

THE AUSTRALIAN POTATO RESEARCH PROGRAM (APRP2)

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May 2013



Presentation overview

1. Introduction
2. Program snapshot
3. Projects
4. Communications / extension
5. Evaluation



Introduction

- APRP2 is the processing potato industry's flagship R&D program
- Successor to APRP1 (completed 2009)
- An international collaboration
- HAL's fourth largest investment

Pyksis - lessons learned APRP1

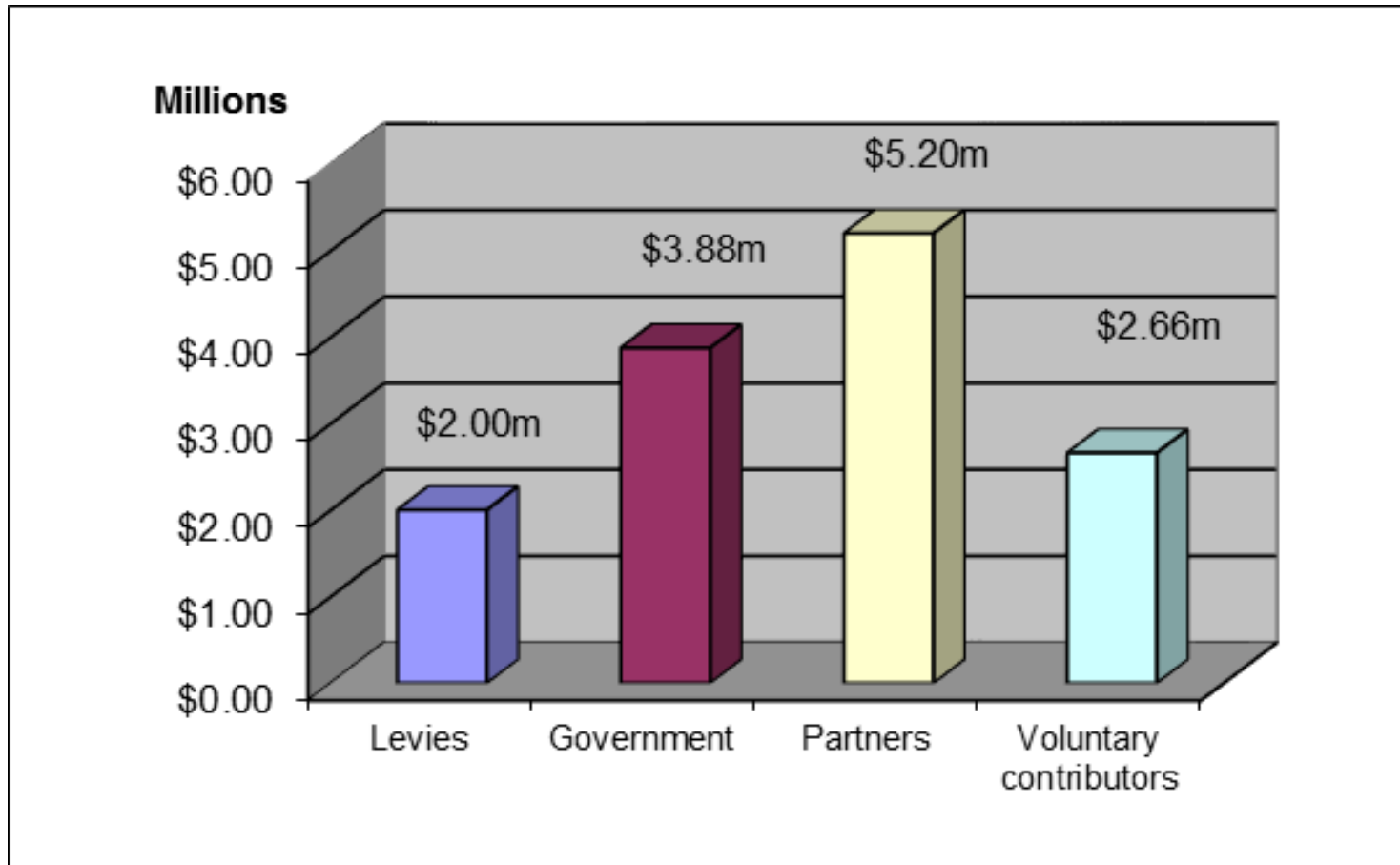
Issue	APRP2?
Focus on programs that address strategic industry needs	✓
Expand industry inclusivity	?✓
Establish realistic expectations and outcomes for programs	✓
Ensure that programs remain focused	✓
Review and streamline existing management, procedures and processes	✓
Expand international collaboration	✓
Ensure effective communications and extension	✓ (but separate program)
Establish program metrics, accountability, routine critical review and mechanisms for change	✓
Expand the available funding sources	?✓

Program snapshot

- Five R&D projects plus SED as manager
- Thirteen providers to HAL and the PPIAC
- Total investment \$13.7m by all contributors over 5 years
- Completion Sep 2014



Funding sources



Voluntary contributions

Voluntary contributions

HAL

PT09039
University of
Ballarat

PT09004
IPM
Technologies

PT09019
TIA

PT09023
SARDI

PT09026
DPI Vic

PT09029
University of
Melbourne

PT09040
SED Advisory

Plant & Food
Research NZ

SARDI

TIA

TIA

Horticulture
NZ

DPI Vic

Flinders
University

Potato
Council UK

VicSPA

Plant & Food
Research NZ

Plant & Food
Research NZ

Horticulture
NZ

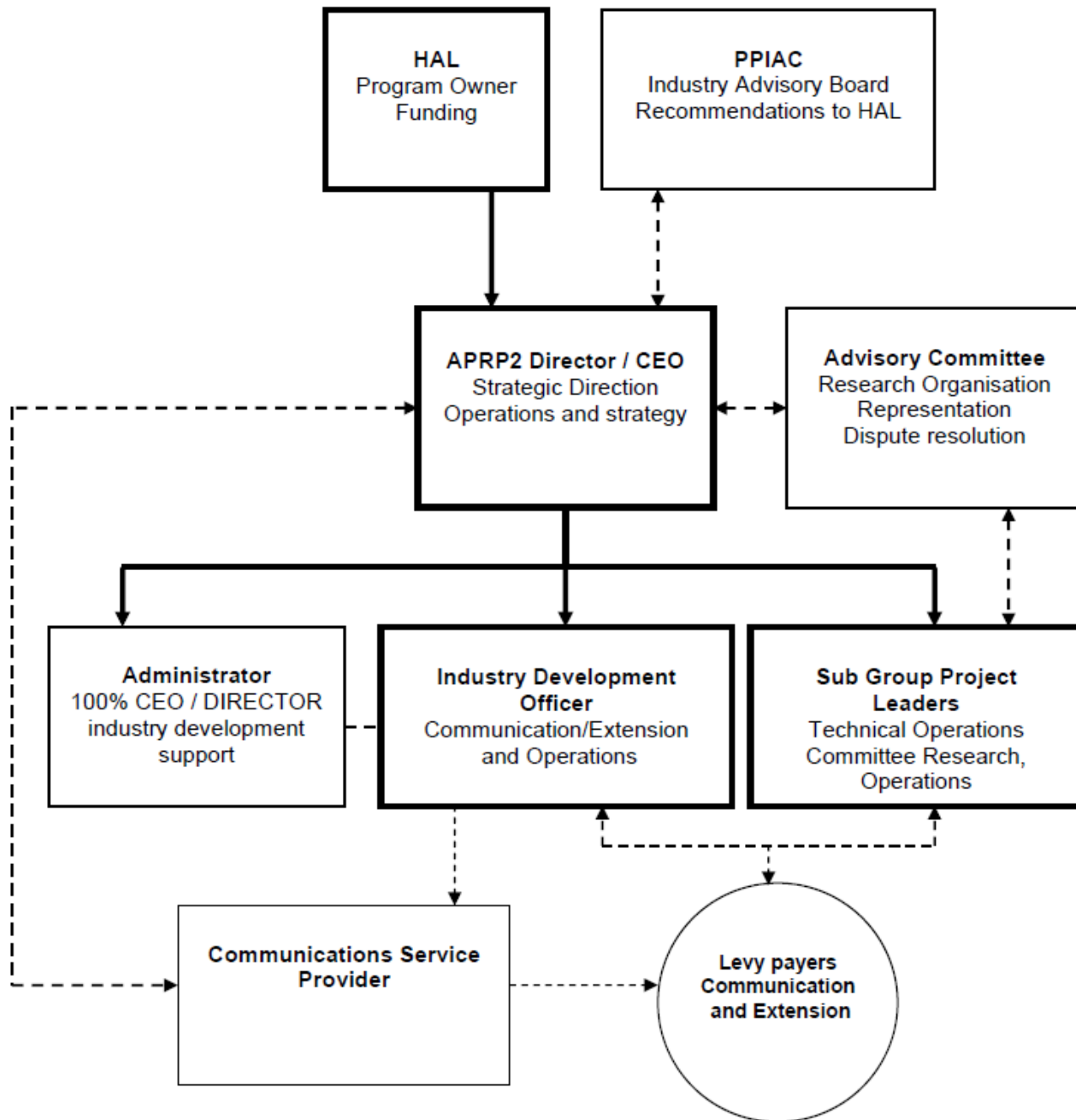
A&L Labs
Canada



At University of Ballarat in Phase 2



Know-how for Horticulture™



Program outcomes

- **PT09004 – IPM Technologies – \$1.06m – Psyllid in IPM**
 - Delivery of IPM strategy to manage tomato-potato psyllid that is compatible with existing IPM strategies and reduced reliance on chemicals
- **PT09019 – TIA – \$0.77m – Tuber-borne inoculum**
 - Delivering opportunities to use DNA diagnostics in Seed Potato Certification schemes. Quantifiable measures of the influence of tuber-borne inocula on disease development under varying soil disease loads

Program outcomes (cont)

- **PT09023 – SARDI - \$4.39m – DNA soil diagnostic tests**
 - Delivering pre-plant, DNA-based soil tests for growers for quantification of soil-borne pathogens (*Spongospora subterraneum*, *Streptomyces scabies*, Rhizoctonia AG2-1 and AG3) and risk factors prior to planting (with supporting reference tools)
 - Delivery of service model and training developed as optional phase 2
- **PT09029 – University of Melbourne – \$0.39m – PED**
 - Fundamental understanding of PED in Australia – cause (Verticillium, nematode interaction)
 - Create a platform for future work

Program outcomes (cont)

- **PT09026 – DPI Vic – \$6.55M – Soil health/disease mitigation**
 - Delivery of a decision chart/brochure describing soilborne disease management strategies based on soil amendments and nutrient manipulations (based on research in APRP1 and APRP2)
 - Research into novel approaches for disease suppression using endophytes and 2,4-D
 - Validation of the role of irrigation water as a source of inoculum for the disease bacterial wilt in potato crops grown in the catchment of the Bunyip river

Control of potato psyllid within an IPM strategy

- IPM Technologies / PFR / Horticulture NZ
 - Project is complete
 - Three predatory insects identified
 - IPM strategy developed
 - Strategy successfully demonstrated on two commercial sites on the South Island (North Island may follow)
 - Other basic knowledge has been gained through PFR and Hort NZ work

Importance of tuber-borne inocula on seed potato health

- TIA / SARDI
 - Point sampling verified against continuous sampling
 - Visual assessments verified against DNA testing
 - Effect of tuber DNA on subsequent disease is still being assessed

Diagnostic test for soil-borne pathogens (international)

- SARDI / TIA / PFR / PCUK / Hort NZ / DPI V
 - Standardisation of DNA testing for powdery & common scab, *Rhizoctonia solani*
 - Improved characterisation of relationship between soil DNA and disease risk
 - DNA testing service for growers, Predicta Pt, will be launched from July 2013 with comprehensive supporting manual

Soil health/disease mitigation program

- DPI V / TIA / PFR / VicSPA / Flinders U / A&L
 - A(i) soil amendments: 3 years' trials completed in Victoria, NZ and Canada examining effects of a range of interventions on common and powdery scab (sulphur, pH modifiers, K:Mg ratios, soil and foliar applications of iron, zinc and sulphur, Nebijin[®], formic acid and others)
 - A(ii) rotations: 3 seasons of DNA surveys of pathogens from paddocks under various rotation regimes completed

Soil health/disease mitigation program (cont)

- DPI V / TIA / PFR / VicSPA / Flinders U / A&L
 - B(i) endophytes: populations characterised, promising candidates isolated and undergoing efficacy testing
 - B(ii) novel chemicals: sub-project completed. Low rates of 2-4,D and also analogues very effective on common scab. Commercial discussions underway.
 - C bacterial wilt: floods have disrupted testing. Protocols have been refined and one positive identification of *Ralstonia* made (2011/12).

Enhancing the understanding of Verticillium in Australian potato production

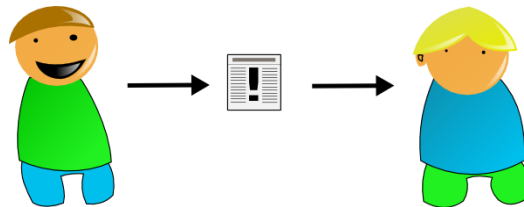
- University of Melbourne
 - PhD and Masters students
 - Improved understanding of Verticillium wilt and PED – species present, pathogenicity, role of nematodes
 - Two resistance screening trials completed providing list of resistant cultivars
 - Testing of organic soil amendments to inhibit *V. dahliae* underway – brown coal had no effect

Overall progress

- Science is generally tracking well
 - Some delays (e.g. bacterial wilt subproject)
 - (Late) mid-term review about to take place
- Administration is challenging
- The task from here to Sep 2014 is to identify concrete outcomes and benefits
 - Distillation of findings into key messages
 - Completion of evaluation

Communication

- APRP2 has limited communication resources
- Mainly internal
 - Website, newsletter, TOC, AC, milestones, etc
- Some external
 - Potatoes Australia, APRP2 Symposia



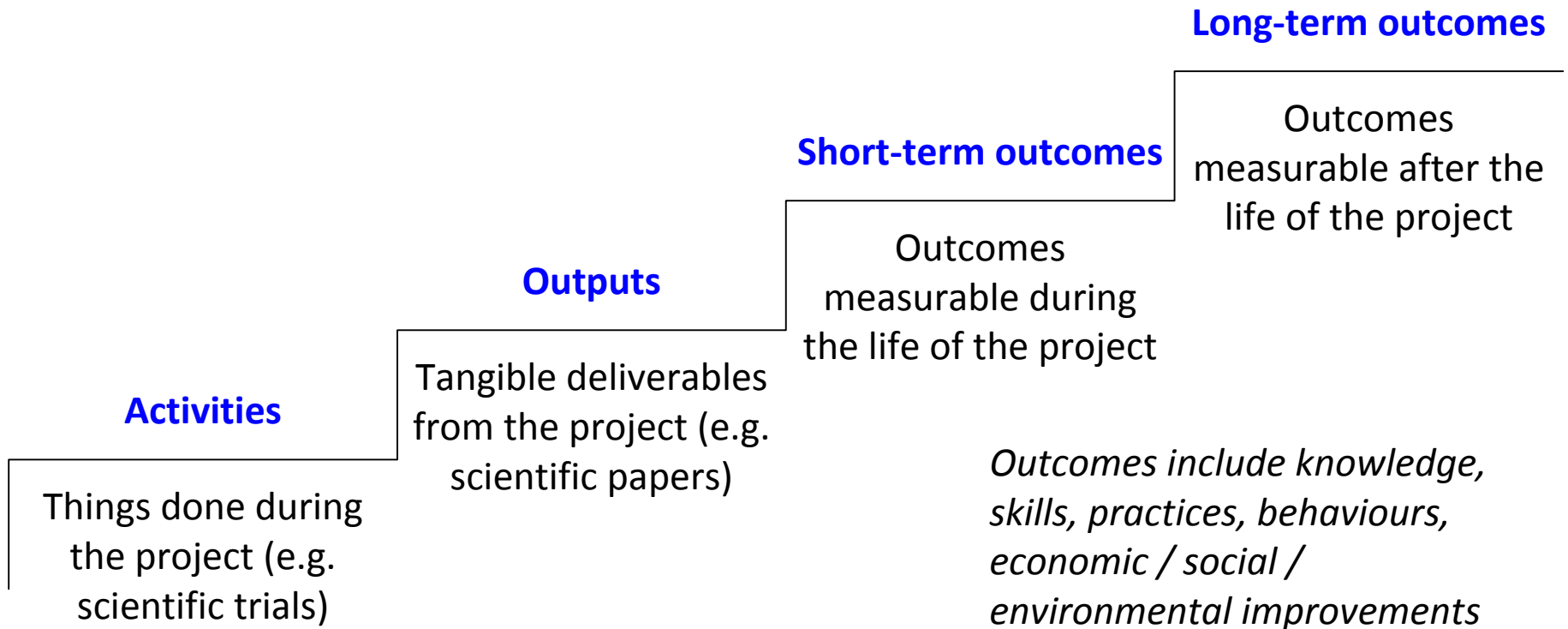
Extension

- Minimal activities are supported through APRP2
- The Potato Extension Program is managed by AUSVEG
 - Workshops
 - Newsletter
- High quality extension will be vital for ROI/maintain PP viability

Evaluation

- APRP2 is primarily R&D based – there is little emphasis on uptake and adoption
- Therefore, evaluation will be limited mainly to activities and outputs
- SED has prepared a ‘cost of diseases’ survey that will form the basis for a benefit/cost analysis

Evaluation logic



Acknowledgment

The projects funded under APRP2 have been facilitated by HAL in partnership with AUSVEG and the Potato Processors Association of Australia (PPAA). They have been funded by the processing potato levy and voluntary contributions from A&L Laboratories (Canada), Horticulture New Zealand, Plant & Food Research (New Zealand) and Potato Council (UK). The Australian Government provides matched funding for all HAL's R&D activities.



Program participants



Australian Potato Research Program Phase 2

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