packaged, sold and then how much is spent in terms of carbon in that process. We all are [part of global organisation]. Yes, our customers are asking for it. The likes of Woolworths, Tesco's and that's a response to consumer expectation. Then our company is probably shipping further than what we are, like the oysters into south-east Asia and all over the place so they're probably more conscious of it at this stage” (International processor)
- “Water and the environment we operate in, it's getting hotter, drier, irrigation from the river is getting less, and salinity is also a concern” (Local processor)

Low-cost Imports

- “As such we don't import any fresh potatoes. Processing potatoes we certainly do import. There certainly will be a trend, I believe, in the future for increased imports of processed potatoes. I think with the 2 processors setting up in China there will be increased imports from China” (Coordinator)
- “Well, the same thing could happen, I'm not saying it is, but there's a possibility the same thing could happen in the french fry industry to maintain lower inventories, they may well start doing the same trick themselves [international processors importing finished products]. If the differential between, it depends on the differential between American prices and Australian prices but the way it was explained to me is that, there's a saying they say 'the cost of water is \$200 tonne and basically as long as we can produce stuff within \$200/tonne of what the Americans or Canadians are producing, we're right but if our costs blow out more than that, then basically we're in trouble', that's the way it was explained to me anyway” (Government co-investor)



- “From my view it's the processed potato industry and global markets. You look at the global market place and the position of the processed potato industry within it and we're competing against places like South America, China, India, South Africa, Europe, America, all of them have, sometimes costs of production which are extremely low compared to our own. The labour costs are extremely low. The government support is extremely high and we're trying to compete with these guys and often, particularly with the processed industry, you're dealing with multinationals, far more so than the fresh industry and just positioning in the right place and those strategic decisions are made in headquarters across the globe” (Government co-investor)
- “Well, I think the key issue for the industry is obviously going to be competitiveness. It's going to have to be mindful of the fact that, well, they already know that New Zealand is there supplying product and, I dare say, product may well come from other parts of the world. The industry has to be competitive” (Government co-investor)
- “...my global view is there are limited places in the world where these potatoes can be grown and I think that in the future the companies will not have the same leverage that they had to move potatoes around because there's such a demand for them and a limited number of places that can grow them in Australia, limited amount of water and I just sort of see in the future that farmers are going to have to be paid enough to do the job properly” (Industry organisation)
- “I can't give you exact figures but...equivalent to a reasonable size processing plant here, so you're talking about 50,000 or 60,000 tonnes equivalent of frozen finished product which is basically a medium sized processing facility and that's on the base of very little work. It would have been...500%, 600% on what it was. It's real, in french fries, it's real. You guys are probably different...there's no movement in the potato product, no movement in crisps or very little” (International processor)
- “From a Simplot point of view and I don't think I'm speaking out of school here. We're having to import from the US and New Zealand because of lack of supply from our suppliers, simply because of price competition and the growers deciding not to grow the course of other options. No, finished product. There's no fresh potato, we're not talking about any fresh potato and it's competitive. International competitiveness of prices that you have to pay. If there's a shortage of water and you have to pay for water then the average price of potatoes is going to be more than if you don't have to irrigate in New Zealand” (International processor)
- “The emergence of cheap potatoes out of emerging economies, developing countries” (Local processor)

Health And Obesity

- “Focus on nutrition. People are getting more aware of the benefits of certain foods, need to capitalise on nutrition foods and techniques. Also commodity bases and agricultural producers” (Agronomist)
- “Acrylamide is a global thing, health and food organisations...gaining momentum - think it's carcinogenic, french fried or anything cooked over 165c (French Fries are cooked at 185c). To put it into perspective, in the US, food authorities are setting a limit - it may or may not happen - they're suggesting 100ppb (parts per billion), we run at around 300ppb. Globally the thing that's sitting over the french fries potato industry is this thing gaining momentum” (Agronomist)



- “Wealthier people tend to be going more towards fresh food and you know, this slow cooking and all those sorts of things, well, poorer people or time-poor people anyway, are going more for fast food or pre-prepared food. So I think french fries are still going to be a major item at the takeaway food restaurants and at, you know people with double income families who've got young kids, they'll be pulling out the frozen french fries from the fridge and cooking them. But I think there is going to be a trend towards this segmentation and as I said, with obesity and things like that, I'm not sure how it's going to go in the future, whether they're going to bring in fat taxes or whatever, I think there is going to be marketing issues with both french fries and potato crisps in the future. The thing that concerns me the most is that, the other thing is not only the rise of obesity but also the rise of diabetes and it seems from what, some of the glycemic indexes, potatoes seem to have scored very badly when they've done this glycemic index research” (Government co-investor)
- “This is not in any particular order. From a processing point of view I think one of the issues will be health or the perception that processed potatoes aren't healthy. Now how true it is, I don't know, I'm not making a value judgment, just perception from the consumer. The other issue I think we're going to confront is climate change” (Government co-investor)
- “The trend for the next 10 years as I see it is away from unhealthy foods towards more healthy foods. Obesity as you know is a huge problem, it's in the news all the time so there will be changes in the way we consume potatoes. Changes in the processed potato product” (Plant breeding program coordinator)
- “French fries are not considered to be a particularly healthy food and while people are thinking more healthy they still eat garbage and there's still an awful lot of McDonald's fries sold and that's obviously a major market for the industry. But certainly they are seeing that as an issue and they're looking at how do you make fries healthier and then you've got what is inherently a bad PR product healthwise, so it is a tough ask” (Subprogram R&D leader)

Disease

- “Disease and pest management I would probably consider the most important in terms of chemicals that are available or the understanding that we don't want to be using some of the chemicals that are there now. We need alternate systems to manage disease and pests. In the 30 years, the main disease issues have always been the same and the main pest issues have been the same but in particular for our area PCN is a new one and we're, I'm a grower that has PCN so, in terms of its impact it's fairly immediate and substantial” (Grower)
- “I think it's dealing with soil-borne diseases, powdery scab is probably the worst” (Local processor)
- “Probably disease as far as I'm concerned, that's a big issue” (Local processor)
- “I see soil-borne diseases as 2, they haven't gone away despite our research efforts and I think the research program that we have has made leeway into managing these diseases but they're still intractable issues for the industry, so the soil-borne diseases, common scab, powdery scab, Rhizoctonia, also I think there is other diseases as well that are having local issues outside of the PPR&D program...some of the virus issues like potato virus YNTN, bacterial wilt, there's a fair few other issues and some of these are very significant to the future of the industry” (Subprogram R&D leader)



- “...there were people saying 'We should be doing this, we should be doing that as well' but somebody kept bringing us back and I think some of the scientists were involved with that as well, bringing people back to the focus on soil-borne diseases which has continued for many, many years and still severe problems for the processing potato industry but also the potato industry in general and for the vegetable industry even more generally”
(Subprogram R&D leader)

Labour Shortages

- “Finding people to do the work - that might be the number one issue” (Grower)
- “Keeping young people in the industry and introducing them [to the industry]” (Grower)
- “Younger generation farmers [are needed] - when you look around I'm one of the younger ones at 36 - we'll eventually retire. Water, that's a main thing and fertilizers and that sort of stuff” (Grower)
- “The only new guys are generally the next generation, there's no one from a non-potato background generally getting into potatoes so, it's generally the son moving up in the business but apart from that, you don't really see anyone else trying to get in and have a go. Just the capital to get started, the land, the machinery” (International processor)



Research

The coordinator and plant breeding program coordinator identified pathology as the main focus of Australian processed potato research to date, but noted an increasing shift to reduction of carbon footprinting, irrigation management and scarcity of water as future issues. In contrast, subprogram R&D leaders identified increased collaboration and attention to soil health, as distinct from disease mitigation, as key trends:

- “Well, research as I've mentioned in the past is very much focused on pathology and it's a major issue. I think the shift that I'm seeing and this may be more of a shift in terms of where the funding is coming from is through water use efficiency and climate change. That seems to be where the big bucks are lying just now and I suspect we'll see a shift towards that anyway because that type of project is going to be funded. By the same token the carbon footprinting program that has, or is in the process of being commissioned, I think, will throw a whole series of questions and I suspect that there will be more research in the future as to how we can reduce carbon footprint of potatoes” (Coordinator)
- “PPR&D1 was mainly about pathology, outside of PPR&D1 was the breeding work. The need for the process industry is to develop cultivars that have a suite of characters. Those include disease resistance. There are climate change trends that will mean that drought tolerance will need to be there as well or irrigation management, things like that as well. Water is a scarce resource” (Plant breeding program coordinator)
- “I think overall in the vegetable industry there is an increased focus on what you might broadly call soil health. So biological health of soil so it's not just focusing on disease but looking more broadly at the soil production and health and that includes both soil structure and chemistry and soil biology. I guess it's, once again the interest in disease reduction but also the interest in sustainability essentially and also water, I think” (Subprogram R&D leader)
- “Trends, probably the trends are more organisational in the fact that we have formed the PPR&D thing, we have more of a coordinated approach. Instead of having a dozen or so or 20-odd individual researchers spending a little bit of time dabbling away, we've now got probably fewer researchers but spending a lot more time in a more coordinated program and coordinated manner” (Subprogram R&D leader)
- “Trends in the research? Well I think it's becoming more collaborative, more focused” (Subprogram R&D leader)



3.1.2 Comparative Advantages And Disadvantages Of The Australian Industry

Respondents nominated high quality, clean and green or safe products as the key advantages of the Australian processed potato industry (n=38 mentions). A minority of respondents mentioned reliable supply, long growing season and climate as other advantages (n=5, 4 and 3 mentions respectively).

Conversely, high cost of production, low prices and import competition, and low sustainability are the main disadvantages according to respondents (n=25, 19 and 13 mentions respectively). Smaller groups of respondents mentioned disease or transport costs as other disadvantages (n=7 and 5 mentions respectively):

Australian Processed Potato Industry			
Advantages	Total No. Mentions	Disadvantages	Total No. Mentions
Locally grown, high quality products	22	Cost of production	25
Clean and green, safe products	16	Low prices and import competition	19
No advantages	5	Low sustainability	13
Reliable, stable supply to processors	5	Disease	7
Long growing season	4	Isolation, distance (transport costs)	5
Climate	3	Concentration of processors	3
Isolation (from disease)	2	Lack of collaboration or information sharing (processors and other industry players)	2
Innovative industry	2	Regulation	2
Well regulated	2	Low consumer awareness	1
Convenience	1	No disadvantages	1
Serves variety of needs	1	Other	6
Other (the people)	1		
Don't know	4		



3.1.3 Australian Processed Potato Research

Strengths And Weaknesses

Subprogram R&D leaders highlighted the collaborative nature of Australian processed potato research and the industry's commitment to a long-term view as the main strengths. Two respondents commented on the need for a wider base of funding or increased international links:

- “The strengths of it is that they're consolidated and focused. That they know what they want and we're not, we've got a common goal, I think, is the strength of it and to somewhat...it's probably, it's a strength in that there are people out there like the processing companies themselves that are involved in the research as well” (Subprogram R&D leader)
- “Let's start with strengths, yeah I think the strength is the collaboration and I think that collaboration is extending beyond Australia, it's within Australia, it's obviously with New Zealand but Iain Kirkwood has been linking with South African, British and a few others. Other country industries that are also very keen to focus on the soil-borne thing” (Subprogram R&D leader)
- “In terms of the research? Well, I don't know, in terms of how we need to run the research I think there's, we need to start to pull in more expertise outside of traditional potato sort of researchers...the issues are broader now” (Subprogram R&D leader)
- “Weaknesses, probably our size and again that relates to budget to. Again, you talked to Mike Storey earlier, he runs British Potato Council which has a budget 10 times the size of HAL's potato budget, so their capacity to do stuff is greater” (Subprogram R&D leader)
- “I go back and I think a strength is that the industry has taken a long-term view about some of these issues and funded the first program for 5 years rather than a shorter length of time which has been fashionable amongst a lot of funding bodies in the past” (Subprogram R&D leader)

Research Organisations

Respondents in the research program segments identified local and international government departments and university research institutes as leaders in processed potato research. International organisations are based in Canada, New Zealand, Scotland, Switzerland and the United States, as set out below:

Australia

- Department of Agriculture and Food (Western Australia)
- Department of Primary Industries (DPI), Victoria
- South Australian Research and Development Institute (SARDI)
- The University of Queensland (UQ), Gatton Campus
- Tasmanian Institute of Agricultural Research (TIAR)



International

- Agriculture and Agri-Food (AAFC) (Canada)
- New Zealand Institute for Crop and Food Research
- Minnesota University (USA)
- Pennsylvania State University (USA)
- Scottish Agricultural College (SAC)
- Scottish Crops Research Institute
- Swiss Federal Institute of Technology (ETH) Zurich
- United States Department of Agriculture (USDA)

Australia's Reputation For Excellence

The majority of respondents in the research program segments reported that Australia is internationally recognised for excellence in potato research, although a minority of respondents were unsure. Respondents identified disease diagnostics such as the DNA probe as the main area of recognition:

- “To a degree. Where we do excel? Yes, the pathology work that Nigel Crump and Dolf De Boer have been working on, that's internationally recognised. That's about the best one” (Plant breeding program coordinator)
- “...people know that we do leading research. No, I'm talking about across the program. Just going off the papers that I've reviewed in potatoes, to do with soil-borne diagnostics right through to amendments, cultivar resistance” (Subprogram R&D leader)
- “Yes. I'm scratching here but I think the DNA technology developed at SARDI is internationally recognised. I would say that DPI Victoria, particularly Nigel Crump is a young, highly intelligent, very bright scientist who's becoming well recognised...abilities and research on potato soil-borne diseases. It's not only him. Tonia is, anyway, she works with Nigel” (Subprogram R&D leader)
- “I believe we are, we've got people going around to international conferences and the collaborative work we've got underway and the work that I've seen going elsewhere leads me to the conclusion that we're doing as good a job as anybody. I think the DNA technology is certainly worldly...the way we're applying those technologies to the potato industry and making the advances we're making are examples” (Subprogram R&D leader)



International Collaboration

According to respondents, research projects involving collaboration between Australian researchers and international researchers are mainly limited to Canada and New Zealand, although there is some collaboration with researchers in other countries such as the United Kingdom and Switzerland. A subprogram R&D leader mentioned attempts to collaborate with researchers at USDA in the United States:

- “There's all levels of collaboration, I guess, depending on how far down the scale you go...scientists collaborate at various levels with international partners all the way through. I mean just another one, that's really part of PPR&D, on the borders of the program we work on is with a guy called Ueli Merz, who's a specialist in powdery scab in Switzerland at ETH” (Coordinator)
- “The breeding program has links with Scottish Crops and association with Crop and Food. Crop and Food is in New Zealand. We've also made links with the University of Zurich and HZPC in the Netherlands and Germicopa” (Plant breeding program coordinator)
- “Probably more informal ones and some of the ones I guess we have formed, we had prior ones too. Certainly the New Zealand groups we've had linkages with in the past and still do. The UK, we're actually starting to develop linkages there. People like Scottish Crop Research Institute in Dundee, Cambridge University Farm, DSL in York, Scottish Ag College” (Subprogram R&D leader)
- “Absolutely, yes. Well, I know for instance that Nigel has been over to England to collaborate with them, Scotland, and I understand that through me, we're trying to set up some collaborations now with the US people who have some very good technologies that we would like to bring into it at some point. The lady I'm working with there, her name is Leslie Warner at USDA in Beltsville, Maryland, which is near Washington DC, it's their flagship research station” (Subprogram R&D leader)

Interaction With Plant Breeding Program

According to the coordinator and the plant breeding program coordinator, there is effective interaction between researchers in PPR&D1 and the plant breeding program:

- “Clearly one of the subprogram leaders is the potato breeder so that's a strong interaction there. I think there's fairly good interaction actually between those 2 programs. I guess we've identified the breeder is not a plant pathologist and it needs a very strong plant pathology input from other researchers and I think he's currently getting that from a number of researchers and he's very much relying on that plant pathology knowledge. There are commercial interests, I guess, within the plant breeding program and that might restrict our interaction a little bit. I think our interaction is pretty good, that's not to say there couldn't be improvements. I think potentially there can be stronger links between the 2 programs” (Coordinator)
- “It's a good interaction at the moment because of my involvement in both programs, so that's one line. That being said, Calum is doing a piece of work at the moment that should really be within the breeding program, it may not be useful to the breeding program by Calum doing it and when this was raised with Iain and Calum before it was submitted and funded, it was just pushed through anyway...it all should really be involved in the breeding program because it's an extensive technology-based piece of research” (Plant breeding program coordinator)



3.1.4 Maintaining The Australian Industry's Competitiveness

According to respondents, to remain competitive the Australian industry needs to develop new or improved varieties, implement production efficiencies, lower the cost of production and improve sustainability (n= 21, 15, 14 and 8 mentions respectively). Smaller groups mentioned the need for disease mitigation, improved productivity, improved water or fertilizer efficiency and effective consumer promotion (n=5, 4, 4, 4 and 4 mentions respectively):

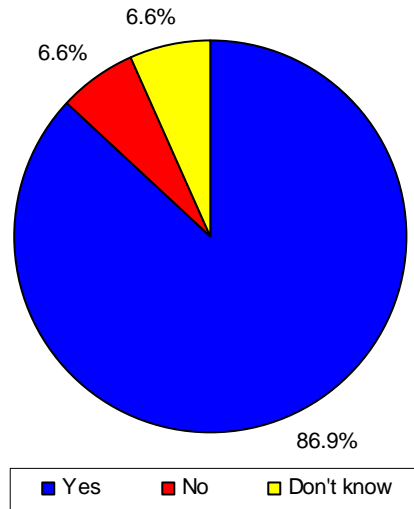
What does the Australian industry need to do to remain competitive?	Total No. Mentions
New or improved varieties	21
Production efficiencies	15
Lower cost of production	14
Sustainability	8
Disease mitigation	5
Government policy or assistance	4
Improved productivity	4
Improved water or fertilizer efficiency	4
Promote the product	4
Improved communication	3
Improved collaboration	2
Other	2
Don't know	1



Potential Role For Research And Development

Most respondents across all segments (86.9%) agreed there is a role for research and development to address these problems, while 6.6% respectively said there is not or they did not know:

Are There Factors That Could Be Addressed By Research And Development?



Base=61

The largest groups of respondents nominated disease mitigation, new or improved varieties, less use of fertilizers or chemicals and sustainability as factors which could be addressed by research and development (n=19, 15, 9 and 9 mentions respectively):

Factors To Be Addressed By Research And Development	Total No. Mentions
Disease mitigation	19
New or improved varieties	15
Less use of fertilizers or chemicals	9
Sustainability or water use	9
Crop management	4
Less or no research and development	3
Efficient agronomy practices	2
Production or supply chain efficiencies	5
Safe products	1
Other	3



Potential For Collaboration

International processors agreed there is potential for collaboration on international research programs on breeding and sustainability, particularly with research groups in the United States and the United Kingdom, given their shared aims and problems:

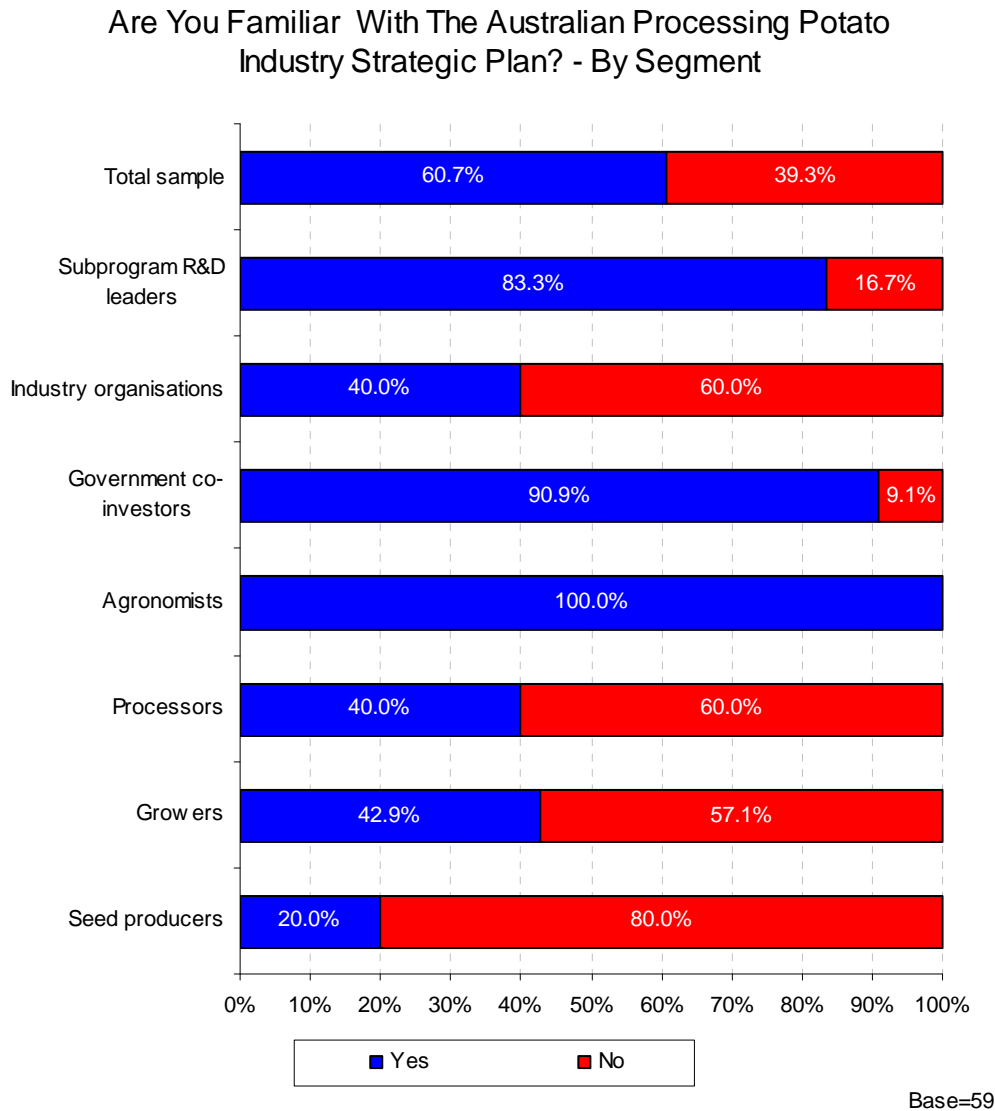
- “As in specific programs or areas? I think there's a lot of work going on that, which is an expectation of PPR&D2 anyway but the UK is a fairly major player and there's so much work going on in the US” (International processor)
- “I suppose what I was referring to at the time was around breeding but there are probably other areas, particularly in relation to sustainability, and the ways of measuring sustainability that probably we could all use. We all have similar customers, we all have Tesco's, we all have Woolworths. They'll be asking the same kinds of questions and if we have a standardised tool rather than us all going off in directions, I think it could be really helpful for us and not duplication of activity that we all have to spend time on. So establishing that as a means, I don't know that there's researchers out there doing it but there probably is globally and I know we are looking at that kind of stuff” (International processor)



Australian Processing Potato Industry Strategic Plan 2006-2011

Almost two-thirds of respondents said they are familiar with the *Australian Processing Potato Industry Strategic Plan 2006-2011* (60.7%), while the remaining 39.3% are not familiar with it.

Significantly fewer respondents from the seed producer, industry organisation, processor and grower segments reported being familiar with the Plan, with 80.0%, 60.0%, 60.0% and 57.1% respectively saying they are not familiar with it:



A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in familiarity with the Australian processing potato industry strategic plan by segment. The results are significant at the 5% level of significance.



When asked to comment on areas of the strategic plan that could be addressed by research and development, consistent with their general feedback on research and development, respondents highlighted sustainability and disease mitigation (n=6 and 4 mentions respectively):

Areas Of Australian Processing Potato Strategic Plan 2006-2011 To Be Addressed By Research And Development	Total No. Mentions
Sustainability	6
Disease mitigation	4
Improved seed production	2
Less use of fertilizers	1
Other	3
Don't know	1

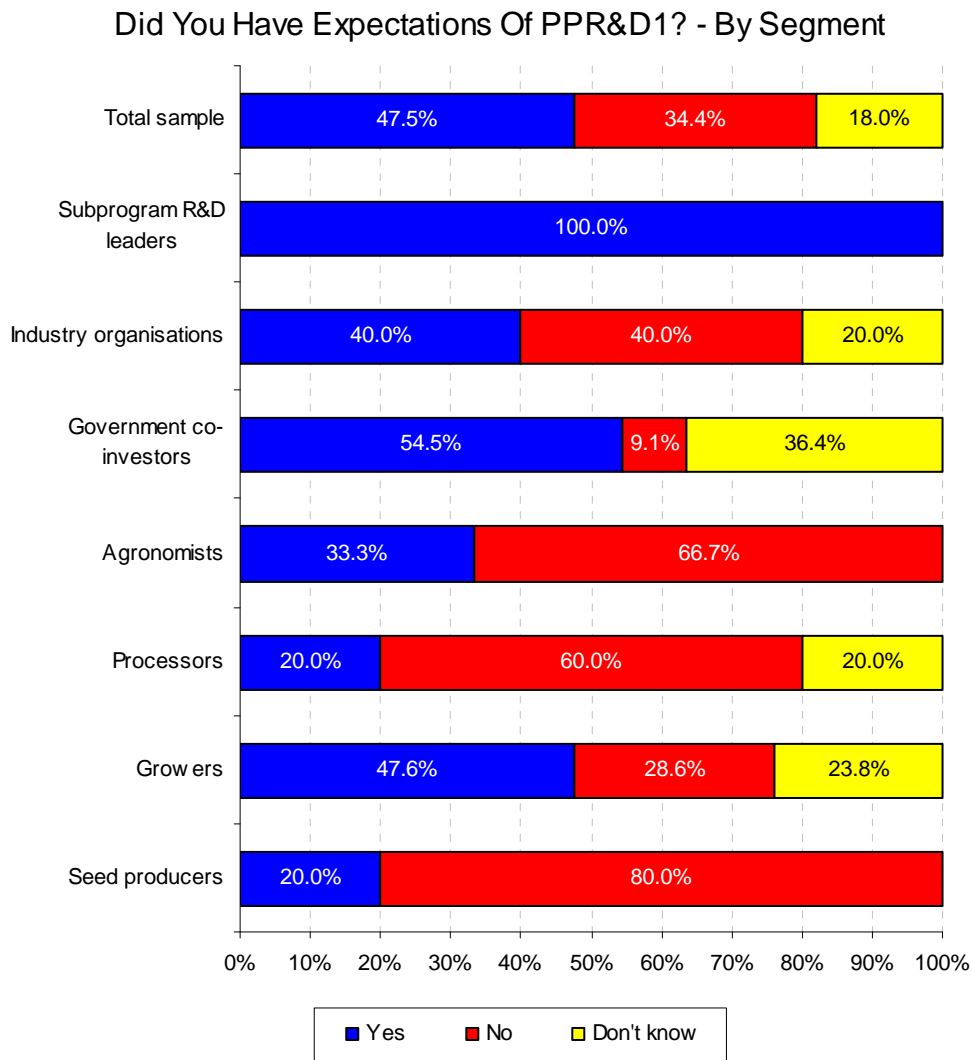


3.1.5 PPR&D1

Expectations

Around half of respondents said they had expectations of PPR&D1 (47.5%), while 34.4% did not, and 18.0% said they did not know.

Significantly more respondents from the subprogram R&D leaders segment had expectations of PPR&D1 at 100%, compared with 40.0% from industry organisations, 54.5% from government co-investors, 33.3% of agronomists, 20.0% of processors, 47.6% of growers and 20.0% of seed producers. In contrast, significantly more seed producers, agronomists and processors did not have any expectations (80.0%, 66.7% and 60.0% respectively):



Base=61

A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in expectations of PPR&D1 by segment. The results are significant at the 5% level of significance.

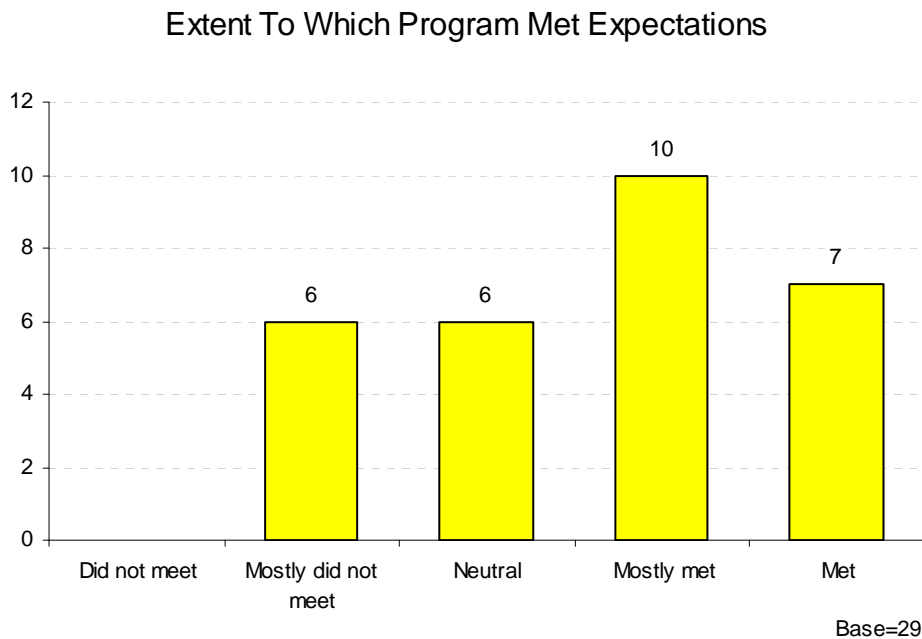


As you would expect, when asked to comment on the nature of their expectations, the largest group of respondents said they expected PPR&D1 to address disease mitigation or deliver diagnostic tools (n=11 mentions), but others mentioned improved productivity or improved collaboration (n=6 and 5 mentions respectively):

Expectations of PPR&D1	Total No. Mentions
Disease mitigation	8
Improved productivity, remain competitive	6
Improved collaboration	5
New or improved varieties	3
Diagnostic tools or tests	3
Integrated research	2
Production efficiencies	2
Improved communication	1
Increased funding	1
Lower production cost	1
Other	2
No expectations	1



Of the 29 respondents who had expectations of the PPR&D1 program, 10 said the program mostly met their expectations and 7 said it met their expectations. Of the balance, 6 respondents respectively said they were neutral or the program mostly did not meet their expectations:



When asked to explain the extent to which PPR&D1 met their expectations, those who said the program met or mostly met their expectations commented on the potential for the techniques developed through PPR&D1 to be adopted by the industry in the near future. In contrast, those who said it did not meet their expectations mentioned the relatively short time-span of the program, saying it would not be reasonable to expect all outcomes of the program to be reached so soon after its start:

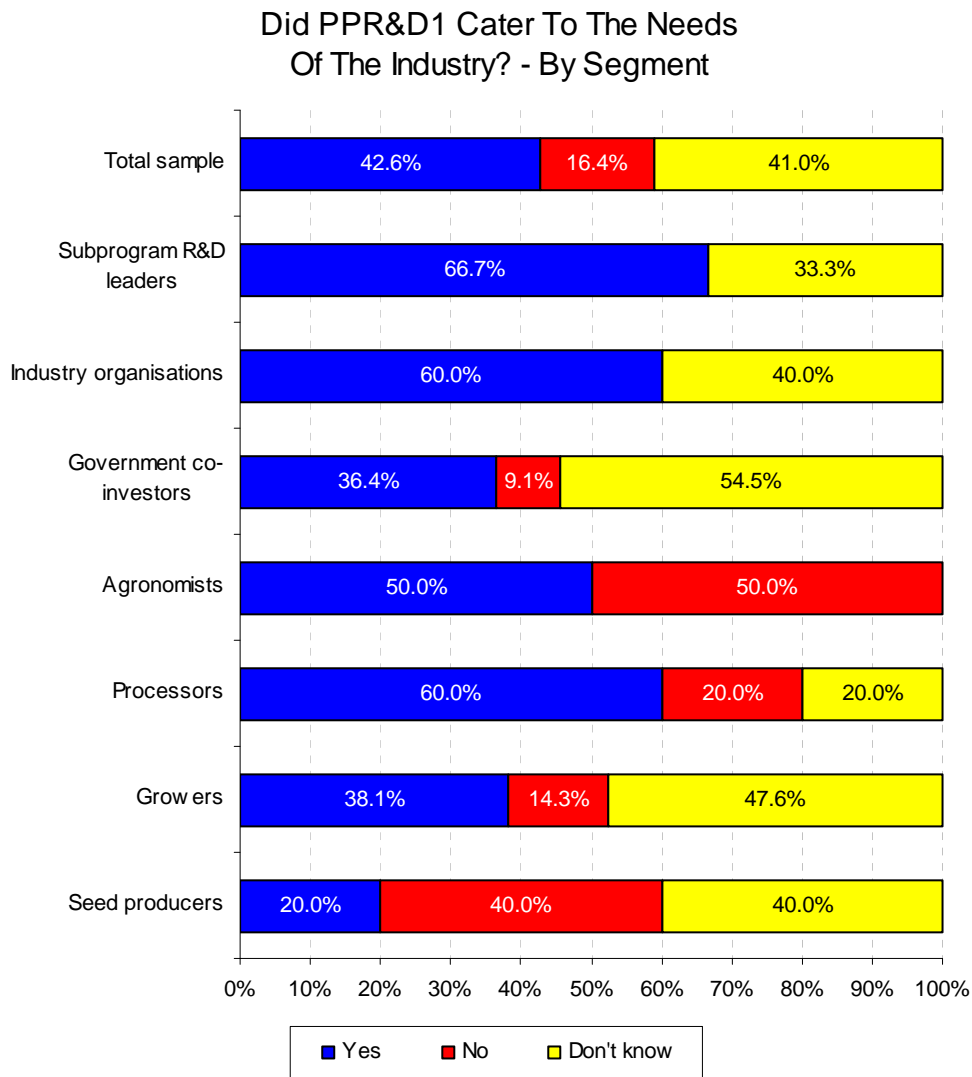
- "Well, I think at this stage and bearing in mind, you know, you've only got the first 5 years, you can't expect starting from the base they started from, you can't expect things to be ridiculous but I think some of the data, some of the soil surveys, some of the survey work that's been coming out has been very useful. We've used that information, it's helpful. I think, as a rule, I think it's been good. I think they have to be very careful how they spend the money on the next stage but you're probably going to ask about that anyway. It has been quite good" (Government co-investor)
- "I think in terms of the whole program, there's been increased integration as we go and it started from a fairly low base, I have to say, so that the integration across the different subprograms was not good at the start. I think it's increasing all the time. I think now, 3.5 years in, we can start to point to, we've got diagnostic tests that within the next few years the industry can have access to and use" (Subprogram R&D leaders)
- "Not much at this stage but there was probably also an understanding that it wasn't the sort of thing that would be even tangible in terms of its measurement over a 5-year period and it would probably take more like 15 years to get solutions to some of those issues" (International processors)



Relevance

More than a third of respondents said PPR&D1 catered to the needs of the industry (42.6%), while 41.0% did not know and 16.4% said it did not cater to the industry's needs.

Relatively more respondents from the agronomists and seed producers segments said PPR&D1 did not cater to the needs of the industry (50.0% and 40.0% respectively). In contrast, relatively more respondents from the subprogram R&D leaders, industry organisations and processors segments said PPR&D1 did cater to the needs of the industry (66.7%, 60.0% and 60.0% respectively):



Base=61

A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in whether PPR&D1 catered to the needs of the industry by segment. The results are not significant at the 5% level of significance.



When asked to comment on the extent to which PPR&D1 catered to the needs of the industry, those who responded favourably highlighted the benefits of a consolidated research program based on consultation with industry stakeholders. Respondents who qualified their response said there is more work to be done to deliver results, the program does not address the needs of growers in Western Australia, or communication could be improved. Those who said PPR&D1 has not catered to the needs of the industry mentioned a lack of tangible results or poor communication of results as the main reasons for their concern:

PPR&D1 Catered To The Needs Of The Industry

- “From my perspective it has addressed a certain sector within the industry which were basically around pathology” (Plant breeding program coordinator)
- “Key needs of the industry? Yes, I would say in addressing the topics that were set out to address, I would say it's gone a step towards addressing those. Not necessarily in all areas. I think some areas we're still lacking but...” (Subprogram R&D leader)
- “So I think, yes, it addressed the needs that were identified at the time. Now, I think, the needs of the industry have probably changed a little bit over the 3 to 5 years but the program, I think, is addressing what the industry wanted it to address at the start” (Subprogram R&D leader)
- “It took all the issues concerned to different groups and structured the research program to address them - it went a long way to answering, to correct a lot of programs...perceived in the industry” (Agronomist)
- “The problems identified, they obviously came from grass roots growers in different areas, people felt they could come up with solutions to fix [the problems]” (Grower)
- “In the first instance we have the breeding program where we're looking for disease resistance for those diseases, and that's a valid project in terms of improved detection systems within laboratories, and that's a valid area to work in. Then from a soil health point of view, we look at soil amendment and soil condition and rotation crops, renewal crops so that's more at our level” (Grower)
- “I think the R&D plan was worked out in consultation with industry - the industry had a chance to set priorities and have...included in the program” (Seed producer)
- “...what this has done is actually given a program approach to research where there has been some identified issues and that were actually consulted with the growers who were facing these problems. They identified the issues and the investment has been made in what they see as being their production issues” (Government co-investor)
- “My feeling from the meeting I did go to and my discussions with our own researchers was, yes, the program has been successful. I think that the growers have been involved and ensuring committee of the program is representative. I think that they've also been conscious of not recreating things that were in operation in other areas of the world, so I think they've maintained good international links” (Government co-investor)
- “I'd say they've gone a long way to it. Tomato spotted wilt has been a very serious one. I mean looking at the last, subprogram 5, I think it was, that potato leaf roll virus [PLRV] is another important one in terms of insect control and say for transmission of potato leaf roll virus” (Industry organisation)
- “At the time it did. It hit the spot we were looking at the time. I'd agree [and Paul's nodding, so taken as a yes from other international processors in the focus group]” (International processors)



PPR&D1 Catered To The Needs Of The Industry To Some Extent

- “Partially, it addressed some of the goals and objectives, provided grounds for moving forward into the future” (Agronomist)
- “With the DNA testing and the work that Tony Slater did is quite useful - came up with some bright ideas. Nigel's things were not quite the results we're looking for. The 10-metre strips - a lot to be learned out of that” (Grower)
- “It's addressing them but there's a long way to go. Getting adoption, getting people involved, and I think that's going to be one of the big challenges confronting both groups, in fact. Both groups have tried different things and we haven't really come up with something that people are happy with. Getting that information out there. Somebody explained to me that there is no right way, there's a whole heap of wrong ways and you just have to perceive all the time. I think we could do a lot better” (Government co-investor)
- “Well, it's um, the research is centred on the eastern states, so Tasmania, Victoria and South Australia, and my understanding is they're looking at a big thrust on diseases and some of those diseases are important across Australia but you know they're looking at common scab and that's not such a great issue in WA. Well, we did a disease, insect and disease survey a few years ago to try and look at our research priorities and we found that pest and diseases really didn't cause a great deal of damage to our industry. I'm not sure exactly, we didn't look at the reasons for it, we were just trying to quantify it” (Government co-investor)
- “Not completely. I think there is a lot of things they could improve, but certainly compared to vegetables, there's a massive improvement anyway” (Government co-investor)

PPR&D1 Did Not Cater To The Needs Of The Industry

- “We've had no positive feedback - if we get no feedback and we're not using anything that comes out of it, they're useless [programs]” (Agronomist)
- “I don't think it was focused enough in understanding the needs of industry, it was too academic and focused on the needs of the research organisations” (Agronomist)
- “South-west Australia were left out so it didn't cater to our needs at all” (Agronomist)
- “A lot was done for the industry generally but not for me specifically” (Grower)
- “Bureaucratic bullshit! It did not help the farmer in the paddock. We are still battling the same problems as 10 years ago. It's costing us money and there's no results for our input” (Grower)
- “Basically I think some of the ground has already been covered and I think we need to move on - more lateral thinking” (Local processor)
- “I haven't had a lot of information - it hasn't filtered down to us” (Seed producer)
- “Not entirely. It's not available to the seed industry because I wouldn't do what they wanted me to do with them. Availability was blackmail” (Seed producer)



Successes And Shortfalls

Respondents nominated disease mitigation, including the DNA probe and diagnostic tools, and collaboration and information sharing as the main successes of PPR&D1 (n=21 and 7 mentions respectively). According to respondents, lack of inclusiveness and poor communication, whether internally or with growers, are the main shortfalls (n=8 and 10 mentions respectively):

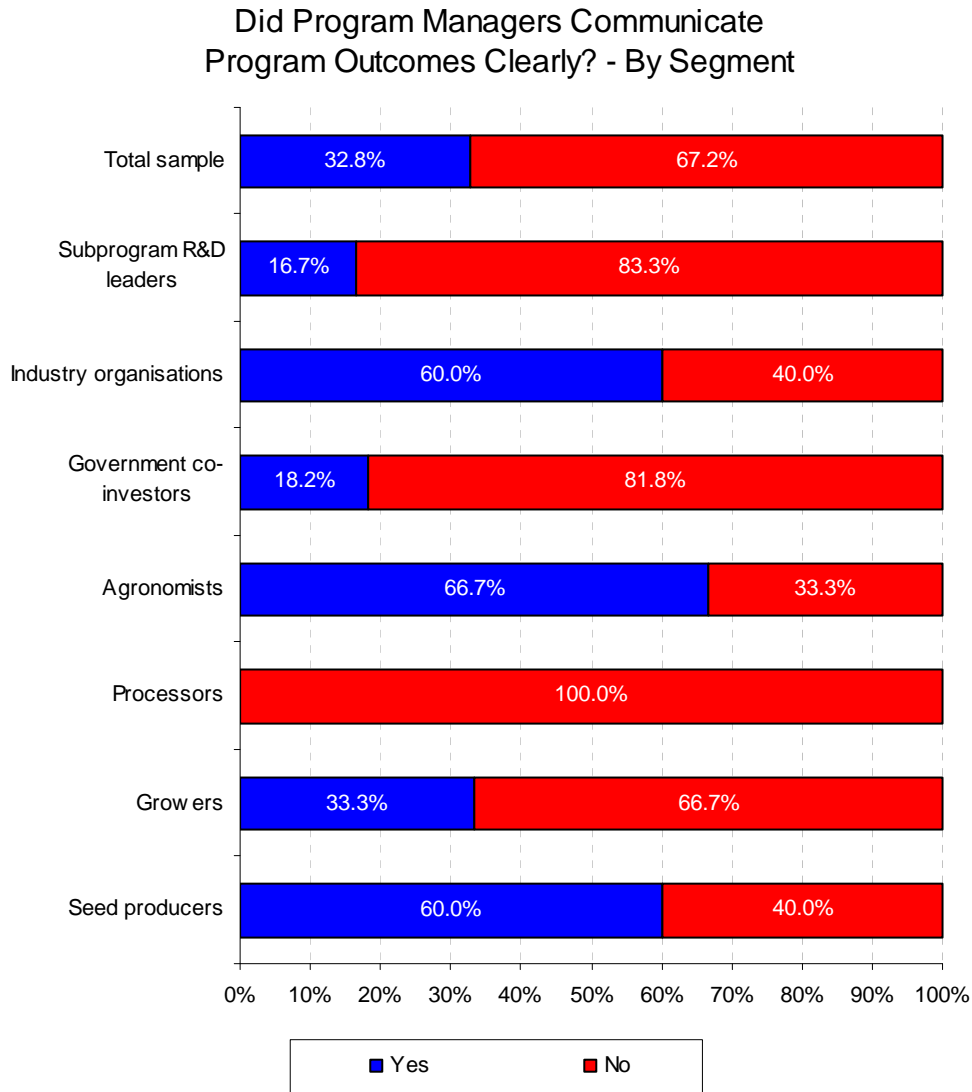
PPR&D1			
Successes	Total No. Mentions	Shortfalls	Total No. Mentions
Disease mitigation	12	Not inclusive	8
Collaboration and information sharing	7	Poorly managed or poor internal communication	6
DNA probe, disease control	6	Lack of communication with growers	4
Crop rotation	3	Not familiar with the program	4
Not aware of program	3	Delays in trials	3
Not aware of the results	3	No shortfalls	3
Diagnostic tools	3	No new or better varieties	3
Strategic direction	2	Lack of agronomy-type research	2
Improved grower skills	1	Lack of funding	1
Increased grower awareness	1	Not aware of results	1
New varieties	1	Poor strategic plans	1
Other	6	Too theoretical	1
Don't know	14	Other	2
		Don't know	17



Effectiveness Of Program Communication

Around two-thirds of respondents (67.2%) said program managers did not communicate program outcomes clearly, while the remaining 32.8% said they did.

The results by segment are generally consistent with the total sample, although relatively more respondents from the agronomists, industry organisations and seed producers segments said the program outcomes were clearly communicated (66.7%, 60.0% and 60.0% respectively):



A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in whether program managers communicated program outcomes clearly by segment. The results are not significant at the 5% level of significance.



Of the majority of respondents who said program managers did not communicate program outcomes clearly, growers commented they either had no awareness of program results or communication of the results did not address farm practice at a practical level. Some also mentioned the variable quality of presentations delivered by program managers. Respondents from the government co-investor and subprogram R&D segments commented on friction between TIAR and AUSVEG, friction among researchers and poor administration. There was mixed feedback on the adequacy of the PPR&D1 communication strategy and level of resourcing for extension, but in general, respondents acknowledged communication among stakeholder groups as a program shortfall.

Suggestions for improving communication included professional branding for PPR&D1, a scorecard reporting system for industry stakeholders, especially growers, grower forums for sharing knowledge about best practice and practical information tools for growers:

Growers

- “It didn't reach all growers, it's a massive problem to get growers together, get them to read” (Grower)
- “I haven't heard anything from them” (Grower)
- “I was asked for some information about crop rotations at the beginning but haven't heard anything else about it so I don't know. I haven't heard anything about the outcomes” (Grower)
- “The information was there but it was difficult to comprehend and digest into anything I could use” (Grower)
- “How do I answer that? It's not that I don't know, it's a question of what is the communication, that's not the word I'm looking for, what is the methodology for getting the message out. It's very difficult to get messages to growers. Look, I've struggled for 25 years to get them to read their weekly newsletter. It is difficult and I think probably, grower example is probably the best way, the field day is the best concept I think is probably the best. You go into a paddock, the guy digs a paddock up, he said he's got his carbon nitrogen ratios right, he's done this, he's done that and you see 30 tonne of potatoes on the ground, you say there's something in what he's doing. So if you want to grow good vegetables start growing one next to a Chinese farmer. That's the old adage. I grew mine next to a Dutchman and that's why I was successful” (Grower)
- “As a grower I really, I say I don't care, I don't care how they get there, I don't need to know the technicality of it all, I just need to understand it at my level, so they've got to make their research connect to the farm practice” (Grower)
- “Farmers have a defeatist attitude. It's a bit of negativity. They say 'Not another government initiative that's not going to end up anywhere'. Farmers like to see results. There's a lot of things going on that people aren't up to speed. Maybe it's just a communication thing with government groups and farmers” (Grower)
- “They are work in progress. All in the IAC have been disappointed a little bit with the reports, they go back to us, and we've chipped them on it, there was a case where they did a presentation in Tasmania, in Burnie one day to the industry and then they turned up and just shafted out, repeated what they did the day before to us. Well, you know, we're the ones who commissioned the bloody thing. We told them to get a bit smarter in what they present” (Grower)



Program Managers And Government Co-investors

- “Very poorly and it's not the subprogram leaders' responsibility to do so either. At the beginning of the project they identified that there needed to be a communications program that would deliver that information through. It was felt that if we, if the subprogram leaders actually go out and extend their work then it would be taking them away from the research that they were doing. There would be a conflict potentially, so originally there was a subprogram within the PPR&D1 that focused on communications but with the change in coordination of communications, that disappeared and I think it's something that's been highlighted many, many times, is that we don't have a solid communications program as part of the PPR&D1” (Coordinator)
- “The communication function is actually part of AUSVEG, which is another institution. Now there has been some friction between TIAR and AUSVEG, as far as communication and who should be doing what and changes in, my understanding is that, there was one understanding at the start of the program and then things changed halfway through and there was some confusion about that change” (Government co-investor)
- “I wouldn't put the fault on the subprogram leaders per se, I would put it more under, the set-up of the program hasn't actually allowed for them to do that because there's no funding in the program for extension. So where the only funding for a communication extension that has been funded through *Potatoes Australia*, a website and the branding and because of that, that has been done but there's no funding for extension. So people who want to do extension can't because they just don't have the funding in their budget. I think that's more the problem” (Government co-investor)
- “The issue is that it hasn't been very well communicated and I think that makes it hard to judge whether or not it's met industry requirements because, sure, the science is good, but if we don't get grower uptake or grower adoption it's kind of pointless, I would say, to actually get good science without the growers actually up-taking that” (Government co-investor)
- “No. I think there's been a huge issue in the program between the coordinator and some of the subproject leaders. Well, I've had absolutely no feedback and I mean no feedback...I think just, it's just basic incompetence and there's no value put on communication. That's the difference” (Government co-investor)
- “Look, not very well. I mean a lot of it has been, it is difficult because they're looking after communicating to all the technical committees but I don't actually think that's been hugely successful. I think, yeah, there's certainly been a lot of disgruntled researchers...It just needs to be managed properly and having the things, when you say you're going to have the things, then do it, and better administration. Having meetings with proper agendas that the researchers know what they're for and all those sorts of things...I think they need someone...who actually drove, I guess the profile of it and getting in collaborations and working overseas and getting more students involved because the individual researchers just don't have enough time to do that” (Government co-investor)
- “It varies across personalities. Some of them you really wouldn't want them out there extending stuff because they're just hopeless at it and others, really you know, are extremely good. When they walk in the room you just know if they're a good extension officer. Just the way they handle themselves, the way they dress, the whole thing” (Government co-investor)
- “Well, I'm on the program manager's side of the fence and I think that there have certainly been problems in communicating from time to time, and from our point of view, at times the expectation of what we should be presenting to the meeting hasn't been clear enough” (Subprogram R&D leader)



Communication Strategies

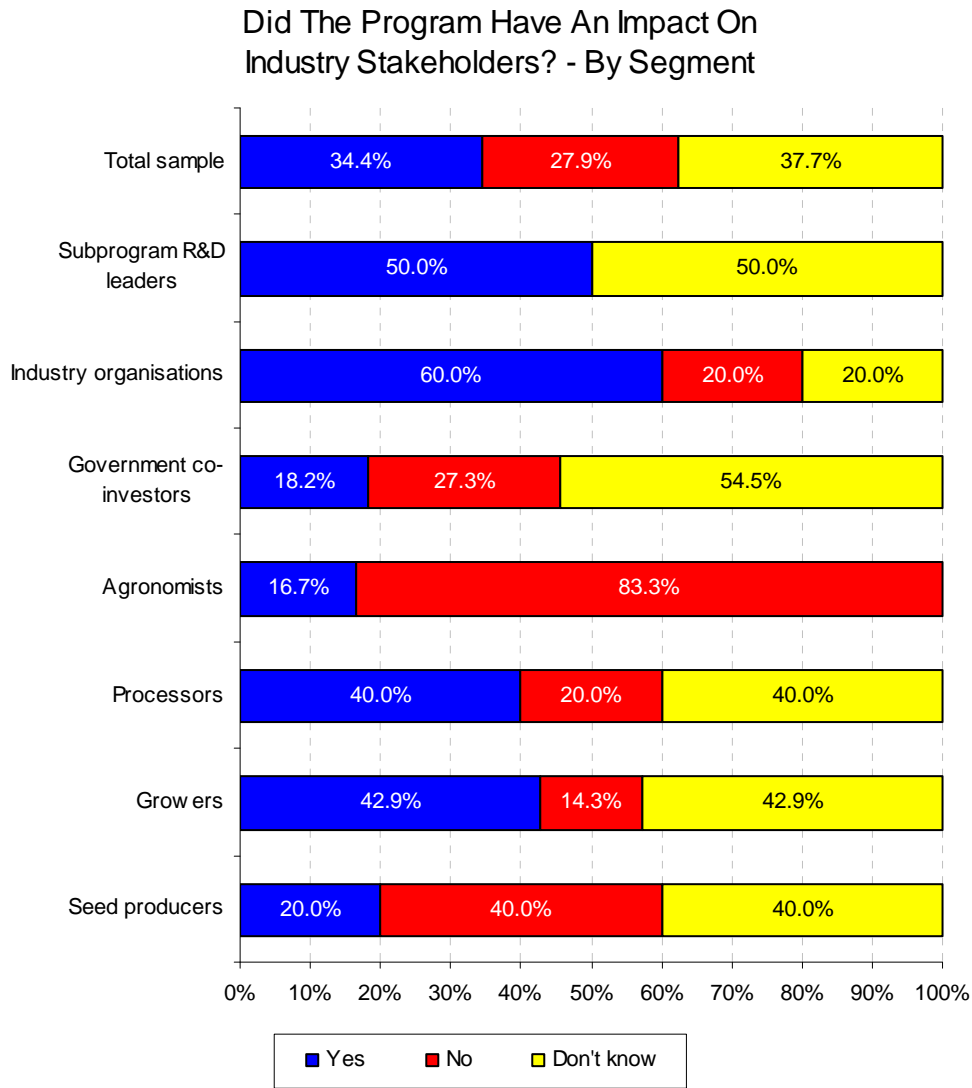
- "...the quality of the communication has improved dramatically in terms of the format of the program and with some marketing expertise and communications expertise brought in by AUSVEG. And this is my perspective, recognising that we needed to try and brand this program" (International processor)
- "I don't know how to answer that one, I would probably say not widespread and that's because we're not badged...the industry probably see me presenting rather than they see the program presenting so although we've got all the badges and all the logos and everything like that and I think that even goes for the organisation, they don't probably even see CPI presenting, they probably see me presenting and that's the way, I just think that's the way it is. So I think if you said who's the PPR&D? Most growers would say they don't know who that is. Who's Horticultural Australia? They know who that is, AUSVEG, they know who that is, who's DPI, they know who that is but I don't think there's an identity of the program. Whether that matters, I don't know" (Subprogram R&D leader)
- "Well, we all work in a corporate world of scorecards. Web-based scorecards are part and parcel of everything we do and I think to have these guys accountable in some form of agreed scorecard that gets married up so that we all have visibility about where it is, I think will help them in that they'll get more feedback rather than assume that it's all happening and just wait for the annual report. I'm not sure any of us want to do that. It generates accountability too. It's a good idea...I don't think there's any one communication method that works. We have to be prepared to use all of them, you know. One of the things that I've noticed with most growers is that if you send a communiqué to them, whatever it is needs to be on one page, relevant at the time and something they can read over their cup of tea at morning tea time. If it's any bigger or any longer, it will get put on top of the mantelpiece and forgotten about, guaranteed" (International processor)
- "For the industry, I suppose I'm unique in that I can speak across the 4 programs I'm involved with. For an example of the communication level that we would be doing with industry is, since the inception of this program I've taken the approach that our field trial sites that we have, have a field day at the end of the season where we invite the local growers to that area. They come and actually see the field trials, see the results for themselves. Whether it worked or didn't work I don't care. It's about showing that we tried this and 'Hey look, it doesn't work guys, so don't bother using it yourself' and what we do at those field days is we have members of my team presenting the different aspects of the program that they work in" (Subprogram R&D leader)
- "...I don't think field days, field days don't work, growers won't go to them, so, I think, you have tie into other things that growers are going to anyway...there's been a lot of talk about 'How do we get face to face communications?' and all these sorts of things but I think that's something that they need to do more of. Probably in terms of being able to produce more materials that can go directly to growers. Probably guides and things like that, they could probably do a few more things of those, just on-farm stuff" (Government co-investor)



Impact

Around a third of respondents (34.4%) said the program impacted on industry stakeholders, while the balance (65.6%) said it did not have an impact or they did not know (27.9% and 37.7% respectively).

By segment, the results are generally consistent with the total sample, although relatively more respondents from the agronomists segment said the program did not have an impact (83.3%) and relatively more respondents from the industry organisations segment (60.0%) said it did:



A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in the impact of the program on industry stakeholders by segment. The results are not significant at the 5% level of significance.



Respondents who said the program impacted on industry stakeholders commented on the benefits of information sharing and increased cooperation, whether among growers, processors or state-based organisations. A number of respondents said the material benefits of the program are yet to be delivered, stressing the need for more effective communication to growers given the pressing issues they face in the short term:

- “Giving stakeholders the tools to overcome problems such as common scab, Rhizoctonia, powdery scab” (Grower)
- “Because it's all been spoken about everyone is more aware of what's going on” (Grower)
- “For some, yes, how to manage the crop in their particular circumstances” (Grower)
- “Yes, because there's been information sharing between growers in Victoria, but we've travelled down to Tassie and we've been invited down there” (Grower)
- “I think so in that it's got people excited about how we're going about things. We've got all the states working together much better” (Grower)
- “Better training for our growers and more information” (Local processor)
- “It got them working together a lot more than they used to which is good thing” (Local processor)
- “I don't think the impact has yet been felt. I think it will. It had had impact but probably more of its impact has been on the science rather than directly on the industry stakeholders” (Coordinator)
- “I think it's had an impact but I don't think the knowledge transfer has necessarily gone out to the growers. Well, the fact that the industry wants to continue, they feel confident about continuing with the investment in the program, that it's a good model, that it's being adopted by other industries as an integrated approach to perhaps what they want to do. That the investment has followed through, like for 5 years” (Government co-investor)
- “I would say it has had an impact on industry stakeholders because they have done some good research and the information is starting to get out there, key people in the Ballarat region. They've got a little bit of information out, so I think a few key stakeholders have seen benefits from it and I think the rest would benefit if they were actually communicated to” (Government co-investor)
- “Definitely, I'm very supportive of some of the areas...A lot of the growers aren't interested in long term and you know, they might not be here in a few years time. You never know if they're running out of water and that's why the breeding thing is a waste of time too, just quietly, because it takes so long and are they really going to measure those benefits at the end? I'm doubtful about that” (Government co-investor)
- “Stakeholders, at this stage I would say it hasn't had a major impact. We are still generating the results. There's been some collateral type of impact that I didn't think about and one of those is that the processing companies actually talk to each other. That started because of the technology bit. It's common ground, it's not a competitive ground and those barriers are breaking down. Even now talking about doing promotion, generic promotion of data and I think the PPR&D should get those lines of communication between the processing companies” (Government co-investor)
- “No, but that's not a negative, though. The DNA project is huge, I think that's got the most long-term potential but not short-term” (Industry organisation)
- “It can only have an impact on industry stakeholders through those communication activities. Only when they're aware of the results of the program can it actually have an impact on it” (Plant breeding program coordinator)

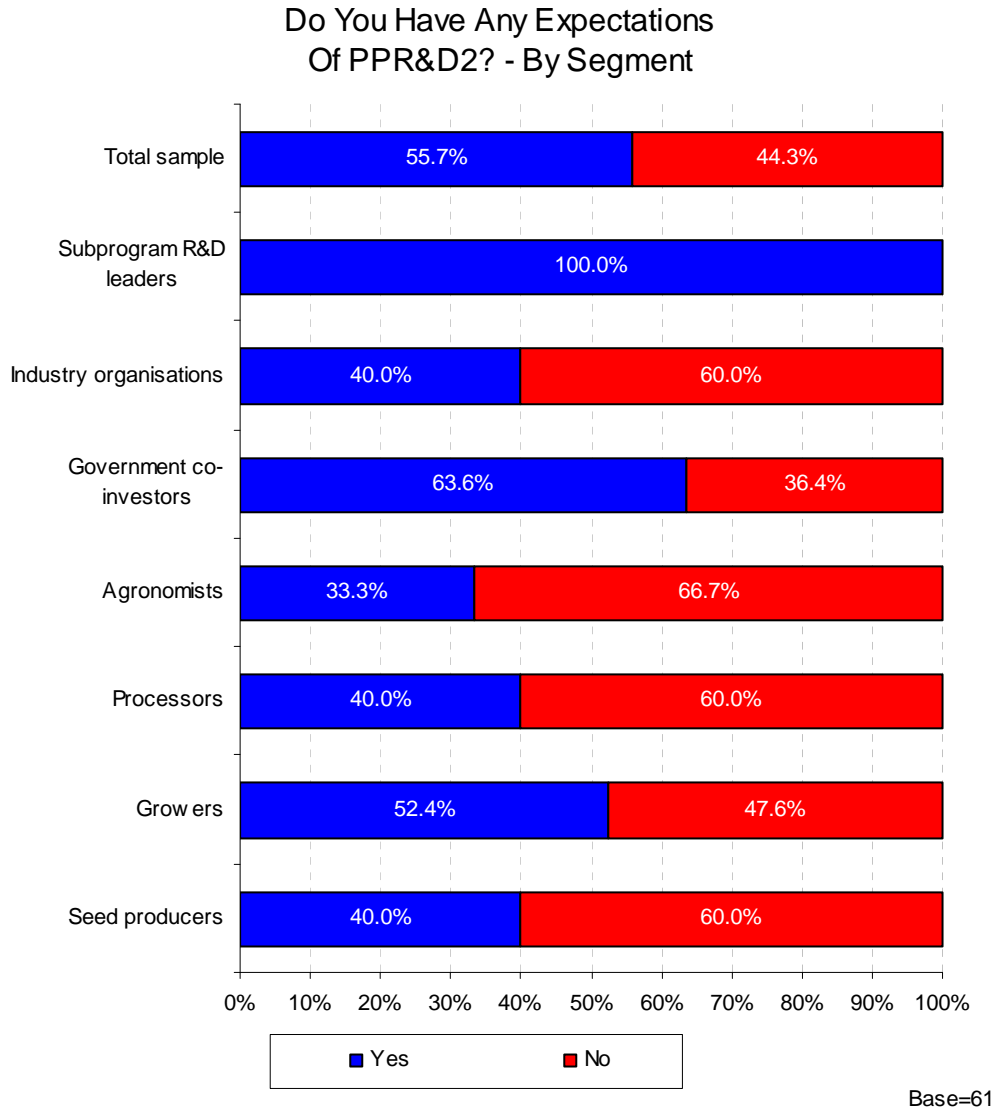


3.1.6 PPR&D2

Expectations

Just over half of respondents said they have expectations of PPR&D2 (55.7%), while the remaining 44.3% do not.

By segment, the results are generally consistent with the total sample, although as you would expect, all respondents from the subprogram R&D leaders segment (100.0%) have expectations of PPR&D2:



A chi square test was conducted at the 5% level of significance to determine whether there is a significant difference in expectations of PPR&D2 by segment. The results are not significant at the 5% level of significance.



Respondents, especially growers, identified delivery of the objectives of PPR&D1 as a key expectation. Other respondents called for an extension of PPR&D1 objectives to address sustainability, production efficiency or a strategic approach to international collaboration. A minority of respondents stressed the need for effective consultation with growers and extension to ensure the program remains relevant and supported:

Continuation Of PPR&D1

- “Research that follows on from PPR&D1” (Agronomist)
- “More of the same. Streamline it so we get more for what we put in - more value for money” (Grower)
- “I'm looking forward to it. It is quite exciting, this one, because personally we can gain a lot of information, with the soil DNA and pathogen levels, as seed growers it's important for us to have a lot of information for us to do the job as well as we can” (Grower)
- “Getting the DNA tests going properly. A bit more help with Rhizoctonia (Grower)
- “To start to use some of the DNA probes - I haven't had enough information on it to answer” (Grower)
- “Deliver what it's promised” (Grower)
- “It will complement the first part to the program and have good research results to send out to the industry” (Grower)
- “Well, I would like to really see the soil diagnostics. The soil DNA diagnostics become a practical tool for farmers, not a science tool but a practical tool for farmers” (Government co-investor)
- “I would say that some areas of the diseases should be maintained because, not only, I think soil-borne diseases is an important area for the industry but also at the same time I don't think it would be very smart to have a program for 5 years and then just cut it off and continue into a completely different area. I think there has to be some clear scientific linkages between the 2 programs” (Government co-investor)
- “Well, I think, I would be disappointed if there's no focus on continuing the soil-borne disease work and I would like to see it more integrated and I'm speaking now really from my perspective. I would like to see that there's a focus on a pre-commercial phase for delivery of the DNA testing technology to industry and that's tied very, very strongly to management strategies” (Subprogram R&D leader)

Extension Beyond PPR&D1

- “I would like to see PPR&D2 perhaps a bit more broadly based” (Government co-investor)
- “...there are some problems we all have, energy is a main one, the cost of production - we need solutions on how can we combat the inflationary pressure on the cost of production: diesel, fertilizer and chemicals” (Grower)
- “That it will lead to improved use of and efficiency of water and fertilizer. Industry adoption of new varieties” (Grower)
- “I'd like to see a major pilot project set up in either Northern Territory or north-west Australia or it could be mid-western Australia depending on the water and I'm thinking now of the Fitzroy River system and that's where I think the water will need to come from” (Industry organisation)
- “...to still use R&D of course as the key, certainly need, we've said it before, the environmental sustainability side of things, whether there's opportunity to link that collaboration-wise internationally. I'm sure it's an issue for many other countries, so what work is being done there?” (International processor)



- “The main priorities, I get the feeling are probably shifting a little bit. The focus of PPR&D1 is very much on plant pathology and as I mentioned earlier I really think the focus of agriculture as a whole is probably going to change quite dramatically. My feeling is we probably need to look more at how we grow spuds, potatoes. Looking at farming systems, looking at methods for improving water use efficiency. Soil health is another one that is critically important” (Coordinator)
- “...to capture some of that unrealised production potential that's out there in industry. The focus has been on diseases as a way to do that in the past. Maybe there are some other aspects of production that we're not addressing that maybe have a bigger impact. Whether that's seed or irrigation I don't know” (International processor)
- “You get one chance and only one chance so in risk management of agriculture production, the concepts will be to reduce those costs that can be reduced and yet maintain the productivity and hope that the prices of the commodities increase efficiently to give that farmer a return” (Subprogram R&D leader)
- “I think it needs to do more international collaboration. It needs to increase its profile and become a brand for Australia so they can start marketing their sort of research or something and they need, definitely, to propagate more PhD students and then look beyond diseases. They really need to think a bit broader than that. Things like improving supply chain problems and marketing processing and putting a bit more effort into those” (Government co-investor)
- “We need to take on more partners and that might mean we lose control. We might become a junior partner in a bigger scheme, bigger international scheme but that's fine. My other expectation would be that if we could generate more PhD students and more researchers who wanted to stay with doing agriculture research that would be a major achievement. The guys we've got now, their average age is 40 to late 40s. So we've only got them for another 15 years and we really need a new crop of people to be coming through and that, so that's a major challenge” (Government co-investor)
- “That we tighten up and extend our connections with overseas people, that would be one. Specifically, Canada at this stage, and the UK. The UK have very good models of extension work” (Grower)

Effective Program And Communication Management

- “I would say the program has to be structured properly. So it has to be structured allowing input from all the different stakeholders but at the same time not becoming too much of a bureaucracy and too many committees and too many meetings and too many reviews. That's what I've heard a lot and I feel myself that there is a lot of committees and there's a lot of reviews” (Government co-investor)
- “I suppose, any expectations, well, I guess, industry consultation to ensure that the research programs are what is needed by the different people in the value chain” (Government co-investor)
- “My expectation would be that we would have some fresh new projects into this and we would use some of the researchers that are sitting below the fellows that have previously worked on it...I think it needs to be embraced more so by the processors and I suppose conveying that through the magazine but also conveying it through the Smiths and the McCains of the world to their growers because they have their growers and they hold many field meetings, for example...they have extension going on. I would have thought that would be a great vehicle to use” (Government co-investor)
- “An industry development officer is required to ensure all these messages get out because even people like Nigel Crump who go out of their way to present his results, that's not his main focus, he has to focus on his research and keeping his team organised and his program” (Industry organisation)



Priorities

Consistent with their expectation of the delivery of PPR&D1 objectives, the largest group of respondents nominated disease mitigation and delivery of the DNA probe as priorities for PPR&D2 (n=26 mentions). Respondents also called for new or improved varieties (n=13 mentions) and smaller groups mentioned lower cost of production, improved communication improved water or fertilizer efficiency and sustainability (n=4, 4, 3 and 2 mentions respectively):

Priorities For PPR&D2	Total No. Mentions
Disease mitigation	19
New or improved varieties	13
DNA probe	7
Lower cost of production	4
Improved communication	4
Improved water or fertilizer efficiency	3
Sustainability	2
Improved collaboration	1
Improved productivity	1
Other	4
Don't know	7
Not aware of program	6



Level Of Involvement

Most respondents confirmed the current stakeholders in PPR&D1 as groups which should be involved in PPR&D2. Other respondents commented on the need to balance state involvement, for example, Western Australia's involvement, to encourage the involvement of the retail trade and to attract the best local and international researchers. One respondent highlighted the opportunity to attract research expertise from the private sector or environmental groups, should PPR&D2 include a program to address sustainability:

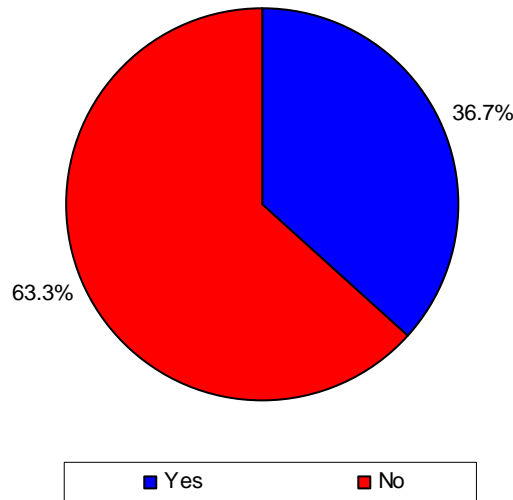
- “Scientists, processors, growers, and fresh market retailers and supermarkets” (Grower)
- “All the stakeholders in the industry including processors and the growers and the best potato researchers in Australia and from overseas” (Grower)
- “...sadly we rarely see the retail section involved in these programs but people like the supermarkets could actually be delivering some inputs into the way things are going. No, I don't know because it's a problem that exists in all of our sectors. They tend to stand back a bit, it seems to be a cultural thing with Coles and Woolworths. I think they probably do need to be drawn into these things a lot more” (Government co-investor)
- “...Definitely the growers, definitely...and actually the processing companies, but they've got to think beyond the 4 majors. There's actually 40 processing companies in Australia” (Government co-investor)
- “Clearly the levy payers are major stakeholders but probably even more importantly the states that grow potatoes are going to be the bigger than they have been in the first program, the bigger stakeholders. About two-thirds of the total project comes from the service providers and only one third from the industry levy, so clearly there is a fairly wide range of industry stakeholders. I don't think we've engaged as well as we perhaps could have done with some of the other states including Western Australia and NSW and Queensland and I think we probably need to look at those stakeholders and look at some of their strategic directives a little bit more closely” (Coordinator)
- “...you might also start including other people. For example, if environment was included, I used environment because it's an easy example I guess, environment was included you probably would start considering different organisations, maybe the private organisations or more environmentally focused organisations. Not necessarily your universities and your Departments of Primary Industry that we currently work with. That's important that those stakeholders are involved and not just involved at the last minute but involved as soon as possible throughout the process when you're actually deciding on priorities because it takes them a long time to decide in their system what their priorities are, whether they have the resources available and actually start building capacity within the organisation to be able to handle that sort of stuff. That's important as well and then broadening it out into international organisations as well” (Government co-investor)



Potential Programs That Should Be Funded By PPR&D2

Almost two-thirds of respondents (63.3%) said they did not know of any potential programs that should be funded by PPR&D2, while the remaining 36.7% said they did:

Do You Know Of Any Potential Programs That Should Be Funded By PPR&D2?



Base=60

A minority of respondents mentioned research into nematodes, storage of potatoes, disease mitigation of seeds, impact of water use and climate change, and extension as areas of research that could be funded in PPR&D2:

- “The budget on PPR&D1 was tight, some projects were put aside, for example, research into the potato cyst nematode” (Grower)
- “There needs to be more work done on the areas that were knocked back last time. The nematodes for instance. There's not a lot of work done on nematodes and if you're coming into the processing side of things, some of the nematodes are really quite an issue” (Government co-investor)
- “It's not an existing program but there should be a program to demonstrate the benefits of the Kestrel variety. The issue with the Kestrel is that there is not much seed around. The sheer volume of the seed is not available. I struggle to get the 50% of my seed requirements that I need with the Kestrel” (Local processor)
- “Lack of research on storage side of things - seed potatoes have been ignored but have a huge impact on the final generation of potatoes as a commercial crop, no funding going in - we're funding it because we think it's important but there needs to be a focus on it” (Seed producer)
- “Well, we would like to have a focus, as a result of some of the work from PPR&D1, we would like to have an increased focus on seed so, once again, with the diagnostics we're finding that there is a lot of pathogen on seeds that, so that we really need to focus on seed as well as soil” (Subprogram R&D leader)



- “I would like to see some research done into storage of potatoes because I think that's going to get more and more demanding because to grow winter crops is very difficult. That's why you run in the winter times, if you get the right elements going with you, you get the crop. If you get the elements going against you, you go broke. I think there's a bit more research has to be gone into that. There's other countries that store potatoes like 6 months of the year, why can't we do it in Australia?” (Grower)
- “...our potatoes aren't a seed, they're a plant cutting which is doused in disease, it carries a huge amount and all we're doing is taking whatever disease our seed grower has got and adding it to our farm. Whereas if we could actually inoculate that with something that we've, not something that wipes out whatever else is there, but is actually more beneficial, that's where you could start winning a few runs, I reckon” (Industry organisation)
- “There's a number of areas in PPR&D1 that weren't funded and it went through a series of funding cuts but I guess the more relevant question is 'Are they still priorities for PPR&D2?' I don't see them as being as strong priorities as the ones we've just discussed, I guess. Some of those were virus management problems. I think they are important issues but in relation to the issue of water use and climate change for example, I think they're probably of lesser importance” (Coordinator)
- “...One that springs straight to my mind is what, George and I had a program looking at the impact of water on common scab. We believed it needed to be done in Australia because of the growing conditions and also just our dry climate lends itself to it a little bit more...Another one would be the recent one that I put up with Stuart Wale [Scottish Agricultural College], working with the UK on knowledge transfer. I mean this wasn't at the start of the program, this is one that sprung from our trip to the UK” (Subprogram R&D leader)
- “Well, I think the issue of irrigation management or water management generally and it was put up because water management is one factor that can influence both powdery and common scabs but it's also, you know, in the current drought conditions and in an era of climate change and more regulation of the water I think, just going to be another area where there's got to be improvements made and growers are going to need assistance to do that” (Subprogram R&D leader)
- “...part of what we're doing at the moment is...what I call 'The Industry Development Needs Analysis' which is really, how do we get that information from the researcher bench, from like the researcher or research institution out and actually realise the results or the benefits in grower land out there? Up and down the supply chain, if we need to communicate the different ways through the supply chain, then how do we do that?” (Government co-investor)
- “What I wonder is, why knowledge transfer can't come in as a project within the PPR&D program. I know it's not a scientifically based thing but that needs to mesh it all together. Yes, and I mean that would link the communications and the extension and the knowledge transfer, plus we're building up international networks that would band it together” (Government co-investor)

Research Being Conducted By Agronomists

When asked whether they know of any research currently being conducted by agronomists that could be included in the new PPR&D2 program, respondents nominated probes of common scab and powdery scab, crop protection, crop nutrition or sustainable water use.



Sources Of New Funding

Of the 11 government co-investors, 9 mentioned potential sources of new funding, mostly government agencies funding research on sustainability and the environment, particularly in relation to water management and conservation. Two respondents mentioned Landcare, and a further 2 nominated Australian Centre for International Agricultural Research (ACIAR) and Environmental Water Allocation of Land and Water Australia. Of the remainder, 2 respondents mentioned the potential to fund research through Voluntary Contributions (VC), and one mentioned the potential for collaborative funding via other research institutions internationally, such as USDA:

- “Only through collaborative funding with other institutions. I know there's been other programs. I've been involved with a sheep genomics program and they manage to leverage USDA for \$40,000,000 or \$10,000,000 or something like and they've got a huge sheep genome program happening, so we can do something the same with the potatoes and get a potato genome happening” (Government co-investor)
- “The VC option is always an option, I guess. I guess the funding for the program I would see as a government levy as well as the state organisations putting in funding as well but also the potential to get VC from corporations either within Australia as well as the British Potato Council or other international bodies” (Government co-investor)
- “The only other alternative source which they may be able to make use of which nobody has really gone into yet, although they've sort of...what do they call themselves ACAIR, it's, the Australian government has an overseas aid organisation and I think that's what the initials stand for and they do all, it coordinates all the agriculture research in overseas countries that Australia is involved in” (Government co-investor)
- “Well I'm sure there's a series of grants and whatever, available through Water Environmental, but again you need the resources to tap into that, someone to do grant submissions for example and source it, which could, I see it is probably another arm to this project where you have your basic scientific research” (Government co-investor)
- “The biggest thing in Canberra, at the moment, is climate change, they're just falling over themselves just trying to give money away and that involves environment and those sorts of things, so that would have to be a prime target and I think a lot hangs off that. Out of Canberra at the present time, they'd like to have seen an agronomist on climate change so you have to have a team of those guys. Yes, basically go to Canberra and say 'We've got a problem, we are polluting the environment and we are putting a lot of CO2 and such forth and we don't want to do that anymore and we want help to, first of all, find the problem' and you need some agronomists there and there's stacks of those around the place and then you take it on from there to find the problem and then you have it go down into research. Now, I know the Chinese are very keen about the environment although they're the greatest polluters in the world of whatever it might be, so there might be some ways there, it's something we might be able to offer the Chinese” (Government co-investor)

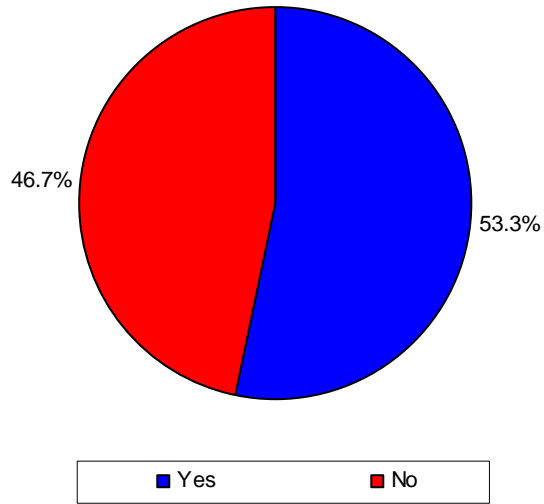


3.1.7 New Technologies

New Technologies

More than half of respondents (53.3%) said they know of new technologies that could be used in the Australian industry, while the remaining 46.7% said they do not:

Do You Know Of Any New Technologies That Could Be Used In The Australian Industry?



Base=60



When asked to name new technologies that could be used in the Australian industry, the largest group of respondents mentioned storage technology (n=5 mentions), followed by GPS on planters, variable rate farming or irrigation technologies and control traffic farming (n=3 mentions respectively). Respondents mentioned a variety of other technologies, such as hydroponic mini-tuber production systems and processed packing:

New Technologies	Total No. Mentions
Storage technology	5
GPS on planters	3
Variable rate farming or irrigation technologies	3
Control traffic farming	3
Hydroponic mini-tuber production systems	2
Processed packing (high-pressure packing)	2
Virus screening	2
DNA probes	2
Amistar treatment (spray for Rhizoctonia control)	2
Magnetic water	1
Test kits	1
Communications	1
Tracking systems	1
New potato nematode test	1
Polymerase chain reaction (PCR) technology	1
Non-pesticide biological pest management system	1
Genetic engineering	1



Adoption Of New Technologies

Most growers (n=15) reported they implemented new technologies in the last 5 years to increase their yield. Of these, only 3 respondents said they received assistance.

When asked to name the specific reasons for adopting new technologies, 8 respondents mentioned sustainability, including water conservation, use of fertilizer or soil conservation, and 5 respondents mentioned irrigation. Other respondents mentioned disease control, planting or harvesting techniques (n=3 mentions respectively), and soil preparation or seeds and mini-tubers (n=2 mentions):

Reasons For Adoption Of New Technologies	Total No. Mentions
Sustainability (including water conservation and monitoring, fertilizer monitoring, soil conservation)	8
Irrigation	5
Disease control	3
Planting techniques	3
Harvesting techniques	3
Soil preparation	2
Seeds and mini-tubers	2



Consistent with their feedback on past adoption of new technologies, growers confirmed the most common reason for adopting new technologies in the future is increased yield, improved quality or reduced cost. Of the 21 growers in the total sample, 9 plan to implement new technologies in the next 5 years. Of these respondents, 4 mentioned plans to implement new irrigation systems, one mentioned a new storage system and another mentioned technology such as satellite and GPS. Of the remainder, 3 respondents said they are planning to implement new technology, but are not considering any particular technology:

Technologies	Reason For Adopting New Technologies In The Future
Irrigation	"We want to make sure we get the most benefit out of the water we put on the crops"
	"Because it's dry"
	"We've started investing into solid set 10 years ago and we're now investing into linear move irrigators, which is a centre pivot style of thing. We're always looking at the way we prepare our ground...One of the issues with potato growing or vegetable growing is soil compaction and we've just got bigger and bigger tractors to bash the bejesus, if I may say, out of the soil to make it conform"
	"Because water is such a valuable commodity these days. You can't afford to have any losses because input costs are so high, even compared with 5 years ago because everything has gone through the roof"
Storage	"It will improve quality and reduce storage losses"
Satellite and GPS	"To be more efficient - fertilizer prices have doubled in last 6 months, going up every week, to do more soil testing - can't afford to waste any"
Uncertain	"To produce a better product and generate more income"
	"To reduce the time I spend at work and give me more time at home"
	"Increase yield or reduce cost"

The majority of growers nominated cost reduction, improved efficiency and yield, reduced labour, industry survival or water efficiency as the main drivers to adopt new technologies. A smaller proportion of respondents mentioned disease control, new cultivars or the environment are also important drivers.

Respondents confirmed the importance of improved efficiency, reduced costs, disease control, water processor requirements, reduced labour, environment, competitive advantage and new cultivars as key drivers of technology adoption.



Information Sources

The majority of growers said they find out about new technologies via word of mouth, or from industry publications, while others learn about new technologies through the internet, overseas travel or agricultural field days:

Sources Of Information About New Technologies	Total No. Mentions
Word of mouth	9
Publications (including magazines, journals and newsletters)	9
Industry sources	7
Internet	7
Field days	2
Overseas travel	2



3.2 International Research Organisations

3.2.1 International Research

Due to differences in the way research and development is funded, managed and conducted, and the fact that priorities can vary between countries, the nature of research conducted varies from country to country. The amount and variety of research is also dependent on the level of development of the potato industry, and the influences of other trends such as the growing impact of climate change and the need to develop sustainable agricultural systems, and the rise of healthy eating habits in the developed world.

The following tables set out the fields of research being conducted by public research bodies in Canada, New Zealand, Peru, South Africa, the United Kingdom and the United States. It is important to note that in many countries privately funded research is conducted directly by the major processing companies, and due to the competitive advantage this research may give the company, the nature and results of this research is not often made public. Accordingly, the tables do not display all research being conducted in all countries, particularly where research relates specifically to the processing industry.



Institution	Country	Research Fields					
		Growing					
		Potato Breeding & Genetics	Growth & Physiology	Seed & Planting	Soil & Irrigation	Cropping Systems & Harvest	Water, Weather & Climate
Agriculture and Agri-Food Canada (AAFC)	Canada	✓					✓
Crop & Food Research	New Zealand	✓		✓	✓		✓
Potato Group of HNZ	New Zealand	✓		✓		✓	
CIP	Peru	✓		✓			✓
Agricultural Research Council (ARC)	South Africa	✓		✓			
ADAS (Private)	United Kingdom		✓				
British Potato Council (BPC)	United Kingdom		✓	✓			✓
Cambridge University Farm (CUF)	United Kingdom		✓	✓			✓
Central Science Laboratory (CSL)	United Kingdom						✓
Department for Environment, Food and Rural Affairs (DEFRA)	United Kingdom						✓
Scottish Agricultural College	United Kingdom			✓			✓
Scottish Agricultural Science Agency	United Kingdom			✓			
Scottish Crop Research Institute (SCRI)	United Kingdom	✓		✓			✓
University of Idaho	United States	✓	✓	✓	✓	✓	
University of Michigan	United States	✓					
University of Minnesota	United States	✓					
University of North Dakota	United States	✓		✓			
University of Oregon	United States			✓			✓
University of Washington	United States	✓		✓	✓		



Institution	Country	Research Fields					
		Diseases And Pests			Supply Chain		
		Diseases	Insects & Nematodes	Weeds	Storage	Food Science, Quality & Safety	Marketing & Economics
Agriculture and Agri-Food Canada (AAFC)	Canada	✓	✓	✓			
Crop & Food Research	New Zealand	✓	✓			✓	✓
Potato Group of HNZ	New Zealand	✓					
CIP	Peru	✓	✓			✓	✓
Agricultural Research Council (ARC)	South Africa	✓	✓				
ADAS (Private)	United Kingdom	✓	✓		✓	✓	
British Potato Council (BPC)	United Kingdom	✓	✓		✓	✓	✓
Cambridge University Farm (CUF)	United Kingdom	✓				✓	
Central Science Laboratory (CSL)	United Kingdom	✓	✓		✓		
Department for Environment, Food and Rural Affairs (DEFRA)	United Kingdom	✓					
Scottish Agricultural College (SAC)	United Kingdom	✓			✓	✓	
Scottish Agricultural Science Agency (SASA)	United Kingdom	✓					
Scottish Crop Research Institute (SCRI)	United Kingdom	✓	✓		✓	✓	
Warwick HRI	United Kingdom						✓
University of Idaho	United States	✓	✓	✓	✓	✓	✓
University of Minnesota	United States	✓					
University of Oregon	United States		✓	✓	✓		✓
University of Washington	United States	✓	✓	✓	✓	✓	✓
University of Wisconsin	United States	✓					



Canada

Research in Canada is divided between public and private research. Public research is conducted principally in the fields of genetics and breeding, the effects of climate change, and management of pests and diseases. It is mostly conducted by the Potato Research Centre at Fredericton New Brunswick, which is funded by Agriculture and Agri-Food Canada. Research is also carried out by universities and funded by the Canadian Horticultural Council. According to the respondent from the Canadian Horticultural Council, research in the processed potato industry is largely conducted by major processing companies such as McCain and Simplot:

- “The private companies, McCains, Simplot and Lamb Wesson, they're doing most of their own research. There's very little public money going into that stuff. There's public breeders and they're trying to get varieties for them but they're doing their own stuff. I should drop in on the chip side of that equation there is Frito Ley and the smaller players. The varieties they develop, they're doing their own breeding programs, they're protected under the plant breeders' rights, which is a whole other issue. I would say from, how would describe, there's agronomic issues back for the growers which are in the public sector and what we're trying to fund and then there's processing for the private sector, I guess the best description would be on the french fry stuff, that's primarily private. We're funding public stuff, for example, low temperature sweetening, long term storage, new cultivars, that's the public stuff being funded through the Stuart Cairns research fund”

New Zealand

The Potato Group of Horticulture New Zealand and Crop & Food Research conducts most potato research in New Zealand. The potato product group is an industry advocacy group funded through a commodity levy (0.75%) on potatoes at first point of sale. Crop & Food Research is one of 9 Crown Research Institutes (CRIs) set up to service the technology and innovation needs of important sectors of the economy.

Research funded by Horticulture New Zealand focuses on issues such as management of pests and diseases, and sustainability, for example, in use of water and fertilizers. According to the respondent from Horticulture New Zealand, the large processing companies also conduct independent, internal research, which generally is not shared. Crop & Food Research also conducts research in processing and production, such as the development of specific consumer potato products:

- “One is around the soil-borne disease issue and we have chosen to focus on Rhizoctonia as one of our key issues here. The other one relates to meeting some of these kind of more, it's not a very good phrase, it's a kind of regulatory compliance type issue, so things about sustainable use resources such as water and nitrogen fertilizers, so the drivers there are one, it does assist in cost reduction if you can reduce your import; 2, it allows us to demonstrate to our regional authorities that we are doing things in a reasonable, sustainable fashion and 3, we can also demonstrate to our customer that we do things in a sustainable fashion”
- “Something I know that's going on but I don't have a good handle on it. A lot of our bigger, private companies are doing their own R&D but for obvious reasons, that's very much a competitive edge of things so they don't tend to share it too much. I mean, that's an interesting question, I guess for a start we are always conscious of the fact that we are a grower organisation so we do tend to strive towards things that will result in some sort of benefit for growers dealing with an issue that they've got that they don't feel they have any solutions for”



Peru

The organisation responsible for most potato research in Peru is the International Potato Centre (Centro Intercional de la Papa, CIP). CIP is a member of the Consultative Group on International Agricultural Research (CGIAR) and conducts research both internally and through partnership programs with other CGIAR members.

The 2 central divisions of CIP are its Genetic Resources Conservation and Characterisation (GRC&C) and Germplasm Enhancement and Crop Improvement (GE&CI) divisions. The GRC&C division is responsible for conservation and maintenance of the potato germplasm, while the GE&CI division is interested in enhancing the germplasm to increase future crop value.

CIP also conducts research in the implementation of solutions to production constraints, such as pests and diseases in ways that are appropriate to the socio-economic constraints of the target population. According to CIP, it seeks to understand and enhance production in complex agro-ecosystems and investigate the linkages between agricultural production, the environment and human health.

South Africa

The Agricultural Research Council (ARC) funds and manages most of the public research on potatoes, in conjunction with the Research Committee of Potatoes South Africa. It focuses on development of cultivars and the protection of crops from pests and diseases. According to the respondent from Potato South Africa, international processing companies such as McCain conduct independent, private research into seed supply and variation:

- “For instance, the Frito Ley company want to do an irrigation plant in part of the country and then they came to us and say this what they planned to do and they want to do it with the industry, so we then get additional funding and we complement their research, make it a bigger project and we invest money in that. Also as far as the french fries are concerned, when we work with a group of farmers they are also present there, we supply funding, they supply expertise and they make resources available for that specific project in that production area”

United Kingdom

Most research on potatoes in the United Kingdom is conducted in association with the Potato Council, which is a wholly owned subsidiary company of the Agriculture and Horticulture Development Board (AHDB). The Potato Council conducts research in-house, and also commissions and manages research conducted by third party organisations, including universities such as Cambridge University, through private research or consultancy companies such as ADAS, and through government funded bodies such as the Scottish Crop Research Institute. According to the respondent from the Potato Council, the primary job of their research is to increase the total size of the potato market, and provide information that will allow them to supply that market competitively.

Research in the United Kingdom has particular emphasis on diseases, especially in relation to seed, and on nematodes, which have been a major problem in the United Kingdom. Research is also being conducted on water usage:

- “What we're looking for in any research that we do, whether it's understanding the market place, the consumer, the consumer buying attitudes, purchasing patterns that support the marketing activities or the chemical research, is identify research that will help make the industry competitive. We're looking to grow the whole market of potatoes and we're looking to support research that will help us supply that market competitively”



United States

According to the respondent from the United States Potato Board, specialised university research centres conduct most potato research in the United States in association with industry organisations, processors and the United States Department of Agriculture (USDA). There are 2 major university research groups in the United States: the Tri-state Potato Variety Development Program, which represents Washington, Idaho and Oregon; and the Quad State Initiative, which represents North Dakota, Minnesota, Wisconsin and Michigan.

Most research centres focus on specific areas of research, such as breeding and genetics or disease management. However, some potato research centres conduct research more broadly. For instance, the Idaho Centre for Potato Research and Education conducts research in 13 focus areas. There is also some non-specific research conducted by general agricultural research units, particularly in relation to disease and pests, which may be applicable to the processed potato industry.

It is important to note that very little research is being conducted in the United States on the effects of climate change or ways to compensate for those changes:

- “There's a couple of things we have seen as important. Number one there is a big investment made outside of the US Potato Board by processors as private companies or on the university system that we have here in the US in all of the agronomic issues around producing potatoes and producing potatoes that have better manufacturing characteristics for french fries or potato chips. So that efforts done, it's significant, it's ongoing, it's important and it's being taken care of”
- “In the US we have a cooperative extension system that works through universities and so there's both a research and teaching component. Universities and the extension service are the hand and glove system of conducting research and transferring the information to the industries in agriculture. Well there are more than these but the ones that have done the most would be the University of Idaho, Washington State University and North Dakota State University and those would be heavily geared towards processing activities”



Researcher Contacts

The following table sets out contact information for Australian and international researchers mentioned by respondents in this research project:

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David McNeil	TIAR	Australia	+613 6226 2611
Rickey Yada	University of Guelph	Canada	+1 519 824 4120
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Tom Wolever	University of Toronto	Canada	+1 416 978 5556
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Chun Keun Lim	Kangwon National University	Korea	+82 33 250 6437
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Jim Moyer	North Carolina State University	United States	+1 919 515 2730
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Rose Loria	Cornell University	United States	+1 607 255 7831
Susie Thompson	North Dakota State University	United States	+1 701 231 8160
Tom German	University of Wisconsin-Madison	United States	+1 608 262 2956



3.2.2 Perceptions Of Australian Research

Respondents provided mixed feedback on the extent to which Australia is recognised internationally for excellence in processed potato research, although most acknowledged the international standing of the soil health and disease diagnostics subprograms. The respondent from South Africa also noted the high quality of Australia's breeding program.

The respondent from the United Kingdom stressed the importance of building strong links between Australian research centres and processors to ensure the work on disease management complements the commercial research conducted by private companies:

- “No, I do not know of anything at this point” (Canada)
- “I'm relatively new to the potato industry...My perception is that Australia has always done fairly well in the research that it has done but it may not be as great a focus for Australia as what it is for Canada” (Canada)
- “...and from my perspective and my understanding of how my researchers here feel about the work and it's all very positive and of a high level of excellence...it appears to me that they are interacting with the key lead scientists internationally and in my experience those guys only mix it with people who they know are going to be a beneficial, mutual relationship” (New Zealand)
- “There are a number of diagnostic tools for a number of pathogens that we've, that my growers have shown an interest in. Yes [DNA monitoring tools]” (New Zealand)
- “I know that they're involved in soil health, I know they have a new perspective on technology transfer, knowledge transfer that I think that is a very good initiative. I know that they work on various diseases, powdery scab, common scab and I know Australia also has a good breeding program. Variety development is I think far better than ours at the moment” (South Africa)
- “I've just been benchmarking the program and my view is if you take an overview on the project, the area that you're working on is disease diagnostics largely and I would say that work is of a very good national standard with some components of the program being internationally recognised. I would think the development of the diagnostics would be a key area and some of the work on the selection of resistance would be up there, selection of resistance to powdery scab” (United Kingdom)
- “What I would say on the Australian R&D program is that it's very much focusing on the diseases side. You know, in terms of understanding process quality, in terms of sugars, dry matter, fry colour, that has been...the assessments have been done but they're very limited, it appears that a lot of that valuation is done within the companies. It doesn't appear to be done by the research centres, so there needs to be good linkages between the research centre and the industry to be able to ensure that what they're doing in terms of the disease work ties in with the commercial ones. I'm not too sure whether the linkages in PPR&D1 with industry are as strong as they could be. Yes, some of them are strong but some are less strong. They need to be worked on and if you like championed about to different parts of the program so that the information is recognised within the industry by growers” (United Kingdom)



3.2.3 International Collaboration

There is general interest in collaboration between countries in terms of research and development among internationally based respondents, provided the aims of research projects are in the interests of both countries, and the research will not lead to problems with intellectual property or competition. In particular, respondents mentioned the potential for collaboration in the area of pest and disease management, and knowledge that will improve growing conditions and production:

- “I think we can cooperate on areas where we are not competing, where it's very specific we're not competing and that comes back to low temperature sweetening, the cultivars, that's clear that we can cooperate on that. I don't see why we wouldn't cooperate on marketing objectives, that to me just makes perfect sense if there is, our basic methodology is the same, why not cooperate on those areas?” (Canada)
- “I mean that's a hard one because we potentially end up being competitors with others so, there are only a few areas that you can collaborate on. I do feel that one area we could improve on is our mechanisms for interacting” (New Zealand)
- “I think certainly on the pest and diseases side in terms of the diagnostics, I think we're both at similar points with different diseases on the development of the diagnostic test kits but what we need, the area that is lacking is the interpretation of those diagnostics in the field situation. Certainly the work that's carried out in Australia picks up very strongly on the soil DNA but less so on the seed. In the UK there's been a lot of work on seed, so there's a synergy there between the work that we've done on seed and the Australian work on soils. I think the key to these is, that we've picked up on, would be Rhizoctonia and powdery scab on the diagnostics. I think there's an increasing interest in rotations and rotational management in relation to understanding soils” (United Kingdom)
- “I think every country has its prioritisation issues and it's a matter of finding those common themes that will deliver against different countries' priorities that's perhaps more a matrix-type of approach. The research placement, we always look to use the best scientific skills that are available to deliver that knowledge” (United Kingdom)
- “The only thing I know of is work done on diseases and pests but there's a great deal of information exchanged about what's observed and what's learned in dealing with particular pests and particular diseases. I think that is a very open collaboration already” (United States)



Sources Of New Funding

Respondents from Canada, New Zealand and the United Kingdom mentioned the potential for research and development programs to receive government or industry funding, provided the program furthers the interests of the potato industry in the local country:

- “In Canada yes we do have some collaborative funding to be able to do that through both the Federal Government and I believe through some of the provincial programs as well depending on the scale of the program we are looking for. Short answer is yes. We use acronyms over here, I would looking at a CAFI program which is through the Department of Agricultural. It's more for export market development and international market relationships. There's that but there's also other specialised programs ACAAF is one that I would probably look into too” (Canada)
- “Obviously, our main source of funding is the Foundation for Research and Science Technology and we tend to work in collaboration with our key research provider who is Crop and Food Research to access that funding and our main area is something called research for industry, so we have the opportunity to use that as voluntary contributions to work with Australia. I do know, and I've sort of been waiting for the right project, there are funds in force that deal specifically with engaging overseas experts, I just haven't quite had the right project to put up for funding in that area, so that's a possibility” (New Zealand)
- “One source of funding is potentially the British Potato Council where if there were collaborative programs beneficial to GB, BPC would certainly be an option there, we're already doing work with Crop & Food in New Zealand and then other research sponsors would be the government departments which would be DEFRA [Department Environment Food & Rural Affairs] for England and Wales and RERAD which is the Scottish Government's rural executive and they fund between them different elements of strategic and applied research. The more fundamental research is the responsibility of the research council, which would be the BBSRC” (United Kingdom)



3.2.4 Competitiveness

Respondents from New Zealand, the United Kingdom and the United States said the potato industry in their country is stable and well established with strong links to research and development and innovation. Both respondents from Canada mentioned difficulties with storage of potatoes and the fragmented infrastructure in the country's processing industry excluding french fries. The respondent from New Zealand mentioned the importance of identifying niche opportunities as a small producer in the global market:

- “On the chip side the process when you talk about the potato chips or crisps is that we can produce a high quality chip, chipping potato, the problem is we can't hold them in storage for long enough. It's quite common to have this low temperature sweetening occur. What we are, we do have some money directed through a research fund looking at the low temperatures and what we're hoping to do, we're being selfish, we want to extend our ability to store them, so we don't have to import” (Canada)
- “I think it's somewhat fragmented. Other than french fries we don't have a lot of infrastructure for other products and there's not a lot of innovation within the Canadian market place. It's mostly, industry is mostly mimicking what's going on in either the UK or Europe and to a bit down in the US but there's not a high degree of research or collaboration” (Canada)
- “I think we need to recognise our size compared to the global kind of scale and we have an opportunity to focus on more kind of niche markets. We're never going to compete on a volume and commodity cost, so we are looking to do some differentiated products and respond to some of the issues” (New Zealand)
- “We've got only 3,000 growers supplying 6 million tonnes of potatoes. So there is consolidation within the supply chain and size, operational size benefits that can have you know, in relation to cost of product. We also I think we have one of the most sophisticated fresh markets for potatoes which is being driven by innovation through the supply chain. New varieties coming forward, new forms of packaging, new forms of presentation of potatoes. Again, raising the profiles of potatoes and looking for the health and convenience aspects” (United Kingdom)
- “We have a huge industry, it's good at what it does. The growers know how to grow, the processors are well set up with modern efficient plants which can produce a huge volume here” (United States)



3.2.5 Trends

Respondents mentioned increased awareness of sustainability and methods of dealing with climate change as an important area of current and future research, particularly in regard to water usage and use of fertilizers. They also mentioned trends in healthier eating habits and the need for healthier processed potato products:

- “We have some major issues. One is we are being affected by climate change as well, we do have areas that have become hotter, we did have a drought last year in south-western or southern Ontario...they lost 60% of the crop last year. So water is an issue, whether it's sourcing it from lakes and streams or groundwater with wells, that is a major issue at this time” (Canada)
- “For the next 10 years I think the trends will generally be healthier eating in Canada which I think is similar to Australia and the US and several other select countries” (Canada)
- “Initiatives to improve efficiency, efficiency of water use, of fertilizer use” (South Africa)
- “I suppose a final area related to water and making best use of what water resources we have. Whether that is soil water, that is rainfall or applied irrigation, and that can be related back to the uniformity program, the pests and diseases program or the diseases program, but it's an important area and we identify that separately” (United Kingdom)
- “Climate change less than sustainability. Certainly growers have had to make some adaptation to whatever climate change they might be experiencing. I'm not aware that it's been so dramatic that growers have had to radically change their operations. I think it's been gradual and very incremental but I know that planning seems to start earlier because the weather is a little bit warmer and causes them to look at their management scheme slightly differently” (United States)
- “It's an issue, that's a factor [health], there are economic issues involved you know, there are also winners and losers in the restaurant business and french fries are primarily sold in the quick serve hamburger chains. Other sectors in the retail business in the US have been the growth sectors and they've been competitive with the hamburger chains at the expense of market share...you can see the impact of health and different style eating choices being made by many consumers” (United States)



3.2.6 Technologies

Respondents from New Zealand and the United Kingdom respectively mentioned the potato calculator developed by Crop & Food New Zealand and PCR diagnostic methods as technologies that could have application in the Australian industry. However, the respondent from the United States said it would be difficult to transfer technologies to Australia because they are proprietary to the major processing companies:

- “I guess the big one that we've got at the moment is something called the potato calculator and I know that the team that's commercialising this here in New Zealand has been working with the Australians. It's primarily at the moment driven, a tool that assists in making decisions around management of irrigation and nitrogen” (New Zealand)
- “I think a lot of it, the technology that the science community are working on are common technologies. I'm thinking about the PCR diagnostics. That is, for pathogens, the fungal pathogens. I think where there is an application of technology that hasn't been adopted in Australia relates to the cyst nematodes diagnostics. But again, that's an area where we are working with Crop & Food in New Zealand so there's a linkage across the Tasman in that way as well” (United Kingdom)
- “I think if there is anything in processing it's very proprietary. In growing potatoes there may be some proprietary stuff but I'm certainly not aware of it, there's just people who are better at it, it's part science, part, I think the science is pretty well understood, I think the part that's art is where individuals can excel themselves and that's probably hard to bottle up and transfer” (United States)



4 Conclusions

Australian Processed Potato Industry

Issues And Trends

- Respondents across all segments highlighted increasing costs of critical inputs and sustainability as the main issues impacting on growers, who face the dual challenges of low-cost imports and comparatively more attractive local agricultural activities, as the cost of inputs and increasingly scarce resources escalates
- According to respondents, growers require appropriate cultivars and tools to help them develop sustainable practices
- Other respondents commented on health and obesity as impacting on the french fries segment of the industry, and the balance of respondents stressed the need to maintain the industry's efforts to mitigate disease

Research

- The coordinator and plant breeding program coordinator noted an increasing shift to reduction of carbon footprinting, irrigation management and scarcity of water, while subprogram R&D leaders identified increased collaboration and attention to soil health, as distinct from disease mitigation

Comparative Advantages And Disadvantages Of The Australian Industry

- Respondents nominated high quality, clean and green or safe products as the key advantages of the Australian processed potato industry (n=38 mentions), while high cost of production, low prices and import competition, and low sustainability are the main disadvantages (n=25, 19 and 13 mentions respectively)

Australian Processed Potato Research

- According to subprogram R&D leaders, the main strengths of Australian processed potato research are its collaborative nature and the industry's commitment to a long-term view
- The majority of respondents in the research program segments regard Australia as being internationally recognised for excellence in potato research. Consistent with feedback from internationally based respondents, several respondents identified disease diagnostics such as the DNA probe as the main area of recognition
- Respondents reported that research projects involving collaboration between Australian researchers and international researchers are mainly limited to the United Kingdom and New Zealand, although there is some collaboration with researchers in other countries such as Canada and Switzerland



Maintaining The Australian Industry's Competitiveness

- According to respondents, to remain competitive the Australian industry needs to develop new or improved varieties, implement production efficiencies, lower the cost of production and improve sustainability (n= 21, 15, 14 and 8 mentions respectively)
- Most respondents across all segments (86.9%) agreed there is a role for research and development to address these problems
- The largest groups of respondents nominated disease mitigation, new or improved varieties, less use of fertilizers or chemicals and sustainability as factors which could be addressed by research and development (n=19, 15, 9 and 9 mentions respectively)

PPR&D1

Expectations

- Only half of respondents said they had expectations of PPR&D1 (47.5%), while 34.4% did not, and 18.0% said they did not know. Significantly more seed producers, agronomists and processors did *not* have any expectations (80.0%, 66.7% and 60.0% respectively), reflecting lower levels of awareness among these groups
- The largest group of respondents said they expected PPR&D1 to address disease mitigation or deliver diagnostic tools (n=11 mentions), but others mentioned improved productivity or improved collaboration (n=6 and 5 mentions respectively)
- Of the 29 respondents who had expectations of the PPR&D1 program, 10 said the program mostly met their expectations and 7 said it met their expectations. Of the balance, 6 respondents respectively said they were neutral or the program mostly did not meet their expectations
- When asked to explain the extent to which PPR&D1 met their expectations, those who said the program met or mostly met their expectations commented on the potential for the techniques developed through PPR&D1 to be adopted by the industry in the near future. Most of those who said it did not meet their expectations said it would not be reasonable to expect all outcomes of the program to be reached so soon after its start

Relevance

- More than a third of respondents said PPR&D1 catered to the needs of the industry (42.6%), while 41.0% did not know and 16.4% said it did not cater to the industry's needs, reflecting relatively low levels of awareness of the program's outcomes to date
- When asked to comment on the extent to which PPR&D1 catered to the needs of the industry, those who responded favourably highlighted the benefits of a consolidated research program based on consultation with industry stakeholders. Those who responded unfavourably mentioned a lack of tangible results or poor communication of results as the main reasons for their concern

Successes And Shortfalls

- Respondents nominated disease mitigation, including the DNA probe and diagnostic tools, and collaboration and information sharing as the main successes of PPR&D1 (n=21 and 7 mentions respectively). The main shortfalls are lack of inclusiveness and poor communication, whether internally or with growers (n=8 and 10 mentions respectively)



Effectiveness Of Program Communication

- Around two-thirds of respondents (67.2%) said program managers did not communicate program outcomes clearly, while the remaining 32.8% said they did, highlighting the need for improved program communication
- Growers who provided negative feedback said they either had no awareness of program results or communication of the results did not address farm practice at a practical level, and some mentioned the variable quality of presentations delivered by program managers. Respondents from the government co-investor and subprogram R&D leader segments commented on friction between key groups and poor administration
- Suggestions for improving communication included professional branding for PPR&D1, a scorecard reporting system for industry stakeholders, especially growers, grower forums for sharing knowledge about best practice and practical information tools for growers

Impact

- Only a third of respondents (34.4%) said the program impacted on industry stakeholders, while the balance (65.6%) said it did not have an impact or they did not know (27.9% and 37.7% respectively)
- Consistent with their feedback on the extent to which PPR&D1 catered to the needs of the industry, respondents who said the program impacted on industry stakeholders commented on the benefits of information sharing and increased cooperation among growers, processors or state-based organisations

PPR&D2

Expectations

- Consistent with the relatively low levels of awareness of PPR&D1, just over half of respondents said they have expectations of PPR&D2 (55.7%), while the remaining 44.3% do not
- Respondents, especially growers, identified delivery of the PPR&D1 objectives as a key expectation, while others called for an extension of PPR&D1 objectives to address sustainability, production efficiency or a strategic approach to international collaboration

Priorities

- Consistent with their expectation of the delivery of PPR&D1 objectives, the largest group of respondents nominated disease mitigation and delivery of the DNA probe as priorities for PPR&D2 (n=26 mentions). Others nominated new or improved varieties (n=13 mentions) and smaller groups mentioned lower cost of production, improved communication improved water or fertilizer efficiency and sustainability (n=4, 4, 3 and 2 mentions respectively)

Level Of Involvement

- Apart from the current stakeholders in PPR&D1, whom most respondents accepted as appropriate for involvement in PPR&D2, a minority of respondents highlighted the need to balance involvement by state, encourage involvement of the retail trade and attract the best local and international researchers



Potential Programs That Should Be Funded By PPR&D2

- A minority of respondents mentioned research into nematodes, storage of potatoes, disease mitigation of seeds, impact of water use and climate change, and extension as areas of research that could be funded in PPR&D2

Sources Of New Funding

- Of the 11 government co-investors, 9 mentioned potential sources of new funding, mostly government agencies funding research on sustainability and the environment, particularly in relation to water management and conservation

New Technologies

- The largest group of respondents mentioned storage technology as a new technology that could be used in the Australian industry (n=5 mentions), followed by GPS on planters, variable rate farming or irrigation technologies and control traffic farming (n=3 mentions respectively). Others mentioned a variety of other technologies, such as hydroponic mini-tuber production systems and processed packing

Adoption Of New Technologies

- Most growers (n=15) reported they implemented new technologies in the last 5 years to increase their yield, specifically to address sustainability (including water conservation, use of fertilizer or soil conservation) or irrigation. Of these, only 3 respondents received assistance
- Consistent with their feedback on past adoption of new technologies, growers confirmed the most common reason for adopting new technologies in the future is increased yield, improved quality or reduced cost
- Of the 21 growers in the total sample, 9 plan to implement new technologies in the next 5 years. Of these respondents, 4 mentioned plans to implement new irrigation systems, one mentioned a new storage system and another mentioned technology such as satellite and GPS

Information Sources

- The majority of growers said they find out about new technologies via word of mouth, or from industry publications, while others learn about new technologies through the internet, overseas travel or agricultural field days



International Research Organisations

International Research

- The areas of research conducted vary from country to country, due to:
 - Differences in the ways that research and development is funded, managed and conducted
 - Variation in the areas that are considered of high importance to the potato industry
 - The level of development of the potato industry
 - Trends such as the growing impact of climate change and the need to develop sustainable agricultural systems
 - Increasing emphasis on healthy eating habits in the developed world
- In Canada, New Zealand and South Africa, research specific to the processed potato industry is largely conducted by the major processing companies, while research of a more general nature such as disease mitigation is conducted by public sector organisations

Australian Research

- Respondents provided mixed feedback on the extent to which Australia is recognised internationally for excellence in processed potato research, although most acknowledged the international standing of the soil health and disease diagnostics subprograms
- The respondent from the United Kingdom stressed the importance of building strong links between Australian research centres and processors to ensure the work on disease management complements the commercial research conducted by private companies

International Collaboration

- There is general interest in collaboration between countries on research and development among internationally based respondents, provided the aims of research project are in the interests of both countries, and the research will not lead to problems with intellectual property or competition:
 - Respondents from Canada, New Zealand and the United Kingdom mentioned the potential for research and development programs to receive government or industry funding, provided the program would further the interests of the potato industry in the local country

Competitiveness

- Respondents from New Zealand, the United Kingdom and the United States said the potato industry in their country is stable and well established with strong links to research and development and innovation. Both respondents from Canada mentioned difficulties with storage of potatoes and the fragmented infrastructure in the country's processing industry excluding french fries
- The respondent from New Zealand mentioned the importance of identifying niche opportunities as a small producer in the global market



Trends

- Respondents mentioned increased awareness of sustainability and methods of dealing with climate change as an important area of current and future research, particularly in regard to water usage and use of fertilizers. They also mentioned trends in healthier eating habits and the need for healthier processed potato products

Technologies

- Respondents from New Zealand and the United Kingdom respectively mentioned the potato calculator developed by Crop & Food New Zealand and PCR diagnostic methods as technologies that could have application in the Australian industry. However, the respondent from the United States said it would be difficult to transfer technologies to Australia because they are proprietary to the major processing companies



5 Recommendations

- 1 Continue to resource the core objectives of PPR&D1, supported by a performance benchmarking and reporting system to meet stakeholders' expectation of delivery of results during the second phase of the program
- 2 When positioning the research program locally and internationally, maximise the relatively high levels of awareness of the DNA probe as an example of research excellence, while ensuring sound planning for its future commercialisation
- 3 Examine the benefits of refining and extending PPR&D1's core objectives, which focus on soil-borne disease mitigation, to include best-practice tools for growers to increase efficiencies and reduce costs as part of the continuing defence against low-cost imports. Tactics could include drawing on the knowledge of innovative growers as champions of new methods
- 4 Examine the benefits of extending PPR&D1's core objectives to include strategies for improving the sustainability of growing and production, whether with respect to increasingly scarce resources such as water and land, or the ageing population of growers
- 5 Either as a formal subprogram or a supporting program to PPR&D2, develop a communications strategy and appropriate resourcing to improve communication between stakeholders and extension outcomes, and raise awareness of the program. With respect to the latter, explore the possibility of leveraging the existing extension resources of processors. Include a formal brand development strategy, as this research suggested higher levels of awareness of subprograms among most respondents than awareness of the program brand
- 6 Explore synergies with international research organisations in Canada and the United Kingdom for the development of programs to address sustainability in PPR&D2. This may involve collaboration with private sector organisations locally

Interim Report

Scoping Phase 2 Processing Potato R&D Program

*Undertaken on Behalf of Horticulture
Australia Limited*

Pyksis Pty Ltd (www.pyksis.com)

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INTERIM REPORT

1. EXECUTIVE SUMMARY



Pyksis has been engaged by Horticulture Australia Limited (HAL) to conduct a project to scope Phase 2 of the Processing Potato Research and Development Program from June 2009 – June 2014.

The project methodology has been identified, incorporating a current stakeholder needs assessment through the conduct of an independent market research program, and initial work has been initiated.

The project is expected to run through to October 2008, with the provision of a final report to the PPIAC including a review of the processed potato industry globally, an independent market research report and a PPR&D2 plan. The PPR&D2 plan will address the industry strategic plan and priority research areas with research project proposals graded by priorities, budgets and timelines; plus recommendations for management structure and knowledge transfer required to achieve the plan.

2. BACKGROUND

To remain competitive in today's global market, the Australian potato industry (fresh and processed potato segments) developed a Processing Potato R&D Program (PPR&D1) in association with HAL to increase the long-term viability and sustainability of the industry.

The PPR&D1 was established by the Processing Potato Industry Advisory Committee (PPIAC) with funding from industry R&D levies, matched by the Commonwealth government and institutional contributions, until June 2009. The program is administered by management supplied by the Tasmanian Institute of Agriculture Research (TIAR).

The industry wishes to continue the PPRD concept beyond June 2009, through establishment of the Processing Potato Research & Development project (PPR&D2) from 2009 to 2014. This program will incorporate a broader scope, focusing on industry problems and opportunities to improve Australia's competitive position in the global market.



3. SCOPING PROGRAM

HAL and the Processing Potato industry have engaged Pyksis to assist in the preparation of the PPR&D2 program in line with the Processing Potato Industry Strategic Plan 2006-2011. Key areas of strategic focus include those summarised in the following table:

Table 1 – Key Areas of Strategic Focus for Potato Industry

Strategic goal	Strategic Imperative
2. Improving industry competitiveness	2.1 Use R&D to build better businesses 2.4 Improve our ability to respond to disease & pest threats
3. Improved industry communication and information systems	3.2 Deliver industry information requirements

3.1. Pyksis

Pyksis is a company that is focused on assisting organisations to develop sustainable businesses, through effective commercialisation of ongoing innovations and their successful integration into an organisation’s core business.

This business approach summarised in the Pyksis Triangle and applies to all forms of organisations, whether large or small, regional or metro-based, and whether in a primary, secondary, tertiary or quaternary industry sector.



The important component is for an organisation to be continually innovating & converting those innovations into sustainable business segments, replacing those elements of core business that have become non-competitive by being replaced through newer smarter technologies and business systems, or simply by becoming “commoditised”.

In the case of the Australian processed potato industry this means there is an ongoing need to innovate to:

- develop varieties that best suit customers needs
- overcome crop diseases that affect the ability to deliver quality product reliably
- focus on areas where Australian research is globally competitive



- work with overseas organisations in their areas of specialty to deliver a complete solution for local needs at the best leverage of the dollars invested
- access supporting funding
- ensuring that these innovations reach the market in a cost effective and efficient manner

3.2. Consultants

Pyksis has assigned four consultants to this project.

3.2.1. Hugo LeMessurier – Project Leader



Hugo LeMessurier is an experienced entrepreneurial business leader with a proven track record of successfully implementing complex business solutions within an international environment. His expertise has assisted the building of sustainable SME businesses via strategic planning, sales and marketing, international business development and public company listing.

For over a decade Hugo has held directorships and senior management positions in start up, listed and multinational organisations in the USA, EU and Australia. He has founded and directed a number of private Australian companies in the food and service industries. Having operated his own successful small businesses and managed start up organisations he understands what it takes for SME's to develop and thrive in today's market place.

Hugo has led an Australian start up Biotechnology company through technology acquisition, regulatory approval, commercial launch and public listing. He has experience in preparing and guiding companies through Australian listing on the primary Australian Stock Exchange and secondary National Stock Exchange. He is also Managing Director of LeMessurier Solutions, a boutique consultancy delivering strategic business and management advice to Universities, Institutes, Biotechnology, Medical Device, Diagnostics, Food and Service companies. Key services include technology / science reviews, intellectual property audit and evaluation of research and development planning.

Hugo has a Bachelor of Science degree and is a member of the University of Adelaide Commercial Accelerator Scheme and Life Science IP Audit Committees, the Australian Institute of Company Directors, BioAngels and AusBiotech.

3.2.2. John Johnston – Project Team Member



John is a co-founder and Director of Pyksis responsible for services and acts as a project team member for the PPR&D2 scoping project. He has over 23 years' experience in helping individual companies protect and commercialise their intellectual property.

John has developed effective business strategies, business and marketing plans, information memoranda and IP strategies for organisations, from large multinationals through to SMEs.



He has successfully assisted businesses to commercialise a wide range of technologies including biotechnology, ICT, engineering, fibres and textiles, food processing, mineral processing, gene transfer and primary industry processes.

John is a board member of four SMEs and is active in raising capital from private investors, and business angels. He has been successful in securing a number of sizeable START grants, COMET & State grants and is currently assisting companies access a much broader range of Federal & State grants for rapid growth.

After starting his career in the oil refining and petrochemical industries, John spent approximately fifteen years in water and wastewater treatment. He was singly responsible for the design of the complete circulating water systems for Bayswater and Mt Piper Power Stations in NSW. Since then he has focused on commercialisation.

John graduated as an Industrial Chemist and Chemical Engineer and completed post-graduate Business Administration and Company Director Diploma qualifications. He is a Fellow of the Australian Institute of Company Directors, a Member of the Institute of Engineers Australia and a Member of the Licensing Executives Society of ANZ.

John leads Pyksis' delivery of services to individual clients and has contributed the wealth of his experience to the development of Pyksis' programs.

3.2.3. Mark Gustowski - Project Team Member



Mark Gustowski has important and valuable experience in both the public and private sectors having been involved in policy development, program and project management, business planning, tendering, procurement, business development, private equity and capital raising.

Previously, Mark worked for a New York based biotechnology advisory firm assisting biotech-based businesses commercialise new products. Mark also spent time as a Business Development Manager for a Sydney-based technology start-up which raised in excess of AUD\$14 million in debt and equity to commercialise its technology platform and undertake competitor acquisitions.

Most recently, Mark spent time working as the Manager of the Business Development Unit for a multi-national contract engineering firm in the United Kingdom where he was responsible for putting together infrastructure proposals in countries including the UK, India, USA, UAE and SE Asia.

Mark holds a Bachelor of Applied Science and a Graduate Certificate in Business Computing. In 2002 Mark was selected by the Victorian Chamber of Commerce to study Venture Capital Financing for Early State Technology Businesses at the HAAS School of Business, University of California, Berkeley. Mark successfully completed that course in late 2002. Mark has a keen interest



in technology commercialisation, team dynamics, team building and innovation policy development.

3.2.4. Max White - Project Team Member



Resume Max White PhD, MBA Max White is an accomplished business manager with over 20 years' experience in marketing and manufacturing management of a number of major entities in the textile and chemical industries.

Prior to that he spent 18 years in wool textile research as a Principal Research Scientist with CSIRO. His academic qualifications include BSc Hons (Applied Chemistry UNSW), MS (Textile Chemistry – Lowell, USA), PhD (Colour Chemistry – Leeds, UK) and MBA (RMIT – Melbourne). On completion of his PhD (1968) he joined the CSIRO Division of Textile Technology, Vic. As a Principal Research Scientist he was responsible for the development and commercial application of new chemical and finishing technologies for the worldwide wool fabric and apparel industries.

In 1985 he joined the Graduate School of Management RMIT, presenting MBA and other programs in operations research, industrial marketing and strategic planning. At the invitation of the IEL Group, he took over the management of Cheetham Salt in 1986. The \$45M Company had operations in all mainland States – with sales into the food, pharmaceutical, animal nutrition, textile, water treatment and chemical industries.

White then joined Penrice Soda, Adelaide, as joint General Manager responsible for Sales (\$105M), Marketing, Distribution and Specialty Products Manufacturing. Company sales encompassed Australia, Oceania, Asia and the Indian Ocean rim).

In 1997 he was invited by Bruck to rejoin the textile industry as General Manager of the Company's manufacturing operations. During his appointment with Bruck the manufacturing operations were transformed through innovative approaches to industrial relations, training, multi-skilling and workplace flexibility. The pre-eminence of Bruck as a major and innovative regional manufacturer resulted in appointments to the Council of RMIT University, regional development authorities and State Government Task Forces. Max retired from full time employment in 2003.

He now acts as an adviser or Board Member on a number of community boards and to several major manufacturing entities. He is an Adjunct Professor (Research) at RMIT University and Chair of an Industry Advisory Group.

He is a specialist consultant with Pyksis and also is a key mentor and facilitator to the Victorian Government's Regional Technology Commercialisation Program and Regional Business Investment Ready Program delivered by Pyksis.



3.3. Project objectives

The primary objectives of the project are as follows:

- Identify current and future needs of the Processed Potato Industry
- Identify priority research areas focused on sustainability and competitiveness
- Identify how best to access national and international collaborative R&D projects and technologies
- Prepare a PPR&D 2 project plan for approval and implementation

3.4. PPR&D2 deliverables

The key deliverables of the project will be to develop a PPR&D2 program and project plan:

- PPR&D2 Program - A program that focuses on the needs of the Processed Potato Industry incorporating consideration of the industry strategic plan. To achieve this end Pyksis will review the existing Australian strengths and areas of excellence in potato research and development, existing and potential international collaborations, as well as the successes and or gaps in the current PPR&D1 program and the effectiveness of knowledge transfer from the PPR&D1.
- PPR&D 2 project plan – A final report including a review of the processed potato landscape and a PPR&D2 project plan incorporating R&D project proposals, budget estimates and timelines.

3.5. Methodology

Pyksis has proposed a milestone based methodology to achieve the project objectives and associated deliverables.

Table 2 – Pyksis Methodology

Milestone 1	Evaluation of the existing program (PPR&D1)
Milestone 2	Establish the primary issues for the potato industry in Australia and Globally
Milestone 3	Potato research and development capabilities
Milestone 4	PPR&D2 project identification
Milestone 5	PPR&D2 management structure review
Milestone 6	Knowledge transfer
Milestone 7	Output reporting

Within these milestones a number of sub-projects will be conducted to achieve the final report output.



3.5.1. Document review



Pyksis has identified and received a number of background documents for review and has requested further documents to provide an in depth understanding of the Processed Potato industry, the PPR&D1 program and potential international collaborations. These documents include:

Table 3 – Background Documentation Reviewed by Pyksis

- | | |
|---|--|
| <ul style="list-style-type: none"> • PPR&D2 Scoping project brief • PPR&D1 R&D plan • Processing Potato Strategic plan • Independent Review (2007) of Processing Potato R&D Program 2004 - 2009 • Processing Potato R&D Plan Stage 1 review • PPR&D1 sub-program meeting reports • PPR&D1 UK Travel Report draft | <ul style="list-style-type: none"> • Potatoes Australia review 07 • Potatoes Australia February 07 • SA Potato State of Play 2005 • National Potato Breeding Program Overview • Potato Breeding Program Benefit Cost Analysis • HAL Supply Chain Strategic Plan 2005 - 2010 • International Levy Board Project Cooperation meeting report |
|---|--|

3.5.2. Potato Industry

In addition to documentation reviews, Pyksis has conducted initial meetings to confirm the background understanding of the industry. These meetings have included the PPR&D1 coordinator, the Potato Breeding Program manager, the British Potato council Research and Development Director, a potato processor, potato growers and a PPR&D1 researcher.

3.5.3. Independent market research

To establish the needs of the needs of the Australian Processed Potato industry, Pyksis has engaged an independent market research organisation to conduct a stakeholder needs assessment. The primary goals of this project will be to identify;

- Key local and international issues and trends impacting on the PPR&D1 and PPR&D2 programs
- The perceived relevance and effectiveness of PPR&D1 among target stakeholders
- Target stakeholders' priorities and expectations of PPR&D2

The market research program involves consultation with up to 72 industry stakeholders. A draft market research brief has been prepared which utilises focus group, face-to-face and telephone interview methods.

The draft market research brief has been forwarded to the PPIAC committee for review and comment. A copy of the draft market research brief can be found in Appendix 1 (Section 5) of this report.



3.5.4. Priority research areas

Following completion of the market research program Pyksis will identify the present and future research and development needs of the Processed Potato Industry and the Priority Research Areas (PRAs) for the PPR&D2 program.

In developing the PRA recommendations, consideration will be given to ensure the focus is in line with the Processing Potato Strategic Plan. The PRAs identified by the market research will be distributed to the PPIAC for review and confirmation and will form a basis for the identification of research projects for inclusion in the PPR&D2 program.

3.5.5. R&D capability

Incorporating information from interviews conducted with Australian researchers and international potato organisations, Pyksis will assess Australia's global position in terms of potato research and review the national potato research capabilities and areas of excellence.

A gap analysis of the Australian and international and potato research and development industry strengths will be conducted in relation to the PRAs to investigate potential projects for the PPR&D2 including;

- Australian R&D projects and researchers / organisations
- International R&D collaborations
- Opportunities for additional funding and or in-kind support
- Access to existing International information / technology relevant to the Australian industry

3.5.6. PPR&D2 research projects

Following identification of the Australian and international research capabilities Pyksis will identify potential projects for the PPR&D2 program, relevant to the PRAs. This will involve;

- A review of the unfunded PPR&D1 projects
- Determination of access to international technology / R&D collaborations
- Identification of Australian researchers / organisations capable of delivering projects not covered above
- Receipt of proposals, budgets and timelines for PPR&D2 projects.

A review of the PPR&D1 research proposal process and PPR&D1 research plan will also be conducted, incorporating market research responses, to identify areas of improvement for the PPR&D2 proposal process.

3.5.7. PPR&D2 management structure

A review of stakeholder feedback from the market research program will be conducted to identify the successes and shortcomings of the PPR&D1 program management structure.



Pyksis will review and propose recommendations to the PPIAC for any amendments to the management structure required to successfully achieve the research projects identified for the PPR&D2 program.

In undertaking this work and in putting forward any associated recommendations (and others within its reports), Pyksis will take into full consideration the obligations imposed on HAL through its *Deed of Agreement with the Commonwealth - Schedule 4* (and in particular, but not limited to paragraph 3) in terms of *Eligible R&D Expenditure*.

3.5.8. Knowledge transfer

A review of the effectiveness of the current Australian and international knowledge transfer programs will be conducted as part of the market research program. This information will be used to identify potential improvements and or changes to the existing knowledge transfer practices for the PPR&D programs.

3.6. Reporting

During the course of the program Pyksis will conduct regular reporting updates to the PPIAC and provide a final PPR&D2 proposal at the end of the project.

3.6.1. Update reporting

A series of updates will be provided by Pyksis including written reports and presentations to the PPIAC. Dates for these reports are provided in the timelines, section 3.7 of this report.

3.6.2. PPR&D2 proposal

The final report due at the end of the project will encompass two sections including;

- Global processed potato landscape
An overview of the processed potato industry in Australia and globally, including the independent market research report and a review of the needs of the Australian processed potato industry.
- PPR&D2 Plan
The PPR&D2 plan incorporating proposed R&D project summaries, project budget estimates, project timeline estimates and any additional proposals to improve the PPR&D2 management structure and knowledge transfer process.



3.7. Timelines

The timelines for completion of this project and key reporting milestones are listed below:

Table 4 – Timelines for Completion of Scoping Study

	Output	Date
1	Independent Market Research	March - April
2	Present to Advisory Committee	14 March
3	Distribute Interim Report	15 March
4	Present to PPIAC	19-20 March
5	Distribute Update Report	30 May
6	Update Report and presentation to PPIAC	4 August
7	Distribute Draft Final Report	30 August
8	Present Draft Final Report to PPIAC	6 October
9	Final Report Distributed	30 October
10	PPIAC review (if required)	1 December

4. NEXT STEPS

From March through to the next update report on May 30, Pyksis will focus on completion of Milestones 1 and 2 and the independent market research project. Reporting for Milestones 3 and 4 is scheduled for the August 4 update with the final Milestones 5 -7 being completed with the provision of the Final Report due on October 30.

4.1. Committee meeting attendance

Pyksis consultants will attend the next Advisory committee and PPIAC meetings in March and provide update presentations.

4.2. Market research

A confidential stakeholder contact database is being developed in association with the PPR&D1 coordinator and will require additional input from the PPIAC and Ausveg to ensure that key industry stakeholders are included in the market research project.

The first interviews have been scheduled with PPIAC members and the PPR&D1 sub-group leaders on the 18th and 19th of March respectively.



5. APPENDIX 1: DRAFT MARKET RESEARCH BRIEF

Proposal for Processed Potato Market Research – PPRD2 Project

1.0 Background

Horticulture Australia Limited (HAL) is a national research, development and marketing organisation, and works in partnership with the horticulture sector to invest in programs that provide benefit to the Australian horticultural industry. HAL receives funding from levies imposed on growers and processors of potato products, and leverages these funds with matched government funding (eg VIC DPI) and other sources including commercial organisations, to conduct research and development (R&D) programs for the benefit and continual improvement of the processed potato industry.

The current program, the Processed Potato Research and Development Program 1 (PPR&D1), began in 2004 is due to end in 2009. The focus of this program revolves primarily around disease control and cropping practices.

The industry wishes to conduct a further program, the PPR&D2, over the next 5 years and has prepared a strategic plan, which includes several key items of consideration.

HAL has commissioned market research to scope an implementation for the PPR&D2 program, seeking input for the PPR&D2 from stakeholders in the processed potato industry.

1.1 Key Research Objectives

Identify:

- Key local and international issues and trends impacting on the PPR&D1 and PPR&D2 programs
- The perceived relevance and effectiveness of PPR&D1 among target stakeholders
- Target stakeholders' priorities and expectations of PPR&D2

1.2 Sample

The sample will include approximately 72 respondents, assuming all respondents are available to be interviewed, and will consist of key stakeholders in the Processed Potato industry (including the IAC and advisory committee members) identified as:



- Potato processors (multinational)
- Potato processors (independent)
- International research or industry organisations
- Plant breeding program
- PPR&D1 Coordinator
- PPR&D1 Sub-program R&D leaders
- State industry organisations
- Seed tuber suppliers
- Potato growers
- Government and co-investors
- Agronomists

Contact details for respondents will be collated by Pyksis with input from the PPR&D1 Coordinator, HAL, members of the PPIAC and AusVeg.

1.3 Method

The research will consist of a variety of structured and semi-structured data collection methods with the various stakeholder groups, including a focus group, in-depth face-to-face interviews, semi-structured telephone interviews and structured telephone interviews, as set out in the table below:

Stakeholder	Research Method	Number
Potato processors, multinational	Focus group, 1.5 hours	1
International research or industry organisations	Semi-structured in-depth face-to-face interview, 45 minutes	5
Plant breeding program	Semi-structured telephone interview, 25 minutes	1
Coordinator	Semi-structured telephone interview, 25 minutes	1
Sub-program R&D leaders	Structured telephone interview, 25 minutes	5
State industry organisations	Structured telephone interview, 25 minutes	5
Seed tuber suppliers	Structured telephone interview, 25 minutes	8
Potato processors, independent	Structured telephone interview, 25 minutes	4
Potato growers	Structured telephone interview, 25 minutes	20
Government co-investors	Structured telephone interview, 25 minutes	5
Agronomists	Structured telephone interview, 25 minutes	10



1.4 Specific Research Aims

1.4.1 Core Topics for Structured Interviews

- Identify the key issues facing the industry now and in the next 10 years in terms of:
 - Trends in Australian and global markets (imports versus exports)
 - Needs of the processed potato industry in Australia in order to remain competitive
 - Environmental factors affecting the industry that may be addressed by R&D
 - The processed potato industry's strategic plan

- Identify the perceived effectiveness and relevance of PPR&D1 with respect to:
 - The extent to which the program met expectations
 - Awareness of useful outcomes/results to the industry
 - Successes of the program
 - Shortfalls of the program

- Identify perceptions of the future PPR&D2 program with respect to:
 - Expectations of a PPR&D2 program
 - Areas of the strategic plan that should be the focus of the PPR&D2 program
 - High priority areas for the PPR&D2
 - Groups that may want to be involved in PPR&D2
 - Potential programs that have not already been funded by PPR&D1
 - Any new or emerging technologies, whether local or international, that may be applicable to the Australian industry but have not been trialled, are not yet available or have not been used widely in Australia, but for which access may be sought through the PPR&D program, and who may be contacted regarding them

Additional Topics for Government, Processors And Industry Organisations

- Identify:
 - potential sources of additional funding that may be available, in kind or cash, other than the existing levy, federal matched, state and institutional funding



Additional Topics for Current Australian Research Organisations

- Identify:
- The strengths and weaknesses of the Australian processed potato research industry in terms of new researchers, research projects and availability of funding
- Research organisations which have strengths and/or facilities capable of conducting processed potato research
- Whether Australia is internationally recognised for excellence or as a pioneer in processed potato research, and if so, in which areas of research International groups/organisations
- which are recognised for excellence or as pioneers in processed potato research, and in which areas.

Additional Topics for Agronomists

- Identify:
- any areas of potato research being conducted, or that could be conducted, by an agronomist that may be included in the new PPR&D2 program, and if so, who is conducting the research, and the field it is being conducted in

Additional Topics for Growers

- Identify:
- Any new technologies they have implemented in the last 5 years, and the reasons for implementing them
- Whether they received assistance implementing new technologies, and from whom
- Technologies they are looking to implement in the next 5 years, and the reasons why
- How they find out about new technologies
- Drivers they consider when deciding to implement new technologies, for example reduced costs, improved efficiency, disease control, environment, water, processor requirements, competitive advantage, reduced labour, new cultivars, etc

1.4.2 Topics for Unstructured Interviews

Processors

Core Topics

- Identify the key issues facing the industry now and in the next 10 years in terms of:
- Trends in Australian and global markets (imports versus exports)
- Needs of the processed potato industry in Australia in order to remain competitive
- Environmental factors affecting the industry that may be addressed by R&D
- The processed potato industry's strategic plan

- Identify the perceived effectiveness and relevance of PPR&D1 with respect to:
- The extent to which the program met expectations



- Awareness of useful outcomes/results to the industry
- Successes of the program
- Shortfalls of the program

- Identify perceptions of the future PPR&D2 program with respect to:
 - Expectations of a PPR&D2 program
 - Areas of the strategic plan that should be the focus of the PPR&D2 program
 - High priority areas for the PPR&D2
 - Groups that may want to be involved in PPR&D2
 - Potential programs that have not already been funded by PPR&D1
 - Any new or emerging technologies, whether local or international, that may be applicable to the Australian industry but have not been trialled, are not yet available or have not been used widely in Australia, but for which access may be sought through the PPR&D program, and who may be contacted regarding them

Additional Topics

- Any current or long-term problem areas of the Australian processed potato industry not addressed by the PPR&D1 that could be addressed by the PPR&D2
- The potential for collaboration on non-confidential international processed potato research programs that may be beneficial to the Australian industry as a whole, who is conducting them, and where

PPR&D1 Coordinator and Plant Breeding Program Coordinator

Core Topics

- Identify the key issues facing the industry now and in the next 10 years in terms of:
 - Trends in Australian and global markets (imports versus exports)
 - Needs of the processed potato industry in Australia in order to remain competitive
 - Environmental factors affecting the industry that may be addressed by R&D
 - The processed potato industry's strategic plan

- Identify the perceived effectiveness and relevance of PPR&D1 with respect to:
 - The extent to which the program met expectations
 - Awareness of useful outcomes/results to the industry
 - Successes of the program
 - Shortfalls of the program



- Identify perceptions of the future PPR&D2 program with respect to:
 - Expectations of a PPR&D2 program
 - Areas of the strategic plan that should be the focus of the PPR&D2 program
 - High priority areas for the PPR&D2
 - Groups that may want to be involved in PPR&D2
 - Potential programs that have not already been funded by PPR&D1
 - Any new or emerging technologies, whether local or international, that may be applicable to the Australian industry but have not been trialled, are not yet available or have not been used widely in Australia, but for which access may be sought through the PPR&D program, and who may be contacted regarding them

Current Australian Research Organisations

- Identify:
 - The strengths and weaknesses of the Australian processed potato research industry in terms of new researchers, research projects and availability of funding
 - Research organisations which have strengths and/or facilities capable of conducting processed potato research
 - Whether Australia is internationally recognised for excellence or as a pioneer in processed potato research, and if so, in which areas of research
 - International groups/organisations which are recognised for excellence or as pioneers in processed potato research, and in which areas

International Organisations

- Identify:
 - Global market trends
 - Advantages and disadvantages of the local industry
 - The needs of the processed potato industry in the local market
 - The key processed potato research groups, including people, location and contact details in the local industry
 - International R&D programs in the local industry, including people, location, project and contact details, that may have applications in the Australian industry and where collaboration or result sharing could be of mutual benefit
 - Technologies that have been developed by the local industry that may have applications to the Australian industry and where access to such technologies may be beneficial, and who to contact regarding those technologies
 - Programs under the existing PPR&D1 that have application in the local market and where collaboration or result sharing would be useful
 - Any technologies that have been developed by the Australian industry that may have application to the local industry and where access to such technologies may be beneficial



- Potential funding sources, for example, in kind or cash, available to the local industry that may be used to support collaborative research projects
- The process by which collaborative programs are typically undertaken in terms of IP sharing, research placements, funding, project selection and dissemination of results.

Market Research Proposal

Pyksis Pty Ltd

March 2008

COMMERCIAL-IN-CONFIDENCE

Proposal for Management Organisation

APRP2 Program

HORTICULTURE AUSTRALIA LIMITED

Pyksis Pty Ltd

April 2009



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Proposal for Management Organisation of APRP2 Program For Consideration by Horticulture Australia Limited and the PPIAC

1. Executive Summary

The following Proposal has arisen from the participation of Pyksis in reviewing the current APRP1 program for the processed potato industry, considerations of the related industry development needs and the drafting of the strategy for the superseding APRP2 program.

This Proposal sets out guidelines and suggestions that Pyksis believes will assist HAL & the PPIAC to institute improvements for program management and governance.

The suggested new organisational structure is analogous to a corporate structure where:

- HAL fills the role of shareholder (and overall manager) with final program authority
- PPIAC fills the role of the Board, including Chair
- Program Director fills the role of the CEO / DIRECTOR
- Researchers fill the role of the divisional managers of research units

This arrangement will require certain adjustments in the way the PPIAC sees itself and its role, but should provide the benefits of clarification and streamlining in its operation. A proposed organisational structure for APRP2 has been prepared and is presented in Appendix 1.

2. Management Recommendations

The following recommendations have been developed as a means of improving upon the current APRP1 management and governance, for review by HAL for the APRP2 program.

2.1. Status Quo & the Future

The existing practice of providing the APRP management via an external Management Organisation (MO) is considered to be beneficial to the APRP2. As with the existing APRP1 program, it is recommended that the MO be a Higher Education Provider (HEP) organisation that is able to claim the Research Infrastructure Block Grants (RIBG) to leverage the \$0.30 per dollar uplift on HAL Levy and Commonwealth funds to pay, *inter alia*, for the APRP2 management.

As per Attachment 1 and Appendix 1 to this Report, Pyksis is suggesting that Option 1 would offer the optimum benefits to HAL in terms of the RIBG uplift and the separation of powers leading to a direct reporting responsibility of the CEO / DIRECTOR to HAL:

- One Head Agreement to be established between HAL and the selected HEP, with all HAL funds paid directly to the HEP, in a similar manner to the existing arrangements under APRP1, against completed milestones.
- The HEP to be responsible for the subcontracting of all Research Organisations (RO) which provide HAL-approved research sub-group programs and to be responsible for approvals to pay all program costs
- HAL to contract all APRP2 management and staff, through a back-to-back agreement with the HEP, where the HEP provides the agreed funding through HAL.
- Research sub-group leaders report to their RO.
- The APRP2 CEO / DIRECTOR reports directly to HAL.
- The APRP2 management staff, contracted by HAL, report directly to the APRP2 CEO / DIRECTOR.

2.2. APRP2 Management

The management of the APRP2 program must be independent of the HEP as actual or perceived conflicts have been raised as an issue for the current APRP1 program where the HEP has also acted as an RO. Recommended changes for the APRP2 staffing arrangements are as follows;

- The CEO / DIRECTOR role should be filled by an individual capable of championing the APRP2 program and with sufficient experience and seniority to provide strategic direction and strong management for the APRP2.
- The CEO / DIRECTOR role is expected to be part-time, although consideration may be given to a full time role during the start of the APRP2. It is considered that 50% of the CEO / DIRECTOR's time will be spent on Strategic / funding activities and 50% on operations.
- To achieve independence of the APRP2 management, the CEO / DIRECTOR appointment must be made by HAL and the position must report directly to HAL.
- The CEO / DIRECTOR should set role descriptions for APRP2 management staff
- APRP2 management staff should be appointed by the CEO / DIRECTOR and report directly to the CEO / DIRECTOR.
- The CEO / DIRECTOR should provide the main link between HAL / PPIAC and the HEP and ROs and be responsible for dispute resolution.
- The CEO / DIRECTOR should conduct research sub-group reviews and implement appropriate Key Performance Indicators (KPI) to manage the progress of the sub-group programs and to provide effective reporting to HAL and the PPIAC.

2.3. Research Organisations

As with the APRP, the ROs will continue to remain responsible for ensuring that the HEP contractual obligations to HAL for the sub-group programs are achieved. A number of additional changes are recommended to ensure that this is achieved for the APRP2;

- Sub-group Program Leaders (SGPLs) must be made accountable for meeting the contractual obligations to HAL.
- SGPLs should have a reporting obligation to the CEO / DIRECTOR on a regular basis, in relation to the HAL obligations, in addition to reporting to the RO.
- Consistent APRP2 Role Descriptions should be established for the SGPLs to ensure roles are understood
- All SGPLs should establish performance KPIs including and incorporating fiscal reporting and responsibility.
- All sub-group programs should include research milestones including go/no-go milestone reviews to provide a means for the CEO / DIRECTOR and PPIAC to review project funding against milestone progress.
- Proposals for project variations should be submitted to the CEO / DIRECTOR for review and proposal to the PPIAC for recommendation to HAL.

2.4. Advisory Oversight

A number of oversight committees were established under the APRP1 Program including the Program Advisory Committee (AC), comprising RO representatives and APRP management, and the Technical Operations Committee (TOC), comprising SGPLs and APRP management. It is recommended the role of committees be revised under APRP2;

A: Technical Operations Committee

- TOC to remain a regular, quarterly, progress meeting between all the SGPLs, the APRP2 management (CEO / DIRECTOR, IDO) and a member(s) of the PPIAC.
- Organisation of the TOC to be conducted and managed by the APRP2 management staff (Agendas, minutes and facilities) and facilitated by the CEO / DIRECTOR.
- Agendas and minutes of meetings to be circulated to SGPLs, Advisory Committee members and PPIAC members for review and comment.
- Advisory Committee and PPIAC members may request agenda items via the Director

B: Advisory Committee

- The AC should remain, consisting of the RO representatives, CEO / DIRECTOR and a PPIAC member(s), as a forum to resolve issues that cannot otherwise be settled by the TOC.
- Technical Meetings convened only when called by Director and should not be considered regular meetings.
- AC representatives are welcome to attend any TOC meeting as an observer.

2.5. Operations

A number of operational recommendations are being proposed to improve the overall management of the APRP2 and to streamline processes within the APRP2.

A: APRP2 Communication and Extension

- An integrated Industry extension and communication program must be established in association with APRP2 to promote good uptake of research outcomes by the levy payers and the industry. It is recognised that HAL has established an Industry Needs Development Program to achieve this end.
- A full time Industry Development Officer (IDO) position should be established, reporting to the CEO / DIRECTOR, with a focus on:
 - Industry extension / communication activities involving the SGPLs and the Communications Provider (AusVeg) (70%)
 - Operational support for the CEO / DIRECTOR (30%)
- An annual APRP2 researcher conference should be established to allow researchers from all sub groups to meet and discuss projects and potential collaborations. It may be useful to make this conference open to international attendees to increase the visibility of the APRP2 and to identify additional collaboration opportunities.

B: APRP2 Processes

- Standardise and simplify processes across the APRP2 organisations, standard processes/templates should be established and used by the management staff, SGPLs, MO, RO and CP e.g. RO contracts, international R&D contracts, IP management, CDA, MTA, R&D program variations etc.
- It is expected that some of these documents and processes exist within HAL processes/templates and may be used. However, the CEO / DIRECTOR should review the current systems and templates, develop new processes where appropriate and establish a procedures manual for the Program.

3. Management Budget

The budget for the management of APRP2 is up to \$350,000 as outlined in the following simplified budget.

APRP2 Management Budget

Staff	Annual Expenditure
CEO / DIRECTOR	\$100,000
IDO *	\$75,000
Administrator *	\$35,000
Sub-total	\$210,000
Operating Expenses	
Travel	\$60,000
Office space	\$25,000
Communications	\$15,000
Annual Meeting	\$25,000
Contingency	\$15,000
Sub-total	\$140,000
Total	\$350,000

* Includes on-costs

Depending on the MO identified, there may be opportunities to reduce the office and communications operating expenses by leveraging facilities provided the MO.

4. APRP2 Stakeholders

In order for these recommendations to be achieved it is important to identify the APRP2 stakeholders and to understand their roles within the program. The following table summarises the APRP2 stakeholders.

APRP2 Key Stakeholders

Stakeholder	Role
Processing potato Growers and Processors	<ul style="list-style-type: none"> Levy payers Beneficiaries of outcomes from the research and development conducted under APRP2, via extension and communication activities.
Horticulture Australia Limited (HAL)	<ul style="list-style-type: none"> Program Owner with overall management responsibility Levy and matching funding contributor Appoints & manages APRP2 Director / CEO / DIRECTOR APRP2 Director / CEO / DIRECTOR reports to HAL

<p>Higher Education Service Provider (HEP)</p>	<ul style="list-style-type: none"> • A Higher Education Provider able to receive Federal RIB Grant funding. • Contracted by HAL to provide research and development services to the Processing Potato levy payers. • Recipient of all HAL funds, levy and Commonwealth matched funding. • Sub-contracts RO's to provide HAL and PPIAC approved research sub group programs. • Liaises with APRP2 Management staff (dependent on model adopted) • Fiscal responsibility for the APRP2 management costs including contractors, staff, offices, travel and other expenses.
<p>Management Organisation (MO)</p>	<p>Depending on the model adopted (in this case Option 1 relationships are described)</p> <ul style="list-style-type: none"> • MO is in a three-way contract with HAL & HEP where HEP provides the funding & accounts for expenditures against acquittals from the MO • MO reports to HAL & is solely accountable to HAL • MO employs CEO, IDO, Administrator
<p>PPIAC</p>	<ul style="list-style-type: none"> • Strategic industry advisory role • Regular meetings with HAL and APRP2 Management • APRP2 recommendations to HAL
<p>CEO / DIRECTOR</p>	<ul style="list-style-type: none"> • Program manager / Champion role - Experienced commercial business manager - Strategic and operations responsibilities • Management responsibilities - APRP2 recommendations to HAL / PPIAC - Fiscal - IDO - Administrator - Research SGPLs monitoring • Regular Technical Group meetings involving - SGPLs - IDO - ROs that wish to attend
<p>Industry Development Officer (IDO)</p>	<ul style="list-style-type: none"> • Reports to CEO / DIRECTOR • Commercial communications / extension experience • Day to day management of the IDNP program • Communication role linking research and extension - Research leaders - Industry - Communications Provider (CP) - Development / implementation / management of effective extension and communications programs with CP and SGPLs • Operations role - Supporting the CEO / DIRECTOR in day to day

	<p>management</p> <ul style="list-style-type: none"> - Developing effective CP activities
Administrator	<ul style="list-style-type: none"> • Reports to CEO / DIRECTOR • Administrative support to CEO / DIRECTOR and IDO - Organisation of regular meetings - Meeting agenda, papers and minutes - Day to day secretarial support for CEO / DIRECTOR - Support IDO extension activities - Support CP in provision of significant meetings
Sub-Group Project Leaders (SGPLs)	<ul style="list-style-type: none"> • Project Research leaders • Dual reporting - Employed by and report to RO - APRP2 CEO / DIRECTOR for contractual obligations to HAL • Research project management 80% - Contractual and fiscal obligations to HAL - Day to day management of research programs • Extension / communication 20% - Develop and implement programs with IDO - Support communications activities via CP
Advisory Committee (AC)	<ul style="list-style-type: none"> • Research Organisation (RO) representatives • Appointed by ROs • Role - Oversight in Technical Group meeting activities <p>Dispute resolution through CEO / DIRECTOR</p>
Communications Provider (CP)	<ul style="list-style-type: none"> • Communications manager e.g. AusVeg • Responsible for implementation of APRP2 communications activities - Industry Publications e.g. Potatoes Australia - Creation of extension materials in collaboration with IDO - Website Management - Industry database management - Organisation of major functions <ul style="list-style-type: none"> • Works directly with and receives direction from - CEO / DIRECTOR - IDO

5. Role Descriptions for APRP2 Management

APRP2 is a large and complex program involving many stakeholders. In order for the APRP2 management to discharge their roles effectively, they will require role descriptions to ensure that responsibilities, reporting and the overall level of communications (both up and down the organisation “tree”) are clearly defined.

Role descriptions have been defined for a number of the key APRP2 management groups and can be found in the appendices;

- Appendix 3: CEO / DIRECTOR
- Appendix 4: IDO
- Appendix 5: Administrator
- Appendix 6: Sub-Group Leaders

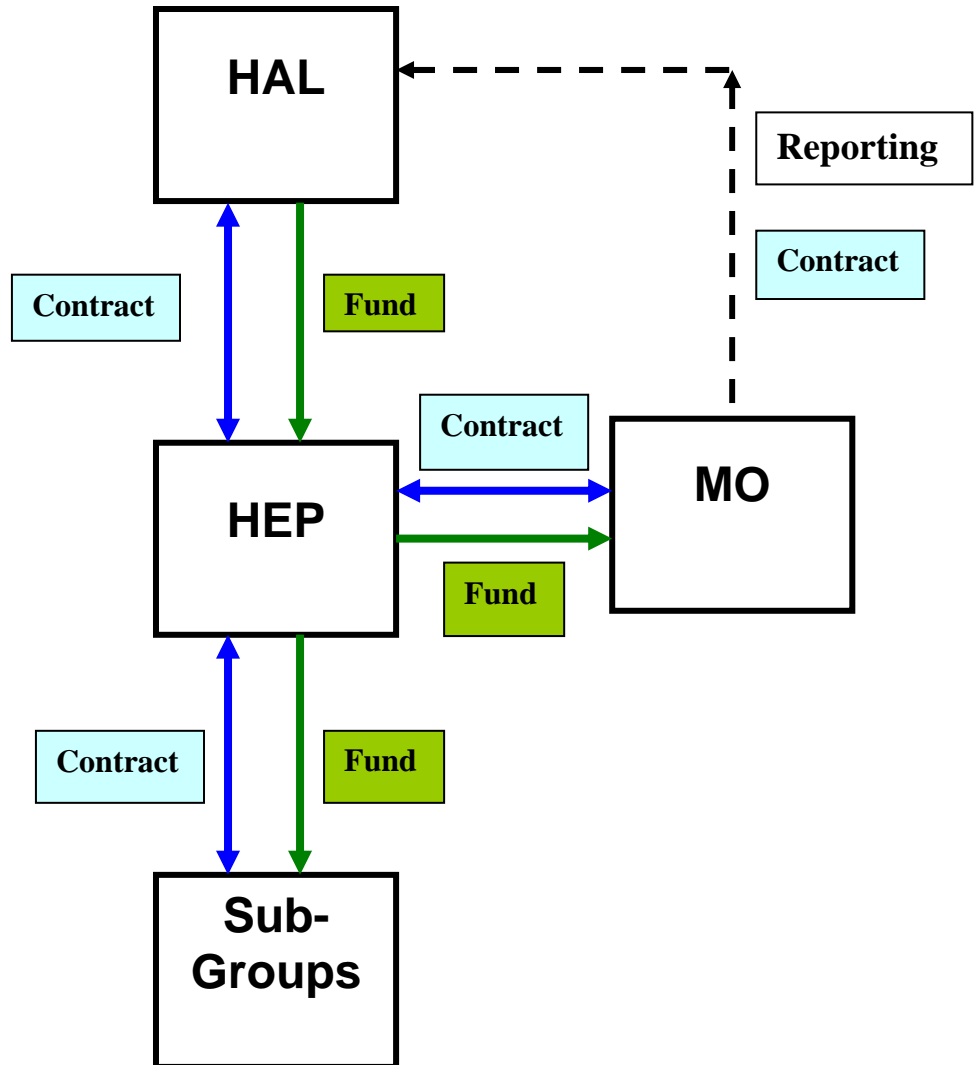
It will also be important to establish terms of Reference for each of the Committees once the program has been established.

It would be preferable to allow the Director to be involved in the establishment of the Program i.e. enter into contract prior to initiating the Program, in the same way as a CEO / DIRECTOR needs to take “ownership” of the Strategic Plan for an organisation, if he/she is to effectively implement it.

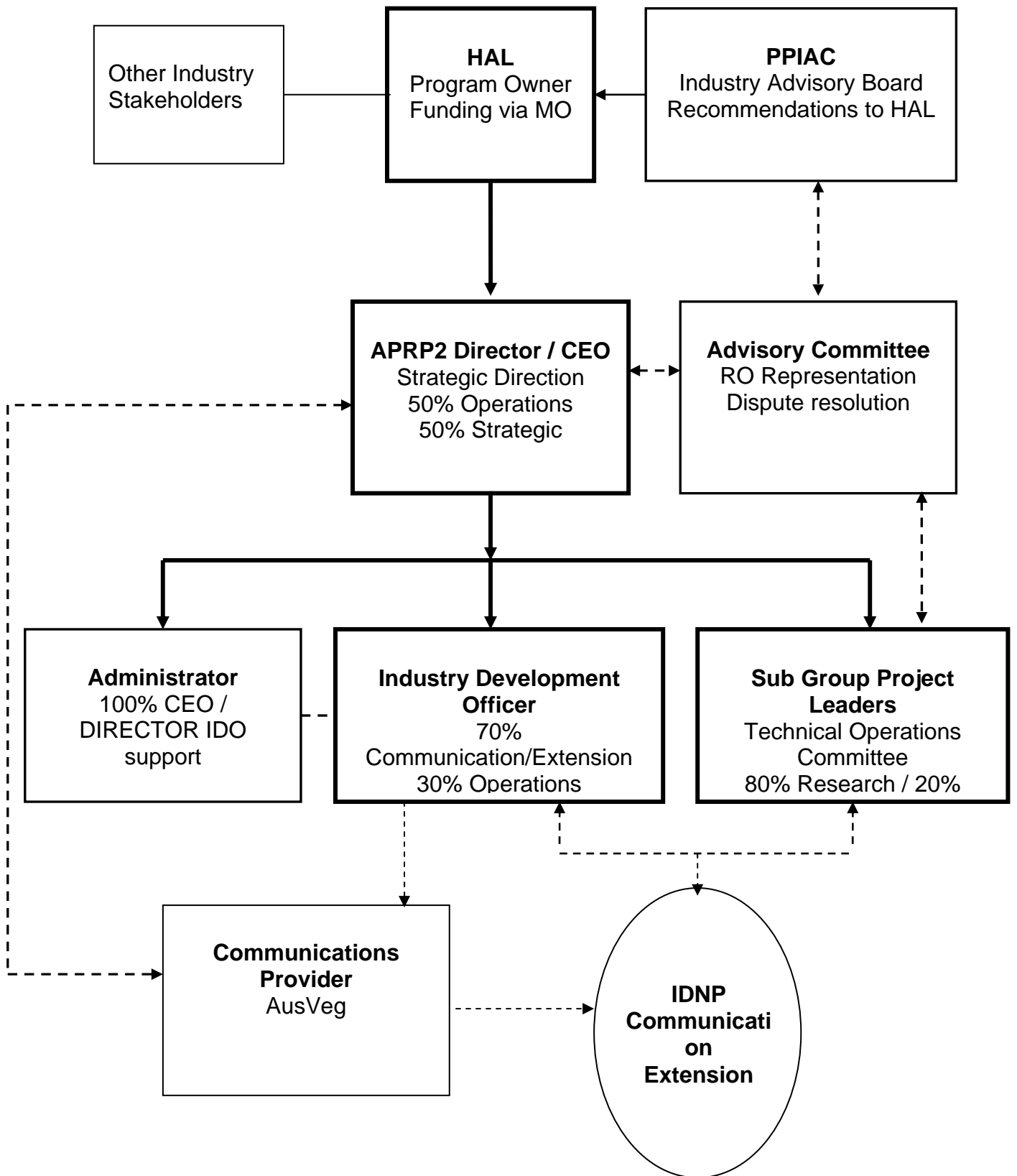
It is recommended that finalisation of the CEO / DIRECTOR Role description and advertising the position be acted upon in the near future to ensure that sufficient time is available to identify an appropriate candidate.

Pyksis Pty Ltd
April 2009

APPENDIX 1: Option 1 – Contractual Arrangements & Funding Flows



APPENDIX 2: Proposed APRP2 Program Structure



APPENDIX 3: APRP2 CEO / DIRECTOR

ROLE DESCRIPTION

PROGRAM:	APRP2
POSITION:	CEO / DIRECTOR (Project Director)
REPORTING TO:	Horticulture Australia Ltd

1. OVERALL OBJECTIVES

APRP2 is a 5 year multimillion dollar Research and Development program for the Australian Processed Potato Industry. APRP2 is funded by Horticulture Australia Limited (HAL) via levy funds, matched Commonwealth contributions and in-kind contributions from Research Organisations.

The primary purpose of this role is to provide strategic direction and operations management for APRP2.

2. KEY RESPONSIBILITIES

Reporting to HAL and working with the PPIAC, the key responsibilities for the CEO / DIRECTOR are in the areas of:

- Strategic Direction for APRP2
- Day-to-day management of APRP2 operations
- Regular reporting to HAL and the Processed Potato Industry Advisory Committee (PPIAC)
- Fiscal reporting and identifying additional sources of funding
- Stakeholder relations
- Promotion & management of national & international partner relationships
- Management of direct reports
- Oversight management of R&D SGPLs and programs

3. KEY RESULTS AREAS

- Champion and promoter of APRP2.
- Providing the Strategic direction and alignment with the industry strategic plan and needs of stakeholders.
- Meeting requirements for management and administration set by HAL principals and the PPIAC.
- Fiscal responsibility for APRP2 including leveraging additional funding sources, both nationally & internationally.
- Providing independent, transparent, contestable and accountable management of APRP2.

- Oversight management of new and existing APRP2 projects to meet timelines and milestones including conducting regular Technical Group meetings with R&D sub-group leaders.
- Developing strong relationships with key stakeholder
- Fostering integration of innovation in the industry via co-ordination of APRP2 R&D, communication and extension programs.
- Management of APRP2 direct reports including;
 - Industry Development Officer
 - Administrator
- Acting as a link between HAL, the PPIAC and Research Organisations including facilitation of dispute resolution.
- Fostering a culture of continual improvement in APRP2
- Fostering international linkages

4. KEY RELATIONSHIPS / STAKEHOLDERS

- HAL
- PPIAC
- Levy payers (Processed Potato growers and processors)
- APRP2 staff
- APRP2 Research Organisations
- APRP2 Sub-group Leaders
- AusVeg
- Government and other funding sources
- International collaborators
- International processed potato organisations

5. ROLE

- Part time with potential to increase hours if necessary e.g. program initiation
- Time split 50% Strategic and 50% Operational
- Contractor reporting to HAL
- Estimate \$75,000 - \$100,000 + office and travel expenses
- Minimum 5 year term
- Able and willing to travel frequently as required
- Independent of research organisations

6. SKILLS

Necessary

- Strategic thinker
- Customer-focused, experienced senior manager with proven leadership skills & administrative capability
- A degree of scientific/technical knowledge and capable of understanding science, given exposure to the program (Bachelor degree minimum)
- Strong influencing skills & ability to promote cooperative efforts & to defuse potential for conflict

- Good facilitator willing to work with researchers and stakeholders
- Ability to work productively with a small team
- Capable of influencing a larger group of non-reporting stakeholders

- Senior management and/or Board reporting experience
- Contacts in government (State and Federal) for funding
- Able to communicate with the researchers and industry

Preferred

- Seasoned professional looking for part time work
- Commercial experience (corporate background) e.g. Agribusiness / Biotechnology background such as CRC, CEO / DIRECTOR research / research manager etc
- Previous responsibility for research teams and research funds
- Experience in the industry and/or a related industry
- Understanding of government organisations i.e. management and reporting processes
- CRC experience or similar

7. AUTHORITIES

- As agreed by HAL and the PPIAC and may include
 - Confidential Disclosure Agreements (CDAs)
 - APRP2 management travel expenses
 - Recruitment and dismissal of APRP2 staff

APPENDIX 4: APRP2 industry Development Officer

ROLE DESCRIPTION

PROGRAM:	APRP2
POSITION:	Industry Development Officer (IDO)
REPORTING TO:	APRP2 CEO / DIRECTOR

1. OVERALL OBJECTIVES

APRP2 is a 5 year multimillion dollar Research and Development program for the Australian Processed Potato Industry. APRP2 is funded by Horticulture Australia Limited (HAL) via levy funds, matched Commonwealth contributions and in-kind contributions from Research Organisations.

The primary purpose of this role is to provide effective extension of the results of the funded R&D Programs to the levy payers (which is a key role that affects the overall success of APRP2) and to provide support for the APRP2 CEO / DIRECTOR.

2. KEY RESPONSIBILITIES

Reporting to the CEO / DIRECTOR and working with the Sub-group Project Leaders and the Communications Provider, the key responsibilities for the IDO are in the areas of:

- Reviewing and categorising the entire cross-section of levy payers to identify the status of their adoption of information, including R&D results, the inhibitors to that adoption and the most effective methodologies for adoption by sub-group
- Developing, in consequence of the above and in consultation with the CEO / DIRECTOR and the Communications Provider, an overall plan (the Technology Transfer Plan) for industry extension, complete with timetable and Key Performance Indicators (KPIs) on a yearly basis that the CEO / DIRECTOR can take forward to HAL & the PPIAC for approval
- Ensuring the effective transfer of APRP research results to levy payers, in accordance with the Technology Transfer Plan and as part of this key responsibility, organising & implementing, *inter alia*, events such as:
 - Demonstration sites for new technologies and methodologies
 - Field Days that are specifically focused on processed potato industry needs & technology transfer
 - APRP participation in larger industry Field days
- Delivering, in coordination with the Communications Provider, timely information in various formats, electronic and printed versions, that fully support the above activities

- Ensuring, in collaboration with the Communications Provider that reports and other information are up-to-date and readily accessible through portals such as the AusVeg website
- Working with other industry groups in Australia and the processed potato industry internationally to identify and adopt the most effective methods for industry extension
- Production of regular reports on status of industry extension
- Reporting, in collaboration with the CEO / DIRECTOR, to the PPIAC on progress, milestone achievements and initiatives
- Be prepared to travel broadly within Australia for effective industry extension and, as required overseas

3. KEY RESULTS AREAS

- Providing the leadership in strategic planning for industry extension
- Being at the forefront in the effective delivery of information and technology to levy payers and its effective adoption
- Acting as the key link between researchers, management, levy players, service providers and stakeholders
- Reporting on effectiveness of the overall strategy embodied in the Technology Transfer Plan and recommendations for improvements
- Optimising the effectiveness of communications
- Fostering improved technology transfer capabilities amongst SGPLs
- Establishing a strong and effective industry extension and communications capability that is targeted to the processed potato industry specific needs

4. KEY RELATIONSHIPS / STAKEHOLDERS

- CEO / DIRECTOR
- Industry stakeholders and levy payers
- AusVeg
- APRP2 Research Organisations
- SGPLs
- Industry service providers
- National and International industry extension providers

5. ROLE

- Full-time
- Time split 70% industry extension and communication and 30% operations
- Contractor to and reporting to HAL via the CEO / DIRECTOR
- Estimate \$75K to \$80k plus car, office and travel expenses
- Minimum 1 year probationary term with option to extend to 5 year term
- Need to travel frequently to regional Australia
- The position will require travel & participation outside normal office hours-

6. SKILLS

Necessary

- Demonstrated ability to conceptualise, plan and implement a strategic plan to meet stakeholder needs
- Demonstrated capability and experience in working closely and effectively with key stakeholder groups
- Diploma or degree in Science
- Proven commitment to and understanding of the key issues relevant to industry extension
- Excellent written, oral, computer and delivery skills, with a proven ability to communicate effectively with people at all levels of company hierarchy as well as those of different backgrounds
- Working knowledge of industry bodies such as HAL and their role in delivering government programs
- Demonstrated ability to perform duties unsupervised
- Possession of a current driver's licence and a good driving record

Preferred

- Previous experience in industry extension & a seasoned professional
- Well-developed set of contacts in agriculture and communications and, preferably, in industry extension
- Familiarity with reporting requirements of government organisations

7. AUTHORITIES

- As agreed with the CEO / DIRECTOR and may include:
 - Approval of commitments to Field Days
 - Approval of commitments to demonstration plots
 - Approval of industry seminars
 - Approval of media publications for technology transfer

APPENDIX 5: APRP2 Administrator

ROLE DESCRIPTION

PROGRAM: APRP2

POSITION: Administrator

REPORTING TO: APRP2 CEO / DIRECTOR

1. OVERALL OBJECTIVES

APRP2 is a 5 year multimillion dollar Research and Development program for the Australian Processed Potato Industry. APRP2 is funded by Horticulture Australia Limited (HAL) via levy funds, matched Commonwealth contributions and in-kind contributions from Research Organisations.

The primary purpose of this role is to provide administrative support to the APRP2 CEO / DIRECTOR and Industry Development officer (IDO).

2. KEY RESPONSIBILITIES

Reporting to the CEO / DIRECTOR and working with the IDO and stakeholders, the key responsibilities are in the areas of:

- Secretarial support
- Office administration
- Organisation of travel and meetings
- Clerical

3. KEY RESULTS AREAS

- Develop strong relationships with key stakeholders.
- Co-ordination of travel, APRP2 meetings and venues
- Secretarial services for the CEO / DIRECTOR
- APRP2 administrative support including:
 - a. Answering telephones.
 - b. Co-ordination of travel requirements.
 - c. Preparation of meeting minutes and reports.
 - d. Conducting mailings.
 - e. Filing.
 - f. Co-ordination of IT support.
 - g. Preparation of expense reports.
 - h. Creation and management of contact databases
- The position may require travel and out of hours activities as required.

4. KEY RELATIONSHIPS / STAKEHOLDERS

- HAL
- PPIAC
- Levy payers (Processed Potato growers and processors)
- APRP2 staff
- APRP2 Research Organisations
- APRP2 Sub-group Leaders
- AusVeg
- International collaborators
- International processed potato organisations

5. ROLE

- Full time
- Employed by the Management Organisation by reporting to the APRP2 CEO / DIRECTOR
- Estimate \$30,000 - \$35,000 + office + travel expenses
- 5 year term
- Able and willing to travel frequently as required

6. SKILLS

Necessary

- Proficient typing and use of Microsoft Office
- Good communicator with proven administrative skills and past responsibilities
- Ability to work productively with a small team

Preferred

- Commercial experience in Agribusiness / Biotechnology etc
- Experience in the industry and/or a related industry

7. AUTHORITIES

- To authorise travel requirements subject to CEO / DIRECTOR approval.

APPENDIX 6: APRP2 Sub-group Program Leader

ROLE DESCRIPTION

PROGRAM:	APRP2
POSITION:	Sub-group Program Leader (SGPL)
REPORTING TO:	Horticulture Australia Ltd

1. OVERALL OBJECTIVES

The APRP2 is a 5 year multimillion dollar Research and Development program for the Australian Processed Potato Industry. The APRP2 is funded by Horticulture Australia via levy funds, matched commonwealth contributions and in-kind contributions from Research Organisations.

The primary purpose of this role is to provide Research and Development services for approved APRP2 research and development programs.

2. KEY RESPONSIBILITIES

Reporting to the CEO / DIRECTOR for contracted APRP2 programs, the key responsibilities are in the areas of:

- Day to day management of the Sub group project
- Regular reporting to the CEO / DIRECTOR including performance against budget and research milestones
- Fiscal management of the Sub group project
- Research extension activities

3. KEY RESULTS AREAS

- Ensuring sub-projects remain on time and on budget
- Fiscal responsibility for APRP2 funds contracted to the sub-group project.
- Providing accurate reporting of sub group project progress against agreed milestones to the CEO / DIRECTOR.
- Ensuring communication of potential sub group project variations to the CEO / DIRECTOR in a timely manner for review and appropriate authorisation.
- Developing and maintaining good relationships with key stakeholders.
- Attending regular APRP2 Technical Group meetings and other meetings as requested by the CEO / DIRECTOR.
- Compliance with APRP2 processes as advised by APRP2 management and in line with HAL requirements for management, administration and program reporting.
- Involvement in extension and communication programs as requested by APRP2 management.

- Raising of any issues and or notification of disputes with the CEO / DIRECTOR for resolution.
- Identifying potential new projects and or funding sources
- Fostering international linkages
- Fostering entry of new researchers into the industry.

4. KEY RELATIONSHIPS / STAKEHOLDERS

- HAL
- PPIAC
- APRP2 CEO / DIRECTOR
- Levy payers (Processed Potato growers and processors)
- APRP2 staff
- Sub-group project staff
- APRP2 Research Organisations
- Other APRP2 Sub-group Leaders
- AusVeg
- Government and other funding sources
- International collaborators
- International processed potato organisations

5. ROLE

- As defined under the Management Organisation (MO) service contract
- Time split 80% Research and development and up to 20% Extension and communication.
- Able and willing to travel frequently as required

6. AUTHORITIES

- As defined under the Management Organisation service contract



ATTACHMENT 1

OPTIONS FOR FUNDING & MANAGEMENT OF PROJECT DIRECTOR & SUPPORT STAFF APRP2 PROJECT

Background:

Pyksis Pty Ltd (Pyksis) has put forward suggestions to Horticulture Australia Limited (HAL) on new arrangements for Project Management to improve the management and operation of the APRP2 over that experienced in APRP1.

In this regard, one of the major concerns encountered in APRP1 was the actual & perceived conflicts of interest between the Management Organisation (MO) and the Project Director and their duties to HAL as the major funds provider.

The new arrangements proposed by Pyksis are designed to overcome these conflicts by:

- Making the Project Director directly accountable to HAL
- Separating out the Project Director from the MO to overcome any confusion in the lines of responsibility and reporting

There are at least three options by which these important outcomes might be achieved, each with their own advantages and disadvantages.

However, the overriding consideration needs to be the separation and clear delineation of lines of reporting and accountability so that the CEO/Director and support staff unambiguously report to HAL and not to the MO, where that MO is also the body responsible for conduct of the R&D.

Should the MO, however, be an entity that is separate from that responsible for the R&D, ie distinctly different from the situation in the case of APRP1, the MO, eg a consulting organisation, this could be an effective means for delivering the separation of powers and avoidance of conflicts of interest.

The options are, in turn, related to the exercise of the leveraging that is available under the Research Infrastructure Block Grant Scheme (RIBG) which provides a 30% uplift on funds employed.

This uplift can only be paid to a Higher Education Provider (HEP) and can only be used for the following purposes:



Research Infrastructure Block Grants Scheme (RIBG)

1.1. The RIBG Grant must be used only for any one or more of the following purposes:

- 1.1.1. non-capital aspects of facilities such as libraries, laboratories, computing centres, animal houses, herbaria, experimental farms;
- 1.1.2. equipment purchase, installation, maintenance, hire and lease;
- 1.1.3. salaries of research support staff (including research assistants; accounting and administrative staff; and technicians) employed to provide general support activity in a given area (e.g. a research assistant providing support for a number of research projects but not a research assistant dedicated to a particular project);
- 1.1.4. provide for travel costs to allow participation in international consortia.

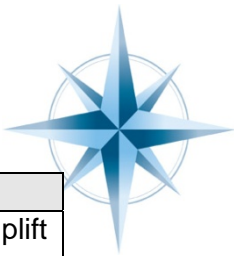
1.2. The RIBG Grant must not be used for:

- 1.2.1. capital works (i.e. construction of buildings);
- 1.2.2. rental of accommodation;
- 1.2.3. salaries of teaching and research, and research-only academic staff (including the cost of 'buying time' to free such staff to do more research);
- 1.2.4. salaries of staff supporting research at the institutional level (e.g. Deputy Vice-Chancellor (Research), Research Grants Officer);
- 1.2.5. stipends of postgraduate research students; or
- 1.2.6. travel costs directly associated with individual projects with the exception of travel costs to allow participation in international consortia.

The situation in terms of practical options is summarised in the following table. The options presented in this table are dependent on the assumption that the interpretation that Pyksis has made of the terms and conditions for how the RIBG uplift may be disbursed are correct. This situation does require validation.

Table 1 – Options for Project Management – APRP2

Option	Description	Advantages	Disadvantages
1.	MO is a separate entity, eg consulting organisation that contracts to HAL & employs Project Director & staff under contract. A necessary component of this is that there is a HEP to obtain the uplift & contracts	<ul style="list-style-type: none"> ▪ no ambiguity on lines of responsibility for Project Director & staff ▪ clear & direct reporting to HAL ▪ Day-to-day responsibility for Project Director and overall delivery against objectives are devolved to MO 	<ul style="list-style-type: none"> ▪ Potential for RIBG uplift



Option	Description	Advantages	Disadvantages
2.	MO is an HEP organisation that is responsible for R&D program management & back-to-back contracts HAL to recruit, contract & manage the Project Director and staff	<ul style="list-style-type: none"> ▪ no ambiguity on lines of responsibility for Project Director & staff ▪ clear & direct reporting to HAL 	<ul style="list-style-type: none"> ▪ Potential for RIBG uplift
3.	MO is HAL & HAL retains part of its funding for contracting Project Director & staff	<ul style="list-style-type: none"> ▪ no ambiguity on lines of responsibility for Project Director & staff ▪ clear & direct reporting to HAL 	<ul style="list-style-type: none"> ▪ No RIBG uplift on this component of HAL funds

In reviewing these options, what needs to be validated is whether RIBG uplift can be obtained on the component of funds that would be allocated to the Project Director & staff activities.

Pyksis has estimated that, on the basis of the current projections of financial support from HAL for APRP2, the uplift will be between \$400k and \$500k per annum, a not insignificant amount.

There are important conditions with respect to the RIBG uplift as the following section reveals and these need to be taken into consideration in the final decision making on preferred options.

RIBG Conditions

The RIBG terms and conditions stipulate that the recipient must be an HEP. That HEP receives all the benefits & must spend the uplift on approved activities (not capital works), as described above.

Clearly negotiations will need to take place between HAL and the HEP to ensure that there is an equitable outcome from the RIB Grant uptake and, in particular, the funds flow to the MO to ensure that the Project Director & associated staff are adequately funded.

The independence & capability of this unit will be central to the success of the APRP in delivering value-added outcomes to the industry.

An important outcome for the HEP will be the kudos that it will gain through being a central player in the conduct of APRP2 and the recipient of the RIB grant.

Pyksis Pty Ltd

April 2009