

Fund Impact assessment 2020/21: Vegetables

Impact assessment of VG15071 *Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables and Native vegetable scoping study*

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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 VG15071 through the contracted projects: *Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables*; and *Native vegetable scoping study*. The projects were funded by Hort Innovation over the period July 2016 to February 2018.

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 and a 5% reinvestment rate to estimate the investment criteria.

Key findings

The delivery of project VG15071 provided new consumer insight knowledge for Australian grown native and Asian vegetables to inform grower supply and support demand creation. The project identified variable perception and sensory traits of native and Asian vegetables, and highlighted strategies to enable growers to leverage the favourable attributes to support demand creation. Various grower resources summarising the results of the research were produced to support awareness and engagement with the findings.

Overall discussions with industry stakeholders and a review of industry data found that while VG15071 provided the potential to influence growers decisions regarding production and supply of native and Asian vegetables, an attributable increase in the volume supplied was not evident. While no quantifiable impacts were identified as a result, several other potential economic and social impacts were still identified:

- [Economic] Increased production of Australian native and Asian vegetables supplied to the domestic market supporting increased grower income.
- [Economic and social] Vegetable action plans inform future RD&E investments supporting more effective RD&E outcomes.
- [Social] A greater supply of Australian native and Asian vegetable varieties aligning with consumer preferences supports increased consumer appeal, thereby supporting increased vegetable consumption with associated health and wellbeing outcomes.
- [Social] Increased contribution to regional community wellbeing from more profitable vegetable growers, including through involvement with indigenous Australians.

These potential impacts may be especially realised by native vegetable growers once commercial supply capacity is sufficiently developed to support reliable consumer availability across retail channels.

Investment criteria

Total funding from all sources for the project was \$0.70 million (2021-22 equivalent value). Impact metrics could not be calculated as the identified benefits were not able to be quantified.

Conclusions

The provision of consumer knowledge and material for emerging vegetable lines is valuable to ensure that future market development is aligned with the available market opportunities. As the production of native vegetables are yet to reach commercial levels at retail channels, the capacity of this impact assessment to quantify how consumer insights has influenced grower supply and consumer demand is limited. Consultation with growers of native vegetables highlighted the potential future benefits of the consumer insight delivered through VG15071, but these had not been realised to date due to the immediate focus on expanding commercial production capacity beyond the current low base. In addition to the lack of farm specific impact, there was no evidence to indicate how the recommendations have been used to inform a native vegetable research and development program, strategic collaboration with other agencies, or involvement of indigenous Australians in native vegetable production initiatives. As such impacts from the *Native vegetable scoping study* were not able to be quantified.

While the supply of Asian vegetables is a more mature vegetable line with established commercial production, the production volume of Asian vegetables had only experienced a marginal increase since the conclusion of the project, with a reported 2.19% average annual volume increase of *leafy Asian vegetables* (representing 3 of 9 Asian vegetables covered in VG15071) from 2017-18 to 2020-21, compared to an average annual growth rate of 3.79% over the period 2012-13 to 2016-17 (Hort Innovation 2022b).

Overall, while VG15071 provided the potential to influence growers decisions regarding production and supply of native and Asian vegetables, an attributable increase in the volume supplied was not evident, limiting the ability to quantify an attributable impact.

Despite the inability to quantify a benefit, there remains a potential for ongoing impacts for vegetable growers as a result of the work completed in VG15071. The forecast growth in the farm gate value of native vegetables of 96% from 2019-20 to 2025 (Laurie 2020) demonstrates the importance of robust consumer insights to guide market development such as that delivered through VG15071. The use of the vegetable action plans to inform future RD&E investments also provides a potential future impact through underpinning effective RD&E outcomes. In the long term, social impacts may also be realised through having a greater selection of Australian native and Asian vegetable varieties aligning with consumer preferences, increasing consumer appeal and thereby supporting increased vegetable consumption with associated health and wellbeing outcomes. An increased contribution to regional community wellbeing from more profitable vegetable growers, including through involvement with indigenous Australians could also be supported through this investment.

Keywords

Impact assessment, consumer insights, native vegetables, Asian vegetables, domestic demand creation

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 *VG15071 Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables and Native vegetable scoping study* (also under VG15071) were 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

Supporting a sustainable domestic vegetable market through initiatives to increase consumer demand has been an increasing priority for the vegetable industry amidst expanding production volumes. The domestic vegetable market remains the major source for levy paying vegetables, with 81.5% of the total vegetable production volume being sold in fresh form to the domestic market in 2020-21.

Consumer research funded by Hort Innovation in 2019 identified that the three major barriers to purchase for Australian consumers to purchase more vegetables were: (1) concerns over wastage; (2) not liking the taste; and (3) perceptions of already consuming enough vegetables (Hort Innovation 2019). While a range of vegetable levy-funded consumer education initiatives have sought to address these barriers (e.g. [Veggycation](#)), the vegetable industry had very limited knowledge of opportunities to diversify the range of vegetables on the domestic market, which may mitigate the influence of purchase barriers.

The vegetable industry identified an opportunity to support domestic market growth through developing consumer insights specifically focused on Australian-grown indigenous and Asian vegetables, to support growers diversify the range of vegetables available domestically. Consumer insights can influence market development priorities (e.g. consumer education, price strategies and channel availability) and identify opportunities to grow and diversify the domestic vegetable market. Project VG15071 was commissioned to gather these insights, and support the vegetable industry grow the domestic market through targeted supply of a wider range of unique and novel native and Asian vegetable products that best align with consumer preferences.

The overall objectives of VG15071 were supported through two separate project contracts under this investment:

Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables (Colmar Brunton)

- To identify the commercial availability of Australian indigenous and Asian vegetables
- To understand how these vegetables are currently, if at all, incorporated into Australian consumer's repertoire; including optimal cooking styles, cuisines and flavour expectations
- To understand the conceptual appeal of key Asian vegetables and Australian indigenous vegetables
- To explore triggers and barriers to purchase and consume Australian indigenous and Asian vegetables
- To understand which sensory characteristics are most desirable to consumers
- To understand the difference in sensory preference between demographics (age, gender, location, cultural background)

- To inform industry of the market development required, such as consumer education, price setting, or channel availability, in order to identify short term and long term opportunities.

Native vegetable scoping study (University of Melbourne)

- To deliver a gap analysis on current R&D initiatives in the native food sector in Australia to guide future R&D investment.

Alignment with the Vegetable Strategic Investment Plan 2017-2021

Vegetable levy investments are guided by a Strategic Investment Plan (SIP). With a focus on developing growth in the domestic vegetable market, VG15071 was closely aligned with the Vegetable SIP Outcome 1: *Growth in the domestic market*, and its underlying strategies including “Consumer Insights: Increase knowledge to better understand consumer trends and segments” and “Stakeholder Education: Improve stakeholder education for vegetables, such as the identification and extension of health benefits associated with vegetables”.

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 VG15071 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 | VG15071 | VG15071 |
| Title | Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables | Native vegetable scoping study |
| Research organization | Colmar Brunton | University of Melbourne |
| Project leader | Dr Denise Hamblin | Dr Chris Williams |
| Funding period | June 2016 to February 2018 | February 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

| | |
|-------------------|---|
| <p>Activities</p> | <p><i>Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables</i></p> <ul style="list-style-type: none"> • Develop a project logic to clarify and communicate intended outcomes and assumptions. • Conduct a knowledge audit and review of Australian indigenous and Asian vegetables through desk research and in depth interviews with supply chain stakeholders (n=2), and ethnographic interviews with indigenous vegetable users (n=4) and Asian vegetable users (n=4). • Convene a Project Reference Group to guide the researchers and validate research findings. • Undertake qualitative consumer research to understand motivations, requirements and limitations; develop and test concepts and education platforms. This included consumer home use testing of identified vegetables. • Review findings and generate a shortlist of Australian native and Asian vegetables (n=18). • Perform quantitative consumer validation (surveying 1,532 consumers) to determine triggers and barriers to purchase, develop parameters for conceptual appeal and estimation of potential market volumes. • Sensory evaluation with vegetable consumers to determine the sensory attributes which yield the highest consumer appeal and likelihood to purchase. • Deliver an action plan for each vegetable, including recommendations on how to approach their commercialisation. <p><i>Native vegetable scoping study</i></p> <ul style="list-style-type: none"> • Desktop review using web-based searches for peer-reviewed, grey and ‘popular’ literature on a range of native vegetables. • Follow-up emails and phone calls with research providers. • Documentation of research project objectives, outputs and outcomes – including issues of current R&D and recommendations to support further research. |
| <p>Outputs</p> | <p><i>Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables</i></p> <ul style="list-style-type: none"> • Program logic documentation. • Knowledge audit and review: <ul style="list-style-type: none"> ○ Category background. ○ Identification of known vegetable types. ○ Shortlist 20 vegetables for qualitative sensory evaluation (9 Asian vegetables) (11 native vegetables). • Qualitative sensory evaluation: <ul style="list-style-type: none"> ○ Triggers and barriers summary. ○ Shortlist 18 vegetables for quantitative validation (7 Asian vegetables) (11 natives vegetables). • Quantitative validation: <ul style="list-style-type: none"> ○ Metrics of overall liking, purchase intent, and price expectations. ○ Volume sales metrics projection. ○ Shortlisting of vegetables (5 Asian vegetables) (5 native vegetables). • Sensory evaluation: <ul style="list-style-type: none"> ○ Profiling of likes and dislikes. ○ Comparison of vegetable performance against total grocery benchmarks. • Action plan for each vegetable in scope. <p>The project team also had plans to deliver an industry workshop to support the findings from each action plan, however this did not occur at the time of project final reporting.</p> <p><i>Native vegetable scoping study</i></p> <ul style="list-style-type: none"> • Literature review identifying R&D opportunities for Australian native vegetables |
| <p>Outcomes</p> | <p><i>Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables</i></p> <ul style="list-style-type: none"> • Improved knowledge of Australian native and Asian vegetables with greatest potential for commercialisation. |

| | |
|---------|--|
| | <ul style="list-style-type: none"> Improved knowledge of consumer triggers and barriers to purchase for the studied native and Asian vegetables. Increased confidence of industry and growers to develop strategies to supply native and Asian vegetables to the domestic market. <p><i>Native vegetable scoping study</i></p> <ul style="list-style-type: none"> Improved knowledge of R&D gaps and opportunity for Australian native vegetables. |
| Impacts | <ul style="list-style-type: none"> [Economic] Increased production of Australian native and Asian vegetables supplied to the domestic market supporting increased grower income. However, discussions with industry stakeholders indicated that while the project did support improved knowledge about the triggers and barriers to consumption of native and Asian vegetables, the extent to which the material has directly influenced growers' decisions to supply and market native and Asian vegetables was limited. [Economic and social] Use of the vegetable action plans to inform future RD&E investments supporting more effective RD&E outcomes. [Social] A greater selection of Australian native and Asian vegetable varieties aligning with consumer preferences supports increased consumer appeal, thereby supporting increased vegetable consumption with associated health and wellbeing outcomes. [Social] Increased contribution to regional community wellbeing from more profitable vegetable growers, including through involvement with indigenous Australians. |

Project costs

Nominal investment

Table 4. Project nominal investment

| Year end 30 June | Hort Innovation (\$) <i>Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables</i> | Hort Innovation (\$) <i>Native vegetable scoping study</i> | University of Melbourne (In-Kind) (\$) (In-Kind) | Total (\$) |
|------------------|---|---|---|------------|
| 2017 | 251,700 | 0 | 0 | 251,700 |
| 2018 | 120,461 | 36,000 | 1,000 | 157,462 |
| 2019 | 2,651 | 0 | 0 | 2,651 |
| Total | 374,812 | 36,000 | 1,000 | 411,812 |

Program management costs

R&D costs should also include the administrative and overhead costs associated with managing and supporting the project. While the University of Melbourne in-kind was captured in the contract documentation (Table 4), 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. From this report, 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 VG15071 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, 2022).

Extension costs

Communication and extension were activities conducted within the project, so the project expenditure is assumed to be inclusive of extension costs.

Project impacts valuation

None of the impacts identified through the logical framework process were able to be valued for VG15071.

With an ongoing industry focus on demand creation through consumer-led insights for vegetable growers, the material provided by VG15071 has the potential to support future impact through informing grower decisions in meeting consumer demand to support sustainable and value-maximising market growth. However, discussions with industry stakeholders indicated that while the project did support improved knowledge about the triggers and barriers to consumption of native and Asian vegetables, the extent to which the material has directly influenced growers' decisions to supply and market native and Asian vegetables has been limited.

The value of native vegetable production is estimated to increase by \$78.5 million to 2025 (Laurie 2020), highlighting the importance of robust consumer insights such as VG15071 in guiding market development. Currently, however, the supply of native vegetables occurs on a very small scale, with commercial supply currently limited to the foodservice channel (premium restaurants) and some localised market sales. As identified through the *Native vegetable scoping study*, extensive R&D is required to support advances in production efficiency and scale of native vegetables as existing supply can be extremely variable, limiting the consistency to which product is available for consumers. In line with this, discussions with native vegetable growers indicated that their main priority was focused towards growing production capacity, and as such the consumer-focused R&D produced through VG15071 was of limited relevance to their business development priorities. In addition to the lack of farm specific impact, there was no evidence to indicate how the recommendations have been used to inform a native vegetable research and development program, strategic collaboration with other agencies, or involvement of indigenous Australians in native vegetable production initiatives. As such impacts from the *Native vegetable scoping study* were not able to be quantified.

While the supply of Asian vegetables is a more mature vegetable line with established commercial production, the production volume of Asian vegetables had only experienced a marginal increase since the conclusion of the project, with a reported 2.19% average annual volume increase of *leafy Asian vegetables* (representing 3 of 9 Asian vegetables covered in VG15071) from 2017-18 to 2020-21, compared to an average annual growth rate of 3.79% over the period 2012-13 to 2016-17 (Hort Innovation 2022b).

Overall, while VG15071 provided the potential to influence growers decisions regarding production and supply of native and Asian vegetables, an attributable increase in the volume supplied was not evident, limiting the ability to quantify an attributable impact.

Public versus private impacts

The potential impacts identified from the investment are predominantly private impacts accruing to vegetable growers and supply chain participants including the retail channel. However, there is also the potential for some public benefits be realised through increased diversity of vegetable consumption supporting improved health outcomes and reduced public healthcare expenditure. Increased production of native vegetables may also stimulate additional employment opportunities for indigenous Australians, delivering a public benefit to these communities.

Distribution of private impacts

The identified potential private impacts of VG15071 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 – specifically growers of native and Asian

vegetables. Substitution effects between vegetable categories as demand for Asian and native vegetables is stimulated over the long term could also be experienced.

Impacts overseas

Project activities and outputs focused on Australian consumers and therefore have limited relevance overseas.

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 (2016-17) as per the CRRDC Impact Assessment Guidelines (CRRDC, 2018).

Investment criteria

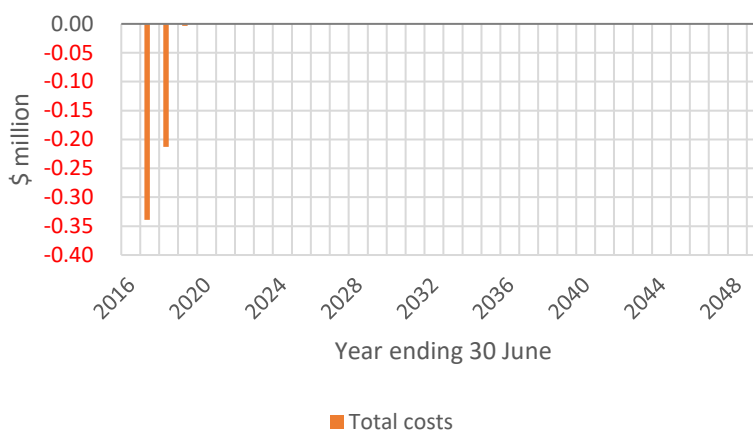
Table 5 shows the impact metrics estimated for different periods of benefit for the total investment. Of the total investment, reported nominal in-kind contributions were \$1,000. Therefore the total investment is considered to not be materially or significantly different from the Hort Innovation investment for the purposes of the summary in Table .

Table 5. Impact metrics for the total investment in project VG15071

| Impact metric | Years after last year of investment | | | | | | |
|---------------|-------------------------------------|-------|-------|-------|-------|-------|-------|
| | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
| PVC (\$m) | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 |
| PVB (\$m) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| NPV (\$m) | -0.70 | -0.70 | -0.70 | -0.70 | -0.70 | -0.70 | -0.70 |
| 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 VG15071. 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

The delivery of project VG15071 provided new consumer insight knowledge for Australian grown native and Asian vegetables to inform grower supply and support demand creation. The project identified variable perception and sensory traits of native and Asian vegetables, and highlighted strategies to enable growers to leverage the favourable attributes to support demand creation. Various grower resources summarising the results of the research were produced to support awareness and engagement with the findings.

The provision of consumer knowledge and material for emerging vegetable lines is valuable to ensure that future market development is aligned with the available market opportunities. As the production of native vegetables are yet to reach commercial levels at retail channels, the capacity of this impact assessment to quantify how consumer insights has influenced grower supply and consumer demand is limited. Consultation with growers of native vegetables highlighted the potential future benefits of the consumer insight delivered through VG15071, but these had not been realised to date due to the immediate focus on expanding commercial production capacity beyond the current low base. In addition to the lack of farm specific impact, there was no evidence to indicate how the recommendations have been used to inform a native vegetable research and development program, strategic collaboration with other agencies, or involvement of indigenous Australians in native vegetable production initiatives. As such impacts from the *Native vegetable scoping study* were not able to be quantified.

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Overall, while VG15071 provided the potential to influence growers decisions regarding production and supply of native and Asian vegetables, an attributable increase in the volume supplied was not evident, limiting the ability to quantify an attributable impact.

Despite the inability to quantify a benefit, there remains a potential for ongoing impacts for vegetable growers as a result of the work completed in VG15071. The forecast growth in the farm gate value of native vegetables of 96% from 2019-20 to 2025 (Laurie 2020) demonstrates the importance of robust consumer insights to guide market development such as that delivered through VG15071. The use of the vegetable action plans to inform future RD&E investments also provides a potential future impact through underpinning effective RD&E outcomes. In the long term, social impacts may also be realised through having a greater selection of Australian native and Asian vegetable varieties aligning with consumer preferences, increasing consumer appeal and thereby supporting increased vegetable consumption with associated health and wellbeing outcomes. An increased contribution to regional community wellbeing from more profitable vegetable growers, including through involvement with indigenous Australians could also be supported through this investment.

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Glossary of economic terms

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| 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.