Industry-specific impact assessment program: Citrus

Impact assessment report for project *Citrus industry communications* (CT15009)

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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 *CT15009: Citrus Industry Communications.* The project was funded by Hort Innovation over the period 18 September 2015 to 18 September 2018.

Methodology

The investment was analysed qualitatively within a logical framework that included activities and outputs, outcomes and impacts. Impacts were categorised into a triple bottom line framework. Principal impacts identified were then considered for valuation. 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.

Results/key findings

The project investment focused on a re-organisation and streamlining of the communication structure and processes for Citrus Australia. Currie Communications was engaged to provide a core and consistent suite of communication products and services.

The investment in CT15009 has provided the Australian citrus industry with an improved structure for their communications; beneficiaries include Citrus Australia, the citrus industry including citrus growers, citrus supply chains citrus exporters and relevant government organisations.

Investment Criteria

Total funding from all sources for the project was $0.95 million (present value terms). All project funding was provided by Hort Innovation. The total value of benefits was $2.25 million (present value terms). This provided a net present value for the investment of $1.30 million, a benefit-cost ratio of 2.36 to 1, an internal rate of return of 42.7% and a modified internal rate of return of 9.3%.

Conclusions

Project CT15009 was successful in that an improved industry communication plan was developed that has been implemented by Citrus Australia to the benefit of the Australian citrus industry as a whole including citrus levy payers. Based on the assumptions made in the economic analysis, the investment criteria estimated show a positive return to the investment from the expected contribution of improved communication to increased productivity and profitability of the industry via more informed and integrated decision making.

Keywords

Impact assessment, CT15009, citrus industry, communications, Currie Communications

Introduction

All research and development (R&D) 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 24 projects worth approximately $16.72 million,
- Eight CT projects worth $5.40 million (nominal Hort Innovation investment) from a total population of 35 projects worth $15.78 million, and
- Four VN projects worth $2.40 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. Four projects had been randomly selected as part of a related Hort Innovation project (MT18011) and were included in the samples for the AL industry (AL14006 and AL16004) and the CT industry (CT15006 and CT15013). This left 25 unique projects randomly selected for evaluation under MT19012.

Project CT15009*: Citrus Industry Communications* was randomly selected as one of the 25 unique MT19012 investments and was analysed in this report.

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

Citrus Industry

The Australian citrus industry is one of Australia's 'traditional' horticultural industries. A range of citrus types are produced in Australia. Oranges are the predominant citrus type grown by tonnage followed by mandarin, lemon/lime and grapefruit, in that order.

Table 1 provides some recent descriptive production and supply statistics for the Australian citrus industry over the past three years. Table 2 illustrates the change in citrus exports (volume and value over the same period.

Table 1: Australian Citrus Production and Value for Years Ending June 2017 to 2019

Year ended June	Total Australian Production (tonnes)	Fresh Supply (tonnes)	Fresh Imports (tonnes)	Fresh Australian Supply (tonnes)	Fresh Supply Wholesale Value ($m)	Fresh Supply Wholesale Value ($/tonne)
2017	714,740	309,822	34,061	275,761	572.2	1,847
2018	747,032	294,956	27,749	267,207	534.7	1,813
2019	744,354	294,568	24,760	269,808	539.0	1,830
Average	735,375	299,782	28,857	270,925	548.6	1,830

Source: Australian Horticultural Statistics Handbook, 2018/19

Table 2: Australian Citrus Exports and Value for Years Ending June 2017 to 2019

Year ended June	Total Australian Production (tonnes)	Fresh Export Volume (tonnes)	Fresh Export Value ($m)	Fresh Export Value ($/tonne)
2017	714,740	218,211	331.7	1520.1
2018	747,032	258,192	427.7	1656.5
2019	744,354	252,250	457.1	1812.1
Average	735,375	242,884	405.5	1669.5

Source: Australian Horticultural Statistics Handbook, 2018/19

The research and development activities of the citrus industry are guided by the industry's Strategic Investment Plan (SIP). The activities are funded by levies payable on citrus produced in Australia, as well as by matching government funds and voluntary industry contributions.

The process of preparing the latest SIP was managed by Hort Innovation in consultation with the industry representative body (Citrus Australia) and the Strategic Investment Advisory Panel. The current citrus SIP has been driven by levy payers and addresses the Australian citrus industry's research and development (R&D) needs (and marketing specifically for the orange industry) from 2017 to 2021.

Project Rationale

While much of Australian citrus production is consumed within Australia, export markets are expanding due to the seasonal advantage of southern hemisphere production compared, for example, to the USA. In addition, the growth in citrus exports has been attributed to the reputation of Australian citrus fruit being high quality and having excellent food safety standards.

To ensure Australian governments, citrus growers and their value chains can make efficient and effective decisions in areas such as, for example, the use of new technologies, new plantings, market access, target markets and new competitors, a range of up to date information is a key input. The communication activity of Citrus Australia had been providing this input through its communication platform. Previous to project CT15009, the platform included, inter alia, communication products such as an industry website, a quarterly national magazine, a monthly season update newsletter, a fortnightly e-newsletter, grower case studies, and media releases.

In 2015, Citrus Australia sought to reorganise and streamline its communication structure and processes and engaged Currie Communications to provide a core and consistent suite of communication products and services to support the industry.

Project Details

Summary

Project Code: CT15009

Title: *Citrus Industry Communications*

Research Organisation: Currie Communications Pty Ltd

Project Leader: Sophie Clayton

Period of Funding: 25 November 2015 to 18 September 2018

Objective

The objective of the investment was to keep all Citrus Australia stakeholders better informed through effective and timely communication and extension. The primary target audience included:

- Citrus levy payers across the citrus production regions of Sunraysia, Riverina, Riverland, Queensland and Western Australia.
- Citrus levy payers across production systems including grapefruit, mandarin, tangelo, and lemon and oranges (Navel and Valencia).

Secondary target audiences included supply chain participants, government stakeholders, Hort Innovation, and citrus consumers.

Logical Framework

Table 3 provides a description of Project CT15009 in a logical framework format, organised by project activities, outputs, outcomes and impacts.

Table 3: Logical Framework for Project CT15009

Activities	<u>Australian Citrus News magazine</u> • Currie Communications (hereafter referred to as Currie) planned, produced and/or sourced articles and edited each edition of the Australian Citrus News magazine. • Currie worked with a graphic designer to design the magazine. • Citrus Australia approved content before publication of each edition. • Articles covered how levy-funded research findings and other knowledge could be used to improve practices, grower case studies, marketing and exporting insights, industry statistics, industry events, innovation features, food safety, and biosecurity. • The pdf version of the magazine was published on the Citrus Australia website and was available to Citrus Australia members. • Individual articles were also published as separate items on the Citrus Australia website for public access (Sophie Clayton, pers. comm., 2020). <u>Citrus eNews</u> • Currie established and desigend Citrus eNews as a regular enewsletter to share industry updates to levy payers and industry stakeholders (Sophie Clayton, pers. comm., 2020). • Currie built Citrus eNews in Mailchimp and over the course of the project updated its style. • Each issue was planned in conjunction with Citrus Australia. • Articles written for the enewsletter were also published on the Citrus Australia website. • Regular content included the Citrus Australia Chief Ececutive Officer report, industy news, event features, links to magazine articles and the season update.

	Season Update • Currie worked with each of the citrus regions to provide relevant seasonal news and updates through the Season Update that was published monthly. • Some contributors were contracted directly by Hort Innovation to compile and publish their region's season update. • Currie streamlined production of the Season Update by combining it with Citrus eNews in the last year of the project to ensure it was reaching more people (Sophie Clayton, pers. comm., 2020). Website • Currie prepared and uploaded to the Citrus Australia website: media releases, articles from the magazine and Citrus eNews produced under the project. • For the first two years of the project Currie wrote media releases and secured positive media coverage for the Australian citrus industry • In the last year of the project, 2018, the approach changed to include media training for the Citrus Australia Chief Executive Officer, and included media releases on the Citrus Market Outlook Forum. Photo Library • Currie staff and their subcontracted photographers took and compiled photographs with respect to various opportunities and needs. • Photos covered targets such as orchards, packing sheds, grower profiles and citrus industry events. • In addition, a selection of photos was assembled in a dedicated album under a Creative Commons licence on Flickr to ensure others – such as journalists – could search, view, download and use positive industry imagery. Case Studies • Case studies were featured in Australian Citrus News magazine as identified earlier. • The objective was to include at least one grower case study in each magazine edition. • The principal purpose was to showcase how growers were adopting good management practice principles by featuring industy leaders.
Outputs	A summary of outputs from the project included: Australian Citrus News magazine • Four editions per year of the magazine were published (total of 12). • Each issue was distributed to about 1500 levy payers. Citrus eNews • A design revamp and production guide for Citrus eNews were developed. • A marketing automation platform and email marketing service (Mailchimp) was utilised, so that each issue of Citrus eNews could be designed within, and distributed from, the platform. Season Update • The update included the weather/climate outlook, crop status and management, top tips from leading growers, and an event calendar. • Season Updates were produced and distributed monthly throughout the project. Website • The contribution made by Currie was the re-publication on the website of articles from the Australian Citrus News magazine and Citrus eNews, as well as media releases. Media

	• Media releases were produced on the Market Outlook Forum as well as delivering other positive media coverage for the citrus industry. • Media training for the Citrus Australia CEO was delivered. <u>Photo Library</u> • A collection of professional citrus industry photos of growers, orchards, and citrus events was built over the project period. • A dedicated citrus photo-library was assembled in Flickr under a Creative Commons licence to ensure access to quality industry photos by industry stakeholders and journalists. <u>Case Studies</u> • Case studies to demonstrate industry leadership were produced that showcased how growers were adopting good management practice principles affecting both profitability and sustainability. • Thirteen case studies were produced over the project covering all major citrus growing regions (Sophie Clayton, pers. comm., 2020).
Outcomes/ Potential Outcomes	<u>Potential early intermediate outcomes</u> • Increased awareness of best management practices by citrus growers, advisers, and members of citrus supply chains. • Encouragement to growers, advisers and members of citrus supply chains to seek further information in relation to decision making related to production, packaging and marketing. • Currie did not have any resources to assemble evidence of changes (e.g. increased awareness or adoption of best management practices by industry due to the revamped communication activities); Currie provided quarterly reports on project outputs to Citrus Australia, but they did not track increased awareness of best management practices (Sophie Clayton, pers. comm., 2020). <u>Potential outcomes</u> • As with awareness, the project did not have capacity to review adoption rates of different practices to assess the impact of the revamped communications; also, it would be challenging to identify a specific causal relationship between the adoption of a specific or suite of practices back to a singular, or even a suite of communication outputs, given other factors would also be at play (Sophie Clayton, pers. comm., 2020). • However, it would be expected that communication about new practices would be part of a suite of triggers that support increased adoption. While direct evidence is lacking, the project was completed using best practice around grower communication to support adoption (Sophie Clayton, pers. comm., 2020). • Hence an expected outcome would be an increased adoption of best management growing, harvesting, storage and packing practices by growers and supply chain managers; this would lead to more informed decision making by growers and supply chain managers relating to new plantings, market access, target markets and production and marketing activities of foreign competitors. • In addition, another expected outcome would be more informed industry bodies and government agencies with regard to a range of issues such as industry priorities, research resource allocation, and market access/ export trade.
Impacts/ Potential Impacts	• Potential increased profitability and environmental sustainability of citrus industry participants from improved decision making along the citrus value chain, including best management practices of citrus growers. • Productivity/ profitability impacts having a flow-on effect to support improved regional community well-being. • A contribution to an increase in capability and capacity of citrus industry participants. • More positive and targeted government and industry policies and support with regard to the citrus industry.

Project Investment

Nominal Investment

Table 4 shows the annual investment in project CT15009 by Hort Innovation. There were no 'other' direct investors in the project.

Table 4: Annual Investment in the Project CT15009 (nominal $)

Year ended 30 June	Hort Innovation ($)	Other ($)	Total ($)
2016	177,819	17,782	195,601
2017	187,813	18,781	206,594
2018	187,814	18,781	206,595
2019	61,494	6.149	67,643
Totals	614,940	61,493	676,433

It is noted from the description of the above activities in the logical framework that there were likely to be resources other than those in Table 4 that would have contributed to the outputs from Project CT15009. For example:

- The input from Citrus Australia personnel in approval and consultation activities.
- The input from contributors contracted directly by Hort Innovation for their assistance in assisting production of the season updates.
- The input from researchers and growers who wrote contributed content, irrespective of whether they were supported or not by Hort Innovation via other sources (Sophie Clayton, perc. comm., 2020).

To allow for these additional resources that contributed to project outcomes, additional resources of 10% of the original Hort Innovation investment has been added to the investment in Table 4 (Other).

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 4.

Real Investment and Extension Costs

For the purposes of the investment analysis, investment costs of all parties were expressed in 2019/20 dollar terms using the GDP deflator index (ABS, 2020). There were no additional costs assumed associated with project extension. Results were communicated to the industry and others as part of the project.

Impacts

Table 5 provides a summary of the principal types of impacts delivered by the project. Impacts have been categorised into economic, environmental and social impacts.

Table 5: Triple Bottom Line Categories of Principal Impacts from Project CT15009

Economic	• Potential contribution to increased productivity and profitability of citrus levy payers via more informed decision making. • A contribution to an increase in capability and capacity of citrus industry participants.
Environmental	• Some contribution to increased environmental sustainability of citrus growers and theirs supply chains from an increase in adoption of best management practices.
Social	• More positive and targeted government and industry policies and support with regard to the citrus industry. • Regional community spillover impacts driven by increased productivity and profitability by citrus growers and their supply chains.

Public versus Private Impacts

Predominantly private industry impacts to Australian citrus supply chains were identified as emanating from the investment. Some public impacts have been delivered as a result of more informed government decision making, an improvement in environmental management, and positive spinoffs to regional communities in citrus growing areas from the citrus profitability increase.

Distribution of Private Impacts

The positive impacts on the citrus industry from investment in this project are likely to be shared along the supply chain among growers, packers, wholesalers, and exporters and associated agents.

Impacts on Other Australian Industries

Impacts on industries other than the citrus industry are not anticipated from the CT15009 investment.

Impacts Overseas

No direct overseas impacts of CT15009 were identified. However, some overseas citrus exporters may indirectly lose some market profitability as the Australian industry may become more efficient due to the impact from improved industry knowledge.

Match with National Priorities

The Australian Government's Science and Research Priorities and Rural RD&E priorities are reproduced in Table 6. The project findings and related impacts will contribute potentially to Rural RD&E priority 4 and to Science and Research Priority 1.

Table 6: 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 Citrus Strategic Investment Plan 2017-2021

The current strategic outcomes and strategies of the citrus industry are outlined the Citrus Strategic Investment Plan 2017-2021[1] (2017). Project CT15009 is potentially relevant to all of the desired outcomes in the SIP. The project directly addresses the third and fourth outcomes particularly through embedded strategies 3.2, 4.1 and 4.2 (extension, skill enhancement and awareness of industry developments).

Valuation of Impacts

Impacts Valued

The impact valued in the assessment of CT15009 was:

- Potential contribution to increased productivity and profitability of citrus levy payers and their supply chains via more informed decision making.

Impacts Not Valued

Several impacts identified but not valued included:

- The contribution to an increase in capability and capacity of citrus industry participants; this impact was not valued as, to a large extent, it was already captured in the productivity and profitability impact that was valued.
- The contribution to increased environmental sustainability of citrus growers; this impact was not valued due to the difficulty of making general assumptions that would cover the various pathways as to how this impact would be delivered (e.g. reduced chemical export to the environment, reduced impact on biodiversity).
- More positive and targeted government and industry policies and support; this impact was not valued due to the difficulty of making a generalised assumption; also, to some extent this impact could be captured in the industry productivity and profitability impact that was already valued.
- Regional community spillover impacts driven by increased productivity and profitability by citrus growers and their supply chains; this secondary social impact was not valued largely due to lack of data to support credible assumptions including the diversity of geographic locations involved.

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

Summary of Assumptions

The impact that was valued was the increased profitability of citrus production due to the improved communication of information regarding best management practices.

The assumptions developed to value the increased profitability are provided in Table 7. The assumptions are based on changes to the gross margins for orange production in the NSW Riverina and SA Sunraysia production regions.

Table 7: Summary of Assumptions for Impact Valued for Project CT15009

Variable	Assumption	Source/Comment
Impact 1: Industry gain due to increased productivity and profitability		
Australian fresh citrus production sold on domestic market	299,782 tonnes per annum (excludes fresh imports, exports and juicing product)	Three year average over 2017, 2018 and 2019 (Horticultural Statistics Handbook, 2018/19) (Table 1)
Exports of fresh citrus production	242,884 tonnes per annum	Three year average over 2017, 2018 and 2019 (Horticultural Statistics Handbook, 2018/19) (Table 2)
Average gross margin in 2018 for orange production based on simple average for Sunraysia orange production for domestic and export markets	$7,436 per ha ($5,986.5 per ha and $8,975.1 per ha respectively)	Citrus Fam Management Handbook, NSW Agriculture (2018)
Average yield for navel orange production based on simple average for Riverina and Sunraysia orange production	37.5 tonnes per ha	
Assumed increase in gross margin due to CT15009 (accommodating quality and yield improvements and any additional costs incurred	10%	Estimate by Analyst
Maximum proportion of industry gaining productivity due to Project CT15009	10%	
First year of some impact from Project CT15009	2018	
Years to maximum adoption	3	
Year of maximum adoption	2020	
Year of final impact	2023	Estimate by Analyst; the curtailment of impacts by 2023 is associated with the counterfactual assumption that, while the improved communication activities increased adoption, this would have happened anyway with the previous communications platform, but at a later time
Risk and attribution factors		
Probability of outcome (proportion of industry experiencing productivity gains form the project)	75%	Estimate by Analyst

Probability of increase in gross margin due to project	75%	
Attribution	100%	

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 (2018/19) as per the CRRDC Impact Assessment Guidelines (CRRDC, 2018).

Investment Criteria

Tables 8 and 9 show the investment criteria estimated for different periods of benefits for the total investment and the Hort Innovation investment alone.

Table 8: Investment Criteria for Total Investment in Project CT15009

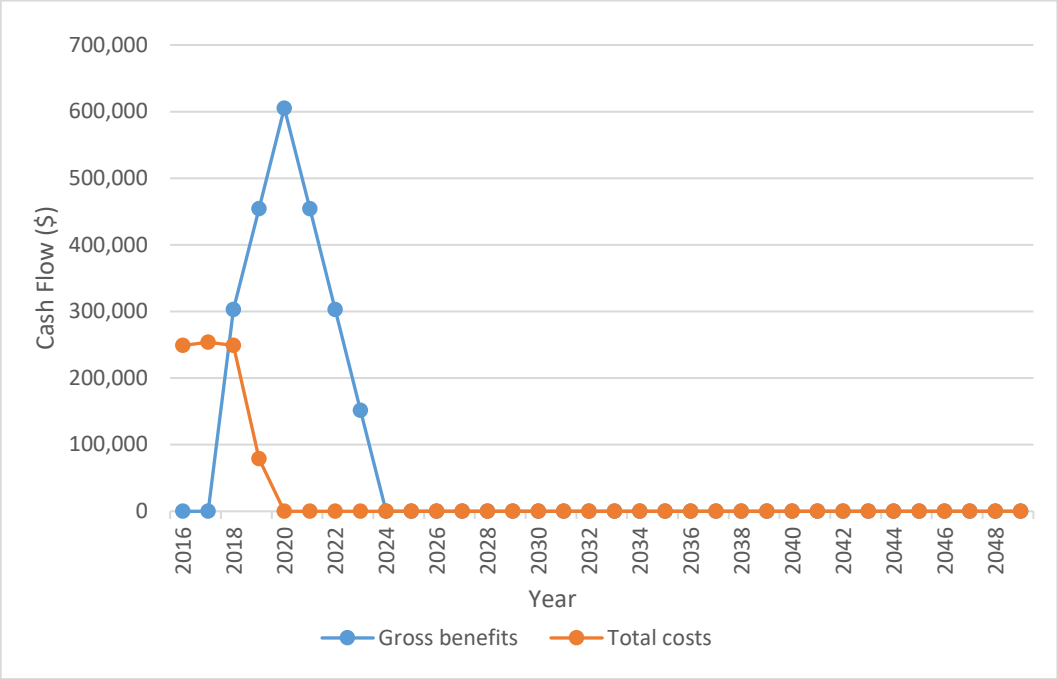
Investment Criteria	**Years after Last Year of Investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present Value of Benefits ($m)	1.42	2.25	2.25	2.25	2.25	2.25	2.25
Present Value of Costs ($m)	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Net Present Value ($m)	0.46	1.30	1.30	1.30	1.30	1.30	1.30
Benefit-Cost Ratio	1.48	2.36	2.36	2.36	2.36	2.36	2.36
Internal Rate of Return (%)	27.03	42.67	42.67	42.67	42.67	42.67	42.67
MIRR (%)	38.21	40.20	19.40	14.04	11.59	10.18	9.27

Table 9: Investment Criteria for Hort Innovation Investment in Project CT15009

Investment Criteria	**Years after Last Year of Investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present Value of Benefits ($m)	1.30	2.07	2.07	2.07	2.07	2.07	2.07
Present Value of Costs ($m)	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Net Present Value ($m)	0.43	1.20	1.20	1.20	1.20	1.20	1.20
Benefit-Cost Ratio	1.48	2.36	2.36	2.36	2.36	2.36	2.36
Internal Rate of Return (%)	27.03	42.67	42.67	42.67	42.67	42.67	42.67
MIRR (%)	38.21	40.20	19.40	14.04	11.59	10.18	9.27

The annual undiscounted benefit and cost cash flows for the total investment for the duration of the CT15009 investment plus 30 years from the last year of investment are shown in Figure 1.

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



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 that show a moderately low sensitivity to the discount rate, largely due to short period of benefits as well as the short period between the investment and the impacts.

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

Investment Criteria	**Discount rate**		
	0%	**5%**	**10%**
Present Value of Benefits ($m)	2.27	2.25	2.25
Present Value of Costs ($m)	0.83	0.95	1.09
Net Present Value ($m)	1.44	1.30	1.16
Benefit-cost ratio	2.73	2.36	2.06

A sensitivity analysis was then undertaken for the maximum proportion of industry that would have improved their profitability earlier due to the communication investment. Results are provided in Table 11.

Table 11: Sensitivity to Assumption of Proportion of Citrus Industry Improving Profitability due to the Investment in CT15009 (Total investment, 30 years)

Investment Criteria	**Proportion of Citrus Industry Improving Profitability**		
	5%	**10% (Base)**	**20%**
Present Value of Benefits ($m)	1.13	2.25	4.51
Present Value of Costs ($m)	0.95	0.95	0.95
Net Present Value ($m)	0.17	1.30	3.55
Benefit-cost ratio	1.18	2.36	4.73

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 12). 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 12: Confidence in Analysis of Project

Coverage of Benefits	Confidence in Assumptions
Medium-Low	Low

Coverage of benefits was assessed as Medium-Low. While the most important impact from the investment was valued, there were four other impacts that were identified but not valued in monetary terms. As a result, the investment criteria as provided by the valued benefit are likely to be underestimated.

Confidence in assumptions for the impact valued was rated as Low, as some of the key assumptions made were not supported directly by data from surveys or other forms of evidence of change.

Conclusions

The investment in Project CT15009 focused on a re-organisation and streamlining of the communication structure and processes for Citrus Australia. To effect this change, Currie Communications was engaged to provide a core and consistent suite of communication products and services.

The project has provided the Australian citrus industry with an improved structure for their communications; beneficiaries include Citrus Australia, the citrus industry including citrus growers, citrus supply chains, citrus exporters and relevant government organisations.

Given the various communication outputs produced by the project investment, it is likely there has been practice changes made by some citrus growers and supply chains. The uncertainty of this assumption has been accommodated in the economic analysis by the use of risk factors and the counterfactual assumption that the increased adoption would have taken place without the project investment but in a later time period.

Total funding from all sources for the project was $0.95 million (present value terms). The investment produced estimated total expected benefits of $2.25 million (present value terms). This gave a net present value of $1.30 million, an estimated benefit-cost ratio of 2.36 to 1, an internal rate of return of 42.7% and a modified internal rate of return of 9.3%.

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.

Reference List

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Abbreviations

CRRDC	Council of Research and Development Corporations
DAWR	Department of Agriculture and Water Resources (Australian Government)
GDP	Gross Domestic Product
MIRR	Modified Internal Rate of Return
OCS	Office of Chief Scientist Queensland
R&D	Research and Development
RD&E	Research, Development and Extension
SIP	Strategic Investment Plan