Industry-specific impact assessment program: table grape

Impact assessment report for project Undertaking industry activity to support the implementation of regulated table grape quality standards (TG09011)

Impact analyst: Michael Clarke

Delivery partner:

AgEconPlus and Agtrans Research

Project code: MT18009

Date:

8 October 2019

Disclaimer:

Horticulture Innovation Australia Limited (Hort Innovation) makes no representations and expressly disclaims all warranties (to the extent permitted by law) about the accuracy, completeness, or currency of information in this report.

Users of this report should take independent action to confirm any information in this report before relying on that information in any way.

Reliance on any information provided by Hort Innovation is entirely at your own risk. Hort Innovation is not responsible for, and will not be liable for, any loss, damage, claim, expense, cost (including legal costs) or other liability arising in any way (including from Hort Innovation or any other person's negligence or otherwise) from your use or non-use of this report or from reliance on information contained in the report or that Hort Innovation provides to you by any other means.

Funding statement:

This project has been funded by Hort Innovation, using research and development levies and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

Publishing details:

Published and distributed by: Hort Innovation

Level 7 141 Walker Street North Sydney NSW 2060

Telephone: (02) 8295 2300

www.horticulture.com.au

© Copyright 2019 Horticulture Innovation Australia

Contents

3
4
4
5
5
6
7
8
8
10
12
14
15
16
17
17

Tables

Table 1: Logical Framework for Project TG09011	7
Table 2: Annual Investment in the Project TG09011 (nominal \$)	8
Table 3: Triple Bottom Line Categories of Principal Impacts from Project TG09011	8
Table 4: Australian Government Research Priorities	9
Table 5: Summary of Assumptions	11
Table 6: Investment Criteria for Total Investment in Project TG09011	12
Table 7: Sensitivity to Discount Rate	13
Table 8: Sensitivity to Increase in Per Capita Consumption due to TG09011	13
Table 9: Sensitivity to Attribution of Impacts to TG09011	13
Table 10: Confidence in Analysis of Project	14

Figures

Figure 1: Annual Cash Flow of Undiscounted Total Benefits and Total Investment Costs	12
--	----

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 *TG09011: Undertaking industry activity to support the implementation of regulated table grape quality standards.* The project was funded by Hort Innovation over the period January 2010 to January 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

Investment in TG09011 did not result in the implementation of regulated quality standards for table grapes sold in domestic markets outside of Western Australia. However, it did raise awareness of the importance of supplying mature fruit and it did make a contribution to systems to improve the presentation of table grapes through supermarket supply chains. Consequently, TG09011 is expected to have made a modest contribution to increased consumption of Australian table grapes in markets outside Western Australia. Additional unquantified social impacts are expected and include increased capacity (ATGA and table grape growers) and a marginal increase in income in regional areas where table grapes are grown.

Investment Criteria

Total funding from all sources for the project was \$0.39 million (present value terms). All project funding was provided by Hort Innovation. The investment produced estimated total expected benefits of \$0.41 million (present value terms). This gave a net present value of \$0.03 million, an estimated benefit-cost ratio of 1.1 to 1, an internal rate of return of 4% and a MIRR of 5%.

Conclusions

Two social impacts were not valued. When inability to value all impacts is combined with conservative assumptions for the principal economic impact 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, TG09011, table grape, quality, quality standards.

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 expost 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 *TG09011:* Undertaking industry activity to support the implementation of regulated table grape quality standards was 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. Table grapes are also grown in NSW, South Australia, Western Australia, the Northern Territory and Queensland. Major table grape varieties include white Menindee and Thompson, red Crimson, Flame and Globe and black Autumn Royal and Pione. Table grapes are harvested from December to May (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.

Rationale

One of the key factors that influence a consumer's decision to purchase fresh Australian table grapes is sweetness. However, with the exception of Western Australia (WA), there is no regulation in place to control the maturity and hence sweetness of Australian table grapes. Table grape growers have an economic incentive to market table grapes before they are mature. Early marketing captures a price premium by supplying when demand is high and volume is low. Once picked from the vine, table grapes are unable to ripen further and deliver the sweetness that consumers require.

Research completed by HAL (now Hort Innovation) has shown that if consumers have a bad eating experience with sour table grapes, it takes at least six weeks before they are willing to repurchase (Scott, 2014).

Voluntary measures aimed at withholding early season white table grapes grown in Queensland were developed by industry group Grape Connect with the support of retailers in the early 2000s. However, even with the support of most Queensland growers, a number of those outside the voluntary arrangement supplied the market with immature fruit. No overall improvement in consumer eating experience (sweetness) was achieved.

WA reacted to the same situation by legislating quality standards in 2001. With the support of the local table grape association (Table Grapes WA), the WA Department of Primary Industries (DPI) and the WA state government, the WA table grape industry was able to introduce maturity standards that were legislated – all growers in WA must meet compulsory quality standards.

This project was to investigate the WA legislation and determine its relevance to the eastern states. A secondary project aim was to improve product quality as it moves through packing and the domestic supply chain. The second project aim was consistent with the industry's 5 year Strategic Investment Plan. Additional R&D projects were funded as part of this plan to improve the handling and display of Australian table grapes.

Project Details

Summary

Project Code: TG09011

Title: Undertaking industry activity to support the implementation of regulated table grape quality standards

Research Organisation: ATGA

Principal Investigator: Jeff Scott

Period of Funding: January 2010 to January 2014

Objectives

The objective of this project was to investigate table grape minimum quality standards used in WA for their applicability to the east coast. The project was to investigate:

- 1. The process used in WA to achieve minimum quality standards.
- 2. The situation in other jurisdictions and whether the WA legislation could be made to work in other states and the Northern Territory.
- 3. Grower education required to achieve compliance with legislated standards.
- 4. Production and supply chain systems required to support table grape quality in the domestic market.

Logical Framework

Table 1 provides a description of TG09011, Undertaking industry activity to support regulated table grape quality standards, in a logical framework.

Table 1: Logical Framework for Project TG09011

• Formation of an ATGA led project steering committee to guide the project. The
 resultant Quality Standards Committee included representation from South Australia, Victoria, Queensland, the Northern Territory and Western Australia. Research to understand the operation of regulated quality standards in WA. Issues addressed through the research in WA included: (1) problem definition (2) leadership required for change (3) legislative drivers (4) stakeholder support for the legislation (5) the role played by WA DPI (6) implementation of the legislation (7) communication of changes to growers (8) the level of grower support received (9) the process used for setting maturity levels given year to year climatic variation (10) who inspects table grapes in the market place and how is inspection funded (11) what happens to fruit that does not meet quality standards (12) what repercussions for growers who supply immature fruit. Consultation also completed with Table Grapes WA and the WA state government Consultation also completed with growers, wholesalers, independent retailers, supermarkets and DPIs in other states to determine acceptability of WA style proposal. Meetings were held in Berri, Barmera, Loxton, Mildura, Robinvale, Swan Hill, Euston, Griffith, Menindee, St George, Mundubbera, Emerald, Charters Towers and Ti Tree. To align with the anticipated improvement in product quality, the project worked with supermarket supply chains to develop strategies to improve the presentation of table grapes at retail. Regulated table grape quality standards were considered by industry and state / territory governments.
 Regulation of quality standards was rejected by eastern state governments with the strongest rejection received from the Victorian state government. Project results were communicated through a final report, industry magazine 'The Vine' and the industry's annual conference.

Outcomes	 Some progress toward improved table grape quality in domestic markets driven <u>b</u>my increased grower awareness of the impact of immature fruit on repeat purchase and improved product presentation through supermarket supply chains.
Impacts	 Marginal improvement in eastern state consumption of table grapes as a result of increased grower awareness of the need to supply mature fruit and improved presentation of table grapes through supermarket supply chains. Increased understanding and industry capacity in relation to state based legislation and the impact of immature fruit – ATGA and table grape growers. Marginal increase in income in regional Australia associated with a more profitable and sustainable table grape industry.

Project Investment

Nominal Investment

Table 2 shows the annual investment (cash and in-kind) in project TG09011 by Hort Innovation. There were no 'other' investors in this project.

Year ended 30 June	Hort Innovation (\$)	Other (\$)	Total (\$)
2010	70,000	0	70,000
2011	110,000	0	110,000
2012	25,000	0	25,000
2013	0	0	0
2014	0	0	0
Totals	205,000	0	205,000

Table 2: Annual Investment in the Project TG09011 (nominal \$)

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 2.

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. The outcomes of consultations with eastern state/territory governments were communicated through the final project report, relevant industry magazines and the industry's annual conference.

Impacts

Table 3 provides a summary of the principal types of impacts delivered by the project. Impacts have been categorised into economic, environmental and social impacts.

Economic	 Marginal improvement in eastern state consumption of table grapes as a result of increased grower awareness of the need to supply mature fruit and improved presentation of table grapes through supermarket supply chains.
Environmental	• Nil.
Social	 Increased understanding and industry capacity in relation to state based legislation and the impact of immature fruit – ATGA and table grape growers. Marginal increase in income in regional Australia associated with a more profitable and sustainable table grape industry.

Table 3: Triple Bottom Line Categories of Principal Impacts from Project TG09011

Public versus Private Impacts

Impacts identified in this evaluation are mostly private in nature. Private benefits will be realised by table grape growers via a marginal improvement in consumption following increased awareness of damage caused by marketing immature fruit and improved presentation of table grapes. Public benefits will include increased capacity (ATGA and table grape growers) as well as a marginal increase in 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, wholesalers and retailers all sharing impacts produced by the project.

Impacts on Other Australian Industries

No impacts on other industries were identified.

Impacts Overseas

No impacts overseas were identified.

Match with National Priorities

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

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

Table 4: Australian Government Research Priorities

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 TG09011 addressed Table Grape SIP Outcome 2, Strategy 2.1.

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

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 was valued – additional consumption of table grapes as a result of increased grower awareness of the need to supply mature fruit and improved presentation of table grapes through supermarket supply chains.

Impacts Not Valued

Not all of the impacts identified in Table 3 could be valued in the assessment. Two social impacts were hard to value due to lack of evidence/data, difficulty in quantifying the causal relationship and the pathway between TG09011 and the impact and the complexity of assigning monetary values to the impact.

The impacts identified but not valued were:

- Increased understanding and industry capacity in relation to state based legislation and the impact of immature fruit ATGA and table grape growers.
- Marginal increase in income in regional Australia associated with a more profitable and sustainable table grape industry.

Valuation of Impact: Additional Consumption of Table Grapes, Eastern State Markets

Investment in TG09011 did not result in the implementation of regulated quality standards for table grapes sold in domestic markets outside of Western Australia. However, it did raise awareness of the importance of supplying mature fruit and it did make a contribution to systems to improve the presentation of table grapes through supermarket supply chains. Consequently, TG09011 is expected to have contributed to an increase in per capita consumption of Australian table grapes, in domestic markets outside Western Australia.

Attribution

A modest attribution factor has been used for TG09011's contribution to increased per capita consumption of Australian table grapes. A number of other investments made over the same period have addressed the industry's 5 year Strategic Investment Plan objective of improving the handling and display of Australian table grapes. The major Australian supermarket chains have also focussed on improving the quality of table grapes at point of purchase (Scott, 2014).

Counterfactual

If project TG09011 had not been delivered it is possible that actions completed as part of the project would have been completed by others with an interest in improving the quality of table grapes at retail e.g. ATGA and Australian supermarket chains. An attribution factor of 35% has been assigned to the TG09011 investment.

Summary of Assumptions

A summary of the key assumptions made for valuation of the impacts is shown in Table 5.

Variable	Assumption	Source/Comment			
Impact: Additional Consumption of Table Grapes, Eastern State Markets					
Increase in per capita consumption of Australian table grapes in domestic markets outside Western Australia.	0.1kg per year	Analyst assumption after considering changes in table grape supply per capita in the Australian Horticulture Statistics Handbook (various additions) between 2009 and 2018.			
Australian population outside Western Australia.	22.8 million	Australian Bureau of Statistics <u>https://www.abs.gov.au/Population</u> . NB: Australian population has been decreased for a WA population of approximately 2.6 million.			
Farm gate value added on additional table grape sales.	\$0.62/kg	Gross value per tonne of fresh table grapes sold on the domestic market sourced from the Australian Horticulture Statistics Handbook (various editions) with value added (economic surplus) sourced from IBIS World (2018).			
Probability that consumption increase attributable to project will be realised and sustained.	50%	Analyst assumption after considering the non- compulsory nature of project recommendations.			
Attribution of additional consumption due to increased grower awareness and improved presentation of table grapes at retail due to TG09011.	10%	Analyst assumption after review of TG09011 final report – other investments have been made to improve table grape quality at retail.			
Counterfactual	65%	If project TG09011 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 retail e.g. ATGA and Australian supermarket chains.			
Year of first impact.	2016/17	Three years after TG09011 completion – time is required to effect change at retail i.e. time is required for retailers to adjust to project recommendations.			
Year of final impact.	2025/26	Impact is dissipated after ten years when other fruit categories available over summer (December to May) implement improved presentation and quality standards.			

Table 5: Summary of Assumptions

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 (2011/12) as per the CRRDC Impact Assessment Guidelines (CRRDC, 2018).

Investment Criteria

Table 6 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.

Investment Criteria	Years after Last Year of Investment						
	0	5	10	15	20	25	30
Present Value of Benefits (\$m)	0	0.05	0.27	0.41	0.41	0.41	0.41
Present Value of Costs (\$m)	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Net Present Value (\$m)	-0.39	-0.33	-0.12	0.03	0.03	0.03	0.03
Benefit-Cost Ratio	0	0.13	0.70	1.07	1.07	1.07	1.07
Internal Rate of Return (%)	negative	negative	negative	4.1	4.1	4.1	4.1
MIRR (%)	negative	negative	negative	4.6	4.7	4.8	4.8

Table 6: Investment Criteria for Total Investment in Project TG09011

The annual undiscounted benefit and cost cash flows for the total investment for the duration of TG09011 investment plus 30 years from the last year of investment are shown in Figure 1.

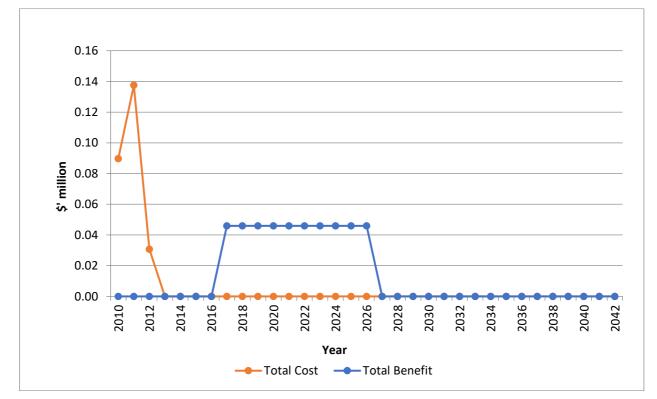


Figure 1: Annual Cash Flow of Undiscounted Total Benefits and Total Investment Costs

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 7 present the results. The results are moderately sensitive to the discount rate. At a 10% discount rate project costs exceed project benefits.

Investment Criteria	Discount rate			
	0%	5%	10%	
Present Value of Benefits (\$m)	0.46	0.41	0.38	
Present Value of Costs (\$m)	0.26	0.39	0.57	
Net Present Value (\$m)	0.20	0.03	-0.19	
Benefit-cost ratio	1.78	1.07	0.66	

Table 7: Sensitivity to Discount Rate (Total investment, 30 years)

A sensitivity analysis was then undertaken for the assumed increase in per capita consumption due to TG09011. At a 0.05kg increase in per capita consumption, project costs exceed project benefits – Table 8.

Table 8: Sensitivity to Increase in Per Capita Consumption due to TG09011 (Total investment, 30 years)

Investment Criteria	Consumption Increase			
	0.05kg	0.1kg (base)	0.2kg	
Present Value of Benefits (\$m)	0.21	0.41	0.82	
Present Value of Costs (\$m)	0.39	0.39	0.39	
Net Present Value (\$m)	-0.18	0.03	0.44	
Benefit-cost ratio	0.53	1.07	2.13	

A final sensitivity test examined the assumed attribution of impacts to the project. At a 5% attribution, project costs exceed project benefits – Table 9.

Table 9: Sensitivity to Attribution of Impacts to TG09011 (Total investment, 30 years)

Investment Criteria		Attribution of Impact		
	5%	10% (base)	20%	
Present Value of Benefits (\$m)	0.21	0.41	0.82	
Present Value of Costs (\$m)	0.39	0.39	0.39	
Net Present Value (\$m)	-0.18	0.03	0.44	
Benefit-cost ratio	0.53	1.07	2.13	

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 10). 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

Coverage of Benefits	Confidence in Assumptions
High	Medium-low

Coverage of benefits was assessed as high – the major benefit, additional table grape consumption as a result of improved product quality was quantified.

Confidence in assumptions was rated as medium-low – both analyst assumptions and Hort Innovation data were required to complete the impact assessment.

Conclusion

Investment in TG09011 did not result in the implementation of regulated quality standards for table grapes sold in domestic markets outside of Western Australia. However, it did raise awareness of the importance of supplying mature fruit and it did make a contribution to systems to improve the presentation of table grapes through supermarket supply chains. Consequently, TG09011 is expected to have made a modest contribution to increased consumption of Australian table grapes in markets outside Western Australia. Additional unquantified social impacts are expected and include increased capacity (ATGA and table grape growers) and a marginal increase in income in regional areas where table grapes are grown.

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.

Table 10: Confidence in Analysis of Project

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

- Council of Rural Research and Development Corporations. (2018). Cross-RDC Impact Assessment Program: Guidelines. Canberra: Council of Rural Research and Development Corporations. Retrieved from <u>http://www.ruralrdc.com.au/wp-content/uploads/2018/08/201804_RDC-IA-Guidelines-V.2.pdf</u>
- Department of Agriculture and Water Resources. (2015). Agricultural Competitiveness White Paper. Canberra: Commonwealth of Australia. Retrieved from <u>http://agwhitepaper.agriculture.gov.au/SiteCollectionDocuments/ag-competitiveness-white-paper.pdf</u>
- Hort Innovation (2016) Table Grape Industry Strategic Investment Plan 2017-2021. Retrieved from https://www.horticulture.com.au/globalassets/hort-innovation/levy-fund-financial-andmanagement-documents/sip-pdfs-new/hortinnovation-sip-table-grape-2017-2021.pdf
- Hort Innovation (2018) Australian Horticulture Statistics Handbook, 2017/18. Retrieved from <u>https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-</u> publications-fact-sheets-and-more/australian-horticulture-statistics-handbook/.
- IBIS World (2018) Grape Expectations: Strong export demand provides growers with opportunity to expand, November 2018 https://www.ibisworld.com.au/
- Office of the Chief Scientist. (2015). Strategic Science and Research Priorities. Canberra: Commonwealth of Australia. Retrieved from <u>http://www.chiefscientist.gov.au/wp-content/uploads/STRATEGIC-</u> <u>SCIENCE-AND-RESEARCH-PRIORITIES 181214web.pdf</u>
- Scott, J (2014) Undertaking industry activity to support the implementation of regulated table grape quality standards. Final Project report TG09011 prepared for Hort Innovaiton.

Acknowledgements

AgEconPlus and Agtrans Research would like to thank all the project and program personnel associated with Horticulture Innovation Australia Limited that were involved in the evaluation process. Their cooperation and feedback throughout the evaluation process contributed significantly to this report.

Specific acknowledgements: Jeff Scott, General Manager, ATGA

Abbreviations

ATGA	Australian Table Grape Association
CRRDC	Council of Research and Development Corporations
DAWR	Department of Agriculture and Water Resources (Australian Government)
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
RDC	Research and Development Corporation
R&D	Research and Development
RD&E	Research, Development and Extension
SIP	Strategic Investment Plan
WA	Western Australia