Hort Innovation

Final Report

Fund Impact Assessment 2020/21 for cherry, vegetables and small tropicals: Evaluation of VG15074

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Delivery partner:

Ag Econ

Project code:

MT21013

Project:

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

Disclaimer:

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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 *VG15074 Export Development of Australian Vegetables to Japan*. The project was funded by Hort Innovation from December 2016 and was terminated in October 2017.

Methodology

The investment was 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.

Results/key findings

The aim of VG15074 was to develop the Japanese export market for a suite of Australian vegetables.

While the project was operating, qualitative and quantitative research was conducted on the Japanese vegetable market and both outbound and inbound trade missions were facilitated.

Specific knowledge was built around the option of sea freighting zucchinis (compared to air freight) to increase cost competitiveness of Australian zucchinis in Japan. The study concluded that sea freight was a feasible freight option. Previously identified as a market opportunity for Australian pumpkins, the project also completed a profile of Kabocha/pumpkins in Japan. Additionally, a Japanese consumer qualitative report was completed with an aim to differentiate Australian vegetables from our competitors. For example, the study identified the Japanese consumer was impressed with the dark green colour of the Australian zucchinis in comparison to the paler Japanese varieties.

The inbound trade mission focused on education around the strict adherence by Australian growers with food safety standards and environmental sustainability credentials. Both the inbound and outbound trade missions also created an opportunity for the steering committee grower members to develop commercial relationships.

The researcher suggested no outputs were communicated to industry, so while the knowledge derived and the relationships developed within the project assisted those in the steering committee to take advantage of export opportunities into Japan, the broader industry impact was minimal as a result of the early termination. In addition, discussions with stakeholders suggested vegetable exports to Japan (and Asia generally) are quite opportunistic. As a result, no impacts could be confidently attributed and quantified for the project.

However, the knowledge gained within the project may have contributed to the establishment and delivery of the follow-on industry export project *VG16061 Vegetable industry export program*.

Investment criteria

Total funding from all sources for the project was $1.35 million (2021-22 equivalent value). Impact metrics could not be calculated as the identified benefits were not able to be quantified.

Keywords

Impact assessment, cost-benefit analysis, vegetable, export, trade, Japan, market access

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 *VG15074 Export Development of Australian Vegetables to Japan* was randomly selected as one of the 9 investments in the 2020-21 sample for the Vegetable Fund. This report presents the analysis and findings of the project impact assessment.

General method

The 2020-21 population for the Vegetable 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 315 Hort Innovation investments, worth an estimated $88.7 million (nominal Hort Innovation investment). Projects in the Frontiers Fund, those of less than $80,000 Hort Innovation investment, multi industry projects where the Vegetable Fund was less than 50% of total Hort Innovation investment, enabler projects that don't directly support a 2017-2021 Vegetable Strategic Investment Plan (SIP) Outcome, and projects that have had a previous impact assessment completed were removed from the sample. A total of 90 projects with a combined value of $54.8 million satisfied these criteria and formed the eligible population. The eligible population was then stratified according to the 2017-2021 Vegetable SIP outcomes, and four project value clusters based on the distribution of project value within the population ($80,000-$265,000; $265,000-$440,000; $440,000-$695,000; $695,000-$8,680,000). A random sample of 9 projects was selected worth a total of $5.86 million (nominal Hort Innovation investment), equal to 10.7% 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 stakeholders including 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.

Some, but not all, of the impacts identified were valued in monetary terms. Where impacts were valued, the impact assessment used 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. As not all impacts were valued, the investment criteria reported potentially represents an underestimate of the performance of that investment.

Background and rationale

Industry background

The national vegetable levy is payable on all vegetable crops excluding potatoes, onions, mushrooms, sweetpotatoes, asparagus, garlic, ginger, herbs (except fresh shallots and parsley) and tomatoes. The levy is payable on vegetables that are produced in Australia and either sold by the producer or used by the producer in the production of other goods. Producers 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. Hort Innovation manages the vegetable levy funds which are directed to R&D investments.

The Australian levy paying vegetable industry has approximately 1,700 growers across Australia (Hort Innovation 2022a), with a 5-year average (to 2020-21) production value of $2.5 billion, growing at a trend 6.19% and a volume trend of 1.77% per annum (Hort Innovation 2022b). The majority of leviable vegetables are supplied to the domestic market, with approximately 10% exported at a total value of $170 million in 2020-21 growing at an average 1.19% per annum from 2016-17. Leviable vegetables are grown across Australia, however Queensland accounts for the highest share (32%), followed by Victoria (24%), Western Australia (16%), New South Wales (8%), South Australia (9%) and Tasmania (8%) in 2020-21.

Rationale

VG15074 Export Development of Australian Vegetables to Japan originated directly from the growers who were on the Reference Committee for the commercially successful Hort Innovation funded project *VG13048 Market Analysis and strategy: broccoli to Japan*. The growers sought to build on the success of VG13048 through this follow up project and apply the methodology to develop export opportunities for a wider range of Australian vegetables to Japan, as well as expand the research to include comprehensive consumer insights and competitor analysis.

Alignment with the Vegetable SIP 2017-21

The vegetable levy investments are guided by a Strategic Investment Plan (SIP). The Vegetable SIP 2017-21 identified "Growth in export markets" as a priority outcome for Australia's vegetable industry. This outcome was supported by the strategies including "Improve and capitalize on the opportunities available for inbound and outbound trade linkages" and "Better understand the export opportunities available to the vegetable industry" with a potential deliverable of this strategy being understanding consumer preferences.

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 VG15074 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	VG15074
Title	Export Development of Australian Vegetables to Japan
Research organization	Department of Agriculture and Fisheries, QLD (QDAF)
Project leader	Bronwyn Warfield
Funding period	From December 2016, terminated October 2017

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	• Establishment of a national Reference Committee involving 7 growers from 3 states, HorticultureWA, DAF and AUSVEG and conduct 3 Reference Committee meetings in three states – Toowoomba, Adelaide and Melbourne
	• Assess and quantify the barriers into the Japanese market, shortlisting potential Australian export vegetables against feedback from the Japanese trade partners; consumer research; and market size, growth and competitor data. A draft methodology highlighting export impediments and strategies to improve competitiveness was applied to a trial shipment of zucchinis by sea freight to Japan in 2017.
	• Identify Japanese consumers' purchase drivers. 5 of the 7 growers on the Reference Committee supplied product to the project which was air-freighted to Japan and included in the consumer research.
	  ○ Qualitative information was collected from 40 consumers and 66 hours of face to face interviews through accompanied shopping expeditions, a comparison with the Australian supplied produce, and focus groups.
	  ○ Quantitative analysis was undertaken in Japan and involved 1,016 female consumers.
	• Analysis of key competitors (New Zealand, United States and Mexico) including desktop research and analysis of Japan's import statistics including market size, competitor market share, seasonality of supply and pricing.
	• Identify and support key importers, retailers and food service operators.
	  ○ A round table discussion in Tokyo involving 20 importers and retailers.
	  ○ An importer/retailer profiling activity involved 8 selection stores in August 2017. In-store sampling of Australian onions was conducted and 83 consumers were surveyed to collect their impressions of Australian onions.
	  ○ A trial sea freight shipment of zucchinis to Japan was a collaboration between this project and the DAF project *Asian Markets Service Supply Chain AM15002*.
	• Inbound trade mission with Japanese importers/retailers meeting 15+ growers (including Reference Committee) in QLD and Vic.
	• Outbound trade mission to Japan June/July 2017, including fourteen "shop alongs" with Japanese consumers.

Outputs	• Case study on sea freighted zucchinis to Japan • Product profile Kabocha/pumpkins in Japan • Japanese consumer qualitative report • Profile on Japan's fresh vegetable market • Video - Japanese consumers' discussing Australian vegetables in English and Japanese • Video – Round table discussion by Vegetable Growers – 'Collaborative exporting and exporting experiences'. • Draft Product profiles – onions, sweet corn

	• Draft Export Development Strategy for Vegetables to Japan • Draft Value Chain Analysis - sweet corn
Outcomes	• Expanded export opportunities for steering committee members via new relationships (from meet / greet with importers). • Increase of potential participation in Japanese vegetable markets • Increased knowledge around Japan's export markets. This knowledge was not extended to industry; however, was potentially incorporated into other export projects such as *VG16061 Vegetable industry export program*.
Impacts	• [Economic] Growth of export opportunities in Japan for steering committee members via relationship development with Japanese importers • [Social-economic] Increased capacity and understanding of Japanese export markets to inform other trade development projects such as *VG16061 Vegetable industry export program.*

Project costs

Nominal investment

Table 4. Project nominal investment

Year end 30 June	Hort Innovation ($)	QDAF ($)	Total ($)
2017	573,543	243,113	816,656
2018	0	0	0
Total	573,543	243,113	816,656

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 14.46% for the VG15074 funding period (2017). 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, 2022).

Extension costs

The researcher suggested there was no extension of outputs due to the early termination of the project.

Project impacts valuation

No impacts were valued for VG15074. Discussions with industry stakeholders indicated that while the project did make progress within the first 9 months, the valuation of impacts was challenged given the lack of clarity around the communication of outputs wider than the steering committee and Hort Innovation.

Discussions with stakeholders indicated that VG15074 did contribute to commercial outcomes for some of the growers participating on the steering committee. While this undoubtedly generated value for those individual growers, in the broader industry context the impact was deemed to be insufficiently large to warrant an impact valuation. Stakeholders also indicated that some of the knowledge produced within the project may have informed the next coordinated export project *VG16061 Vegetable industry export program.*

Public versus private impacts

The potential impacts identified from the investment are predominantly private impacts accruing to vegetable a small

number of growers and supply chain participants. However, some public benefits have also been produced in the form of capacity built to inform future RD&E.

Distribution of private impacts

The limited private impacts of VG15074 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

The project activities were explicit to the Australian vegetable industry.

Impacts overseas

Findings on the Japanese vegetable import market and Japanese vegetable consumer were not made public, so no overseas impact from this project is anticipated.

Results

All costs were discounted to 2021-22 using a real discount rate of 5%. All analyses ran for the length of the project investment period plus 30 years from the last year of investment (2017-18) as per the CRRDC Impact Assessment Guidelines (CRRDC, 2018).

Investment criteria

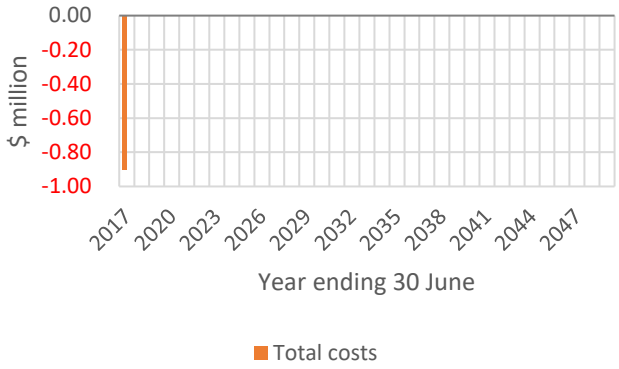
Table 5 shows the impact metrics estimated for different periods of benefit for the total investment. Hort Innovation was the only investor in VG15074.

Table 5. Impact metrics for the total investment in project VG15074

Impact metric	Years after last year of investment						
	0	5	10	15	20	25	30
PVC ($m)	1.35	1.35	1.35	1.35	1.35	1.35	1.35
PVB ($m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NPV ($m)	-1.35	-1.35	-1.35	-1.35	-1.35	-1.35	-1.35
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 VG15074. Cash flows are shown for the duration of the investment plus 30 years from the last year of investment.

Figure 1. Annual cash flow of undiscounted total benefits and total investment costs



Conclusions

VG15074 was terminated 9 months into an 18 month project. While the project was operating, qualitative and quantitative research was conducted on the Japanese vegetable market and both outbound and inbound trade missions were facilitated.

Specific knowledge was built around the option of sea freighting zucchinis (compared to air freight) to increase cost competitiveness of Australian zucchinis in Japan. The study concluded that sea freight was a feasible freight option. Previously identified as a market opportunity for Australian pumpkins, the project also completed a profile of Kabocha/pumpkins in Japan. Additionally, a Japanese consumer qualitative report was completed with an aim to differentiate Australian vegetables from our competitors. For example, the study identified the Japanese consumer was impressed with the dark green colour of the Australian zucchinis in comparison to the paler Japanese varieties.

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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