

Almond

Strategic Investment Plan

2022-2026



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EXECUTIVE SUMMARY

The overarching strategic intent of this Strategic Investment Plan (SIP) is to embrace innovation to maintain and strengthen profitable growth in export and domestic markets with sustainable and efficient production and processing of consistent quality almonds.

The almond SIP 2022-2026 provides a roadmap to guide Hort Innovation's investment of almond industry levies and Australian Government contributions, ensuring investment decisions are aligned with industry priorities.

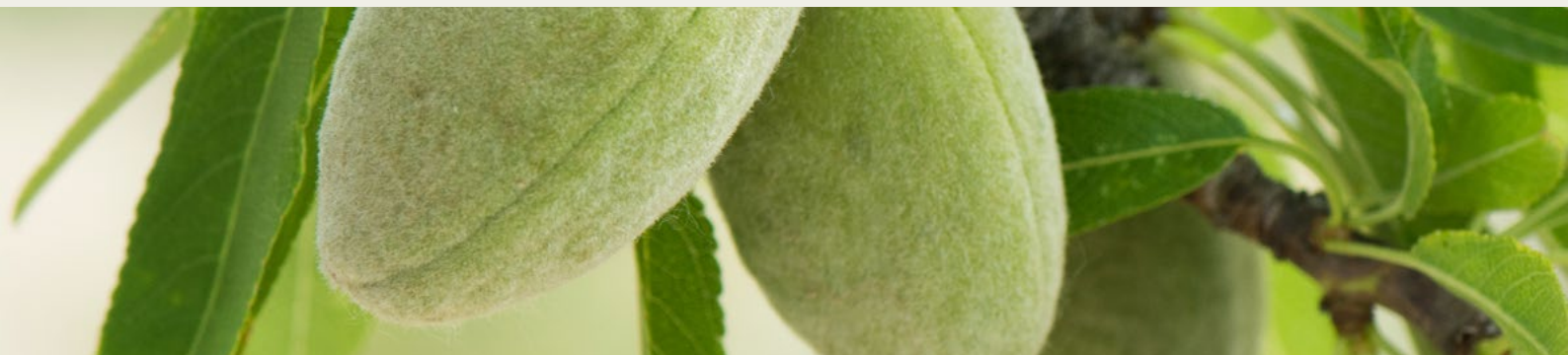
The Australian almond industry situation in 2019/20 is described on **page 4** with further information provided in **Appendix 1**. The industry is expanding rapidly with the total area of almond plantations having increased from 3,555 hectares in 2000 to 58,046 in 2020. There is strong demand for almonds globally with consumption growth worldwide expected to continue due to the increased awareness of the positive health attributes, the use of almonds in new food products, and rapidly growing demand from developing markets. There are five almond producing regions in Australia – Adelaide, Riverland, Riverina, Sunraysia and Western Australia – with the majority grown along the Murray River corridor.

The strategic intent of the almond SIP provides a summary of how the almond industry will drive change over the life of the SIP. The key focus for the SIP will be growth in Australian almond sales to emerging and established markets, as well as improving the current production system including sustainability, intensive production systems, pollination, pest and disease management, new varieties, biosecurity, and water-use efficiency.

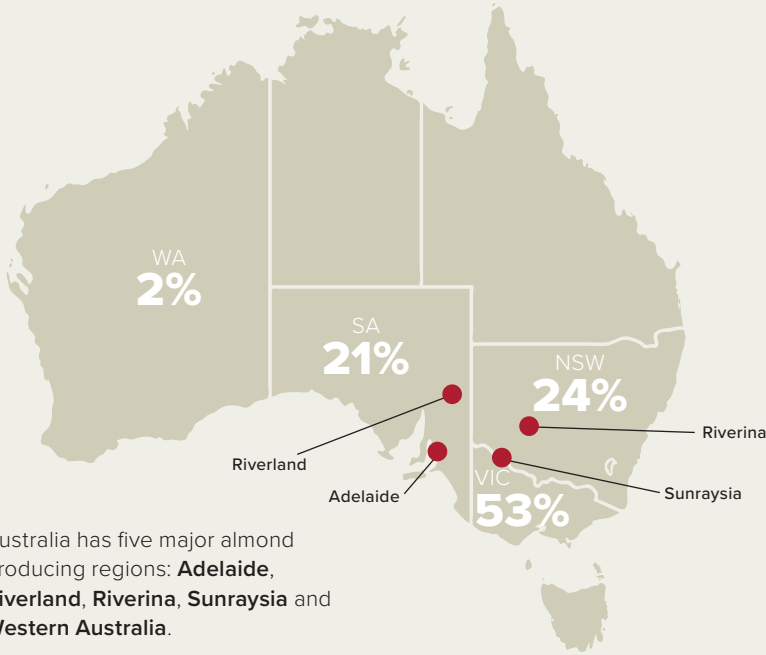
The financial estimates give an indicative overview of the funding availability for the period of FY2022-FY2026. Whilst a major portion of the available research and development (R&D) funds is currently allocated to key projects in the early years of the SIP, available funds for investment will increase over the life of the SIP, both because of current projects concluding, but also the increased levy as a result of forecast increasing production.

The four outcome areas of this SIP cover significant themes under which programs and investments will be focused. These are listed in priority order for the almond industry with an emphasis on sustainable production including intensive orchard systems, new varieties, integrated pest and disease management (IPDM), pollination, and water efficiency and supply. The increasing production volume will also see a key emphasis on export market access and development opportunities. These key project areas will be fundamental drivers of this SIP.

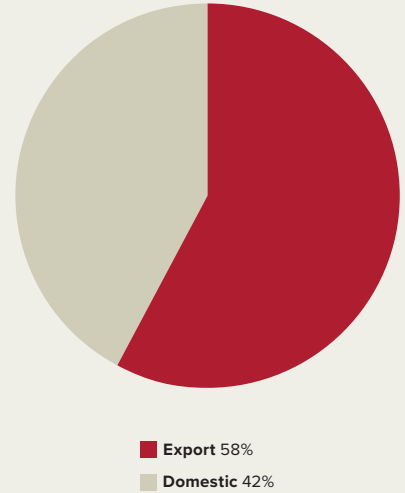
The key performance indicators (KPIs) detail how the impact of each strategy will be measured, for example, the development of an almond sustainability framework, new knowledge on the performance of Horizon 2 and Horizon 3 production systems, availability of self-fertile almond varieties and successful export trade education programs.



PRODUCTION REGIONS:



EXPORT/DOMESTIC:



GROWTH TRENDS:

SINCE 2000...

TOTAL AREA PLANTED

+1500%

CONSUMPTION INCREASE

+9% p.a.

(average)

PRODUCTION WINDOW:



Feb-May

NUMBER OF GROWERS:



180 growers

with a of total orchard area of

53,000 ha

PER CAPITA CONSUMPTION:



1.9 kg

in 2019/20

PRODUCTION VOLUMES:



FORECAST:

120,000
kernel tonnes

in 2021

FARMGATE VALUE OF PRODUCT:



\$954 million

in 2019/20

Total area planted to almonds has increased from **3,555 hectares** in 2000 to **53,014** in 2020.

Consumption increase has averaged **9% per annum** between 2000-2020

THE ALMOND STRATEGIC INVESTMENT PLAN

The almond SIP is the roadmap that will guide Hort Innovation's oversight and management of the almond industry's investment programs. It lays the foundation for decision-making in investments and represents the balanced interest of the whole industry. The important function of the almond SIP is to ensure that the investment decisions align with almond industry priorities to address the gaps in knowledge, technology and resources needed to implement the SIP.

Hort Innovation has led the process for preparing the refresh of the almond SIP, listening and engaging with levy payers and key stakeholders including Industry Representative Bodies (IRBs) and expertise available through advisory mechanisms and delivery partners. The refresh process involved consultation with and input from a wide range of levy payers, objective analysis of performance and learning from the previous SIP, as well as environmental scanning to identify emergent trends and issues that could impact on industry profitability and sustainability.

Hort Innovation has developed this SIP to strategically invest almond R&D levy funds and the collective industry fund (CIF) into the priority areas identified and agreed by the almond industry.

The whole-of-company approach taken by Hort Innovation to produce this SIP has harnessed existing external and internal knowledge, learning, partnerships and relationships. The output is a tailored plan with which the almond industry can be confident of its strategic intent, including visibility on how investment impacts will be identified. Specific investments to address the SIP strategies and align with industry strategic priorities will be outlined in detail via the almond Annual Investment Plan (AIP). The AIP will be published each year over the lifespan of the SIP and detail the investments that will be prioritised based on potential industry impact, as well as the availability of levy funds. Hort Innovation will advise industry stakeholders when the AIP has been published via established communication channels each year. The AIP will be developed with input from the almond Strategic Investment Advisory Panel (SIAP), IRBs and other key stakeholders.

Producers in the almond industry pay levies to the Department of Agriculture, Water and the Environment, which is responsible for the collection, administration and disbursement of levies and charges on behalf of Australian agricultural industries.

Agricultural levies and charges are imposed on primary producers by government at the request of industry to collectively fund R&D, biosecurity and residue testing programs.

Levy is payable on almonds that are produced in Australia and either sold by the producer or used by the producer in

the production of other goods. The R&D levy is set at a rate of 1 cent per kilogram for almonds in shell, 2 cents per kilogram for shelled almonds and 1.5 cents per kilogram for almonds in shell (Nonpareil).

Hort Innovation manages the almond R&D levy funds which are directed to project investments and Hort Innovation's corporate costs. In 2019/20, the total almond R&D levy receipts were approximately \$2 million and are forecast to increase to \$3.5 million by 2025/26.

The almond industry also has a voluntary fund for marketing administered by the Almond Board of Australia, which is dealt with in the almond industry strategic plan and is not covered in this SIP.

In addition to levy funds for R&D, the almond industry has established a CIF, being an additional voluntary grower contribution to fund development of future production systems best suited to Australian growing conditions and market development projects. External to Hort Innovation, contributions to this project have been made by the South Australian and Victorian Governments with contributions by the Australian Government through the 'Rural Research for Profit' project *Advanced Production Systems for Temperate Nut Industries* (due to finish in 2022).

Hort Innovation manages the almond levy funds proportion directed to R&D as above, and separately Plant Health Australia (PHA) manages plant health programs (0.1 cent per kilogram).

This SIP represents the Australian almond industry's collective view of its R&D needs over the next five years (2022-2026). Learning, achievements and analysis of the previous SIP, consultation with Australian almond levy payers, and synthesis of various strategic documents have been incorporated into the development of this SIP. **Appendix 5** acknowledges the people who were consulted in the preparation and validation of this SIP. Statistics and data within this publication are sourced from the Australian Horticulture Statistic Handbook 2019/20 and other documents unless stated otherwise and are listed in **Appendix 6**. A list of acronyms used within the document is available in **Appendix 7**.

Financial estimates

The annual revenue from the almond R&D levy, the almond CIF, and Australian Government contributions for eligible R&D set the overall budget parameters for the SIP. Importantly, a portion of these funds is already committed, as the industry has current multi-year projects for R&D activities. In addition, the levy income from year to year will vary due to changes in seasonal and market conditions.

The indicative financial estimates used for the purposes of developing this SIP are presented in **Table 1** below. These figures are regularly reviewed to reflect the latest information and statistics for the industry and any changes in investment priority. For further details refer to the almond AIP.

TABLE 1. Indicative financial estimates for the almond SIP over the life of the SIP

	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$
R&D					
Balance end FY2021	378,939				
Estimated levy funds (growers)	2,385,000	2,645,000	2,683,500	2,683,500	2,683,500
Australian Government contribution	2,108,343	2,528,969	2,794,322	2,838,934	2,389,050
Current investments	2,789,000	2,565,000	1,823,000	1,400,000	123,500
New investments	850,000	1,800,000	3,000,000	3,500,000	4,000,000
Total project investments	3,639,000	4,365,000	4,823,000	4,900,000	4,123,500
CCR	577,686	692,937	765,644	777,868	654,600
Projected end balance	611,000	681,000	480,000	300,000	560,000
CIF					
Balance end FY2021	67,293				
Estimated levy funds (growers)	1,400,000	1,300,000	1,300,000	1,300,000	1,300,000
Australian Government contribution	1,100,811	637,312	1,390,498	1,390,498	1,390,498
Current investments	1,900,000	100,000	800,000	800,000	800,000
New investments	–	1,000,000	1,600,000	1,600,000	1,600,000
Total project investments	1,900,000	1,100,000	2,400,000	2,400,000	2,400,000
CCR	301,622	174,623	380,997	380,997	380,997
Projected end balance	337,000	430,000	355,000	280,000	205,000

Disclaimer: All figures are indicative only and may change depending on actual income and expenditure.

Balance end FY2021 – The closing balance of the fund as at 30 June 2021

Estimated levy funds – Net levy income/revenue that is generated and collected by levy revenue services (LRS)

CIF – Collective industry fund: voluntary grower levy

Australian Government contribution – Amount of contribution from the Australian Government on R&D levy-funded expenditure

Current investments – Current estimated value of contracted projects

New investments – The estimated dollar value that is available for potential new investments for industry subject to industry advice

CCR – Corporate cost recovery: the cost to implement and manage R&D and marketing investment programs for each industry

Projected end balance – Forecast of the anticipated final position of the fund



ALMOND INDUSTRY OUTCOMES

The overarching strategic intent of this SIP is to embrace innovation to maintain and strengthen profitable growth in export and domestic markets with sustainable and efficient production and processing of consistent quality almonds.

Industry outcomes

Outcome statements as identified and prioritised by the almond industry have been prepared under four key outcome areas: industry supply, productivity and sustainability; demand creation; extension and capability; and business insights.

OUTCOME 1: Industry supply, productivity and sustainability

Support sustainable orchard systems through an integrated approach focused on plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.

Productivity will be driven through reducing costs and inputs and increasing outputs and value. Supply and productivity will be supported through improvements to production efficiencies that will drive profitability outcomes while ensuring long-term sustainability outcomes.

The strategic intent of this outcome is to accelerate the application of production practices that optimise returns and reduce risk to growers. Achieving the outcome will involve:

- Reducing the impact of pests and diseases on yields and the quality of almonds through enhanced IPDM and sustainable chemical use
- Enhancing crop pollination and resilience through improved pollination security by supporting the honey bee industry to meet industry demand for high-health hives for pollination
- Lifting average industry yield from 3 tonnes to 4 tonnes per hectare, through almond industry crop production systems that support further efficiencies in conventional (Horizon 1) orchards and the development of denser planted (Horizon 2 and 3) orchards (refer **Appendix 4**)
- Utilising new almond varieties that feature market-acceptable, high yielding, self-fertility and fully sealed shells, use of proven 'shake and catch' harvesting and postharvest systems, and development of sustainable practices to achieve 4 megalitres of irrigation water per tonne of almond kernel yield
- Understanding impacts of climate change, and improving soil health and resilience to a variable climate with clear pathways towards carbon neutrality
- Industry preparedness for biosecurity threats for the almond and honey bee industry
- Proactively monitoring potential crop protection regulatory threats and having access to a broader suite of effective, socially acceptable and environmentally sound crop protection solutions.



OUTCOME 2: Demand creation

Contribute to improving consumer knowledge, attitudes and purchase intent to drive volume growth.

Demand creation will support the industry to develop existing and future domestic and international markets. This will contribute to improved consumer knowledge and attitudes, in addition to encouraging purchase intent to drive category volume growth.

The strategic intent of this outcome is to maintain and strengthen consumer demand, as the foundation for sustainable expansion of production and consumption in domestic and international markets. It means the industry is investing to:

- Broaden consumer awareness so that almonds are more top of mind and purchased more frequently
- Support product positioning with consistent quality, evidence of beneficial product health attributes and responsible industry production practices
- Develop strong relationships across the supply chain with a shared goal to grow the category
- Raise awareness of opportunities and pathways for businesses to be involved in meeting demand in new domestic markets.

OUTCOME 3: Extension and capability

Building capability and innovative culture.

Building capability and an innovative culture will support industry cohesion and increase knowledge, attitudes, skills and aspirations (KASA) to use the relevant investment outputs across the supply and demand initiatives to better manage risk and create positive change.

The strategic intent of this outcome is to manage knowledge, relationships, systems and processes required to communicate effectively with internal and external stakeholders. Achieving the outcome will involve:

- Maintaining and improving industry cohesiveness, with most businesses and most of the industry actively engaged in implementation of this strategy
- Proactive strategic and evidence-based decision-making in businesses and for industry on investment priorities and risk management
- Growers, supply chain, media and governments being well informed on industry initiatives and achievements as a vital part of regional communities and networks
- A change in KASA leading to increased adoption of R&D findings, proven management practices, and technologies that will help growers to enhance productivity and reduce production costs associated with irrigation, pollination, energy, nutrients, labour, and control of pests, weeds and diseases
- Enhancing the transition of agricultural science graduates to positions in the almond industry.

OUTCOME 4: Business insights

Measure industry supply (production) and demand (consumer behaviour) data and insights to inform decision-making.

Business insights will support the industry to remain aware of market and industry trends to drive informed decision-making.

The strategic intent of this outcome is to deliver data and insights which is foundational to achieving success in the other three outcome areas of demand creation; supply, productivity and sustainability; and extension and capability.

Achieving the outcome will involve reliable baseline data and analysis to provide insights and understand current and emerging trends. Key investments will support the provision of consumer knowledge and tracking, trade data, independent reviews, production statistics and forecasting to enable better decision-making process at industry level and with individual businesses.

These investments underpin and are complementary to delivery of the other outcome areas.

ALMOND INDUSTRY STRATEGIES

Strategies to address industry investment priorities

The strategies and identified impacts for each of the key outcome areas are described in the tables below. The highest priority investments lay the foundation for the SIP, and its implementation will require a balanced approach to ensure the industry has a high likelihood of success over the short term (0-3 years), medium term (3-5 years) and long term (5-10 years).

The ability to deliver on these strategies (and subsequent investments) will be determined by the ability of the statutory levy to provide the resources to do so. Further resources and efficiencies may potentially become available through alternative funding sources by way of Hort Frontiers strategic partnership initiative, external grants and/or cross-industry initiatives.

OUTCOME 1: Industry supply, productivity and sustainability

The Australian almond industry has increased profitability, efficiency and sustainability through innovative R&D focusing on an integrated approach to plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Develop and evaluate superior scion varieties and rootstock varieties suitable to current and future climates and production systems (Horizon 2 and Horizon 3), and evaluate superior rootstock varieties and maintain high-health mother trees for varieties	<ul style="list-style-type: none"> • Access to new varieties that are adapted for current and future Australian growing conditions based on identified industry needs incorporated into breeding program evaluation criteria • Improved understanding of water and nutrient requirements for different genotypes (variety/rootstock), soil types, planting densities and production systems (e.g., redevelopment, whole orchard recycling) • Increased grower confidence in estimating return on investment, and improved orchard productivity and resource-use efficiencies with superior genetics • Improved on-farm biosecurity and orchard productivity with high-health and high quality budwood material
2. Support further efficiencies in Horizon 1 orchards and intensification of Horizon 2 and Horizon 3 orchards to better understand the integration of soil health, nutrition, tree architecture, plant physiology and orchard design	<ul style="list-style-type: none"> • Improved understanding of the feasibility of intensification • Improved crop production productivity and resource use efficiencies • Reduction in labour costs • Improvements in nut quality to meet consumer needs
3. Identify options to improve water efficiency and supply, and promote healthy soils through covered cropping/mixed cropping, inter-row plantings, organic amendments, and waste stream management	<ul style="list-style-type: none"> • Reduction in farm/production wastes • Optimal water and nutrient use efficiency • Increased soil health and tree resilience against current and future climates

Continued >>

OUTCOME 1: Industry supply, productivity and sustainability

The Australian almond industry has increased profitability, efficiency and sustainability through innovative R&D focusing on an integrated approach to plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.

<p>4. Support pollination security through robust honey bee health, pest and disease mitigation, and investigating alternative mechanical and crop solutions</p>	<ul style="list-style-type: none"> • Maintained access to high-health honey bees for pollination • Understanding of best practice to maintain hive health in almond orchards • Increased honey bee pollination efficiency • New innovations developed to support and supplement honey bee pollination • Access and availability of self-fertile varieties • Reduction of honey bee hives per hectare required for effective pollination
<p>5. Continue to develop, enhance and implement almond industry IPDM options and strategies concentrating on practices that have the most impact on productivity and almond quality</p>	<ul style="list-style-type: none"> • Improved productivity through the reduction in pest, disease and weed impacts on crop production. (e.g., Carpophilus beetle, carob moth, hull rot and trunk disease) • Implementation of effective IPDM programs support a sustainable almond industry crop production system • Improved access to new chemistry and optimal efficacy of existing chemistry
<p>6. Utilise relevant emerging technologies to improve production efficiency, harvest and postharvest systems and support the move from a ground-based recovery operation to integrated 'shake and catch', and product dehydration and storage</p>	<ul style="list-style-type: none"> • Reduction in farm/production wastes • Reduction in labour costs • Understanding and managing orchard variability
<p>7. Improve resilience to biosecurity threats by enhancing rapid diagnostic and surveillance capacity and capability for high priority pests and diseases</p>	<ul style="list-style-type: none"> • On-farm impacts from exotic pest and disease outbreaks are minimised through effective rapid response diagnostic and surveillance capability and relevant response strategies • Growers are aware of endemic and exotic threats and actively prevent biosecurity threats entering farms
<p>8. Enhance the understanding of the impacts of climate change on almond production systems, including defining the almond industry greenhouse gas emissions footprint, and evaluating industry options for offsetting greenhouse gas impacts</p>	<ul style="list-style-type: none"> • Understanding of industry greenhouse gas emissions • Improved understanding of the feasibility of greenhouse gas mitigation options
<p>9. Prioritise the major crop protection gaps through a Strategic Agrichemical Review Process (SARP)*</p>	<ul style="list-style-type: none"> • Available registered or permitted pesticides are evaluated for overall suitability against major disease, insect pests and weed threats. The SARP aims to identify potential future solutions where tools are unavailable or unsuitable
<p>10. Provide regulatory support and co-ordination for crop protection regulatory activities with the potential to impact plant protection product access, both in Australia and internationally*</p>	<ul style="list-style-type: none"> • Regulatory Risk Assessments have informed proactive strategic priority setting to avoid pest management gaps in the event access or use is negatively impacted
<p>11. Generate residue, efficacy and crop safety data to support applications to the Australian Pesticides and Veterinary Medicines Authority (APVMA) that seeks to gain, maintain or broaden access to priority uses for label registrations and/or minor use permits for crop protection needs*</p>	<ul style="list-style-type: none"> • Crop protection solutions meet industry priority needs as identified in the industry SARP or biosecurity plan

OUTCOME 2: Demand creation

Demand creation supports the Australian almond industry to develop existing and future domestic and international markets.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Inform health professionals and foodservice operators about the positive and distinctive health and nutrition attributes of Australian almonds	<ul style="list-style-type: none"> • More informed health professionals and foodservice industry members that can influence consumers on the benefits of almonds
2. Prioritise and manage risks to enhance the industry's reputation as a reliable supplier of superior quality, safe and responsibly-grown produce	<ul style="list-style-type: none"> • Maintained and improved consumer sentiment for Australian almonds with resultant grower sales and profitability
3. Collaborate with government and other industries to improve technical market access for current markets, and access to new, high value markets	<ul style="list-style-type: none"> • Expanded and more diversified market opportunities available to Australian almond industry
4. Facilitate Australian almond exports through market research and sharing insights with firms across Australian almond supply chains	<ul style="list-style-type: none"> • Improved grower sales and profitability
5. Educate and engage targeted trade stakeholders in established and emerging markets globally	<ul style="list-style-type: none"> • Demand growth for Australian almonds as a snack and ingredient

OUTCOME 3: Extension and capability

Improved capability and an innovative culture in the Australian almond industry maximises investments in productivity and demand.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Deliver extension and communication capabilities and business insights to support positive change in the areas of productivity and demand	<ul style="list-style-type: none"> • A change/progression in KASA and practice change for grower/industry profitability and sustainability through use of best practices and innovating
2. Provide opportunities for the required levels of engagement across the almond industry to innovate through trusted relationships	<ul style="list-style-type: none"> • Improved engagement will contribute to a stronger, more resilient industry • Improved networks and cross-industry collaboration will increase efficiencies and use of R&D outputs to build a stronger, more resilient industry
3. Strengthen industry skills and leadership through targeted training, leadership development and a career pathway program for the almond industry	<ul style="list-style-type: none"> • Proactive strategic and evidence-based decision-making in businesses and for industry on investment, priorities and risk management • The industry is respected as a professional career choice with future labour availability



OUTCOME 4: Business insights

The Australian almond industry is more profitable through informed decision-making using consumer knowledge and tracking, trade data, production statistics and forecasting, and independent reviews.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Enable demand-led alignment and product positioning across domestic and overseas supply chains through market research and insights on consumer attitudes towards quality and other attributes*	<ul style="list-style-type: none"> • New and existing domestic and export market opportunities maximised by industry
2. Use trade data to guide ongoing export development opportunities*	<ul style="list-style-type: none"> • Development of effective industry export plan/initiatives
3. Identify priorities and performance with increasing industry productivity and profitability through industry production benchmarking and monitoring	<ul style="list-style-type: none"> • Productivity and profitability improvements through both prioritisation of new R&D, adoption of existing knowledge, and growers identifying areas for improvement through understanding their relative performance against other growers
4. Develop in-season almond production forecasts that support industry strategic market planning strategies in domestic and export markets	<ul style="list-style-type: none"> • Industry and commercial operators can maximise market opportunities for the forecasted crop availability

* Foundational investments provide data and information that underpin the delivery of other SIP outcome areas and will be aligned to this strategy. Foundational investment areas include:

- Consumer behavioural data
- Consumer usage and attitudes, and brand health tracking data
- Impact assessments
- Trade data
- Crop protectant data.





ALMOND SIP MONITORING AND EVALUATION

The almond SIP Monitoring and Evaluation (M&E) Framework development has been informed by Hort Innovation’s Organisational Evaluation Framework.

Progress against the SIP will be reported in Hort Innovation publications and through industry communication channels. The SIP outcomes and strategies are used to inform KPIs that in turn drive the investments and individual projects to deliver on the SIP. Projects responsible for delivering the strategy aligned with each KPI will collect the data.

An M&E and reporting framework is shown below. The framework shows what will be measured to demonstrate progress against the SIP and how metrics will be tracked. Reporting on KPIs will be processed through various formal channels to inform industry and government investors of progress, performance, and impact. Data sources to support M&E will be identified and collected as part of the requirements for each levy investment.

Hort Innovation will facilitate the regular review of the SIP to ensure it remains relevant to industry.

Almond SIP Monitoring and Evaluation Framework

The almond SIP M&E Framework is shown below. It includes KPIs and data collection methods both at a macro/industry (trend) level and at more specific SIP strategic level/s.

OUTCOME	STRATEGIES	KPIs
Industry supply, production and sustainability		
Outcome 1: The Australian almond industry has increased profitability, efficiency and sustainability through innovative R&D focusing on an integrated approach to plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.	1. Develop and evaluate superior scion varieties and rootstock varieties suitable to current and future climates and production systems (Horizon 2 and Horizon 3), and evaluate superior rootstock varieties and maintain high-health mother trees for varieties	<ul style="list-style-type: none"> • Demonstration sites with superior scion and rootstock varieties • Availability of new scion varieties suitable for current and future Australian conditions with superior traits • New knowledge on the performance of superior scion and rootstock varieties under Australian conditions • Almond variety true-to-type, high-health mother trees maintained.
	2. Support further efficiencies in Horizon 1 orchards and intensification of Horizon 2 and Horizon 3 orchards to better understand the integration of soil health, nutrition, tree architecture, plant physiology and orchard design	<ul style="list-style-type: none"> • New knowledge for Horizon 2 and Horizon 3 production systems are available for early adopters • Delivery of variety x rootstock management guidelines to optimise water and nutrient input, ensure long-term productivity, minimise pest and disease and tree failure, and enhance water-use efficiency

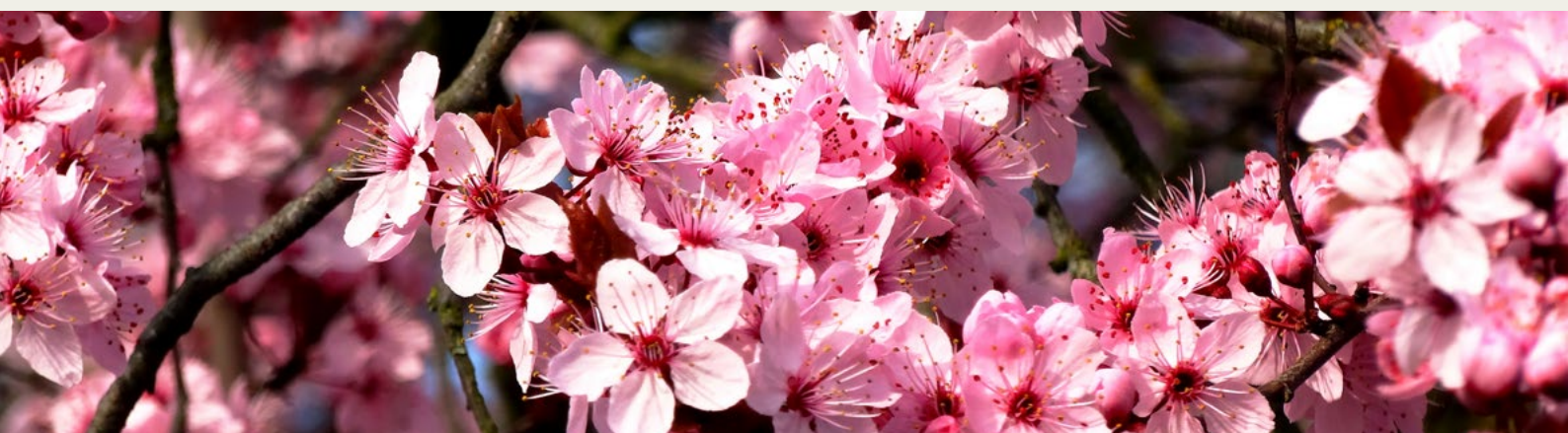
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OUTCOME	STRATEGIES	KPIs
Industry supply, production and sustainability		
<p>Outcome 1: (continued) The Australian almond industry has increased profitability, efficiency and sustainability through innovative R&D focusing on an integrated approach to plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.</p>	<p>3. Identify options to improve water efficiency and supply, and promote healthy soils through covered cropping/mixed cropping, inter-row plantings, organic amendments, and waste stream management</p>	<ul style="list-style-type: none"> Increased water-use efficiency t/ML
	<p>4. Support pollination security through robust honey bee health, pest and disease mitigation, and investigating alternative mechanical and crop solutions</p>	<ul style="list-style-type: none"> Optimal orchard layouts identified that maximise honey bee pollination Contribution to the National Bee Pest Surveillance Program Improved access to high-health hives that are free of endemic and exotic honey bee pests of commercial importance Understanding of the impact of self-fertile almond varieties on honey bee pollination dependence
	<p>5. Continue to develop, enhance and implement almond industry IPDM options and strategies concentrating on practices that have the most impact on productivity and almond quality</p>	<ul style="list-style-type: none"> Developed control methods and strategies for key pests of importance developed Development of new knowledge on key pests and diseases of almonds, particularly trunk pathogens Development of new knowledge on biologicals for pest and disease management Development of resources from the integrated pest management (IPM) and integrated disease management (IDM) programs
	<p>6. Utilise relevant emerging technologies to improve production efficiency, harvest and postharvest systems and support the move from a ground-based recovery operation to integrated 'shake and catch', and product dehydration and storage</p>	<ul style="list-style-type: none"> Availability of next generation harvest and postharvest management technology Feasible mechanisation options for harvest and postharvest systems adopted in commercial orchard systems Improved moisture management for postharvest and during storage No identification of biological or physical contamination of nuts

Continued >>



OUTCOME	STRATEGIES	KPIs
Industry supply, production and sustainability		
<p>Outcome 1: (continued) The Australian almond industry has increased profitability, efficiency and sustainability through innovative R&D focusing on an integrated approach to plant improvement, orchard productivity, soil health, water-use efficiency, pollination, IPDM and emerging technologies.</p>	<p>7. Improve resilience to biosecurity threats by enhancing rapid diagnostic and surveillance capacity and capability for high priority pests and diseases</p>	<ul style="list-style-type: none"> • Development and implementation of up-to-date tree nut industry biosecurity plans, and biosecurity incident standard operating procedure • Development of an Owner Reimbursement Cost framework developed in conjunction with PHA • Adoption of sustainable chemical options (e.g., organic, inorganic, biological, etc.) and Maximum Residue Limits (MRLs) not exceeded for key markets
	<p>8. Enhance the understanding of the impacts of climate change on almond production system, including defining the almond industry greenhouse gas emissions footprint, and evaluating industry options for offsetting greenhouse gas impacts</p>	<ul style="list-style-type: none"> • Development of almond industry greenhouse gas emission footprint • Development of options for managing almond industry greenhouse gas mitigation
	<p>9. Prioritise the major crop protection gaps through a SARP*</p>	<ul style="list-style-type: none"> • Coordinated industry priority setting with a clear outlook of gaps and risks in existing pest control options • Industry priority needs published and shared with stakeholders, including registrants
	<p>10. Provide regulatory support and co-ordination for crop protection regulatory activities with the potential to impact plant protection product access, both in Australia and internationally*</p>	<ul style="list-style-type: none"> • Regulatory Risk Assessments maintained
	<p>11. Generate residue, efficacy and crop safety data to support applications to the APVMA that seeks to gain, maintain or broaden access to priority uses for label registrations and/or minor use permits for crop protection needs*</p>	<ul style="list-style-type: none"> • Data to support applications to the APVMA and the establishment of MRLs



OUTCOME	STRATEGIES	KPIs
Demand creation		
<p>Outcome 2: Demand creation supports the Australian almond industry to develop existing and future domestic and international markets.</p>	<p>1. Inform health professionals and foodservice operators about the positive and distinctive health and nutrition attributes of Australian almonds</p>	<ul style="list-style-type: none"> Health research outcomes that link almond consumption to improved human health communicated to health and foodservice professionals
	<p>2. Prioritise and manage risks to enhance the industry's reputation as a reliable supplier of superior quality, safe and responsibly-grown produce</p>	<ul style="list-style-type: none"> Development of a current almond export plan to guide industry export initiatives
	<p>3. Collaborate with government and other industries to improve technical market access for current markets, and access to new, high value markets</p>	<ul style="list-style-type: none"> Market access solutions for identified priority emerging export market opportunities Development of an almond sustainability framework that highlights industry sustainability practices
	<p>4. Facilitate Australian almond exports through market research and sharing insights with firms across Australian almond supply chains</p>	<ul style="list-style-type: none"> Development of an almond export plan to guide industry export initiatives
	<p>5. Educate and engage targeted trade stakeholders in established and emerging markets globally</p>	<ul style="list-style-type: none"> Sales growth of Australian almonds in targeted markets globally Positive influence on buying attitudes of Importers, traders and distributors Positive influence on the purchase of Australian almonds by targeted food manufacturers and retailers
Extension and capability		
<p>Outcome 3: Improved capability and an innovative culture in the Australian almond industry maximises investments in productivity and demand.</p>	<p>1. Deliver extension and communication capabilities and business insights to support positive change in the areas of productivity and demand</p>	<ul style="list-style-type: none"> Establishment of a baseline and then demonstrate an increased share of industry (ha) with positive change in KASA, practice and impact in targeted high priority areas (e.g., IPDM, biosecurity, soil and water management)
	<p>2. Provide opportunities for the required levels of engagement across the almond industry to innovate through trusted relationships</p>	<ul style="list-style-type: none"> Demonstrated growth in cooperation within industry and across industries leading to business and industry innovations (i.e., survey data)
	<p>3. Strengthen industry skills and leadership through targeted training, leadership development and a career pathway program for the almond industry</p>	<ul style="list-style-type: none"> Increased participation in industry leadership initiatives Increased availability of suitable staff for industry Enhanced transition of agricultural science graduates to positions in the almond industry

OUTCOME	STRATEGIES	KPIs
Business insights		
Outcome 4: The Australian almond industry is more profitable through informed decision-making using consumer knowledge and tracking, trade data, production statistics and forecasting, and independent reviews.	1. Enable demand-led alignment and product-positioning across domestic and overseas supply chains through market research and insights on consumer attitudes towards quality and other attributes*	<ul style="list-style-type: none"> • Development of a consumer insights strategy • Evidence that consumer insights inform strategic market engagement • Availability of new consumer knowledge
	2. Use trade data to guide ongoing export development opportunities*	<ul style="list-style-type: none"> • An interpretation of supply and demand balance considering increasing supply from California, Australia and Spain • Quantitative and qualitative research on emerging almond export markets • Fundamental and up-to-date quantitative and qualitative domestic market research
	3. Identify priorities and performance with increasing industry productivity and profitability through industry production benchmarking and monitoring	<ul style="list-style-type: none"> • Almond industry statistics and data collection – covering 2016-2021 • Almond industry data that records the Australian almond industry's performance with respect to energy use, carbon footprint, carbon sequestration and water-use efficiency using guides developed by the Californian almond industry that will, once collected, assist with the marketing of Australian almonds
	4. Develop in-season almond production forecasts that support industry strategic market planning strategies in domestic and export markets	<ul style="list-style-type: none"> • Australian almond plantings database/world planting trends • Annual international supply and demand data sets

* Foundational investments provide data and information that underpin the delivery of other SIP outcome areas and will be aligned to this strategy. Foundational investment areas include:

- Consumer behavioural data
- Consumer usage and attitudes, and brand health tracking data
- Impact assessments
- Trade data
- Crop protectant data.

Reporting framework

Hort Innovation will use dynamic reporting aligned to the Organisational Evaluation Framework to report regularly on progress and performance. Reporting will be processed through formal channels to inform industry and government investors.

A review of investment performance against the respective industry outcome and/or strategy-level KPIs for the almond SIP will be completed annually as the primary reporting mechanism. The SIP performance report will provide:

- Evidence of progress towards achieving the industry-specific outcomes and strategies through an assessment of the KPIs identified in the SIP
- Evidence of progress towards cross-industry investment strategies and outcomes. It will involve Hort Innovation's whole-of-horticulture reporting obligations and corporate plan and involve annual reports and Hort Innovation's Annual Operating Plan.

SIP performance reports will also inform the Australian Government of progress towards achieving government priorities. In particular, reporting will support Hort Innovation to meet the Performance Principles and requirements contained in the [Deed of Agreement 2020-2030](#).

COLLABORATION AND CROSS-INDUSTRY INVESTMENT

Based on advice from industry throughout the engagement process, Hort Innovation understands that Australian horticulture industries have common issues, and in turn have identified prospective areas for collaboration and cross-industry or regional investment.

These opportunities have been included as strategies across multiple industry SIPs where relevant and required. By delivering targeted multi-industry collaboration in research, development and extension (RD&E), marketing and international trade, Hort Innovation aims to support more effective and efficient outcomes for growers and the wider horticulture sector. This includes driving investment through the Hort Frontiers strategic partnership initiative. Importantly, while this approach acknowledges there is value in solving issues across industries and regions, it does not reduce the importance of industry-specific initiatives.

Cross-industry/regional opportunities identified through portfolio reviews:

- Climate resilient productions systems
- Nutrient content claims for Australian horticultural products
- Impact of pesticides on beneficial arthropods – resources to assist effective IPM
- Longitudinal study on crop varieties and their pollination dependence
- Leadership
- Biosecurity preparedness and response
- Orchard management including pollination, water-use-efficiency and soil health.

Cross-industry areas of collaboration for demand driving outcomes provide the opportunity to advance the prosperity of the sector through gaining efficiencies in the delivery of the program and contributing to stronger overall outcomes. By collaborating as one sector to win the hearts and minds of the consumers, in addition to individual demand driving programs, there is the potential to enhance the total category value proposition, contributing to driving returns for Australian growers.

Areas of consideration for collaboration across the lifespan of the almond SIP 2022-2026 include:

- Communications to bring horticulture to top of mind (saliency) and reposition the benefits they provide to Australian and international consumers.
- Retail partnerships to advance total category and shopper demand-driving programs
- A global brand platform to reinforce the unique selling proposition of Australian-grown horticultural produce and drive preference with international consumers.

Strategic science and research focus

Collaboration across the agriculture research community is essential, including with IRBs and organisations such as the CSIRO, universities, private enterprise and state government agencies. Hort Innovation is a member of the National Horticulture Research Network (NHRN) together with other senior horticultural R&D representatives from state and Australian Government agricultural agencies. The NHRN is responsible for the development and implementation of the broader Horticulture RD&E Strategy under the National Primary Industries RD&E Framework.

During the engagement process, key delivery partners were contacted including lead agencies within the NHRN Framework as well as specific delivery partners for each industry. The lead agency involved with the almond industry investment program South Australian Research and Development Institute (SARDI) and Agriculture Victoria (Ag Vic), were engaged during the development of this SIP to ensure consideration and strategically aligned priorities for the almond industry. In addition, strategic priorities and opportunities identified by the Almond Board of Australia (ABA) have been considered in the development of the almond SIP where applicable.

TABLE 2. Government and key agency priorities

Industry Plan – Almond Board of Australia	SARDI priorities	Ag VIC priorities	Rural RD&E for Profit priorities	Australian Government Science and Research priorities
Market access and development	Water scarcity and precision irrigation	Intensive orchards using self-fertile cultivars and standard and size reducing rootstocks	Advanced technology	Food
Pollination	Optimised production systems	On-farm water and fertiliser usage	Biosecurity	Soil and water
Input efficiency	Alternate varieties and rootstocks	Management options to mitigate extreme weather events and long-term climate change	Soil, water and managing natural resources	Advanced manufacturing
Sustainability	Soil health	Improved soil health	Adoption of R&D	Environmental change
Pest and disease management	Pest and disease management	Tree architecture, plant physiology and orchard design integration		Health
Improving yields	Climate adaptation			

This SIP has been developed alongside the government and key agency priorities listed in **Table 2**, with consideration of issues faced by the almond industry. These strategic areas further emphasise the opportunity and importance of cross-industry and regional collaboration. All the priority areas are of importance to Australian horticulture, and these will play a role in driving the efficiency and effectiveness of investment across the sector.

Annual investment planning

Specific investments to address the SIP strategies and align with industry strategic priorities will be outlined in detail each year via the almond AIP. Investment decisions are guided by the SIP and prioritised based on potential industry impact, as well as the availability of levy funds each year. The AIP will be developed with input from the almond SIAP, which is made up of growers and other industry representatives as well as IRBs and other key stakeholders. Wherever possible, investments will be aligned to form multi-industry projects to increase the efficiency of funding availability. Details of the SIAP can be found on the Hort Innovation website [here](#), and the AIP will be published on the same page each year.



Investment opportunities through Hort Frontiers

Innovation is key to the future success of Australian horticulture. The next evolution of the long-range, higher risk and transformational R&D that has the potential to make a significant impact will be possible through Hort Innovation's Hort Frontiers strategic partnership initiative.

Hort Frontiers is a strategic partnership initiative that facilitates collaborative, cross-industry investments focused on the longer term and more complex themes identified as critical for Australian horticulture by 2030. The partnership framework is currently being established and will include a number of key investment themes for potential investment to guide the initiative and drive transformational R&D across horticulture. Key investment themes will include:

- Environmental sustainability (water, soil and climate)
- Pollination
- Green cities
- Biosecurity
- Health, nutrition and food safety
- Advanced production systems
- International markets
- Leadership
- Novel food and alternate uses (waste reduction).

The development of these areas for investment will benefit all of horticulture, with support from partners with aligned priorities to co-invest in deliverables identified that require alternative funds available outside the levy. Hort Frontiers is being developed to align with the Australian-grown Horticulture Sustainability Framework and to invest in specific impact areas to drive innovation and sustainability initiatives.

The almond industry views a number of these investment areas as opportunities for success into the future, including:

- Environmental sustainability (water, soil and climate)
- Health, nutrition and food safety
- Advanced production systems
- International markets
- Leadership.

Partnering with Hort Frontiers on these areas would provide the almond industry with opportunities for access to world-class research, specialised project management teams and large-scale R&D.



“The important function of this SIP is to ensure that the investment decisions align with almond industry priorities to address the gaps in knowledge, technology and resources.”

Australian-grown Horticulture Sustainability Framework

Hort Innovation has developed the Australian-grown Horticulture Sustainability Framework, aiming to strengthen the horticulture industry's sustainability to meet the changing expectations and needs of growers, consumers, the community, investors and governments. The framework applies across the whole of Australian horticulture, including fruits, vegetables, nuts, nursery stock and turf. Through widespread consultation with industry and external groups, proposed sustainability goals and indicators were identified and are detailed within the framework. The framework is aligned to the UN Sustainable Development Goals.

Four key pillars were identified in the framework (*Figure 1*).

FIGURE 1. Four key pillars of the Australian-grown Horticulture Sustainability Framework



The framework should be cross-referenced when undertaking prioritisation of investments. At the time of publication, Hort Innovation is working with industry groups regarding the overall responsibility for the framework, setting and reporting progress against the framework targets and performance measures.

View the Australian-grown Horticulture Sustainability Framework on the Hort Innovation website [here](#).



Table 3 provides examples of almond SIP strategies showing how the industry is already aligning to the framework.

TABLE 3. Almond SIP strategy examples showing how the industry is already aligning to the Australian-grown Horticulture Sustainability Framework

STRATEGY	POTENTIAL BENEFIT AND IMPACT	SUSTAINABILITY GOAL
Enhance understanding of the impacts of climate change on almond production systems, including defining the almond industry greenhouse gas emissions footprint, and evaluating industry options for offsetting greenhouse gas impacts	<ul style="list-style-type: none"> • Understanding of industry greenhouse emissions • Improved understanding of the feasibility of greenhouse mitigation options 	Planet & Resources
Identify options to improve water efficiency and supply, and promote healthy soils through covered cropping/mixed cropping, inter-row plantings, organic amendments, and waste stream management	<ul style="list-style-type: none"> • Reduction in farm/production wastes • Optimal water and nutrient use efficiency • Increased soil health and tree resilience against current and future climates 	Planet & Resources



“The almond SIP is the roadmap that will guide Hort Innovation’s oversight and management of the almond industry’s investment programs.”

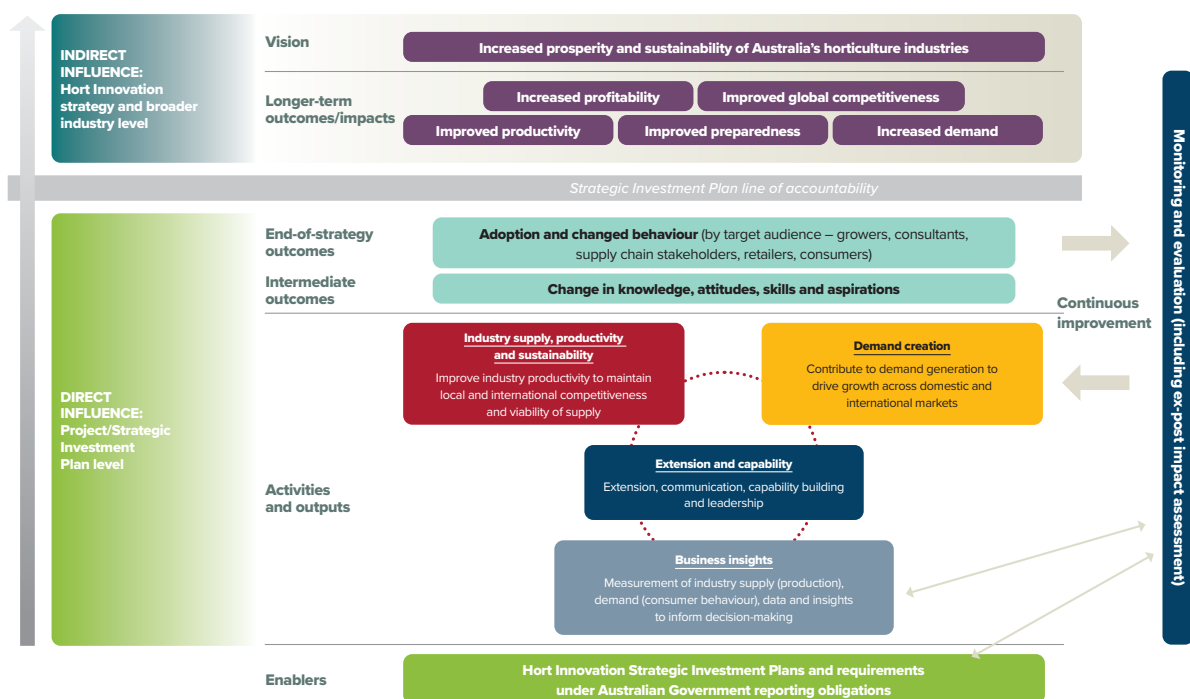
HORT INNOVATION



Strategic Investment Plan logic

The SIP logic (Figure 2) identifies how investment activities and outputs (delivered through each SIP outcome area) will support changes in industry KASA, which drive adoption and behaviour change. Beyond the SIP, investment will contribute to driving longer-term impacts for the sector like increased preparedness, demand, productivity, global competitiveness and profitability. Realising these impacts will support Hort Innovation’s vision of increased prosperity and sustainability of Australia’s horticulture industries.

FIGURE 2. Strategic Investment Plan logic



Aligning to Hort Innovation investment priorities

Hort Innovation is committed to sustainable growth in horticulture, with the overarching aim of increasing the sector’s value to \$20 billion by 2030. We will do this through implementing the SIP and investments against the three core pillars, committed to:

1. Drive knowledge and innovation into horticulture industries
2. Deliver the highest value R&D, marketing and international trade investments across industries now and into the future
3. Enable activities that drive all strategic imperatives.

Hort Innovation is governed by a Deed of Agreement with the Australian Government, which allows for the transfer and

investment of levies and Australian Government contributions. As a Research and Development Corporation (RDC), Hort Innovation is able to leverage industry levy investments in RD&E with Australian Government contributions up to a value of 0.5% of the industry’s gross value of production. All investments made by Hort Innovation are thoroughly considered to ensure they contribute to the guiding performance principles:

- Productivity
- Profitability
- Preparedness for future opportunities and challenges
- Competitiveness
- Demand: demonstrates how productivity, preparedness and demand lead to profitability and competitiveness and sustainability.

APPENDICES

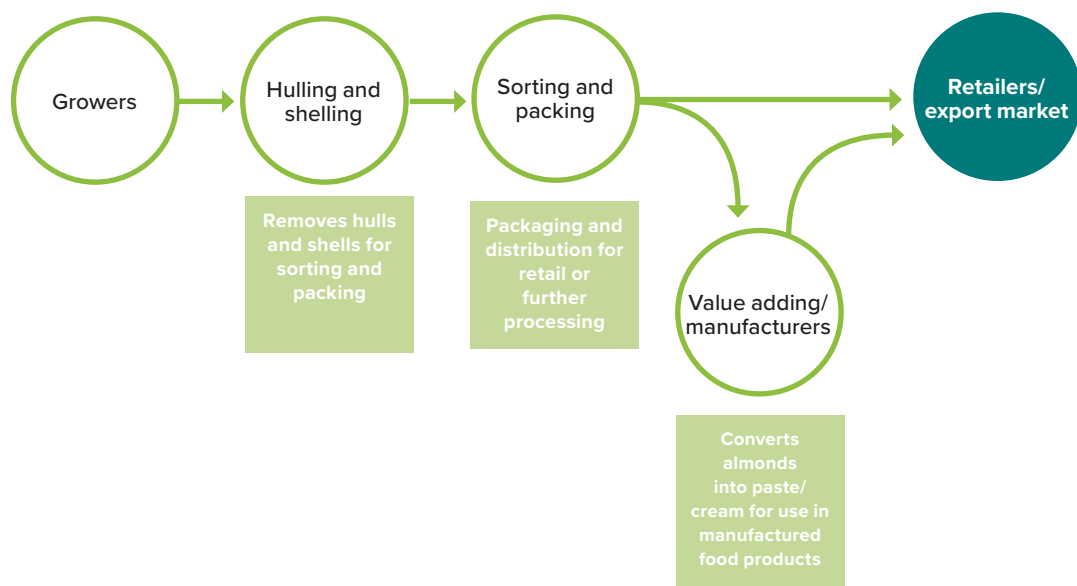
APPENDIX 1: Industry context

Industry supply chain

Australian almonds are a major horticultural industry and Australia's largest nut industry. There are approximately 180 commercial almond growers with a total orchard area of over 53,000 hectares that has increased more than fifteen times the size of plantings in the early 2000's and is forecast to increase to 58,000 hectares in 2024. The Riverina has been the focus of recent industry expansion, and this is expected to continue.

The broader supply chain comprising of hulling and shelling, sorting and packing, value adding, marketing and exporting. Most Australian almonds are supplied for the fresh export market.

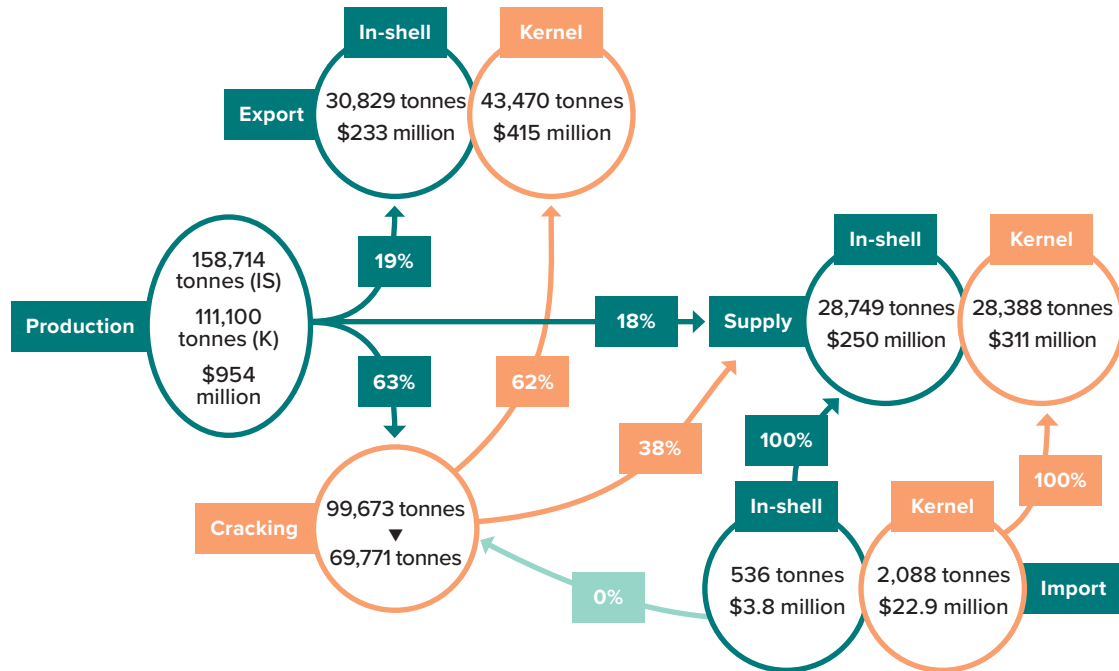
FIGURE 3. Almond supply chain



The almond industry comprises both includes small growers (less than 15 hectares of orchard), and 55% of almond properties less than 50 hectares are family operated. However, total production output is dominated by large-scale corporate farms that account for more than 90% of Australian almond production. Several of the larger Australian corporate almond growers have become vertically integrated and encompass processing, packing, domestic and export marketing.

Australian almonds make up 5% of the total domestic supply volume, with small levels of imports from the USA.



FIGURE 4. Almond supply chain, 2019/20

Source: Australian Horticulture Statistics Handbook (2019/20)

Export markets are the main destination for Australian almonds, with the kernel market making up two-thirds of exports in terms of value. The kernel market is also the dominant domestic market, with kernels making up 55% of the value of this market. 63% of almonds being cracked in Australia shows that there is a significant domestic processing sector (*Figure 4*).

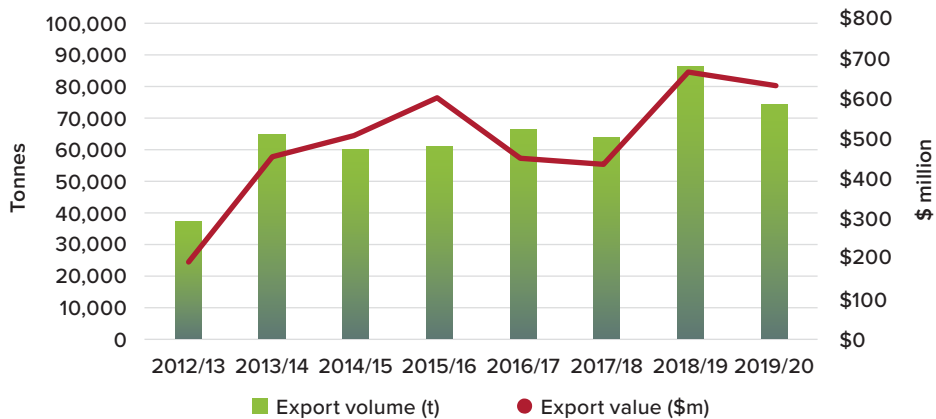
Domestic consumers and drivers of demand

The domestic fresh market accounted for 41% of the Australian production volume in the 2019/20 year. While the domestic market is not the most significant market channel for Australian almonds, it has still experienced consistent growth with the supply per capita growing from 0.91 kilograms in 2012/13 to 1.88 kilograms in 2019/20. Over 90% of almonds consumed in Australia are grown and produced by Australian farmers.

Health and nutrition are key drivers of almond consumption in Australia. Almonds offer a unique mix of nutrients and have been clearly linked with improved heart health. Almonds are key ingredients in an array of products including snack foods, confectionery, baking goods, breakfast cereals and desserts. In the 2019/20 marketing year, almonds were the most frequently used nut ingredient in new products launched. During this period, 240 products were launched into the Australian market. The five main categories for new products with almonds were cereals, snacks, bakery, confectionery and nut milks (drinks, yoghurt and ice cream).

A considerable portion of the population (42%) buys packaged almonds, with a greater number of households purchasing products with almonds listed as an ingredient. The majority of almonds at retail are sold through the major supermarkets (81%) followed by other supermarkets (12%) and non-supermarkets (7%), as of the 52 weeks to 6 September 2020. The average household spent approximately \$31.94 over the same period. Homescan data indicates that almond consumption increased by 2.8% compared to the previous 52 weeks in terms of volume, and 2.9% in terms of dollar sales. The percentage the average amount spent per household also increased while the average weight purchased per household was flat.

FIGURE 5. Almond exports, 2012/13 to 2019/20



Source: Australian Horticulture Statistics Handbook (2019/20)

Globally, almond production is led by California, the major world producer, where plantings were over 10 times that of Australia at 535,691 hectares in 2020¹. Global almond supply is restricted by limited access to suitable growing conditions.

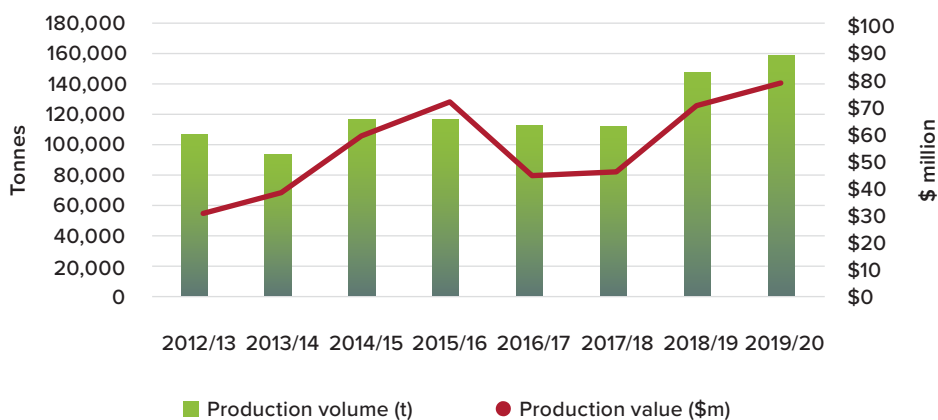
Almond exports underpinned industry growth and expansion over the duration of the industry’s development. 65,059 tonnes were exported (kernel equivalent volume) in 2019/20, valued at \$648 million, which is an increase from the 2014/15 volume (12%) and value (29%) (Figure 5). Almonds are Australia’s most valuable horticultural export product accounting for 24% of the value of fresh horticulture exports. 58% of the volume of production was exported in 2019/20.

Most almonds are exported to China, which accounted for 51% of volume in 2019/20 and is the world’s leading market for tree nuts. Exports to China have grown strongly in recent years to become the major export market in response to increasing trade tensions with the USA, which is the world’s largest supplier of almonds. Other key export markets include the USA, broader Asia (Japan, India), Europe (Germany, Spain) and the Middle East. Small volumes of almonds are imported from the USA, and account for approximately 5% of the domestic fresh market supply.

The Hort Innovation projects *Market access, maintenance and development programs* (AL17008 and AL19002) continue to develop markets for the next large surge in production through activities such as trade missions, industry-specific trade education programs and representation at trade shows.

Industry production

FIGURE 6. Almond production, 2012/13 to 2019/20



Source: Australian Horticulture Statistics Handbook (2019/20)

1 Almond Board of Australia (2020). Almond Insights 2019/20

The Australian almond industry had an estimated production value of \$954.0 million in 2019/20 and production volume of 158,714 tonnes. Although lower export prices mean that the current figure is down from a peak of \$854.1 million in 2015/16, almond production remains a major contributor to the total value of horticultural production in Australia.

The industry is expanding rapidly, and this is evidenced by the total area planted to almond plantations having increased from 3,555 hectares in 2000 to 58,046 in 2020. Currently, 10,829 hectares (18.7%) of orchard plantings are not yet bearing a crop². Worldwide demand for almonds is strong and has more than doubled over the past decade. During this period, consumption growth has averaged 9% per annum³. This growth trend is expected to continue due to the increased awareness of the positive health messages, the use of almonds in new food products, and rapidly growing demand from developing markets.

Australian almonds are predominantly grown along the Murray River corridor. Australia has five major almond producing regions including the Adelaide Plains and Riverland (SA); Riverina (NSW); Sunraysia (VIC); and the Swan Region (WA). The majority (53%) of almonds produced in 2019/20 were grown in Victoria. Almonds require a Mediterranean climate – cold winters during dormancy and warmer summers to develop the nut. Almonds must have access to suitable land and water, and production is dependent on access to managed honey bees for pollination. An estimated 230,000 hives are currently required during the almond pollination season.

Australia’s almond growing season commences with the almond blossom in August each year. Harvest takes place from February to April, with produce ready for market from April.

Almond trees take three years to bear a crop and around six to seven years to reach mature production levels that average around 3.2 tonnes per hectare. The volume of almonds produced in Australia has increased by 51% since 2012/13 to 2019/20 with production value also growing by 155% over this period reflecting the strong growth trajectory of the industry (Figure 6). With 29% of plantings not yet bearing and 36% of bearing trees not yet fully mature, the industry’s production will continue to increase regardless of future plantings. Current indications suggest over 120,000 kernel tonnes of almonds will be produced in the 2021 season and is forecast to increase to 175,000 tonnes in 2025.

Australia is the second largest producer of almonds contributing around 7% of the global supply. Global production is dominated by the USA (79%). Other almond-producing countries include Spain (6%), Turkey (1%), Chile (1%). The global production of almonds has increased from around a million kernel tonnes produced in the 2013 season to over 1.43 million tonnes in 2019.

The industry is investing in sophisticated growing systems to facilitate a steep increase in orchard productivity. These include Hort Innovation projects *Almond productivity: Tree architecture and development of new growing systems (AL14007)*, *Evaluation of potential prunus rootstocks for almond production – stage 2 (AL16006)* and *National almond breeding and evaluation program (AL17005)*. Pollination has been an industry focus as well, with collaborative efforts across impacted industries undertaken to ensure that crop losses from a lack of pollinator supply is avoided.

TABLE 4. Seasonality of Australian almonds

STATE	19/20 TONNES	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
New South Wales	26,664												
Victoria	58,883												
South Australia	23,331												
Western Australia	2,222												
Harvest legend													
			Harvest										None

Source: Australian Horticulture Statistics Handbook (2019/20)

2 Almond Board of Australia (2020). Almond Insights 2019/20

3 Almond Board of Australia. All about Australian Almonds

APPENDIX 2: Almond industry situation analysis

At the time of refreshing the SIPs in 2021, the global coronavirus (COVID-19) pandemic continues to affect horticulture industries to varying degrees. Although the outcome and ultimate impact of the pandemic are unknown, areas of investment across horticulture that may be influenced over the period of this SIP include export and trade relationships, domestic and international demand, logistics and supply chain, labour supply – all having potential impacts on grower profitability.

Environmental, economic and social sustainability are vitally important to Australian horticultural growers and industries. Customers, consumers, and investors also seek information about the sustainability and ethics of how their food is produced. Sustainability is particularly crucial as topics such as climate variability, health and ethics continue to shape the social, environmental, and political landscape for agricultural industries. The impact of these issues may have influence on a whole range of investment areas for horticulture from production practices and land management, demand and reputation of products, quality expectations and cultural/community engagement.

Strengths, weaknesses, opportunities and threats

Table 5 has been used to analyse the almond industry's strengths, weaknesses, opportunities, and threats (SWOT). The SWOT tool assists the industry to build on what works, observe what is lacking, minimize risks, and take the greatest possible advantage of chances for success.

TABLE 5. Almond SWOT analysis

The almond industry	
Strengths	<ul style="list-style-type: none"> • A Mediterranean climate with access to suitable supplies of water and land – these conditions are only available in a few locations anywhere in the world and mainly first-world countries • Mechanised production that offsets the high cost of labour that holds back other Australian horticultural industries • An industry that is internationally competitive on cost. It operates in international markets without production or export subsidy. There are no tariffs on imported almonds and few on exports • Competitive in regard to product quality compared to California but partially eroded by insect damage • Production and processing owned by well-resourced, organised and cooperative corporate entities • An effective industry development program (extension) and data sets that deliver industry insight • Linkages to the Almond Board of California and the Spanish almond industry allowing collaborative research, knowledge sharing and leadership to drive international market development • An industry with innovative drive that provides momentum to continuous improvement in practices, knowledge and technology and attracts collaboration, skilled staff and funding resources • A product with high integrity – the industry is open and honest with its customers and takes seriously concerns about quality, food safety and sustainable production • An increasing production base to support R&D and marketing programs • World-class processing sector • Skilled marketers prepared to invest in market development via the CIF • High health status planting material • A well-resourced USA industry investing strategically in market development • A world-leading research facility to conduct R&D trials • Increase in horticultural production area requiring paid pollination services met with an industry decreasing in capacity • Significant reliance on one primary pollinator – honey bee – for all pollination needs

The almond industry	
Weaknesses	<ul style="list-style-type: none"> • Pest and disease problems that can result in a major increase in serious defects in harvested almonds • A heavy reliance on the honey bee industry for pollination which is vulnerable to pests (Varroa) and diseases (American foulbrood), is of variable quality and is increasing in cost substantially year on year • Cost disadvantage compared to the Californian almond industry on some key inputs (crop protectants, fuel, energy, labour, water, fertiliser, machinery, transport), services and cost of borrowing • Current production systems developed in California are unsuited in a number of ways to Australian growing conditions in terms of weather, tree size, soils and input costs • Significant user of irrigation water – 780 gigalitres per annum forecast by the time this plan has been fully implemented • Reliance on inadequately resourced water market and river management system • A harvest that is long, inefficient and conducive to food safety problems with some open shell varieties • Reliance on pumped irrigation systems that are large users of energy that is costly and sometimes unreliable • Susceptible to weather events more likely with climate change such as frost, hail, heatwaves, wind and rain in summer's harvest period • Need of profitable use of hull and shell biomass • Hull and shell biomass prone to self-combustion
Opportunities	<ul style="list-style-type: none"> • Additional growth in Australian almond sales to emerging and established markets • Further research and promotion of the health benefits of consuming almonds – almonds are an excellent source of protein, vitamin E, dietary fibre and mono-saturated fat • Additional strategic links with the Californian and Spanish industries to shortcut technology evaluation and share almond production, processing and marketing knowledge • Novel technologies to increase efficiency of pollination
Threats	<ul style="list-style-type: none"> • Increased global production may lead to unprofitable almond prices • A major new producing country emerges with a very low cost of production • Return to a high Australian dollar making Australian product expensive relative to that sourced from California • High reliance on water availability and deliverability in peak irrigation season



APPENDIX 3: Almond industry risk analysis

Almond industry risks are summarised in **Table 5**. The risk analysis was prepared by the ABA following industry consultation in December 2020. Critical industry risks most relevant to R&D and extension planning relate to pollination, water, growth in almond supply and a food safety/contamination event.

TABLE 5. Almond industry risk analysis

RISK NUMBER	RISK DESCRIPTION	MOST LIKELY SCENARIO	ADVERSE SCENARIO
1	A sustained increase in the cost of pollination arises	High	High
2	Constrained access to water and deliverability issues	High	High
3	World supply of almonds grows significantly faster than demand causing depressed pricing	Medium	High
4	A major food safety/contamination issue with resultant public awareness	High	High
5	Reduced access to pest, disease and weed management chemicals	Medium	High
6	Increase in the value of the Australian dollar compared to the US dollar and other currencies	Medium	High
7	Supply of high-quality planting material falls short of industry demand	Low	High
8	Availability of economically priced fertilisers	Low	High
9	Exotic pest/disease incursions	High	High
10	Loss of R&D and/or Australian Government contributions	Low	High
11	Inability to compete in international markets due to non-compliance with customer requirements	Low	High
12	A new low-cost entrant changes global supply dynamics (e.g., China)	Low	Medium
13	Inability to compete in major export markets due to access/trade barriers	Medium	High
14	Long-term climate change trend resulting in unsuitable weather conditions	Medium	High
15	Shortage of skilled labour	Low	Medium
16	Shortage of unskilled labour	Low	Medium
17	Decline in international almond industry cooperation and collaboration	Low	Medium
18	Major interruption or supply problem in the value chain	Low	Medium
19	Environmental lobby limits almond industry's 'licence to operate'	Medium	Medium
20	Industry fragmentation/lack of cohesion	Low	Medium

APPENDIX 4: Horizon analysis by the Almond Board of Australia

Horizon analysis developed by the ABA provides additional insight into the industry's longer-term thinking and a guide for RD&E planning:

- Horizon 1 – improving the current production system that dominates existing plantings. Current system based on Californian varieties and technologies
- Horizon 2 – development of a production system based on twice the density of trees down a row that offers higher returns earlier in an orchard's life
- Horizon 3 – development of a production system best suited to Australian growing conditions that improves yields and input efficiency whilst reducing risks.

The three-horizon investment planning requires a long term holistic approach rather than simply addressing problems as they emerge in current orchards. The approach was considered when developing the previous almond SIP (2017-2021) and had at its core an Australian Government 'Rural Research for Profit' project jointly funded by the Australian Government, an industry CIF and the Victorian and South Australian Governments. The 'Rural Research for Profit' project is titled *Advanced Production Systems for the Temperate Nut Industries* and was used to establish the Almond Centre Experimental Orchard. The three horizons remain a key aspect of this 2021-2026 SIP.

The Almond Centre Experimental Orchard at Loxton is becoming the focal point for orchard research and demonstration of:

- Accelerating the evaluation of new varieties – including closed shell varieties
- Rootstocks – especially dwarfing types for creation of smaller trees/intensive orchards
- Planting densities – higher densities for ease of management and resource use efficiency
- Soil health – orchard floor management, ideal soil, soil ameliorates, the potential for incorporation of hull waste to improve water holding capacity
- Improving nutrient management – nutrition efficiency trials
- Water-use efficiency – irrigation efficiency trials
- Capacity to manage a variable climate and extreme weather events
- Intensive orchards – smaller trees, ultra-high-density plantings, advanced tree architecture, managed on a vertical plane to maximise sunlight interception
- Improved harvesting – on-farm hulling, use of smaller 'shake and catch' machines along with investigation of alternative harvesting technologies
- Postharvest techniques – to enhance product quality.

This SIP recognises the importance of these investments and those at the Ag Vic experimental orchard in Sunraysia.



APPENDIX 5: People consulted

The following people are acknowledged for their contribution to the almond SIP development process.

NAME	INDUSTRY ROLE	REGION
Peter Hayes	Chair, Almond Board of Australia	Adelaide, SA
Peter Cavallaro	Deputy Chair, Almond Board of Australia; Chair, Production and Plant Improvement Committees; Pollination Committee; Grower	Adelaide, SA
Brendon Sidhu	Director, Almond Board of Australia; Chair, Market Development Committee; Almond SIAP Member; Grower	Riverland, SA
Robert Wheatley	Director, Almond Board of Australia; Chair, Pollination Committee; Production Committee; Grower	Riverland, SA
James Callipari	Director, Almond Board of Australia; Production Committee; Grower	MIA, NSW
Neale Bennett	Director, Almond Board of Australia; Pollination Committee; Grower; Contract harvester	Sunraysia, VIC
Darren Minter	Director, Almond Board of Australia; Plant Improvement Committee; Grower	Sunraysia, VIC
Stephen Beckwith	Director, Almond Board of Australia; Chair, Chemical Committee; Grower	Swan Region, WA
Nigel Carey	Director, Almond Board of Australia; Market Development Committee; Processor; Marketer	Riverland, SA
Damien Houlihan	Director, Almond Board of Australia; Market Development Committee; Grower; Processor; Marketer	Brisbane, QLD
Tim Jackson	Director, Almond Board of Australia; Market Development Committee; Processor; Marketer	Riverland, SA
Laurence Van Driel	Director, Almond Board of Australia; Market Development Committee; Grower; Processor; Marketer	Melbourne, VIC
Ben Brown	Production Committee; Almond SIAP Member; Grower; Processor; Marketer	Riverland, SA
Thomas Dobbin	Production Committee; Processor; Marketer	Riverland, SA
Pierre Janse van Rensburg	Production Committee; Pollination Committee	Sunraysia, VIC
Drew Martin	Production Committee; Pollination Committee; Grower	Riverland, SA
Paul Martin	Production Committee; Grower	Riverland, SA
Zubair Shahzad	Production Committee; Grower; Processor; Marketer	Melbourne, VIC
Craig Simes	Production Committee; Almond SIAP Member; Agronomist	Riverland, SA
Daryl Winter	Production Committee; Plant Improvement Committee; Grower	Hillston, NSW
Roxanne Tan	Market Development Committee; Grower; Processor; Marketer	Melbourne, VIC
Andrew Lacey	Plant Improvement Committee	Riverland, SA
Scott McKenzie	Plant Improvement Committee; Grower	Riverland, SA
Brett Rosenzweig	Plant Improvement Committee; Grower	Riverland, SA
Tony Spiers	Plant Improvement Committee; Grower	Riverland, SA
Michelle Wirthensohn	Plant Improvement Committee; Researcher	Adelaide, SA
Doug Somerville	Pollination Committee; Researcher	Canberra, ACT

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NAME	INDUSTRY ROLE	REGION
Michael Ward	Pollination Committee; Grower; Processor; Marketer	Riverland, SA
Ian Zadow	Pollination Committee; Apiarist	Mallee, SA
Joe Riordan	Pollination Committee; Apiary Inspector	Rutherglen, VIC
Domenic Cavallaro	Almond SIAP Member; Grower	Adelaide, SA
Troy Richman	Almond SIAP Member; Grower	Sunraysia, VIC
Ross Skinner	CEO, Almond Board of Australia; Almond SIAP Member	Sunraysia, VIC
Joseph Ebbage	Market Program Manager, Almond Board of Australia;	Melbourne, VIC
Deidre Jaensch	Industry Development Manager, Almond Board of Australia	Riverland, SA
Josh Fielke	Industry Development Officer, Almond Board of Australia	Riverland, SA

APPENDIX 6: Reference material

Footnotes

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APPENDIX 7: List of acronyms

ABA	Almond Board of Australia
Ag Vic	Agriculture Victoria
AIP	Annual Investment Plan
APVMA	Australian Pesticides and Veterinary Medicines Authority
BMP	best management practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
FY	financial year
GI	glycemic index
IRB	Industry Representative Body
KASA	knowledge, attitudes, skills and aspirations
KPI	key performance indicator
M&E	monitoring and evaluation
MRL	Maximum Residue Limit
NHRN	National Horticulture Research Network
PHA	Plant Health Australia
R&D	research and development
RDC	Research and Development Corporation
RD&E	research, development and extension
SARDI	South Australian Research and Development Institute
SARP	Strategic Agrichemical Review Process
SIAP	Strategic Investment Advisory Panel
SIP	Strategic Investment Plan
SWOT	strengths, weaknesses, opportunities and threats



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