Delivery partner resource

Horticulture Impact Assessment Program

AV20004 Impact Assessment

June 2026

Hort Innovation

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Telephone: (02) 8295 2300

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AV20004 Avocado Market Access and Trade Development

Executive Summary

Australia's avocado industry has been rapidly increasing production, with production value increasing 38% from $426.7 million in 2018-19 to $589.0 million in 2023-24.[1] Over this period, exports have accounted for an increasingly large proportion of production value, with exports growing 388% from $19.7 million to $96.1 million, with export markets providing a profitable outlet for domestic oversupply, offering a higher price per kilogram than domestic sales.[2]

AV20004 – Avocado Market Access and Trade Development program AV20004 was designed to expand Australian avocado exports by supporting access to new protocol markets, strengthening demand for Australian avocados in existing international markets and building the capacity of industry to support increased production to meet rising demand. A key component of the project was preparing the Australian avocado industry and its supply chain to access these new markets and to adhere with the phytosanitary requirements in export markets. AV20004 aided growers through the provision of export education, the development of systems, and other trade related activities thereby ensuring the readiness of the industry to meet growing demand for exports.

This investment has a total nominal cost of $2,090,901, all of which was funded by Hort Innovation. This impact assessment identified a clear pathway to impact for the research undertaken. Two of the benefits identified were quantified to demonstrate the impacts of Hort Innovation's investment, these included:

— Increased demand for Australian Avocados. The project supported growth in Australian avocado exports through the provision of new export markets for select exporters. Further the project supported increased demand for Australian avocados within existing markets aiding growth in exports.

— Faster access to, and penetration within, protocol markets. The project prepared growers and exporters to rapidly meet the increase in demand induced through new protocol market access and large increases in demand from existing markets.

There were additional benefits identified through the research that were not quantified due to data limitations and high rates of uncertainty around attributable impact. These benefits include:

— Supports the maintenance of the price premium associated with Australian avocados. The project equipped growers and exporters with the knowledge and tools to meet phytosanitary requirements in export markets, helping to preserve the reputation of Australian avocados and sustain the price premium linked to their quality.

— Avoided instances of over-supply in domestic markets. By securing new export markets and expanding existing markets, the project enabled growers to redirect excess supply into high-value international channels instead of flooding the domestic market, thereby moderating deflation of domestic prices and reducing the risk of fruit going to waste.

— Reduced waste. By opening and expanding export markets, surplus fruit is diverted from potential loss or

[1] Hort Innovation (n.d.). *Australian Horticulture Statistics Handbook 2024/25*. Accessed at: https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/australian-horticulture-statistics-handbook/

[2] Ibid

landfill into productive use, which cuts methane emissions from decomposition and improves the efficiency of land, water, and energy use per tonne of marketed avocados

— Provided funding for a full-time trade position in Avocados Australia. The project helped establish a full-time Export Development Manager role at Avocados Australia to carry out market-access and export-development work, coordinate government and overseas engagement, and promote export-ready practices across the industry.

The results show that, taking all quantified costs and benefits into account, the investment produced a positive net result. The investment has a net present value (NPV) of $11.83 million and a benefit-cost ratio (BCR) of 6.16 at 5 years after investment completion using a 5% discount rate. This shows that the investment delivers a net positive return to levy payers and the broader community, returning $6.16 for every $1 in investment. This project has been attributed with 57% of the impacts, as the projects investment accounts for 57% of the total investment to date and the research to date accounting for 100% of the research required to realise the benefits identified.

Context, objective, and details of investment

Australia's avocado production has increased significantly, resulting in increased domestic market pressure and concerns of oversupply.[3] The avocado industry has demonstrated resilience and continued to grow despite challenges including the COVID-19 pandemic, labour shortages, rising production costs and rapid production growth.[4] Exports account for an increasingly large share of production value, between 2018-19 and 2023-24 exports as production grew from 5% to 16%. Over this period the value of avocado production increased by 38% from $426.7 million to $589.0 million, while export value grew 388% from $19.7 million to $96.1 million.[5] Over this period the price per kilogram for avocado exports has continually exceeded the corresponding price in domestic markets, ensuring exports remain a commercially viable and appealing option for avocado growers, and the industry in general.[6]

AV20004, led by Avocados Australia (AAL), ran from 2021 to 2024 with the aim of improving the Australia avocado export industry. Having strong export trade for avocados is key to the growth of the industry and its sustainability in the long run, however there are challenges in navigating complex export regulations and gaining access to international markets.[7] The project aimed to expand existing export markets and gain access to new export markets[8] with the following objectives:

— design and guide the Australian avocado industry's ongoing market access and trade development agenda and develop tools and training to capitalise on the opportunities being created

— grow exports through creating an informed industry with capacity to participate effectively in export supply chains

[3] Hort Innovation (2024). *Final report: AV20004 Avocado Market Access and Trade Development*. Accessed at: https://www.horticulture.com.au/contentassets/1e52dad1d4f141d38ce939e776b282dd/av20004---final-report.pdf

[4] Ibid.

[5] Hort Innovation (n.d.). *Australian Horticulture Statistics Handbook 2024/25*. Accessed at: https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/australian-horticulture-statistics-handbook/

[6] Ibid.

[7] Hort Innovation (2024). *Final report: AV20004 Avocado Market Access and Trade Development*. Accessed at: https://www.horticulture.com.au/contentassets/1e52dad1d4f141d38ce939e776b282dd/av20004---final-report.pdf

[8] Ibid.

— grow exports through improving supply chain connectivity and market access opportunities

— engage with all relevant stakeholders both domestically and internationally to facilitate export market access and market development for the Australian avocado industry

— develop and maintain information to guide export decision making and to build export knowledge within the Australian avocado industry, through linkages with related projects

— provide export industry development services for the Australian avocado industry and deliver extension services to develop an export culture and increased knowledge of export, including knowledge of all aspects of the supply chain and activities needed to grow export capability and success.[9]

AV20004 was funded by Hort Innovation using the avocado research and development levy and Australian Government contributions.[10] The overall budget for the project was $1.74 million. A previous evaluation of the research project (AV23001) completed a cost benefit analysis, covering the 4 years between 2021-22 and 2023-24. This impact assessment generated a benefit-cost ratio of 3.78:1 and resulted in an estimated return of over $10.5 million.[11]

Alignment with Strategic Investment Plan

AV20004 was guided by, and therefore closely aligned with, the Avocado Strategic Investment Plan 2017-21 (SIP).[12] AV20004 sought to directly address Outcome 3 of the SIP, 'By 2021, over 10% of production will be exported to markets where customers have a willingness and capacity to pay a premium for Australian avocados.' Within Outcome 3 the project contributed to the following strategies:

— Strategy 3.1 – Develop trade with existing export markets
— Strategy 3.3 – Gain technical access in high value markets as defined by avocado exporters
— Strategy 3.4 – Coordinate integrated industry response to expand exports into newly accessed, high value markets
— Strategy 3.5 – Value chain collaboration for gathering and sharing market intelligence on existing and new export markets.

Despite the introduction of the new SIP midway through the project, AV2004 still hit each of the target outcomes in the Avocado Strategic Investment Plan 2022-2026.[13] The project strengthened international demand and supported growth through accessing new export markets and increasing export volumes (Outcome 1). This has supported Outcome 2, by indirectly improving supply chain sustainability and industry productivity. Further, the project includes educational activities such as workshops and seminars for growers on export protocols, aiming to improve grower's knowledge and skills (Outcome 3). The project aligns with Outcome 4 as it provides high-quality insights and an economic case study of the avocado industry's export growth journey.

Overall, the project aligns with the outcomes of the Avocado SIP and delivers key improvements in Australia's

[9] Hort Innovation (2024). *Final report: AV20004 Avocado Market Access and Trade Development*. Accessed at: https://www.horticulture.com.au/contentassets/1e52dad1d4f141d38ce939e776b282dd/av20004---final-report.pdf

[10] Ibid.

[11] Ibid.

[12] Hort Innovation (2017). Avocado Strategic Investment Plan 2017–2021. Accessed at: https://www.horticulture.com.au/globalassets/hort-innovation/levy-fund-financial-and-management-documents/sip-pdfs-new/hortinnovation-sip-avocado-2017-2021.pdf

[13] Hort Innovation (2022). Avocado Strategic Investment Plan 2022–2026. Accessed at: https://www.horticulture.com.au/globalassets/hort-innovation/levy-fund-financial-and-management-documents/sip-2022-2026-pdfs/hort-innovation-sip-2022-26-avocado.pdf

domestic avocado industry and its access to key export markets.

Table 1 Project details of AV20004

Project code	AV20004
Title	Avocado Market Access and Trade Development
Research organisation(s)	Avocados Australia
Project leader	John Tyas
Funding period	2021-2024
Objective	To expand the avocado export industry by accessing new markets and building industry capacity to support the rapid increase in avocado production.

Source: Hort Innovation

Related investments

The project was linked with 4 other investments, these are:

- AV23001 – Growing horticulture through protected cropping innovation: project evaluation of AV20004. The objective was to receive an independent evaluation of project AV20004 including recommendations for future trade investments in the avocado industry. This evaluation was key in helping Hort Innovation understand the impact of their export development investment, identifying what worked and what didn't and giving evidence based recommendations for the future.
- AV23003 – Avocado Market Access and Trade Development Project: follows on from AV20004, started in November 2024 and will end in March 2029. This project continues research into building and expanding export market to absorb the growing avocado industry. It aims to strengthen relationships with trade partners and train growers in exporting skills.
- AM17010 – Taste Australia retail program: Taste Australia is used by Hort Innovation to help increase the profile, sales and consumption of premium horticulture products in key exports markets, particularly Asia and the Middle East. Export market development activities are undertaken to build a globally competitive and profitable Australian horticulture industry through sustainable investment in high value and high growth export markets.
- AV17000 – Avocado export readiness and market access: avocado export readiness and market access. This project ran from 2017 to 2020 and aimed to ensure the Australian avocado industry was prepared to export and had capacity to pursue new export markets. It provided the support for government negotiations with intended markets as required.

Governance

The governance structure of AV20004 was designed to ensure strategic alignment, scientific integrity, and effective industry engagement. Hort Innovation provided oversight to ensure the project met its objectives and aligned with industry priorities. The project was funded through the avocado research and development levy, with contributions from the Australian Government. Avocados Australia was the delivery partner, with John Tyas as the project lead. A Project Reference Group (PRG) was established to guide project priorities and ensure the research aligned with the needs of the industry and that it conformed with the Avocado SIP.

Additionally, the project incorporated extensive stakeholder engagement. This included collaboration with avocado growers and government agencies such as the Department of Agriculture, Fisheries and Forestry

(DAFF). These engagement activities supported grower readiness for export protocols, market access requirements and trade development initiatives.

The governance structure enabled the ongoing alignment of research activities with the needs of industry, facilitated comprehensive stakeholder engagement ensuring the collation of diverse perspectives and dissemination of information, and ensured research findings were practical and applicable to improve the avocado export market and domestic supply chain.

Impact pathway

A clear pathway from input to impacts can be identified for the investment.

Table 2 Impact pathway of AV20004

Pathway	Description
Inputs and activities	**Project setup and governance** • Funded by Hort Innovation using industry levies • Export Development Manager (EDM) who managed the day-to-day activities within the project • Project Reference Group (PRG) formed with exporters, a representative from the AAL Board and a representative from Hort Innovation to plan and review project activities • Annual reporting with continuous feedback and review **Prior research projects** • This project followed on from AV17000 which supported export readiness and market access, and AM17010 which aided increased exposure of Australian avocados to export markets **Survey and baseline data collection** • Data analysis delivered by Avocados Australia to support export development • Avocados Australia commissioned a mobile phone application to report on Maximum Residue Limits (MRLs) for key export markets • Australian Wine Research Institute (AWRI) used to monitor and update the withholding periods for Active Ingredients **Stakeholder engagement** • Regular engagement with DAFF to discuss market access issues • Formal Market Access Advisory Group (MAAG) meetings • EDM represented the avocado industry on the Horticulture Export Industry Consultative Committee (HEICC), attending 4 meetings between 2022 and 2024 • Engagement with Austrade and state-level trade agencies such as the Department of Primary Industries and Regional Development and Trade and Investment Queensland • Stakeholder roundtable to inform the Avocado Market Access R&D Plan **Research team, collaboration and capacity building** • Avocados Australia provided 1-on-1 post-webinar support to help growers and packers complete their online registrations and prepare for their audit
Outputs	**Project planning, governance and reporting** • Annual market access and trade development work plan which involved six-monthly reviews of the annual work plan, including stakeholder engagement plan, and the risk management plan and program logic **Extension, communication, and industry engagement** • Export forums and interaction with growers on export specific topics • Members of the project team delivered 8 export regional forums with over 230 participants in attendance including commercial stakeholders, including growers and packhouses

Pathway	Description
	• Engagement and representation with avocado growers, and stakeholders to support with protocol adoption and registration • Contribution to each edition of Talking Avocados (printed quarterly) • Export section set up in the industry newsletter Guacamole to provide a focal point for news and information specifically relevant to export stakeholders • Project updates distributed fortnightly through articles in Guacamole and direct emails to export news subscribers • Case study on Australian table grapes industry turned into articles and a promotional video • 87 articles published in the 12 editions of the Talking Avocados magazines • Best Practice Resource (BPR) website made information available • Industry showcase video and Shepard showcase video with interviews of growers, showing farms and growing region landscape and some avocado recipes • Participated in and attended trade shows in Hong Kong and Thailand, Japan, UAE and India **Capacity building and research capability** • Protocol checklist, training video and webinar provided to growers and packers • Provided support to the market access related R&D and provide coordination support for the prioritisation for the R&Ds **Export market engagement** • Participation and coordination of 4 outbound and 3 inbound trade missions • Organisation of the product launch programs upon market access successfully granted • Exporter directory created
Outcomes	**Access to new protocol markets** • The project enabled Australian avocado growers to access new export markets by securing formal protocol approvals, including entry into India and Thailand and expansion within Japan. The project provided the necessary R&D to support protocol market applications. **Sustained access to protocol markets** • Through the project, Avocados Australia have supported the coordination and facilitation of the annual inspection by the trading partner auditors. Granting access to export orchards to assess their ongoing compliance with the phytosanitary requirements of trading partners. **Improved the readiness of growers and exporters to fulfill export demand** • The project ensured that growers and exporters were ready and able to support increased exports to meet growing international demand for Australian avocados. **Enhanced the export capabilities and capacities of the avocado industry** • The project provided practical resources such as export-protocol guidance, training videos, and systematic information on how to meet market access requirements. The provision of these resources supported growers to prepare to supply avocados for overseas markets. **Provided funding for a full-time trade position in Avocados Australia** • The project supported the formalisation of a full-time position at Avocados Australia for an Export Development Manager who implemented the project's market-access and export-development activities, coordinated engagement with government and overseas markets, and built export readiness and industry capacity to meet regulatory and market requirements through targeted workshops, guidance and the promotion of best-practice approaches. This role helped translate project outcomes into on-ground action, strengthened industry-government alignment, and accelerated the industry's ability to capitalise on new and expanded protocol markets. **Improved coordination across the supply chain**

Pathway	Description
	• The project improved the coordination of the avocado supply chain, supporting the alignment of growers, packers, exporters and government around shared export protocols and a common export-strategy pathway. Through clearer registration and compliance processes, along with regular industry-government engagement, the project reduced delays, improved information-sharing, and better synchronised production and shipping with new and expanded market requirements. **Aided the delivery of the Australian Avocado Export Strategy** • The project team provided input to export planning and facilitated the development of the Avocado Export Strategy 2022-2026.
Impacts	**Increased demand for Australian Avocados** • The project supported growth in Australian avocado exports through the provision of new export markets for select exporters. Further, the project supported increased demand for Australian avocados within existing markets aiding growth in exports. **Faster access to, and penetration within, protocol markets** • The project prepared growers and exporters to rapidly meet the increase in demand induced through new protocol market access in Thailand and India. The project acted as a catalyst for the industry's ability to quickly adjust to and meet the increased demand. **Supports the maintenance of the price premium associated with Australian avocados** • The project equipped growers and exporters with the knowledge and tools to meet phytosanitary requirements in export markets, helping to preserve the reputation of Australian avocados and sustain the price premium linked to their quality. **Avoided instances of over-supply in domestic markets** • The project has supported the creation of new, large and reliable export outlets for surplus fruit. By securing new export markets and expanding existing markets, the project enabled growers to redirect excess supply into high-value international channels instead of flooding the domestic market, thereby moderating deflation of domestic prices and reducing the risk of fruit going to waste.

Source: ACIL Allen

Cost and benefits

Costs

Cost of the investment

The investment was solely funded by Hort Innovation, with work conducted by Avocados Australia. Hort Innovation contributed $1,781,188 in cash and $309,718 in overheads. Table 3 below shows the total nominal cash and in-kind contributions.

Table 3 Nominal costs of the investment by contributing partners of AV20004

Organisation	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Hort Innovation – Cash	$159,103	$481,555	$339,829	$958,805	-$158,103	**$1,781,188**
Hort Innovation – Overheads	$25,844	$78,117	$59,944	$174,086	-$28,273	**$309,718**
Total	**$184,947**	**$559,672**	**$399,773**	**$1,132,891**	**-$186,376**	**$2,090,907**

Source: Hort Innovation

The total nominal investment of $2.09 million is adjusted for inflation to represent the real value of investment. Adjustment for inflation is meant to present historical costs in today's dollars, by making periods comparable by converting nominal values to real values (adjusted for changes in purchasing power due to inflation).

Costs of the investment, in nominal terms and real terms, are provided in Table 4 below.

Table 4 Real costs of the investment AV20004

Organisation	Hort Innovation	Partners	Total
Nominal costs	$2,090,907	$0	**$2,090,907**
Real costs ($2025 financial year)	$2,294,608	$0	**$2,294,608**

Source: ACIL Allen, modelled using ABS inflation data

After converting to real terms, the cost of the investment is around $2.29 million.

Benefits

Table 5 below summarises the potential benefits of the investment and categorised them into 3 categories: economic, environmental and social impact. It provides a description of the benefits and how the investment could achieve them. The table also shows the assessment method that was used for each benefit.

Table 5 Summary of potential impacts of AV20004

Type of impact	Assessment	Description
Economic impact	Quantified	**Increased demand for Australian avocados** – the project supported growth in Australian avocado exports through the provision of new export markets for select exporters. Further the project supported increased demand for Australian avocados within existing markets aiding growth in exports. This benefit has been quantified by estimating the growth in avocado exports beyond historical trends in major export markets and establishing assumptions for assigning attribution.
	Quantified	**Faster access to, and penetration within, protocol markets** – the project prepared growers and exporters to rapidly meet the increase in demand induced through new protocol market access in Thailand and India, in addition to the large increase in demand from existing markets. The project acted as a catalyst for the industry's ability to quickly adjust to and meet the phytosanitary requirements associated with these new markets. This benefit has been quantified by valuing exports to newly established protocol markets, and developing assumptions for attribution to industry that reflect the faster access to, and penetration within, protocol markets due to the research.
	Unquantified	**Supports the maintenance of the price premium associated with Australian avocados –** the project equipped growers and exporters with the knowledge and tools to meet phytosanitary requirements in export markets, helping to preserve the reputation of Australian avocados and sustain the price premium linked to their quality. While a link can be drawn, data and evidence are insufficient to support quantification.

Type of impact	Assessment	Description
	Unquantified	**Avoided instances of over-supply in domestic markets** – the project has supported the creation of new, large and reliable export outlets for surplus fruit. By securing new export markets and expanding existing markets, the project enabled growers to redirect excess supply into high-value international channels instead of flooding the domestic market, thereby moderating deflation of domestic prices and reducing the risk of fruit going to waste. This benefit has been left unquantified to avoid double counting, as the avoided oversupply in domestic markets is largely captured by the quantified benefit of increased international demand.
Environmental impact	Unquantified	**Reduced waste** – by opening and expanding export markets, surplus fruit is diverted from potential loss or landfill into productive use, which cuts methane emissions from decomposition and improves the efficiency of land, water, and energy use per tonne of marketed avocados. This benefit has not been quantified to avoid double counting, as the reduction in waste is largely an underlying consequence of the quantified increase in export demand.
Social impact	Unquantified	**Provided funding for a full-time trade position in Avocados Australia** – the project supported the formalisation of a full-time position at Avocados Australia for an Export Development Manager who implemented the project's market-access and export-development activities, coordinated engagement with government and overseas markets, and drove the adoption of export-ready protocols and practices across the industry. This role helped translate project outcomes into on-ground action, strengthened industry-government alignment, and accelerated the industry's ability to capitalise on new and expanded protocol markets. The role has supported several benefits, though its effect cannot be isolated from other project activities. Therefore, to avoid double counting benefits, this impact has not been quantified.

Source: ACIL Allen

Data and assumptions

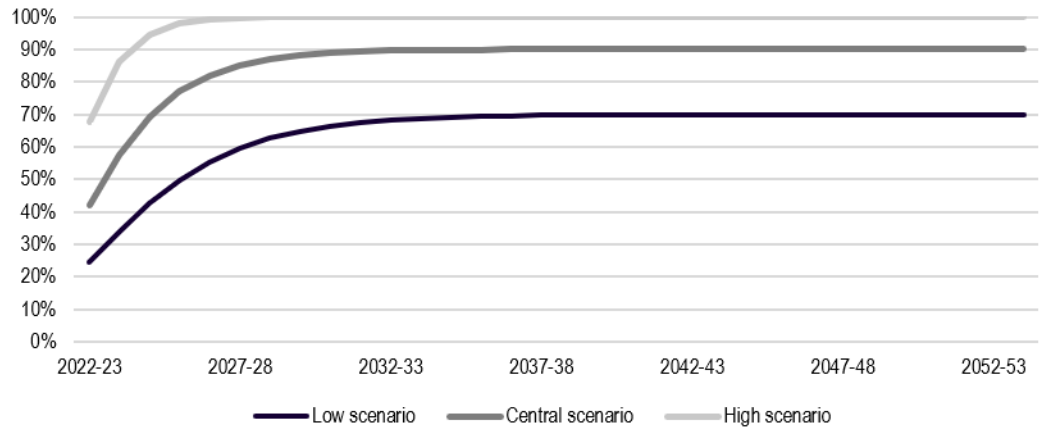
The required data, assumptions and calculations used to estimate the impacts of the investment are presented in Table 6 below. The data were sourced from project data, external sources through literature review, industry data provided by Hort Innovation and other publicly available databases.

Table 6 Data and assumptions used for AV20004

Data/Assumption	Source and rationale
Data	
Value of exports to new protocol markets (value of exports in 2023-24)	$10 million Hort Innovation Statistics Handbook 2024-25 – Trade (Thailand, India, and Japan*) *Note Japan only includes the change in value since the project commenced.

Data/Assumption	Source and rationale
Long term growth in export protocol markets	15% p.a. between 2023-24 and 2029-30 – Following a period of substantial growth where the value avocado exports grew 644% between 2017-18 and 2023-24 (27.9% compounding annual growth rate (CAGR)), avocado export growth has tempered slightly with a CAGR of 18.3% over the last 3 financial years to 2024-25. Since the project commenced, growth in export value has been far from linear with sharp increases in 2021-22 and 2023-24, and a small decline in 2024-25. Based on these observations, a slightly more conservative CAGR of 15% has been applied to future growth in protocol markets over the 5 year investment horizon following the projects completion.
Attribution of access to protocol markets assigned to industry efforts (incl. AV20004)	100% declining to 80% over the life of the project, before a linear reduction to zero over five years following the conclusion of the project. Access to protocol markets requires coordinated effort across industry to negotiate market access and to meet the regulatory and logistical requirements of these new export markets. In this instance, the coordinated efforts of DAFF and Avocados Australia helped establish new markets and supported the avocado industry to embed compliant practices and build grower capability to meet export requirements. In the absence of coordinated industry representation and efforts it is considered highly unlikely that, in the short term, a private enterprise would provide an alternative approach that would have granted access to these protocol markets, particularly at the scale observed. Accordingly, 100% of export value to new protocol markets in the first year is attributed to these coordinated industry efforts. This attribution is expected to decline over time as domestic oversupply increases the likelihood of alternative market access pathways emerging.
CAGR before project	31.3% compounding p.a. This figure is based on the CAGR for the 5 years preceding AV20004. Hort Innovation Statistics Handbook 2024-25
CAGR after project	37.6% compounding p.a. This figure is based on the CAGR for the 4 years of export data available data following the commencement of AV20004. Note the export data used excludes Thailand, India and Japan, this is done to avoid double counting benefits. Hort Innovation Statistics Handbook 2024-25
Difference in CAGR since the project commenced	6.3% compounding p.a. (CAGR before project - CAGR after project) This approach, when applied to exports in the year that the project commenced, provides an estimate of growth in avocado exports beyond the historical trend. This provides a foundation for estimating the additional growth in exports attributable to the coordinated efforts of industry, including AV20004. This approach ensures the value of exports matches actual market observations throughout the forecast period to 2024-25. Given that benefits attributable to the project diminish rapidly over time, an exponential (compounding) rate is deemed suitable for application, particularly because the forecast period is relatively short. This approach reflects the expectation that most of the project's impact will be realised in the early years, with progressively smaller attribution thereafter.
Value of exports in 2020-2021	$22 million Hort Innovation Statistics Handbook 2024-25 – Trade
Attribution of export growth assigned to	50% across the life of the project, before a linear reduction to zero over five years following the conclusion of the project. This reflects project's role as a key enabler of additional growth in exports, while also acknowledging the project was not the sole driver of this growth. The project provided critical information, tools,

Data/Assumption	Source and rationale
industry efforts (incl. AV20004)	and pathways that supported market access, improved industry capability, and supported growth in demand for Australian avocados in existing international markets. However, growers, processors, and other stakeholders must still invest, adapt practices, and make commercial decisions to realise that potential. This attribution recognises the shared contribution of stakeholders, while acknowledging the important role the project and played in growing export opportunities and aiding the uplift in industry capacity to meet rising international demand.
Assumption	
Attribution	Attribution for the project was 57%, this is based on the nominal costs of the investment as a proportion of the total nominal costs of related investments. These investments include projects such as: AV17000 – Avocado export readiness and market access AM17010 - Taste Australia program AV23003 - Avocado Market Access and Trade Development Project (2024-2029) While there are other factors that might have contributed to the realisation of benefits, it is difficult to isolate them in the export context. 57% is therefore used as a proxy as it represents the contribution of this project as a share of table grapes export-focused related investments in the same timeframe.
Counterfactual	Access to protocol markets requires coordinated effort across industry to negotiate market access and to meet the regulatory and logistical requirements of these new export markets. In this instance, the coordinated efforts of DAFF and Avocados Australia helped establish new markets and supported the avocado industry to embed compliant practices and build grower capability to meet export requirements. In the absence of coordinated industry representation and efforts it is considered highly unlikely that, in the short term, a private enterprise would provide an alternative approach that would have granted access to these protocol markets, particularly at the scale observed.
Adoption	Due to protocol access market's requiring 100% compliance with their phytosanitary requirements, adoption of practices among growers and exporters supplying avocados to newly established protocol markets is assumed to be 100%. Adoption of the resources, tools and practices created and/or supported by AV20004 was widespread, as signalled by the industry's ability to support the huge growth in exports observed throughout the project. Additionally, AV20004 actively engaged with industry throughout the project, disseminating information and resources to support adoption of best practice across the supply chain. This included workshops and seminars, the provision of online resources, and articles in various publications. These efforts, in addition to the clear benefits of adoption, ensured adoption across industry occurred quickly.

Data/Assumption	Source and rationale
	Figure 1 Adoption curve  *Source: ACIL Allen*
Confidence level	80% to 2024-25, 50% thereafter. The model has high confidence for benefits realised through to 2024-25 as it builds on existing trade data for that time period, without the need for forecasting. Some uncertainty still exists due to the estimation of attributable growth in exports assigned to the project. Beyond this period the level of confidence falls as it relies on forecasting which introduces additional uncertainty. This uncertainty includes changes in growing conditions that impact supply, increased competition in export markets, changes in exchange rates, changes in consumer tastes and preferences, and protocol durability. Given this uncertainty, the confidence level is reduced for benefits incurred after 2024-25 to 50%.
Calculation	
Growth in protocol markets	*Value of exports to protocol markets x Attribution of value assigned to industry efforts x Proportion of impacts delivered by the investment x Confidence*
Growth in other export markets beyond trend	*[Value of exports in base year x (1+(CAGR after project)^n) – (Value of exports in base year x (1+(CAGR before project)^n)] x Attribution of value assigned to industry efforts x Proportion of impacts delivered by the investment x Confidence*

Source: ACIL Allen

Net impact

A summary of the net impact of the investment is presented in Table 7. The results show that, taking all quantified costs and benefits into account, the investment produced a positive net result. The investment has an NPV of $11,831,935 and a BCR of 6.16. The entirety of this is attributed to Hort Innovation. All benefits are realised within the first 5 years following on from the investment, with future benefits attributed to the follow-on research project AV23003.

Table 7 Net impact results of AV20004

	Years after investment completion	
	0	5
Whole investment		
PV of Costs ($m)	$2.29	$2.29
Benefits ($m)	$6.39	$14.87
PV of Benefits ($m)	$6.54	$14.13
NPV ($m)	$4.25	$11.83
BCR	2.85	6.16
IRR	Negative	Negative
MIRR	Negative	Negative
Attributable to Hort Innovation		
PV of Costs ($m)	$2.29	$2.29
Benefits ($m)	$6.39	$14.87
PV of Benefits ($m)	$6.54	$14.13
NPV ($m)	$4.25	$11.83
BCR	2.85	6.16
IRR	Negative	Negative
MIRR	Negative	Negative

Note: IRR and MIRR are negative because the majority of the benefits occur before the model's base year (2025-2026). As IRR and MIRR are measures of rate of return, it also takes into account future benefits (positive cashflows) and not past benefits, resulting in negative figures.

Source: ACIL Allen

Sensitivity analysis

Sensitivity analysis was conducted to test the robustness of susceptibility of the analysis to key assumptions and parameters. Given the uncertainty of a number of assumptions used in this CBA, sensitivity testing is important to determine the appropriateness of underlying assumptions.

The results of the sensitivity analysis are presented in Table 8 below.

Table 8 Sensitivity analysis results of AV20004

	NPV	BCR	IRR	MIRR
Under standard assumptions (Central case scenario and 5% discount rate)	$11.83	6.16	Negative	Negative
3% Discount rate	$12.11	6.28	Negative	Negative
7% Discount rate	$11.58	6.05	Negative	Negative
Low adoption	$10.46	5.56	Negative	Negative
High adoption	$12.88	6.61	Negative	Negative
Low - protocol market export value	$7.55	4.29	Negative	Negative
High - protocol market export value	$16.62	8.24	Negative	Negative
Low – protocol markets attribution to industry efforts	$6.81	3.97	Negative	Negative
High – protocol markets attribution to industry efforts	$14.00	7.10	Negative	Negative
Low – export growth beyond trend	$9.79	5.26	Negative	Negative
High – export growth beyond trend	$13.88	7.05	Negative	Negative
Low – export growth attribution to industry efforts	$9.79	5.26	Negative	Negative
High – export growth attribution to industry efforts	$13.88	7.05	Negative	Negative
Low – confidence	$7.22	4.15	Negative	Negative
High – confidence	$16.44	8.17	Negative	Negative
Low – project attribution	$8.30	4.62	Negative	Negative
High – project attribution	$15.36	7.70	Negative	Negative

Source: ACIL Allen

Key findings

The following key findings have been identified for this assessment:

The project aligns closely with the Avocado Strategic Investment Plan 2022-26, supporting strengthened international demand for avocados, supply chain sustainability and industry productivity, grower knowledge and skills, and insight generation into the industry and its recent growth.

— the project supported increased demand for Australian avocados within existing markets and aided growth in Australian avocado exports by supporting exporters to access new protocol markets and building the export capability and capacity of the Australian avocado industry

— the project prepared growers and exporters to rapidly meet the phytosanitary requirements of new export markets, and acted as a catalyst for the industry's ability to quickly adjust to and meet the increased demand

— the project has strengthened Australia's trade position by reinforcing both market access and competitive advantage in key export markets.

There are considerable benefits associated with this research that have not been quantified due to data and methodology limitations. Were these additional benefits quantified they would likely enhance the research's BCR. This further highlights the significant positive returns to industry resulting from the investment. The unquantified benefits associated with this research include:

— avoided instances of over-supply in domestic markets by aiding access to, and the development of, new export markets

— a full-time trade position in Avocados Australia aiding the realisation of outcomes

Moving forward, there are opportunities to build upon and adopt observed enablers for this research. These enablers include:

— continuous stakeholder engagement. By incorporating extensive stakeholder activities and travelling to key grower regions, the project's engagement activities supported grower readiness for export protocols, market access requirements and trade development initiatives.

— project governance. The governance structure ensured ongoing alignment of the project activities with the needs of industry.

— collaboration with government. The project, through Avocados Australia, worked in partnership with the Australian government (through DAFF) to establish market access in new protocol markets, providing a link between government and industry.

— establishment of a full time Export Development Manager. The project establishes a full time and ongoing role within Avocados Australia. This role helped to translate project outcomes into action, strengthened industry government alignment, and accelerated the industry's ability to capitalise on new and expanded protocol markets. The role embeds ongoing export capability in Avocados Australia, and retains the knowledge gained through the project.

Consultations

— John Tyas, Avocados Australia

— Flora Zhang, Avocados Australia

— Mimi Doan, Hort Innovation Australia

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