

Industry-specific impact assessment program: table grape

Impact assessment report for project *Table grape export market access and maintenance (TG11007)*

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Executive Summary

What the report is about

This report presents the results of an impact assessment of a Horticulture Innovation Australia Limited (Hort Innovation) investment in *TG11007: Table grape export market access and maintenance*. The project was funded by Hort Innovation over the period August 2011 to June 2014.

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 2017/18 dollar terms and were discounted to the year 2018/19 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 has contributed to table grape access to new export markets and the maintenance of existing export markets. A profitable trade in the export of Australian table grapes to Japan, South Korea and the Philippines was established during TG11007 and the fledgling trade in Australian table grapes to China was nurtured and grown. While not all of this export market success is attributable to TG11007, the project has made an important contribution. Consequently TG11007 is likely to have contributed additional profitable export sales for Australian table grape growers. Positive social impacts are also anticipated. These may include increased capacity in trade negotiating and exporting and increased income in regional Australia where table grapes are grown.

Investment Criteria

Total funding from all sources for the project was \$0.44 million (present value terms). All project funding was provided by Hort Innovation. The investment produced estimated total expected benefits of \$2.40 million (present value terms). This gave a net present value of \$1.96 million, an estimated benefit-cost ratio of 5.5 to 1, an internal rate of return of 37% and a MIRR of 13%.

Conclusions

Two social impacts were not valued. When inability to value all impacts is combined with conservative assumptions for the principal economic impacts valued, it is reasonable to conclude that the valuation may be an underestimate of the actual performance of the investment.

Keywords

Impact assessment, cost-benefit analysis, TG11007, table grape, export, market access.

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 apple & pear (AP), avocado (AV), mushroom (MU) and table grape (TG) RD&E investment funds.

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

- Nine AP projects were chosen worth \$15.46 million (nominal Hort Innovation investment) from an overall population of 19 projects worth an estimated \$33.31 million,
- Seven AV projects worth \$1.91 million (nominal Hort Innovation investment) from an overall population of 27 projects worth approximately \$9.97 million,
- Five MU projects worth \$1.75 million (nominal Hort Innovation investment) from a total population of 20 projects worth \$7.94 million, and
- Six TG projects worth \$2.84 million (nominal Hort Innovation investment) from an overall population of 11 projects worth \$5.0 million.

The project population for each industry included projects where a final deliverable had been submitted in the five-year period from 1 July 2013 to 30 June 2018.

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.

Project *TG11007: Table grape export market access and maintenance* was randomly selected as one of the 22 unique MT18009 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

Background

The Australian table grape industry consists of approximately 1,000 growers producing 175,900 tonnes of fresh table grapes per year (3 year average 2016 to 2018). Most table grapes are grown in the Sunraysia Region of Victoria on small to medium sized farms. Major varieties include white Menindee and Thompson, red Crimson, Flame and Globe and black Autumn Royal and Pione. Table grapes are harvested December to May and imports, mainly from the United States (US), are available July to November (Hort Innovation, 2018).

The Australian Table Grape Association (ATGA) represents growers nationally. ATGA provides a platform for industry members to collectively respond to industry wide issues, deliver research and marketing, share knowledge, and interact with government and other stakeholders (ATGA website, accessed May 2019).

Growers pay a levy of one cent per kilogram for table grapes produced in Australia. The levy is managed by Hort Innovation which directs funds to table grape R&D (50% of collected levies) and marketing programs (50% of collected levies). Typically the levy raises \$1.8 million per annum. Funds allocated to R&D are matched by the Australian Government.

As recently as 2011, the table grape industry produced 50% more table grapes than the domestic market was able to consume. The survival of many table grape growers was dependent on new international market access and the maintenance of existing export markets. In 2011, the major focus on growing export markets was on the newly opened China market with emerging opportunities in Japan and South Korea. Other Asian markets were targeted for market access improvement and maintenance (Scott, 2014).

Market access covers phytosanitary (pests and diseases), sanitary (contaminants such as pesticides) and non-quarantine (e.g. duties, quotas, tariffs, licenses) requirements which need to be addressed through the established channels for authorising or improving market access.

Rationale

Industry had established new market access and maintenance of existing export markets as its highest priority for many years and had set a target of increasing exports by 50% between 2000 and 2008. Australia developed a submission for table grape market access to China, Japan and South Korea in 2002. Consequently, TG11007 was a continuation of previous R&D investment projects including TG07006 and TG09508 Table Grape Market Access and Maintenance. The outcomes of these projects have assisted with:

- Market access into mainland China
- Establishing table grapes as the number one negotiating priority for market access, Japan and South Korea
- Receiving of the pest list from South Korea
- Compliance of phytosanitary requirements for Thailand and Vietnam
- Re-negotiating the US protocol
- Support for recognition by overseas countries of cold tolerance work on Qfly and Medfly
- Continued work on Maximum Residue Limits (MRLs) for Vietnam
- Submission of documentation for non-phytosanitary countries becoming phytosanitary compliant
- Support for cold treatment verification for the Japanese
- Support for fruit fly area freedom submissions to Japan, South Korea and Taiwan
- Submission on Free Trade Agreements (FTAs) to reduce tariffs on table grapes
- Reinforcing table grape access priorities for official bilateral negotiations.

TG11007 which ran from 2011 to 2014 was followed by *TG14000 Market Access, Maintenance, Biosecurity and Developing Export Markets Development* (2014 to 2017) and *TG17000 Table Grape Export Readiness and Market Access* (commenced 2018).

TG11007 was also linked to previous Industry Strategic Plan initiatives (1) increase consumer demand for Australian table grapes, and (2) improve industry competitiveness. TG11007 is relevant to the current Table Grape Industry Strategic Investment Plan 2017-21, Outcome 1: Increased demand for Australian table grapes by strengthening and developing domestic and export market opportunities that will improve industry viability and

sustainability.

The rapid growth in Australian table grape exports and key countries targeted as part of TG11007 is shown in Table 1.

Table 1: Australian Table Grape Exports 2009 to 2018 (tonnes)

	Total	China	HK	Japan	Korea	Taiwan	Thailand	Vietnam	Indonesia	Philippines	US
2009	70,012	0	25,701	0	0	1,194	8,267	4,271	8,842	0	0
2010	32,034	0	7,508	0	0	150	3,592	1,545	7,699	0	0
2011	30,725	21	9,863	0	0	403	2,760	2,539	5,751	0	0
2012	40,500	215	17,350	0	0	187	2,730	3,761	6,246	0	0
2013	72,409	3,917	22,265	0	0	166	5,156	7,194	11,111	99	0
2014	80,164	9,864	27,681	235	6	902	3,912	10,257	11,405	1,033	0
2015	84,102	14,330	29,659	2,394	588	794	4,968	5	13,204	3,079	0
2016	110,007	29,936	13,097	9,383	256	1,946	6,219	4,285	17,363	4,446	0
2017	106,666	41,114	8,013	8,397	162	1,394	4,640	5,287	15,586	3,684	0
2018	110,280	41,668	8,074	10,882	776	1,424	5,106	4,601	16,149	5,310	0

Source: Australian Horticulture Statistics Handbook, various additions

Project Details

Summary

Project Code: TG11007
 Title: *Table grape export market access and maintenance*
 Research Organisation: ATGA
 Principal Investigator: Jeff Scott
 Period of Funding: August 2011 to June 2014

Objectives

The objective of TG11007 was to actively progress Australian table grape market access and maintenance issues for key export markets. The project was to focus on the key markets of China, Japan, South Korea, Taiwan, Thailand, Vietnam, Indonesia, Hong Kong, and the US. The project was to expand exports through improvements in quarantine and non-quarantine protocols and barriers.

Logical Framework

Table 2 provides a description of TG11007, export market access and maintenance, in a logical framework.

Table 2: Logical Framework for Project TG11007

Activities and Outputs	<ul style="list-style-type: none"> • Establishment of a skills-based export advisory committee to assist with the development of priorities and annual market access/maintenance work plans. • The export advisory committee, its support staff and the ATGA worked closely with Hort Innovation and the Office of Horticulture Market Access between 2011 and 2014 • ATGA provision of scientific evidence to support DAWR bilateral trade negotiations. • ATGA participated in overseas delegations (official and industry) to progress market access issues and to forge and maintain working relationships with trade partners. • Participation in relevant Australian Government agency meetings including meetings with DFAT, Biosecurity Australia, Australian Quarantine Inspection Service, Austrade. • Hosting of international trade and technical delegations to establish new export protocols and progress improvements in existing protocols. • Bilateral trade negotiations held with South Korea in September 2011. Subsequently a delegation from South Korea visited Australia for the 2012 table grape harvest and
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	<p>inspected production, pest management, picking, packing and cold chain systems. In May 2012 an ATGA delegation visited Korean importers and markets. Korean importers and retailers visited Australia in March 2013 and were hosted by ATGA. Market access was agreed in 2014 and FTE of the same year will reduce tariffs from 45% to 0% by 2019. First shipment of table grapes exported to Korea in 2015. ATGA provided support for Korean inspectors post trade establishment (post TG11007).</p> <ul style="list-style-type: none"> • Bilateral trade negotiations held with Japan in October 2011. Subsequently a delegation from Japan visited Western Australia to inspect Medfly cold disinfestation research costing \$1.5M and focussing on the Crimson Seedless variety. The Japanese delegation was impressed with research outcomes and was accompanied by a number of major retailers. Mission partly paid for by DPI Victoria. First shipment of Australian table grapes to Japan was realised in 2014. ATGA provided support for Japanese inspectors once trade establishment (post TG11007). • Australian table grape exports to China first achieved in 2010 and prior to the commencement of TG11007. In 2012, 2013 and 2014, ATGA provided support for Chinese inspectors who visited Australia to supervise preparation and loading of table grape exports. In 2013 there were 277 shipping containers packed for China export – 33% failed Chinese inspection, due to the presence of ‘a range of pests, and poor hygiene’. China threatened to close the trade and ATGA and DAWR worked together to develop a successful response to China’s concerns. • Notification received in 2012 that the Philippines was prepared to revise its import protocols for fresh produce. A delegation from the Philippines was hosted by the project in Sunraysia. A subsequent cold treatment trial shipment was successful and the trade commenced on a commercial basis in 2013. • Attendance at Australia-Indonesia Working Group on Agriculture, Food, Forestry Cooperation 2012 to make the case for changes to fresh produce import protocols. Revised Indonesian protocol stipulates that imports would only be permitted when domestic fruit supply is demonstrated to be insufficient to meet local demand. Despite this restrictive protocol exports have grown strongly in the period since 2013. • ATGA included as part of an Australia Fresh trade mission to Taiwan in 2012. Trade mission met with government officials, importers and Taiwanese retailers. • ATGA visited trade shows in China, Hong Kong, Japan, Korea, the Philippines and Indonesia in 2011, 2012, 2013 and 2014. Key trade shows included Asia Fruit Logistica, Asia Fruit Congress, China World Fruit and Vegetable Trade Fair. Trade shows were used to showcase Australian table grapes and encourage additional sales. • The project delivered improved and sustainable access for key markets and increased trade opportunities especially China, Japan, Korea and the Philippines. • Stronger links were established with authorities and officials in key export markets through the provision of appropriate information and technology transfer. A deeper understanding of safety and structure of the Australian industry was communicated. • An annual status report was presented by ATGA to the table grapes conference. • Articles were prepared and published in industry magazine ‘The Vine’.
Outcomes	<ul style="list-style-type: none"> • The establishment of a profitable trade in the export of Australian table grapes to Japan, South Korea and the Philippines. • Nurturing and expansion of the fledgling trade in Australian table grapes to China.
Impacts	<ul style="list-style-type: none"> • Additional profitable sales for table grape growers in China, Japan, South Korea and the Philippines. • Increased capacity in trade negotiation and exporting – ATGA, DAWR and table grape growers. • Increased income in regional Australia associated with a more profitable and sustainable table grape industry.

Project Investment

Nominal Investment

Table 3 shows the annual investment (cash and in-kind) in project TG11007 by Hort Innovation. There were no ‘other’ investors in this project.

Table 3: Annual Investment in the Project TG11007 (nominal \$)

Year ended 30 June	Hort Innovation (\$)	Other (\$)	Total (\$)
2012	45,000	0	45,000
2013	135,000	0	135,000
2014	90,000	0	90,000
Totals	270,000	0	270,000

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, investment costs of all parties were expressed in 2017/18 dollar terms using the GDP deflator index. There were no additional costs associated with project extension. Progress with table grape market access and maintenance was reported to industry through the relevant industry magazine and the industry’s annual conference.

Impacts

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

Table 4: Triple Bottom Line Categories of Principal Impacts from Project TG11007

Economic	<ul style="list-style-type: none"> Additional profitable sales for table grape growers in China, Japan, South Korea and the Philippines.
Environmental	<ul style="list-style-type: none"> Nil.
Social	<ul style="list-style-type: none"> Increased capacity in trade negotiation and exporting – ATGA, DAWR and table grape growers. Increased income in regional Australia associated with a more profitable and sustainable table grape industry.

Public versus Private Impacts

Impacts identified in this evaluation are mostly private in nature. Private benefits will be realised by table grape growers via additional profitable sales to China, Japan, South Korea and the Philippines. Public benefits will include increased capacity (ATGA, DAWR and table grape growers) as well as increased income in regional Australia associated with a more profitable and sustainable industry.

Distribution of Private Impacts

The impacts on the table grape industry from investment in this project will be shared along the supply chain with input suppliers, growers, transporters and exporters all sharing impacts produced by the project. It is noted that, at least in the short term, consumers will pay more for table grapes with increased competition from export markets.

Impacts on Other Australian Industries

Impacts on industries other than the table grape industry may include potential gains in other industries via any future spillovers from the increase in trade negotiation and exporting capacity.

Impacts Overseas

Impacts overseas will include additional supply of Australian table grapes and increased competition for alternative suppliers.

Match with National Priorities

The Australian Government's Science and Research Priorities and Rural RD&E priorities are reproduced in Table 5. The project findings and related impacts will contribute to 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	1. Food
2. Biosecurity	2. Soil and Water
3. Soil, water and managing natural resources	3. Transport
4. Adoption of R&D	4. Cybersecurity
	5. Energy and Resources
	6. Manufacturing
	7. Environmental Change
	8. Health

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

Alignment with the Table Grape Strategic Investment Plan 2017-2021

The strategic outcomes and strategies of the table grape industry are outlined in the Table Grape Strategic Investment Plan 2017-2021¹ (Hort Innovation, 2016). Project TG11007 addressed Table Grape SIP Outcome 1, Strategy 1.1.

Valuation of Impacts

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.

A single impact type was valued – additional table grape sales in export markets whose access was facilitated or maintained by TG11007.

Impacts Not Valued

Not all of the impacts identified in Table 3 could be valued in the assessment. Social impacts were hard to value due to lack of evidence/data, difficulty in quantifying the causal relationship and pathway between TG11007 and the impact and the complexity of assigning monetary values to the impact.

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

The social impacts identified but not valued were:

- Increased capacity in trade negotiation and exporting – ATGA, DAWR and table grape growers.
- Increased income in regional Australia associated with a more profitable and sustainable table grape industry (spillover impact).

Valuation of Impact: Additional Table Grape Sales in Export Markets

TG11007 built on previous Hort Innovation funded table grape market access and maintenance projects. TG11007 activities were completed alongside DFAT market access investments and a willingness and goodwill by industry and government in importing countries targeted by Australia for improved market access. Against this background the project was instrumental in delivering new market opportunities for Australian table grape growers. A profitable trade in the export of Australian table grapes to Japan, South Korea and the Philippines was established. A nurturing and expansion of the fledgling trade in Australian table grapes to China was also achieved. Reference to Table 1 shows how the importance of these markets to Australian table grape growers has grown over time.

Attribution

A modest attribution factor of 15% has been used for TG11007's contribution to profit in export markets that are new or have improved access. Many other investments made over a long period of time have contributed to profitable Australian table grape sales in these destinations. For example the Horticulture Australia/Hort Innovation, Office of Horticultural Market Access has been working on market access for China, Japan and Korea since 2002.

Counterfactual

If project TG11007 had not been completed it is possible that actions completed as part of the project would have been completed by others with an interest in table grape export development e.g. ATGA, Australian Horticultural Exporters Association and DFAT. An attribution factor of 35% has been assigned to the TG11007 investment.

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: Additional Table Grape Sales in Export Markets		
Additional table grape exports achieved in China, Japan, South Korea and the Philippines – average of three year's data after TG11007 linked activity.	7,075 t/year	Data sourced from Australian Horticulture Statistics Handbook, various additions.
Table grape grower profit on additional export sales.	\$228/t	Gross value per tonne derived from Australian Horticulture Statistics Handbook (various editions) with profit sourced from IBIS World (2018). Profit adjusted downward by 40% to allow for extra costs and low margins associated with exporting (e.g. additional packaging, disinfestation, inspection, certification, freight, brokerage, etc.).
Attribution of market access and market maintenance – China, Japan, South Korea and the Philippines to TG11007.	15%	A modest attribution factor of 15% has been used for TG11007's contribution to profit in export markets that are new or have improved access. Many other investments made over a long period of time have contributed to profitable Australian table grape sales in these destinations. For example the Horticulture Australia/Hort Innovation, Office of Horticultural Market Access has been working

		on market access for China, Japan and Korea since 2002.
Year of first impact.	2014/15	One year after TG11007 completion.
Counterfactual	65%	If project TG11007 had not been completed it is 35% likely that actions completed as part of the project would have been completed by others with an interest in table grape export development e.g. ATGA, Australian Horticultural Exporters Association and DFAT.

Results

All costs and benefits were discounted to 2018/19 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

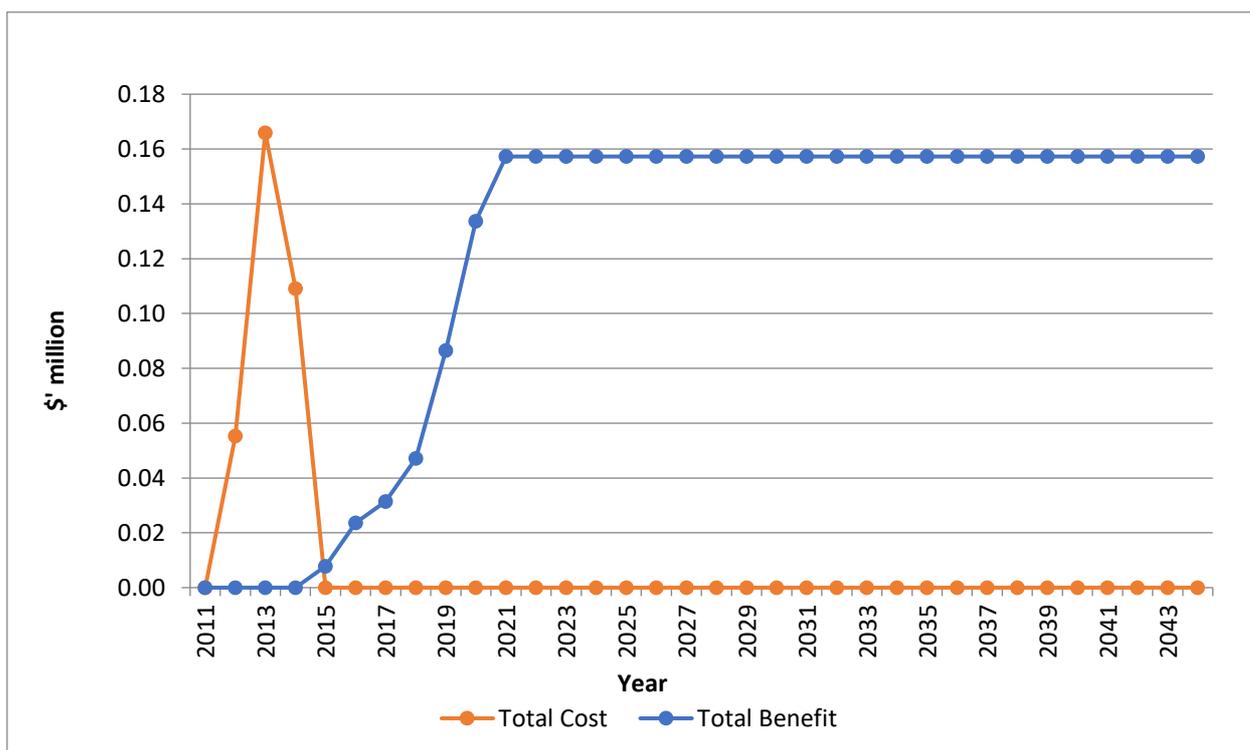
Tables 7 shows the investment criteria estimated for different periods of benefit for the total investment. Hort Innovation was the only contributor to this project so there is no second set of analyses showing results for Hort Innovation.

Table 7: Investment Criteria for Total Investment in Project TG11007

Investment Criteria	Years after Last Year of Investment						
	0	5	10	15	20	25	30
Present Value of Benefits (\$m)	0	0.21	0.87	1.40	1.82	2.15	2.40
Present Value of Costs (\$m)	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Net Present Value (\$m)	-0.44	-0.23	0.43	0.96	1.38	1.71	1.96
Benefit-Cost Ratio	0	0.47	1.97	3.18	4.14	4.88	5.47
Internal Rate of Return (%)	negative	negative	31.2	36.4	37.3	37.4	37.4
MIRR (%)	negative	negative	19.4	18.1	15.9	14.3	13.0

The annual undiscounted benefit and cost cash flows for the total investment for the duration of TG11007 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 8 present the results. The results are moderately sensitive to the discount rate.

Table 8: Sensitivity to Discount Rate
(Total investment, 30 years)

Investment Criteria	Discount rate		
	0%	5%	10%
Present Value of Benefits (\$m)	4.10	2.40	1.63
Present Value of Costs (\$m)	0.33	0.44	0.58
Net Present Value (\$m)	3.77	1.96	1.05
Benefit-cost ratio	12.43	5.47	2.81

A sensitivity analysis was then undertaken for the assumed attribution of new market access to TG11007. Even with a halving of the assumed attribution rate of 15%, the project produces a positive return on investment – Table 9.

Table 9: Sensitivity to Attribution of New Market Access to TG11007
(Total investment, 30 years)

Investment Criteria	Attribution of Market Access to TG11007		
	7.5%	15% (base)	30.0%
Present Value of Benefits (\$m)	1.20	2.40	4.80
Present Value of Costs (\$m)	0.44	0.44	0.44
Net Present Value (\$m)	0.76	1.96	4.36
Benefit-cost ratio	2.73	5.47	10.93

A final sensitivity test examined the assumed profit earned by table grape growers in new export markets. Halving assumed profit continues to deliver benefits that exceed investment cost – Table 10.

Table 10: Sensitivity to Profit Earned by Table Grape Growers in New Export Markets
(Total investment, 30 years)

Investment Criteria	Profit Earned by Grape Growers in New Markets		
	\$114/tonne	\$228/tonne (base)	\$456/tonne
Present Value of Benefits (\$m)	1.20	2.40	4.80
Present Value of Costs (\$m)	0.44	0.44	0.44
Net Present Value (\$m)	0.76	1.96	4.36
Benefit-cost ratio	2.73	5.47	10.93

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 11). 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 11: Confidence in Analysis of Project

Coverage of Benefits	Confidence in Assumptions
High	Medium-high

Coverage of benefits was assessed as high – the major benefit, new and improved market access was quantified.

Confidence in assumptions was rated as medium-high. Data were mostly drawn from Hort Innovation.

Conclusion

The investment has contributed to table grape access to new export markets and the maintenance of existing export markets. A profitable trade in the export of Australian table grapes to Japan, South Korea and the Philippines was established during TG11007 and the fledgling trade in Australian table grapes to China was nurtured and grown. While not all of this export market success is attributable to TG11007, the project has made an important contribution. Consequently TG11007 is likely to have contributed additional profitable export sales for Australian table grape growers. Positive social impacts are also anticipated. These may include increased capacity in trade negotiating and exporting and increased income in regional Australia where table grapes are grown.

Two impacts were not valued. When inability to value all impacts is combined with conservative assumptions for the principal economic impacts valued, it is reasonable to conclude that the valuation may be an underestimate 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

ATGA	Australian Table Grape Association
CRRDC	Council of Research and Development Corporations
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
R&D	Research and Development
RD&E	Research, Development and Extension
SHAFFE	Southern Hemisphere Association of Fresh Fruit Exporters
SIP	Strategic Investment Plan
US	United States of America