

Impact assessments

During 2019/20, Hort Innovation engaged independent consultants to evaluate the impact of our R&D investments in the previous financial year, providing insights into the type and magnitude of impacts generated across the company's strategic levy programs.

The evaluation revealed a range of economic, social and environmental benefits being generated for horticulture growers, supply chain participants, and the community at large.

The undertaking of this work marked the second year of an annual process for the company which began in 2018/19.

How assessments were made

Because Hort Innovation invests in R&D across a host of industry-specific levy programs, projects that were completed in 2018/19 across all industry funds were available to be randomly sampled for the impact assessment. This ensured a representative list of projects was used as the basis for the evaluation.

Here's what happened

1. A pool of projects was identified, with the criteria of being completed in the 2018/19 financial year and with a Hort Innovation managed value investment of at least \$80,000 – met by a total of 85 projects with a Hort Innovation investment value of \$44.6 million.
2. From this pool, a random sample of 15 projects was selected. Together, these 15 projects had a nominal Hort Innovation managed fund value of \$7.1 million (15.9 per cent of the overall investment value).
3. Each of the 15 projects was evaluated using a framework approach, looking at project objectives, activities, outputs and impacts. Some of the impacts identified were also valued in monetary terms.

The approach for evaluating the impacts was performed in line with impact assessment guidelines defined by the Council of Rural RDCs. The impact assessment consultants engaged with researchers, Hort Innovation staff and industry stakeholders to support the evaluations.

The results

Through the assessments, 64 impacts were subjectively identified as having been generated directly by the 15 randomly selected projects. The impacts themselves were grouped into 13 broad categories, as seen in the table below. Specific benefits ranged from yield and quality improvements for citrus to enhanced food safety in vegetables.

ECONOMIC IMPACTS	SOCIAL IMPACTS	ENVIRONMENTAL IMPACTS
<p>Increased productivity and/or profitability for Australian horticulture crops</p> <p>Example relating to the investment <i>Regional capacity building to grow vegetable businesses - Bowen Gumlu and FNQ</i> (VG15004): Increased vegetable production in each of the three regions with associated increased productivity and profitability, and potentially, further increases in vegetable exports through strong support from the existing Industry Development Officer and other networks/initiatives.</p>	<p>Increased knowledge and scientific/research capacity</p> <p>Example relating to the investment <i>Managing almond production in a variable and changing climate</i> (AL14006): Increased almond grower capacity in managing risks associated with weather and climate, as well as increased researcher skills in the relationship between climate and tree physiology.</p>	<p>Reduced chemical export off-farm</p> <p>Example relating to the investment <i>Development of national strategies to manage citrus gall wasp</i> (CT15006): More judicious use of chemicals by some citrus growers in managing citrus gall wasp.</p>
<p>Increased supply of and/or demand for Australian horticulture products</p> <p>Example relating to the investment <i>Managing almond production in a variable and changing climate</i> (AL14006):</p> <p>Progress towards the industry goal of increasing average yield from 3 to 4 t/ha as well as increased yield achieved through avoided crop loss as a result of improved weather risk management.</p>	<p>Productivity/profitability benefits having a flow-on effect to support improved regional community wellbeing</p> <p>Example relating to the investment <i>Development of high health status mother plantings for new Australian almond varieties</i> (AL16004):</p> <p>The improved productivity of the almond industry will increase or protect current positive benefit spill-overs to regional areas where almonds are produced and distributed.</p>	<p>Avoided waste</p> <p>Example relating to the investment <i>Australian Citrus Quality standards (Stage 3)</i> (CT15013): Reduced need for waste disposal, resulting in beneficial knock-on effects to the environment.</p>
<p>Maintained and/or improved market access (domestic or international)</p> <p>Example relating to the investment <i>Implementing brown sugar flotation for assuring freedom of fruit from Qfly</i> (CY16011): Maintained or increased market access (currently domestic only) for Australian cherries contributing to the current expansion of the Australian cherry industry.</p>	<p>Improved producer and/or consumer health, wellbeing or utility</p> <p>Example relating to the investment <i>Educational opportunities around the perceptions and aversions to vegetables through digital media</i> (VG16018): Children eating additional vegetables, forming positive lifelong habits, and reducing the cost of endemic diseases.</p>	<p>Enhanced biodiversity</p> <p>Example relating to the investment <i>Evaluation of nursery tree stock balance parameters</i> (NY15001): Potential increase in the value of biodiversity in some local government areas.</p>

<p>Decreased production or supply chain costs</p> <p>Example relating to the investment <i>ProbiSafe - developing biocontrol agents to inhibit pathogen growth</i> (VG16005): Reduced postharvest vegetable treatment costs because of reduced need for pathogen disinfection treatments.</p>	<p>Increased industry or other stakeholder capacity (for example, export capacity)</p> <p>Example relating to the investment <i>Olive oil food service</i> (OL16004): Increased capacity in chefs working in the Australian food services sector, as well as increased knowledge and capacity amongst teachers working in NSW and Victorian TAFE and other culinary schools.</p>	<p>Increased adoption of environment-friendly best management practices</p> <p>Example relating to the investment <i>Benchmarking the macadamia industry 2015-2018</i> (MC15005): Potential contribution to improved environmental outcomes through increased adoption of best management practices (for example, integrated pest and disease management and improved chemical use).</p>
<p>Increased efficiency of resource allocation, particularly for horticulture R&D expenditure</p> <p>Example relating to the investment <i>Growing Leaders</i> (VG15030): Better industry decisions – more integrated, efficient, and profitable supply chains, better allocation of public R&D, and capacity to shape favourable public policy outcomes.</p>		

What about monetary impact and value?

Where suitable data was available, the impacts were also valued to provide a quantitative assessment of the project via a cost-benefit analysis in monetary terms.

The cost-benefit analysis was projected over a 30-year timeframe following the project’s conclusion, recognising that benefits from an investment may continue to be realised following its immediate conclusion. Costs and benefits were discounted to a present value (in 2019/20 terms) using a five per cent discount rate to reflect the time value of money.

The results demonstrated that across the 14 sampled projects*, an average benefit-cost ratio of 3.4 to 1 was achieved, generating a total net present value of \$40.5 million over 30 years. The Hort Innovation-only (levy fund) investment component of this generated a net present value of \$17.4 and a weighted average benefit-cost ratio of 3.4 to 1. Although some impacts were valued, other benefits weren’t quantifiable (such as the benefit of positive impacts on regional communities from enhanced grower incomes, or broader supply chain efficiencies). As such, these results give a conservative estimate of the true benefits that would be realised for growers, supply chain participants and the broader public.

* For the second series of Hort Innovation’s annual impact assessments, 14 of the 15 projects had impacts that were valued in monetary terms. Impacts were not valued for project VG16005 and detailed reasoning behind the decision not to value the impacts identified can be found in the individual project evaluation report available from Hort Innovation.

Glossary of economic terms

The following economic terms have been used in the following table, illustrating the benefit-cost analysis by project sampled:

- **Present value of benefits:** The discounted value of benefits to 2019/20 terms.
- **Present value of costs:** The discounted value of investment costs to 2019/20 terms.
- **Net present value:** The discounted value of the benefits of an investment, less the discounted value of the costs – that is, present value of benefits minus present value of costs.
- **Benefit-cost ratio:** The ratio of the present value of investment benefits to the present value of investment costs.

Results by project sampled

PROJECT CODE	PROJECT NAME	R&D PORTFOLIO	PRESENT VALUE OF BENEFITS (\$M)	PRESENT VALUE OF COSTS (\$M)	NET PRESENT VALUE (\$M)	BENEFIT-COST RATIO
AL14006	Managing almond production in a variable and changing climate	Natural resources	5.28	1.35	3.94	3.93
AL16004	Development of high health status mother plantings for new Australian almond varieties	Breeding	0.21	0.12	0.09	1.69
CT15006	Development of national strategies to manage citrus gall wasp	Integrated pest and disease management	2.47	0.93	1.54	2.65
CT15013	Australian Citrus Quality standards (Stage 3)	Postharvest	2.66	0.83	1.83	3.20
CY16011	Implementing brown sugar flotation for assuring freedom of fruit from Qfly	Biosecurity and market access	0.41	0.14	0.27	2.97
MC15005	Benchmarking the macadamia industry 2015-2018	Industry analysis	1.27	0.19	1.08	6.84
NY15001	Evaluation of nursery tree stock balance parameters	Product integrity	12.48	2.11	10.36	5.90

OL16004	Olive oil food service	Human nutrition	0.49	0.21	0.28	2.35
VG15004	Regional capacity building to grow vegetable businesses - Bowen Gumlu and FNQ	Technology transfer and adoption	1.90	0.99	0.92	1.93
VG15013	Improved management options for cucumber green mottle mosaic virus	Plant health: pathology / virology / nematodes	7.36	1.78	5.58	4.13
VG15030	Growing Leaders	Training and leadership	2.09	0.71	1.38	2.93
VG16005	ProbiSafe - developing biocontrol agents to inhibit pathogen growth	Product integrity	NR	1.09	NR	NR
VG16018	Educational opportunities around the perceptions and aversions to vegetables through digital media	Industry market research	3.34	1.01	2.33	3.30
VG16035	Training growers to enhance their consumer engagement	Industry development	0.20	0.17	0.03	1.19
VG16084	Vegetable market price reporting pilot program	Industry analysis	0.34	0.16	0.19	2.19