Hort Innovation

Final Report

Fund Impact Assessment 2020/21 for cherry, vegetables and small tropicals: Evaluation of CY15002

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MT21013

Project:

Fund Impact Assessment 2020/21 for cherry, vegetables and small tropicals (MT21013)

Disclaimer:

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Contents

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 project cluster *Cherry Communications Program (CY15002)* and *Cherry communications support (CY16003)*. The projects were funded by Hort Innovation over the period May 2016 to June 2019.

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 2021-22 dollar terms and were discounted to the year 2021-22 using a real (inflation-adjusted), risk free, pre-tax discount rate of 5% to estimate the investment criteria.

Key findings

The Hort Innovation investment in projects CY15002 and CY16003 delivered a quarterly industry newsletter, monthly email newsletter and two videos annually to communicate levy-funded R&D initiatives to cherry growers. From these outputs, CY15002 and CY16003 was assessed to have supported a range of potential impacts.

- Earlier industry awareness and adoption of levy research outputs generating:
  - [Economic] Increased farm productivity and profitability.
  - [Social] Increased contribution to regional community wellbeing from more profitable cherry growers as a result of adoption of new levy research outputs.
  - [Social] Increased sustainability of quality and affordable cherry supply, supporting increased consumption of cherries with associated health and wellbeing benefits.
  - [Environmental] Increased environmentally sustainable production from adoption of industry best practice.
- [Economic, social, environmental] Increased grower understanding of and engagement with the cherry levy investment process and industry level activities, potentially supporting greater industry involvement and improved future outcomes

The direct industry impact of communications (as part of a broader extension and communication program) is best quantified by the extent to which it changes the diffusion and adoption of practice change within the industry. The degree to which communication and extension can shift the adoption curve will in part depend on the specifics of the innovations being communicated, so the impact pathway should be quantified for each specific topic that was communicated. A review of CY15002 and CY16003 outputs and discussions with industry stakeholders indicated that while the communication topics were valued by stakeholders (particularly among smaller growers that may not have been as readily engaged with alternative communication and extension channels), the impact on farm-level practice change could not be confidently attributed and therefore quantified.

In addition, some communication topics were assessed to have no direct industry impact due to a lack of available outputs for adoption (in the case of ongoing or preliminary research) or due to a focus on whole of industry rather than grower specific issues (in the case of industry marketing and biosecurity plans). While this additional research has the potential for impact (e.g. increased industry level biosecurity preparedness or increased consumer demand), this was not assessed to have been supported by communication to growers in CY15002 and CY16003.

Investment criteria

Total funding from all sources for the project was $0.56 million (2021-22 equivalent value). Additional funding provided through CY16003 to support the contributions of the cherry industry body, Cherry Growers Australia, to deliver cherry communications is also captured in this total. As potential project impacts could not be quantified, a full set of investment criteria could not be produced.

Keywords

Impact assessment, cost-benefit analysis, cherry, communications, extension

Introduction

Evaluating the impacts of levy investments is important to demonstrate to levy payers, Government and other industry stakeholders the economic, social and environmental outcomes of investment for industry, as well as being an important step to inform the ongoing investment agenda.

The importance of ex-post evaluation was recognised through the Horticulture Innovation Australia Limited (Hort Innovation) independent review of performance completed in 2017, and was incorporated into the Organisational Evaluation Framework.

Reflecting its commitment to continuous improvement in the delivery of levy funded research, development and extension (RD&E), Hort Innovation required a series of impact assessments to be carried out on a representative sample of investments across a cohort of Funds in its RD&E portfolio. The assessments were required to meet the following Hort Innovation evaluation reporting requirements:

- Reporting against the Hort Innovation's Strategic Plan and the Evaluation Framework associated with Hort Innovation's Statutory Funding Agreement with the Commonwealth Government.
- Reporting against strategic priorities set out in the Strategic Investment Plan for each Hort Innovation industry fund.
- Annual Reporting to Hort Innovation stakeholders.
- Reporting to the Council of Rural Research and Development Corporations (CRRDC).

As part of its commitment to meeting these reporting requirements, Ag Econ was commissioned to deliver the *Fund Impact assessment 2020/21: Cherry, Sweetpotato, Vegetables, Small Tropicals* (MT21013). This program consisted of a once-off impact assessment series of randomly selected Hort Innovation RD&E investments (projects) within each of the nominated Funds.

Project CY15002 *Cherry Communications Program* was randomly selected as one of the 3 investments in the 2020-21 sample for the Cherry Fund. After CY15002 was selected it was identified that CY16003 *Cherry Communications Support* provided additional capacity through the provision of grower contact details and content guidance to enable the delivery of CY15002. As such the investment costs through CY16003 are also captured in the overall assessment. This report presents the analysis and findings of the project cluster's impact assessment.

General method

The 2020-21 population for the Cherry Fund was defined as an RD&E investment where a final deliverable had been submitted in the five year period from 1 July 2016 to 30 June 2021. This generated an initial population of 61 Hort Innovation investments, worth an estimated $3.9 million (nominal Hort Innovation investment). Projects in the Frontiers Fund, those of less than $80,000 Hort Innovation investment, multi industry projects where the Cherry Fund was less than 50% of total Hort Innovation investment, enabler projects that didn't directly support a 2017-2021 Cherry Strategic Investment Plan (SIP) Outcomes, and projects that have had a previous impact assessment completed were removed from the sample. A total of 7 projects with a combined value of $2.44 million satisfied these criteria and formed the eligible population. The eligible population was then stratified according to the 2017-2021 Cherry SIP outcomes and three project value clusters ($80,000-$180,000; $180,000-$280,000; $280,000-$850,000), based on the distribution of projects by value within the eligible population. A random sample of 3 projects was selected worth a total of $1.35 million (nominal Hort Innovation investment), equal to 55% of the eligible RD&E population (in nominal terms).

The impact assessment followed 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 included both qualitative and quantitative descriptions that are in accord with the impact assessment guidelines of the CRRDC (CRRDC, 2018).

The evaluation process involved reviewing project contracts, milestones, and other documents; interviewing relevant Hort Innovation staff, project delivery partners, growers and other industry stakeholders where appropriate (see *Acknowledgements)*; and collating additional industry and economic data where necessary. Through this process, the project activities, outputs, outcomes, and impacts were identified and briefly described; and the principal economic, environmental, and social impacts were summarised in a triple bottom line framework.

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. As not all impacts were valued, the investment criteria reported for individual investments potentially represent an underestimate of the performance of that investment.

Background and rationale

Industry background

The Australian cherry industry included approximately 346 growing businesses in 2020-21 (Hort Innovation 2022a). The cherry industry recorded a five year average production of 16,321 tonnes (to year ending June 2021) increasing by a trend average 11% per year, although annual volumes have varied through these years due to seasonal weather impacts (Hort Innovation 2022). The industry recorded a nominal production value of $231 million in 2020-21 which had increased at a trend average 16% per year from 2016-17 (Hort Innovation 2022b). In 2020-21, New South Wales, Victoria and Tasmania accounted for approximately 81% of cherry production. Approximately 62% of production went to the domestic fresh market, 30% to exports, and 8% to processing (Hort Innovation 2022b).

Cherry growers pay levies to the Department of Agriculture, Fisheries and Forestry (DAFF), which is responsible for the collection, administration and disbursement of levies and charges on behalf of Australian agricultural industries. Levy is payable on cherries that are produced in Australia and either sold by the producer or used by the producer in the production of other goods. Hort Innovation manages the cherry levy funds which are collected for both R&D and marketing purposes.

Rationale

The cherry industry recognised the importance of an industry communication program, targeted to a national grower audience, in order to support:

- increased awareness of levy investments by Australian cherry growers
- increased adoption of levy-funded R&D investment
- building a stronger, more resilient cherry industry
- increased understanding of the cherry levy system, especially among cherry growers.

CY15002 aimed to achieve these goals by building on the previous communication project CY11026 *Maintenance and ongoing development of communications across the Australian cherry industry*. CY16003 was established to provide background support to CY15002 not covered in the initial contract, including use of the Cherry Growers Australia (CGA) database, and participation in the cherry communications Editorial Reference Group.

Alignment with the Cherry Strategic Investment Plan 2017-2021

With a focus on supporting the timely delivery of R&D and marketing content to levy-payers and enhance on-farm productivity and research profitability, CY15002 and CY16003 were closely aligned to Outcome 4 of the Cherry 2017-21 SIP: *Drive a culture of continuous improvement to improve industry professionalism and profitability.*

Alignment with national priorities

The Australian Government's National RD&E priorities (2015a) and Science and Research Priorities (2015b) are reproduced in Table 1. The project outcomes and related impacts will contribute to RD&E Priority 4, and to Science and Research Priority 1.

Table 1. National Agricultural Innovation Priorities and Science and Research Priorities

Australian Government	
National RD&E Priorities (2015a)	**Science and Research Priorities (2015b)**
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.

Project details

Summary

Table 2. Project details

Project code	CY15002	CY16003
Title	Cherry Communications Program	Cherry Communications Support
Research organization	Coretext	Cherry Growers Australia
Project leader	Andrew Cooke	Tom Eastlake
Funding period	May 2016 to June 2019	September 2016 to September 2018

Logical framework

A logical framework is shown in Table 3 to highlight the connection between the project activities, outputs, outcomes, and impact.

Table 3. Project logical framework

Activities	• Develop a stakeholder engagement plan to identify the relevant stakeholder groups and strategies to engagement with each group. • Develop an annual communication strategy. • Conduct stakeholder surveys at commencement, at a mid-point after 18 months and at project conclusion to inform editorial choices and to evaluate delivery of the communications plan against KPIs. • Develop and implement the quarterly newsletter publication: *Cherry Industry Grower Magazine*, a hard copy 20 page publication. • Develop and implement the monthly email newsletter publication. • Produce two videos per year communicating R&D project outputs hosted on a dedicated *Cherry Magazine* YouTube Channel. • Engage with Cherry Growers Australia and state regional bodies to align communication messages for R&D and marketing investments and the provision of state-by-state seasonal updates. • Engage with Fruit Growers Tasmania who managed a database that maintained magazine and email newsletter subscriber and advertiser details.
Outputs	• Stakeholder engagement plan. • Two updated annual communication strategies. • Three stakeholder surveys. • Five biannual status reports. • 12 editions of Cherry Industry Grower Magazine, from Spring 2016 to Winter 2019, delivered to a subscriber base of approximately 550 people. • 36 monthly email newsletters delivered to final subscriber base of 720 people. • 6 videos published on the Cherry Magazine YouTube Channel.

Outcomes	• Increased awareness and knowledge of cherry levy funded R&D and marketing identified above. Key knowledge areas communicated were:
	  ○ Cherry export development.
	  ○ Nutrition management.
	  ○ Progress of Fruit Fly and Sterile Insect Technique research.
	  ○ Minor use permits for cherry pest and disease management.
	  ○ Biosecurity planning.
	  ○ Marketing activities and consumer insights.
	  ○ Pollination research.
	  ○ Export opportunities.
	• Increased growers' knowledge of the R&D and marketing levy investment processes.

	• Increased Hort Innovation knowledge and understanding of preferred communication pathways for industry stakeholders.

Impacts	• Earlier adoption of levy research outputs generating:
	  ○ [Economic] Increased farm productivity and profitability.
	  ○ [Social] Increased contribution to regional community wellbeing from more profitable cherry growers as a result of adoption of new levy research outputs.
	  ○ [Social] Increased sustainability of quality and affordable cherry supply, supporting increased consumption of cherries with associated health and wellbeing benefits.
	  ○ [Environmental] Increased environmentally sustainable production from adoption of industry best practice.
	• [Economic, social, environmental] Increased grower understanding of and engagement with the cherry levy investment process and industry level activities, potentially supporting greater industry involvement and improved future outcomes

Project costs

Nominal investment

Table 4. Project nominal investment

Year end 30 June	Hort Innovation ($) (CY15002)	Hort Innovation ($) (CY16003)	Total ($)
2017	130,732	15,000	145,732
2018	81,389	25,000	106,389
2019	71,712	20,000	91,712
Total	283,833	60,000	343,833

Program management costs

R&D costs should also include the administrative and overhead costs associated with managing and supporting the project. The Hort Innovation overhead and administrative costs were calculated for each project funding year based on the data presented in the *Statement of Comprehensive Income* in the *Hort Innovation Annual Report* for the relevant year. Where the overhead and administrative costs were equal to the total expenses, less the research and development and marketing expenses. The overhead and administrative costs were then calculated as a proportion of combined project expenses (RD&E and marketing), averaging 16.0% for the CY15002 and CY16003 funding period (2017-2019). This figure was then applied to the nominal Hort Innovation investment shown in Table 4.

Real Investment costs

For purposes of the investment analysis, the investment costs of all parties were expressed in 2021-22 dollar terms using the Implicit Price Deflator for Gross Domestic Product (ABS, 2022b).

Extension costs

CY15002 and CY16003 were communications project. Some of the underlying R&D communicated through the projects included separate communication and extension activities. As such, communication activities provided through CY15002 and CY16003 re-enforced existing channels to increase awareness above that which would otherwise have occurred.

Project impacts

None of the impacts identified through the logical framework process were able to be valued for CY15002 and CY16003. The industry economic impact of communication projects (as part of a broader extension and communication program) is best quantified by the extent to which it changes the diffusion and adoption of practice change within the industry. The degree to which a communication program can shift the adoption curve will in part depend on the specifics of the innovations being communicated, so the impact pathway should be quantified for each specific topic that was communicated.

A review of CY15002 individual communications topics (see Table 3 Outcomes), discussions with stakeholders and evidence obtained from project surveys indicated that while the underlying R&D and may have supported practice change and impact, the likelihood of faster or higher adoption as a result of communication through CY15002 could not be confidently established and quantified. Reasons included that the communicated R&D initiatives were ongoing with outputs not yet available (e.g. SITPlus, biosecurity preparedness of spotted wing drisophila), had inconclusive results (varietal development); related to industry level planning and activities with limited on-farm application (levy funded marketing initiatives); or were also communicated directly to growers through separate channels (e.g. boosting yields and fruit quality through soil health – CY12002, and export development – CY16004).

Project monitoring data collected throughout the communications program identified that communications of R&D material was influential in supporting changes to farm management practices. A total of 58% of respondents (n=24) at the mid point, and 79% (n=30) at the conclusion of the project identified that some aspects of the provided communications has supported changes to farm practice during a season. While this monitoring data indicates that on-farm grower impacts have likely been stimulated through communications material, an inability to connect these to specific practice changes and therefore impacts (cost reduction, yield increase, etc) limits the ability to quantify the extent of impact. Future efforts to link outcomes (changes in knowledge, skills, awareness, and actual or intended practice changes) to specific communications topics would support the ability to develop a more precise quantified measure of impact.

As a result, while earlier adoption of R&D remains a possible impact of CY15002 and CY16003, the high level of uncertainty made it too difficult to quantify with confidence. A lack of reliable data also prevented the valuation of other impacts identified such as improved industry engagement in the RD&E process improving longer term outcomes, and social and environmental benefits from the adoption of best practice.

Public versus private impacts

The potential impacts identified from the investment included private impacts accruing to cherry growers and supply chain participants as well as public benefits in the form of potential spillovers to regional communities from improved environmental outcomes and enhanced grower capacity, yield and income.

Distribution of private impacts

The identified potential private impacts of CY15002 and CY16003 would include direct and flow-on (spillover) impacts. Spillover impacts would include:

- Production-induced effects, which reflect the flow-on changes to the supply chain (upstream and downstream) that result from farm level changes in inputs (chemicals, labour, packaging, transport, marketing) associated with practice change.
- Consumption induced effects, which reflect the flow-on changes generated through the payments of wages and salaries to households and the subsequent expenditure of those incomes of purchasing household goods and services.

Furthermore, the true impact would also be influenced by the equilibrium (price) effect, which reflects changes in prices (of inputs and outputs) as a result in changes in supply and demand of those inputs and outputs. The price effect, essentially shifts benefits along the supply chain and between producers to consumers. The extent to which this would occur would depend on the slope of the short and long term supply and demand curves.

Impacts on other Australian industries

Communicated R&D relating to area wide management of fruit fly, and spotted wing drosophila preparedness may also be relevant to growers who produce other temperate fruit commodities. Communicated R&D relating to pollination may also be relevant to growers of other pollinator reliant crops.

Impacts overseas

The communication program had a focus on Australian cherry stakeholders. There may be some small impacts induced through communication of market access status updates that contributed to improved capacity to supply Australian cherries into overseas markets and therefore consumption of cherries by overseas consumers.

Results

All costs were discounted to 2021-22 using a real discount rate of 5%. While no identified impacts were able to be quantified, the results are shown 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

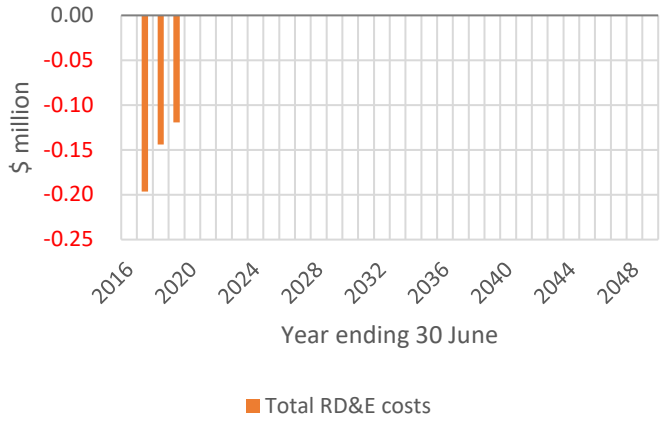
Table 6 shows the impact metrics estimated for different periods of benefit for the total investment. Hort Innovation was the only investor in CY15002 and CY16003.

Table 5. Impact metrics for the total investment in project CY15002

Impact metric	Years after last year of investment						
	0	5	10	15	20	25	30
PVC ($m)	0.564	0.564	0.564	0.564	0.564	0.564	0.564
PVB ($m)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NPV ($m)	-0.564	-0.564	-0.564	-0.564	-0.564	-0.564	-0.564
BCR	NA	NA	NA	NA	NA	NA	NA
IRR	NA	NA	NA	NA	NA	NA	NA
MIRR	NA	NA	NA	NA	NA	NA	NA

Figure 1 shows the annual undiscounted cash flows for the total investment of CY15002 and CY16003. Cash flows are shown for the duration of the investment plus 30 years from the last year of investment.

Figure 1. Annual undiscounted cash flows



Conclusions

The findings of this impact assessment highlight that the capacity of a communications program to generate impact is directly related to the extent of material R&D innovations and best practice that are available for communication and that can be adopted by industry. Furthermore, communication of R&D that does not necessarily have farm level implications (such as industry level biosecurity planning or marketing activities) can still generate value for industry such as through increased grower understanding of and engagement with the cherry levy investment process and industry level activities, potentially supporting greater level of industry involvement, cohesiveness and improved outcomes.

For CY15002, discussions with industry stakeholders indicated that while the underlying R&D was valuable, the extent of practice change as a result of communication through the project was uncertain. Reasons included the R&D being ongoing with outputs not yet available (e.g. SITPlus, biosecurity preparedness of spotted wing drisophila) or inconclusive (varietal development); the R&D relating to industry level planning and activities with limited on-farm application (levy

funded marketing initiatives or industry level biosecurity preparedness); and the R&D outputs being communicated directly to growers through separate channels (e.g. boosting yields and fruit quality through soil health – CY12002).

Project monitoring data collected throughout the communications program identified that communications of R&D material was influential in supporting changes to farm management practices. A total of 58% of respondents (n=24) at the mid point, and 79% (n=30) at the conclusion of the project identified that some aspects of the provided communications has supported changes to farm practice during a season. While this monitoring data indicates that on-farm grower impacts have likely been stimulated through communications material, an inability to connect these to specific practice changes and impacts (cost reduction, yield increase, etc) limits the ability to quantify the extent of impact. Future efforts to link outcomes (changes in knowledge, skills, awareness, and actual or intended practice changes) to specific communications topics would support the ability to develop a more precise quantified measure of impact.

A lack of reliable data also prevented the valuation of other impacts identified such as improved industry engagement in the RD&E process improving longer term outcomes, and social and environmental benefits from the adoption of best practice.

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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.
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.

Abbreviations

CRRDC Council of Rural Research and Development Corporations

DAFF Department of Agriculture, Fisheries and Forestry (Australian Government)

GDP Gross Domestic Product

GVP Gross Value of Production

IRR Internal Rate of Return

MIRR Modified Internal Rate of Return

PVB Present Value of Benefits

PVC Present Value of Costs

RD&E Research, Development and Extension

SIP Strategic Investment Plan

Ends.