Industry-specific impact assessment program: Onion

Impact assessment report for project *Communications plan for the Australian onion industry – project extension* (VN12003)

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What the report is about

This report presents the results of an impact assessment of a Horticulture Innovation Australia Limited (Hort Innovation) investment in *VN12003: Communication plan for the Australian onion industry – project extension.* The project was funded by Hort Innovation over the period June 2013 to March 2016.

Methodology

The investment was first analysed qualitatively within a logical framework that included activities and outputs, outcomes, and impacts. Actual and/or potential impacts then were categorised into a triple bottom line framework. Principal impacts identified were then considered for valuation in monetary terms (quantitative assessment). Past and future cash flows were expressed in 2019/20 dollar terms and were discounted to the year 2019/20 using a discount rate of 5% to estimate the investment criteria and a 5% reinvestment rate to estimate the modified internal rate of return (MIRR).

Results/key findings

The investment in VN12003 has provided an effective conduit for delivery of research and market information to onion growers (Key-Link Solutions 2015). Consequently, VN12003 is likely to contribute to lower onion production costs and additional profitable onion sales.

Investment Criteria

Total funding from all sources for the project was $0.81 million (present value terms). The investment produced estimated total expected benefits of $1.71 million (present value terms). This gave a net present value of $0.90 million, an estimated benefit-cost ratio of 2.11 to 1, an internal rate of return of 14.8% and a modified internal rate of return of 7.3%.

Conclusions

A positive return has been assessed for this project. Two impacts identified were not valued, the impacts were considered uncertain and indirect compared with the impact valued. Consequently, the investment criteria provided by the valuation may be underestimates of the actual performance of the investment.

Keywords

Impact assessment, cost-benefit analysis, onion industry, communication plan, research adoption, market conditions, cost of production, profitable sales.

Introduction

All research, development, and extension (RD&E) and marketing levy investments undertaken by Horticulture Innovation Australia Limited (Hort Innovation) are guided and aligned to specific investment outcomes, defined through a Strategic Investment Plan (SIP). The SIP guides investment of the levy to achieve each industry's vision. The current industry SIPs apply for the financial years 2016/17 – 2020/21.

In accordance with the Organisational Evaluation Framework, Hort innovation has the obligation to evaluate the performance of its investment undertaken on behalf of industry.

This impact assessment program addresses this requirement through conducting a series of industry-specific ex-post independent impact assessments of the almond (AL), banana (BA), citrus (CT) and onion (VN) RD&E investment funds.

Twenty-nine RD&E investments (projects) were selected through a stratified, random sampling process. The industry samples were as follows:

- Nine AL projects were chosen worth $5.84 million (nominal Hort Innovation investment) from an overall population of 21 projects worth an estimated $10.78 million,
- Eight BA projects worth $3.02 million (nominal Hort Innovation investment) from an overall population of 22 projects worth approximately $16.72 million,
- Eight CT projects worth $5.4 million (nominal Hort Innovation investment) from a total population of 35 projects worth $15.78 million, and
- Four VN projects worth $2.4 million (nominal Hort Innovation investment) from an overall population of 8 projects worth $3.89 million.

The project population for each industry included projects where a final deliverable had been submitted in the five-year period from 1 July 2014 to 30 June 2019.

The projects for each industry sample were chosen such that the investments represented (1) at least 10% of the total Hort Innovation RD&E investment expenditure for each industry, and (2) the SIP outcomes (proportionally) for each industry.

General Method

The impact assessment follows general evaluation guidelines that are now well entrenched within the Australian primary industry research sector including Research and Development Corporations, Cooperative Research Centres, State Departments of Agriculture, and some universities. The approach includes both qualitative and quantitative descriptions that are in accord with the impact assessment guidelines of the CRRDC (CRRDC, 2018).

The evaluation process involved identifying and briefly describing project objectives, activities and outputs, outcomes, and impacts. The principal economic, environmental, and social impacts were then summarised in a triple bottom line framework.

Some, but not all, of the impacts identified were then valued in monetary terms. Where impact valuation was exercised, the impact assessment uses cost-benefit analysis as its principal tool. The decision not to value certain impacts was due either to a shortage of necessary evidence/data, a high degree of uncertainty surrounding the potential impact, or the likely low relative significance of the impact compared to those that were valued. The impacts valued are therefore deemed to represent the principal benefits delivered by the project. However, as not all impacts were valued, the investment criteria reported for individual investments potentially represent an underestimate of the performance of that investment.

Background & Rationale

Background

The Australian onion industry is a mature industry with stable production. It is the fourth largest vegetable crop produced in Australia and the second largest vegetable category exported. Onions are grown across most Australian states, but South Australia (48%), Tasmania (23%), and Queensland (10%) produce most of the crop. Major growing areas include upper South Australia, the Adelaide Plains, the north-west region of Tasmania and the Lockyer Valley of Queensland. Brown onions account for 79% of production, red onions 19%, white onions 1% and shallots/spring onions less than 1% (Hort Innovation 2020).

In the five years ending 30 June 2019, Australia produced an average 247,423 tonnes of onions valued at $164.8 million (Table 1).

Table 1: Australian Onion Production and Value 2014/15 to 2018/19

Year Ended 30 June	Onion Production (tonnes)	Onion GVP ($m)
2015	231,465	136.0
2016	260,674	157.7
2017	237,635	174.2
2018	249,145	164.8
2019	258,195	191.2
Average	247,423	164.8

Source: Australian Horticulture Statistics Handbook 2017/18 and 2018/19

The onion industry has a statutory levy in place for RD&E, marketing, biosecurity, and residue testing programs. The RD&E levy is guided by the Onion industry's SIP. The current SIP has been developed by levy payers and addresses the Australian onion industry's needs from 2017 to 2021. Strategies and priorities in the SIP have been driven by a set of four desired outcomes (Hort Innovation 2017):

1. Increased domestic consumption
2. Growth in export markets
3. Improved farm productivity
4. An informed and engaged industry.

Rationale

The Australian onion industry is constantly striving to improve its sustainability and long-term profitability. The Industry, through Hort Innovation is investing in RD&E and in marketing that lowers the cost of production per unit produced, whilst also increasing the demand for Australian onions. Industry communication aims at ensuring that all levy payers have the necessary information that would enable them to adopt research findings and better capture market opportunities.

A 2013 review of Australian onion industry strategy identified the need for retention and improvement of the industry's communication plan (VN07008). An effective communication plan was required to ensure levy payers have the capacity to make informed production and marketing decisions.

The original communication plan (VN07008) was the result of extensive consultation with levy paying growers, the onion industry advisory committee, packers, wholesalers, and retailers. Subsequent consultation in 2013 revealed that the communication plan should be maintained and extended. Peak industry body, Onions Australia, would be retained to deliver communication materials to the industry. The new communication plan was to be a "living plan" with capacity to adopt new technologies and approaches as they become relevant.

The communication plan (VN12003) was to deliver quality industry data to stakeholders including technical data and market intelligence. Communication channels were to include the industry magazine, newsletters (print), monthly E-newsletters, events, website updates, local and international news, and regular quarterly meetings in onion growing areas.

Project Details

Summary

Project Code: VN12003

Title: Communication Plan for the Australian Onion Industry - Project Extension

Research Organisation: Onions Australia

Project Leader: Lechelle Earl

Period of Funding: June 2013 to March 2016

Objectives

The objective of this project was to supply the Australian onion industry, and especially levy paying growers, with up-to-date information to inform production and marketing decisions.

Logical Framework

Table 2 provides a detailed description of the project in a logical framework.

Table 2: Logical Framework for Project VN12003

Activities	Major project activities included: • Collate and edit research, marketing, biosecurity, and other material in the Onions Australia office. Task undertaken by CEO and the Communications and Events Officer. • Edited material used to populate, magazines, newsletters, and the website. • Design and printing outsourced to Creative Genesis, Mount Gambier. • Magazines and newsletters uploaded to the Onions Australia website. • Routine upgrade of technology supporting the website to ensure it was consistent with the requirements of relevant search engines. • Coordination of regional levy payer meetings, grower walks and field days. • Communication support – checks on information accuracy, media releases, media presentations, coordination of communications, setting timelines and goals. • Communication plan management including reporting to Hort Innovation and contributing to an independent review of the project.

Outputs	The important outputs of the project were:
	• Onion stock survey report (extension of OnionSTAT) – a report that provides forecasts of onion industry planting. The report is only provided to growers who input their own data
	• Information package for rapid identification and reporting of pests and diseases.
	• A flyer detailing onion growing regions, storage protocols, varieties, types and uses.
	• Onions Australia Magazine – containing industry and R&D project updates. A single edition was produced and released in November each year.
	• "Layers" Newsletter – a print document published every January, April, and August. The newsletter focussed on current industry issues, research, and market updates.
	• Electronic Newsletter – distributed first Monday of each month, providing updates of industry developments. Also *ad hoc* use of social media including Facebook, Twitter.
	• Onions Australia website (https://www.onionsaustralia.org.au/) which includes:
	  • About onions – facts, size, value of the industry, onion types, and onion benefits.
	  • Growers and levy payers – registration, industry advisory committee, 25 years of R&D project findings, grant opportunities, relevant links.
	  • About Onions Australia – chair and CEO, Reg Miller Award, publication information.
	  • Association members – levels of membership, joining, an industry service directory.
	  • Biosecurity and agrichemical – review process, and minor use chemical permits.
	  • OnionSTAT – data collection process, steps required to become involved.
	  • Contact page – how to communicate with Onions Australia.
	• Regional levy payer meetings including production of agendas, content, and minutes.
	• Events including grower walks and field days – events held twice per year.
	• An independent mid-term review that found that "Onions Australia was doing an effective job in managing the current communication program. Interviewees spoke highly of organisation efforts, stating that there has been an improvement in the frequency and quality of the messages they were receiving in relation to R&D and industry issues. Onions Australia has the necessary networks and credibility with levy payers to communicate and drive the adoption of R&D" (Key-Link Solutions 2015).

Outcomes	• A more connected and informed industry. • OnionSTAT to guide industry planning including, but not limited to, improved research and marketing fund allocation. • Increased responsiveness to pest and diseases outbreaks. • Growers better managing agricultural chemicals. • Consumers better informed about purchase, storage and use of onions. • Growers better informed about research findings that lower production costs.

	• Growers better informed about market conditions and matching supply with demand.
Impacts	• Economic – lower costs of production for onion growers as a result of research adoption. • Economic – additional profitable sales for onion growers with increased awareness of market conditions and supply opportunities. • Capacity – Onions Australia staff and growers with additional skills in communication, production efficiency and understanding market conditions. • Social – future contribution to improved regional community wellbeing with more profitable and sustainable onion growers.

Project Investment

Nominal Investment

Table 3 shows the annual investment made in Project VN12003. Hort Innovation investment in this project accounted for approximately 75% of the total. Project balance was provided by Onions Australia via membership fees, advertising revenue, and website sponsorship (VN12003 Project Agreement, June 2013).

Table 3: Annual Investment in Project VN12003 (nominal $)

Year ended 30 June	HORT INNOVATION ($)	ONIONS AUSTRALIA ($)	TOTAL ($)
2013	110,876	27,719	138,595
2014	97,332	24,333	121,665
2015	97,332	24,333	121,665
2016	88,022	22,006	110,028
Total	**393,562**	**98,391**	**491,953**

Source: VN12003 Project Agreement, June 2013

Program Management Costs

For the Hort Innovation investment the cost of managing the Hort Innovation funding was added to the Hort Innovation contribution for the project via a management cost multiplier (1.162). This multiplier was estimated based on the share of 'payments to suppliers and employees' in total Hort Innovation expenditure (3-year average) reported in the Hort Innovation's Statement of Cash Flows (Hort Innovation Annual Report, various years). This multiplier was then applied to the nominal investment by Hort Innovation shown in Table 3.

Real Investment and Extension Costs

For the purposes of the investment analysis, the investment costs of all parties were expressed in 2019/20 dollar terms using the Implicit Price Deflator for Gross Domestic Product (ABS, 2020). No additional costs of extension were included; the project was focused on the communication of research and market information to growers.

Impacts

Table 4 provides a summary of the principal types of impacts delivered by the project, based on the logical framework. Impacts have been categorised into economic, environmental, and social impacts.

Table 4: Triple Bottom Line Categories of Principal Impacts from Project VN12003

Economic	• Lower costs of production for onion growers as a result of research adoption. • Additional profitable sales for onion growers with increased awareness of market conditions and supply opportunities.
Environmental	• Nil.
Social	• Onions Australia staff and growers with additional skills in communication, production efficiency and understanding market conditions.

	• Future contribution to improved regional community wellbeing with more profitable and sustainable onion growers.

Public versus Private Impacts

Impacts from investment in VN12003 will be mainly private and realised by onion growers. Onion grower benefits will include adoption of research that lowers production costs and application of market insights that can be used to realise additional profitable onion sales.

Distribution of Private Impacts

Economic benefits will be shared along the supply chain with input suppliers, transporters, wholesalers, exporters, retailers, and consumers all benefiting. The share of benefit realised by each link in the supply chain will depend on both short- and long-term supply and demand elasticities in domestic and export onion markets.

Impacts on Other Australian Industries

Impacts on other Australian industries are unlikely – the project generated extension and market information targeted specifically to the Australian onion industry.

Impacts Overseas

Impacts overseas are unlikely. While some of the extension and market information communicated via the project may have relevance to overseas onion industries, project materials were either delivered directly to levy payers or protected behind website passwords. Indirectly, project outcomes may contribute to the competitiveness of Australian onion exports in overseas markets.

Match with National Priorities

The Australian Government's Science and Research Priorities and Rural RD&E priorities are reproduced in Table 5. The project outcomes and related impacts will contribute to Rural RD&E Priority 4 as well as Science and Research Priority 1.

Table 5: Australian Government Research Priorities

Australian Government	
Rural RD&E Priorities (est. 2015)	**Science and Research Priorities (est. 2015)**
1. Advanced technology 2. Biosecurity 3. Soil, water and managing natural resources 4. Adoption of R&D	1. Food 2. Soil and Water 3. Transport 4. Cybersecurity 5. Energy and Resources 6. Manufacturing 7. Environmental Change 8. Health

Sources: (DAWR, 2015) and (OCS, 2015)

Alignment with the Onion Strategic Investment Plan 2017-2021

The strategic outcomes and strategies of the onion industry are outlined in the Onion Industry's Strategic Investment Plan 2017-2021[1] (Hort Innovation, 2017). Project VN12003 commenced prior to the industry's current SIP. Nevertheless, the project aligns with Outcome 4 'an informed and engaged industry results in greater ability to respond to market shifts', Strategy 1 'investigate ways to drive greater indusry engagement'.

Valuation of Impacts

[1] For further information, see: https://www.horticulture.com.au/hort-innovation/funding-consultation-and-investing/investment-documents/strategic-investment-plans/

Impacts Valued

Analyses were undertaken for total benefits that included future expected benefits. A degree of conservatism was used when finalising assumptions, particularly when some uncertainty was involved. Sensitivity analyses were undertaken for those variables where there was greatest uncertainty or for those that were identified as key drivers of the investment criteria.

Two impacts were valued – lower costs of production for onion growers as a result of research adoption and additional profitable sales with increased awareness of market conditions.

Impacts Not Valued

Not all of the impacts identified in Table 4 could be valued in the assessment. The two social impacts identified but not valued were:

- Onions Australia staff and growers with additional skills in communication, production efficiency and understanding market conditions.
- Future contribution to improved regional community wellbeing with more profitable and sustainable onion growers.

These potential impacts were not valued due to an absence of data that would allow the development of credible assumptions.

Valuation of Impact 1: lower costs of production for onion growers as a result of research adoption.

VN12003, continuation of the onion industry communication plan, provided packaged information on the outcomes from research projects in a grower friendly format via magazines, newsletters, the webpage, and grower events. Readily available information is expected to contribute to increased adoption of a range of technologies that lower the cost of onion production.

Valuation of Impact 2: additional profitable sales with increased awareness of market conditions.

VN12003 has provided onion growers with valuable information on planting intentions, crop size and demand allowing growers to make more informed, and therefore profitable decisions, in relation to their crop. As a result of this project grower profit is greater than would otherwise have been the case.

Attribution

Information with the potential to lower production costs and increase profitable sales is also available through other channels including, but not limited to, extension completed as part of research projects and market reports prepared by companies like Ausmarket Consultants. For these reasons, a relatively modest attribution of 40% is attributed to this project (VN12003).

Counterfactual

In the absence of Hort Innovation investment in VN12003, it is assumed that the project would have proceeded but with only 25% of its resources i.e. those supplied by Onions Australia.

Summary of Assumptions

A summary of the key assumptions made for valuation of the impacts is shown in Table 6.

Table 6: Summary of Assumptions

Variable	Assumption	Source/Comment
Impact 1: lower costs of production for onion growers as a result of research adoption		
Average cost of production without VN12003.	$304/tonne.	ABARES data for onions on AUSVEG website, https://ausveg.com.au/resources/economics-statistics/australian-vegetable-production-statistics/#pricecost
Saving in cost of production due to VN12003.	0.5%.	A total saving of 2% is assumed by the analyst. However, 1.5% of this gain is attributable to the research rather than its communication via VN12003.
Impact 2: additional profitable sales with increased awareness of market conditions		
Profit on onion production	$155/tonne.	Onion price of $459/tonne and costs of production of

at farmgate.		$304/tonne (ABARES data on AUSVEG website,https://ausveg.com.au/resources/economics-statistics/australian-vegetable-production-statistics/#pricecost
Increase in profit due to VN12003 market insights.	1%	Analyst assumption.
Assumptions common to valuation of both impacts		
Annual production of onions.	247,423 tonnes.	See Table 1 above.
Proportion of production achieving cost reduction.	75%	Equivalent of six large growers adopting research outcomes. The majority of Australian onion production is orchestrated through eight large businesses (Onion Industry SIP 2017-2021).
Year of first impact.	2015/16	One year before NV12003 completed – some adoption taking place throughout the project e.g. use of market insights to plan onion sales.
Number of years to maximum impact is reached.	5 years.	Analyst assumption.
Number of years of maximum impact.	10 years.	Analyst assumption.
Number of years over which impact declines to zero.	5 years.	Analyst assumption.
Probability of VN12003 generating valuable outputs.	100%	Onions Australia has delivered communication plan commitments.
Probability of VN12003 outcomes generating assumed impacts.	90%	There is some risk that materials communicated will not deliver production cost savings or increased profit.

Results

All costs and benefits were discounted to 2019/20 using a discount rate of 5%. A reinvestment rate of 5% was used for estimating the Modified Internal Rate of Return (MIRR). The base analysis used the best available estimates for each variable, notwithstanding a level of uncertainty for many of the estimates. All analyses ran for the length of the project investment period plus 30 years from the last year of investment (2015/16) as per the CRRDC Impact Assessment Guidelines (CRRDC, 2018).

Investment Criteria

Tables 7 and 8 show the investment criteria estimated for different periods of benefit for the total investment and Hort Innovation investment, respectively. The present value of benefits (PVB) attributable to Hort Innovation investment only, shown in Table 8, has been estimated by multiplying the total PVB by the Hort Innovation proportion of real investment (82%).

Table 7: Investment Criteria for Total Investment in Project VN12003

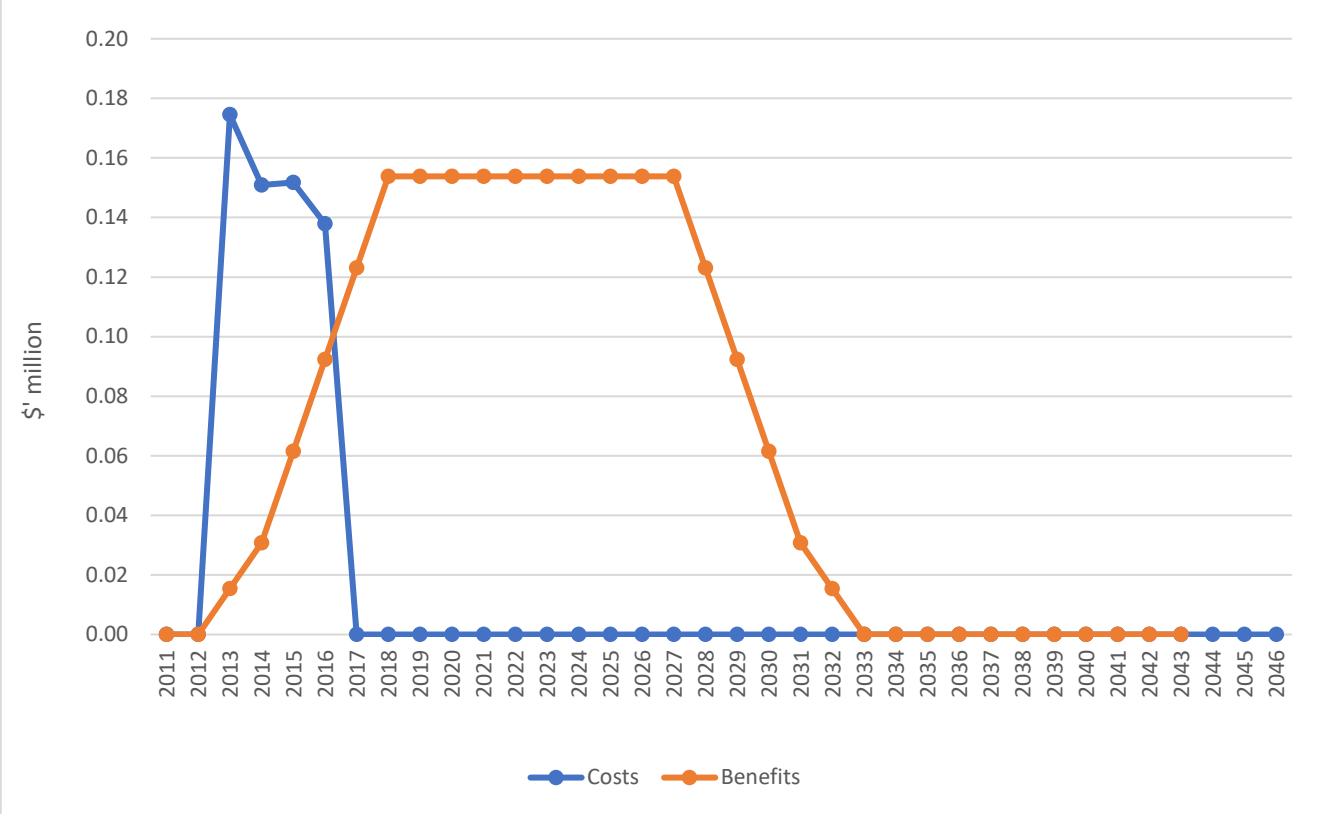
Investment Criteria	**Years after Last Year of Investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present Value of Benefits ($m)	0.02	0.49	1.12	1.60	1.71	1.71	1.71
Present Value of Costs ($m)	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Net Present Value ($m)	-0.79	-0.32	0.31	0.79	0.90	0.90	0.90
Benefit-Cost Ratio	0.02	0.60	1.39	1.98	2.11	2.11	2.11
Internal Rate of Return (%)	negative	negative	9.1	14.2	14.8	14.8	14.8
MIRR (%)	negative	negative	7.3	9.3	8.6	7.8	7.3

Table 8: Investment Criteria for Hort Innovation Investment in Project VN12003

Investment Criteria	Years after Last Year of Investment						
	0	5	10	15	20	25	30
Present Value of Benefits ($m)	0.02	0.40	0.92	1.32	1.41	1.41	1.41
Present Value of Costs ($m)	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Net Present Value ($m)	-0.65	-0.26	0.26	0.65	0.74	0.74	0.74
Benefit-Cost Ratio	0.02	0.60	1.39	1.98	2.11	2.11	2.11
Internal Rate of Return (%)	negative	negative	9.1%	14.2%	14.8%	14.8%	14.8%
MIRR (%)	negative	negative	7.3%	9.3%	8.6%	7.8%	7.3%

The annual undiscounted benefit and cost cash flows for the total investment for the duration of the VN12003 investment plus 30 years from the last year of investment are shown in Figure 2.

Figure 1: Annual Cash Flow of Undiscounted Total Benefits and Total Investment Costs



Source of Benefits

Estimates of the relative contribution of each benefit valued, given the assumptions made, are shown in Table 9.

Table 9: Contribution to Total Benefits from Each Source

	Contribution to PBV ($m)	Share of benefits (%)
Lower costs of production for onion growers as a result of research adoption.	0.85	49.5
Additional profitable sales with increased awareness of market conditions.	0.86	50.5
Total	1.71	100.0

Sensitivity Analyses

A sensitivity analysis was carried out on the discount rate. The analysis was performed for the total investment and with benefits taken over the life of the investment plus 30 years from the last year of investment. All other parameters were held at their base values. Table 10 presents the results. The results show a moderate sensitivity

to the discount rate.

Table 10: Sensitivity to Discount Rate
(Total investment, 30 years)

Investment Criteria	Discount rate		
	0%	5% (base)	10%
Present Value of Benefits ($m)	2.18	1.71	1.41
Present Value of Costs ($m)	0.62	0.81	1.05
Net Present Value ($m)	1.57	0.90	0.36
Benefit-cost ratio	3.55	2.11	1.34

A sensitivity analysis was then undertaken on the assumed share of onion production adopting research findings and market insights communicated through VN12003. Results are provided in Table 11. The table shows that if only 35% of production adopts communication plan content, then the project will 'breakeven'.

Table 11: Sensitivity to Share of Onion Production Adopting Communication Plan Content
(Total investment, 30 years)

Investment Criteria	Share of Onion Production Adopting Communication Plan Content		
	35%	50%	75% (base)
Present Value of Benefits ($m)	0.80	1.14	1.71
Present Value of Costs ($m)	0.81	0.81	0.81
Net Present Value ($m)	-0.01	0.33	0.90
Benefit-cost ratio	0.99	1.41	2.11

A final sensitivity analysis tested the probability of reduced production cost and increased profitable onion sales with adoption of communication plan content. The results (Table 12) show that the probability of impact would need to fall to 45% before the project would 'breakeven'.

Table 12: Sensitivity to Probability of Communication Plan Impacting Onion Grower Business
(Total investment, 30 years)

Investment Criteria	Probability of Communication Plan Content Impacting Production Cost and Profitable Sales		
	45%	67.5%	90% (base)
Present Value of Benefits ($m)	0.85	1.28	1.71
Present Value of Costs ($m)	0.81	0.81	0.81
Net Present Value ($m)	0.05	0.47	0.90
Benefit-cost ratio	1.06	1.58	2.11

Confidence Rating

The results produced are highly dependent on the assumptions made, some of which are uncertain. There are two factors that warrant recognition. The first factor is the coverage of benefits. Where there are multiple types of benefits it is often not possible to quantify all the benefits that may be linked to the investment. The second factor involves uncertainty regarding the assumptions made, including the linkage between the research and the assumed outcomes.

A confidence rating based on these two factors has been given to the results of the investment analysis (Table 13). The rating categories used are High, Medium, and Low, where:

- High: denotes a good coverage of benefits or reasonable confidence in the assumptions made
- Medium: denotes only a reasonable coverage of benefits or some uncertainties in assumptions made
- Low: denotes a poor coverage of benefits or many uncertainties in assumptions made

Table 13: Confidence in Analysis of Project

Coverage of Benefits	Confidence in Assumptions
High	Medium

Coverage of benefits valued was assessed as High – two key economic impacts were valued. Confidence in assumptions was rated as Medium – a number of key assumptions were made by the analyst.

Conclusion

The investment in VN12003 has provided an effective conduit for delivery of research and market information to onion growers (Key-Link Solutions 2015). Consequently, VN12003 is likely to contribute to lower onion production costs and additional profitable onion sales.

Total funding from all sources for the project was $0.81 million (present value terms). The investment produced estimated total expected benefits of $1.71 million (present value terms). This gave a net present value of $0.90 million, an estimated benefit-cost ratio of 2.11 to 1, an internal rate of return of 14.8% and a modified internal rate of return of 7.3%.

As two impacts identified were not valued, the investment criteria estimated by the evaluation may be underestimates of the actual performance of the investment.

Glossary of Economic Terms

Cost-benefit analysis:	A conceptual framework for the economic evaluation of projects and programs in the public sector. It differs from a financial appraisal or evaluation in that it considers all gains (benefits) and losses (costs), regardless of to whom they accrue.
Benefit-cost ratio:	The ratio of the present value of investment benefits to the present value of investment costs.
Discounting:	The process of relating the costs and benefits of an investment to a base year using a stated discount rate.
Internal rate of return:	The discount rate at which an investment has a net present value of zero, i.e. where present value of benefits = present value of costs.
Investment criteria:	Measures of the economic worth of an investment such as Net Present Value, Benefit-Cost Ratio, and Internal Rate of Return.
Modified internal rate of return:	The internal rate of return of an investment that is modified so that the cash inflows from an investment are re-invested at the rate of the cost of capital (the re-investment rate).
Net present value:	The discounted value of the benefits of an investment less the discounted value of the costs, i.e. present value of benefits - present value of costs.
Present value of benefits:	The discounted value of benefits.
Present value of costs:	The discounted value of investment costs.

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Abbreviations

AL	Almond
BA	Banana
CEO	Chief Executive Officer
CRRDC	Council of Research and Development Corporations
CT	Citrus
DAWR	Department of Agriculture and Water Resources (Australian Government)
GDP	Gross Domestic Product
GVP	Gross Value of Production
IRR	Internal Rate of Return
MIRR	Modified Internal Rate of Return
OCS	Office of Chief Scientist Queensland
PVB	Present Value of Benefits
RD&E	Research, Development and Extension
VN	Onion