

Nashi

Strategic Investment Plan

2022-2026



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EXECUTIVE SUMMARY

The overarching strategic intent of this Strategic Investment Plan (SIP) is to create a sustainable Australian nashi industry that is profitable at each link in the supply chain. The industry's primary focus is on optimising and stabilising production to meet demand and the secondary focus is to create additional demand.

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

The Australian nashi industry situation in 2019/20 is described on **page 4** with further information provided in **Appendix 1**. There are about 20 commercial growers nationally, including one major producer. Australian nashi production is concentrated in the Goulburn Valley, Victoria, with small production areas in South Australia, New South Wales, and Western Australia. Production volume has steadily declined since 2001, although 2018 saw an increase in production from 1,552 tonnes to 2,170 tonnes, providing an increase in farmgate value from \$4.6 million to \$6.5 million. The strategic intent of the nashi SIP provides a summary of how the nashi industry will drive change over the life of the SIP, which will ultimately come about by growers having access to the tools required to increase their profitability and meet the demands of domestic and export consumers.

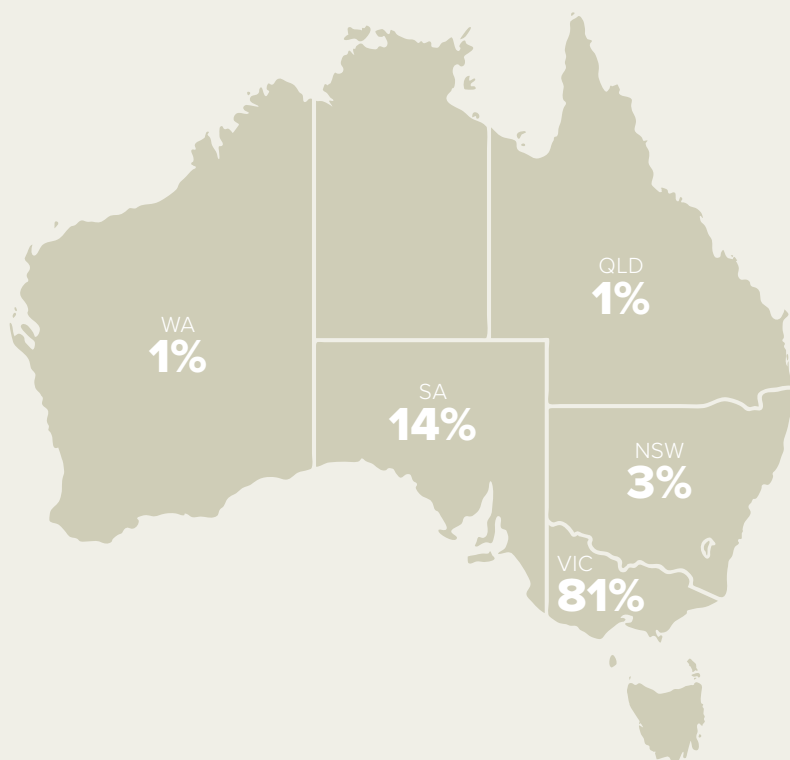
The financial estimates give an indicative overview of the funding available for the period of FY2022-FY2026. Currently the nashi R&D fund has the capacity to invest, however, noting that the levy rate on nashi was reduced to zero from 2011, this will have an impact on any future investments beyond FY2026.

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 nashi industry. Productivity/supply is the focus due to high production costs and sustainable packaging options, followed by demand creation with priorities being creating value-added products, evaluating new variety options, and establishing nutritional/ pharma benefits of nashi.

The key performance indicators (KPIs) detail how the impact of each strategy will be measured, for example, identifying innovations that reduce the cost of thinning and budding (e.g., by leveraging tools and technologies from other industries) by identifying and validating practices to decrease production cost.

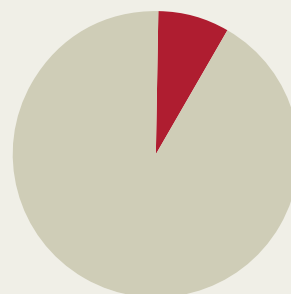


PRODUCTION REGIONS:

EXPORT/FRESH DOMESTIC/
PROCESSING:**100%**

of production supplied domestically

RETAIL VS FOODSERVICE:


■ Retail 92%
 ■ Foodservice 8%

PRODUCTION WINDOW:

**Feb-Dec**

NUMBER OF GROWERS:

**Approx.
20**

PRODUCTION VOLUMES:

**877
tonnes**

in 2019/20

PER CAPITA CONSUMPTION:

**0.14 kg**

FARMGATE VALUE OF PRODUCT:

**\$3 million**

in 2019/20

VARIETIES:


**Nijisseiki, Hosui,
Shinko, Papple,
Hakka, Kosui &
Indiana Pearl**

THE NASHI STRATEGIC INVESTMENT PLAN

The nashi SIP is the roadmap that will guide Hort Innovation's oversight and management of the nashi 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 this SIP is to ensure that the investment decisions align with nashi industry priorities.

Hort Innovation has led the process for preparing the refresh of the nashi 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 valued the support, advice, time, and commitment of all stakeholders that contributed to producing this SIP, especially nashi growers.

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 nashi 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 nashi 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 nashi Strategic Investment Advisory Panel (SIAP), IRBs and other key stakeholders.

Producers in the nashi industry have paid 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, marketing, biosecurity and residue testing programs.

Levy was payable on nashi fruit that was produced in Australia and either sold by the producer or used by the producer in the production of other goods. The levy rate on nashi was reduced to zero, effective from 2011.

Hort Innovation manages the nashi levy funds proportion directed to research and development (R&D). In February 2019, the nashi industry began investing unspent funds from earlier levy collections. Approximately \$900,000 is available for investment over the period of this SIP.

Hort Innovation has developed this SIP for the nashi industry to strategically invest the collected nashi levy funds into the priority areas identified and agreed by the nashi industry.

This SIP represents the Australian nashi industry's collective view of its R&D needs over the next five years (2021-2026). Learning, achievements and analysis of the previous SIP, consultation with Australian nashi levy payers, and synthesis of various strategic documents have been incorporated into the development of this SIP. **Appendix 3** 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 4**. A list of acronyms used within the document is available in **Appendix 5**.

Financial estimates

Unspent levy funds and Australian Government contributions for eligible R&D set the overall budget parameters for the SIP. The levy rate for nashi has been reduced to zero since 2011. The industry is seeking to invest the levy funds that are available.

The financial estimates used for the purpose of developing this SIP are presented in **Table 1** below and are indicative. The intention of the table is to offer a strategic overview of the industry fund at a specific point in time, and the figures will be regularly reviewed to reflect the latest information for the industry and any changes in investment priority. Further details will be available within the AIP each year.

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

	2022 \$	2023 \$	2024 \$	2025 \$	2026 \$
R&D					
Balance end FY2021	862,623				
Estimated levy funds (growers)	–	–	–	–	–
Australian Government contribution	164,706	211,765	241,176	118,235	147,647
Current investments	80,000	110,000	160,000	1,000	1,000
New investments	200,000	250,000	250,000	200,000	250,000
Total project investments	280,000	360,000	410,000	201,000	251,000
CCR	49,412	63,529	72,353	35,471	44,294
Projected end balance	705,000	508,000	277,000	164,000	20,000

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)

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

“The important function of this SIP is to ensure that the investment decisions align with nashi industry priorities.”

NASHI INDUSTRY OUTCOMES



The overarching strategic intent of this SIP is to create a sustainable Australian nashi industry, profitable at each link in the supply chain. The industry's primary focus is on optimising and stabilising production to meet demand and the secondary focus is to create additional demand.

Industry outcomes

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

OUTCOME 1: Industry supply, productivity and sustainability

Improve industry productivity (inputs/outputs) to maintain local and international competitiveness and viability of supply.

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 and quality, which will drive profitability outcomes.

The strategic intent of this outcome is to increase industry profitability by reducing the average cost of production and by consistently supplying a higher quality product to market. Achieving the outcome will involve:

- Identifying better and more sustainable packaging options
- Identifying innovations that reduce the cost of thinning and budding (e.g., by leveraging tools and technologies from other industries)
- Identifying/trialling new varieties that may be more resistant to pests and disease, but which produce quality fruit for consumers
- Identifying/trialling new varieties that may be more resistant/robust to scuffing and bruising and/or suited to waxing
- Preparing a whole-of-supply-chain handling, storage and display/merchandising manual for nashi fruit
- Developing improved devices to remove nashi stems
- Identifying an opportunity to align with the apple and pear biosecurity plan renewal
- Developing productive working relationships between Australian and international researchers to access and leverage world-class know-how on production.



OUTCOME 2: Demand creation

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

Demand creation will support the industry to develop existing and future markets, both domestically and internationally. This will contribute to improved consumer knowledge and attitudes and encourage purchase intent to drive category volume growth.

The strategic intent of this outcome is to maintain and strengthen consumer demand. In today's increasingly health-conscious world, demand for products can increase quickly if promoted as 'great to eat', nutritious and containing health-enhancing properties (e.g., avocados and almonds). Consumers seek a new experience with food and beverages – the rapid rise of craft beers and gin distilleries is a case in point.

The nashi industry has the opportunity to explore equivalent options by:

- Creating value-added products such as spirits and chips (note: some work has been done in this area previously and should be re-examined – review previous reports)
- Evaluating new variety options with specific quality attributes (note: this may require a Memorandum of Understanding (MOU) with Japan to access germplasm)
- Establishing nutritional/pharma benefits of nashi
- Producing organic nashi
- Preparing a whole-of-supply-chain handling, storage and display/merchandising manual for nashi fruit
- Collaborating with government and other industries to work towards achieving or improving technical market access in priority export markets with similar or better returns for growers
- Identifying new varieties that are more suited to domestic and export markets
- Undertaking reviews of potential export markets
- Undertaking market research to better understand consumer preferences and segments
- Raising awareness of opportunities and pathways for businesses to be involved in meeting demand in new domestic or export markets.

OUTCOME 3: Extension and capability

Build capability and innovative culture.

Building capability and 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 the majority of industry supply chain actively engaged in implementation of this strategy
- Using extension and communication processes to support industry achievement of supply and demand priorities.

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.

Business insights will be provided to the industry to support and engage in productivity and demand drivers and measure the impacts of investments. Key investments will support the provision of consumer knowledge and tracking, access to trade data, industry benchmarking and independent reviews. These investments underpin and are complementary to support the delivery of the other outcome areas.

NASHI INDUSTRY PRIORITIES



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 available funds 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 nashi industry has increased profitability, efficiency and sustainability through innovative R&D, sustainable best management practices (BMPs) and varieties.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Identify better and more sustainable packaging and storage options	<ul style="list-style-type: none"> • More sustainable packaging • Cheaper packaging • Higher-quality fruit
2. Identify innovations that reduce the cost of thinning (e.g., by leveraging tools and technologies from other industries)	<ul style="list-style-type: none"> • Identification of technologies/knowledge from other industries • Adaptation of such technologies to the nashi industry • Reduced cost of production • Improved quality through better thinning
3. Identify/trial new varieties that may be more resistant/robust to scuffing and bruising and/or suited to waxing	<ul style="list-style-type: none"> • Higher quality and more robust fruit • Increased consumer demand for Australian nashi
4. Improve pest and disease management by trialling more resistant varieties and extending identified BMPs	<ul style="list-style-type: none"> • Higher quality fruit • Reduced costs through reduced chemical use and labour • Greater opportunities to produce organic produce
5. Evaluate new variety options with specific quality attributes (note: explore the opportunity with a MOU with Japan for access to germplasm)	<ul style="list-style-type: none"> • Higher quality fruit • Increased consumer demand for Australian nashi
6. Prepare a whole-of-supply-chain handling, storage and display/merchandising manual for nashi fruit	<ul style="list-style-type: none"> • Whole-of-supply-chain BMP manual • Enhanced fruit quality and display
7. Investigate the opportunity to align with the apple and pear biosecurity plan renewal in 2022	<ul style="list-style-type: none"> • Updated industry biosecurity plan • Enhance biosecurity preparedness and promote of biosecurity awareness

OUTCOME 2: Demand creation

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

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Increase domestic consumer demand for fresh, quality Australian nashi through sharing consumer knowledge, attitudes and purchase intent	<ul style="list-style-type: none"> Increased consumer demand for Australian nashi Increased awareness of health benefits of nashi
2. Review previous reports completed on value-added products (e.g., spirits, chips) and prioritise potential opportunities	<ul style="list-style-type: none"> Availability of new products Greater opportunities to sell lower quality fruit Increased demand

OUTCOME 3: Extension and capability

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

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Deliver communication and extension capability to create positive change in the areas of productivity	<ul style="list-style-type: none"> Establishment of a baseline and then increased share of the industry with positive change in KASA, practice and implementation concerning targeted high priority areas Trusted relationships across supply chains

OUTCOME 4: Business insights

The Australian nashi industry is more profitable through informed decision-making using consumer knowledge and tracking, and benchmarking.

STRATEGIES	POTENTIAL BENEFIT OR IMPACT
1. Develop benchmarking within and across enterprises to better understand the cost of production with data used to measure and track industry productivity and profitability, identifying areas for ongoing priority	<ul style="list-style-type: none"> Improved data on the cost of production across enterprises of different scales Identification of specific areas where costs can be removed or reduced Provision of information to confirm research, development and extension (RD&E) priorities
2. Increase industry alignment with quality and brand-positioning opportunities driven by consumer insights*	<ul style="list-style-type: none"> Provision of business insights to deliver against demand, supply and extension outcomes New information to better target nashi products and meet consumer expectations

* 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.

NASHI SIP MONITORING AND EVALUATION



The nashi SIP Monitoring and Evaluation (M&E) Framework has been developed and 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 key performance indicators (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 plan 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.

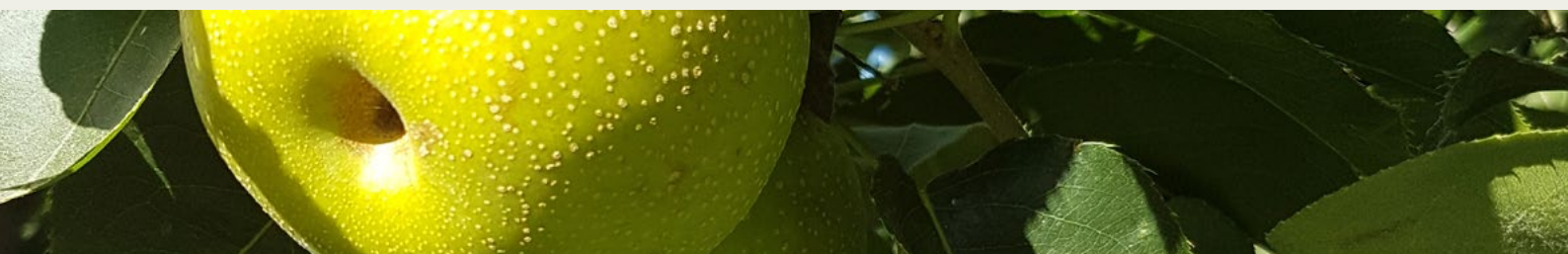
Hort Innovation will facilitate the regular review of the SIP to ensure it remains relevant to industry.



Nashi SIP Monitoring and Evaluation Framework

The nashi 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, productivity and sustainability		
Outcome 1: The Australian nashi industry has increased profitability, efficiency and sustainability through innovative R&D, sustainable BMPs and varieties.	1. Identify better and more sustainable packaging and storage options	<ul style="list-style-type: none"> Packaging effectiveness identified for maintenance of nashi quality Increased packaging sustainability, such as recyclable or biodegradable solutions
	2. Identify innovations that reduce the cost of thinning (e.g., by leveraging tools and technologies from other industries)	<ul style="list-style-type: none"> Practices identified and validated to decrease production costs
	3. Identify/trial new varieties that may be more resistant/robust to scuffing and bruising and/or suited to waxing	<ul style="list-style-type: none"> New varieties are identified and trialled with positive postharvest scuffing performance
	4. Improve pest and disease management by trialling more resistant varieties and extending identified BMPs	<ul style="list-style-type: none"> New varieties are identified and trialled with validated superior performance of pest and disease resistance
	5. Evaluate new variety options with specific quality attributes (note: explore opportunity with a MOU with Japan for access to germplasm)	<ul style="list-style-type: none"> Information distributed to growers on new variety options
	6. Prepare a whole-of-supply-chain handling, storage and display/merchandising manual for nashi fruit	<ul style="list-style-type: none"> Merchandising manual developed and adopted by key supply chain stakeholders Improved knowledge of merchandising requirements by supply chain stakeholders
	7. Investigate the opportunity to align with the apple and pear biosecurity plan renewal in 2022	<ul style="list-style-type: none"> Development of an industry biosecurity plan, possibly in combination with the apple and pear industry
Demand creation		
Outcome 2: Demand creation supports the Australian nashi industry to develop existing and future domestic markets.	1. Increase domestic consumer demand for fresh, quality Australian nashi through aligning consumer knowledge, attitudes and purchase intent	<ul style="list-style-type: none"> Positive influence on consumer preference Viability of organic nashi is determined
	2. Review previous reports completed on value-added products (e.g., spirits, chips) and prioritise potential opportunities	<ul style="list-style-type: none"> Number of viable new products identified and scoped



OUTCOME	STRATEGIES	KPIs
Extension and capability		
Outcome 3: Improved capability and an innovative culture in the Australian nashi industry maximises investments in productivity and demand.	1. Deliver communication and extension capability to create positive change in the areas of productivity	<ul style="list-style-type: none"> Establishment of a baseline and then increased share of the industry with positive change in KASA, and practice and implementation concerning targeted high priority areas
Business insights		
Outcome 4: The Australian nashi industry is more profitable through informed decision-making using consumer knowledge and tracking, and benchmarking.	1. Benchmark within and across enterprises to better understand cost of production using data to measure and track industry productivity and profitability, and identifying areas for ongoing priority	<ul style="list-style-type: none"> Data available to support extension activities and individual grower decision-making Evidence of data used to support industry-level decision-making and grower practice change
	2. Increase industry alignment with quality and brand-positioning opportunities driven by consumer insights*	<ul style="list-style-type: none"> Delivery of consumer insights strategy Evidence that consumer insights inform strategic market engagement

* 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.

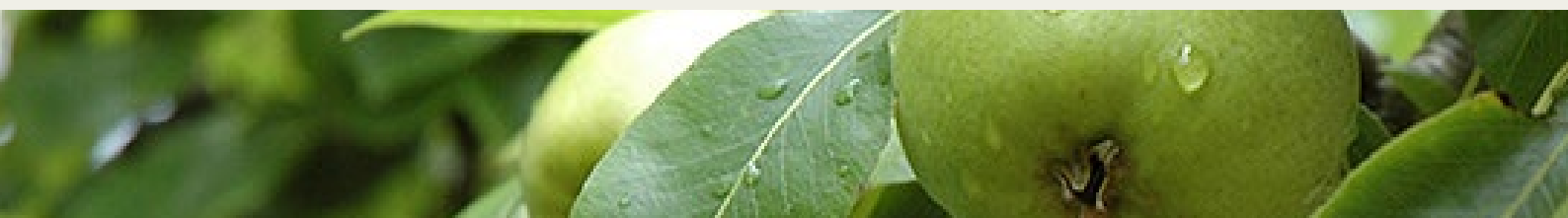
Reporting framework

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 nashi 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 RD&E, marketing and international trade, Hort Innovation aims to support more effective and efficient outcomes for growers and the wider horticulture sector. Where cross-sectoral priorities are identified Hort Innovation will seek to work with other Research and Development Corporations (RDCs) and cross-RDC initiatives such as the Plant Biosecurity Research Initiative. 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 for the nashi industry include:

- Advanced production systems
- Developing an industry biosecurity plan with the apple and pear industry.

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 for demand driving outcomes across the lifespan of the nashi SIP 2022-2026 include:

- All-of-horticulture consumer marketing campaigns designed to drive awareness, consideration, and purchase behaviour change
- 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.

These opportunities particularly relate to the outcome areas of demand creation, extension and capability, and business insights.

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.

Priorities and opportunities identified within the strategic plans of national and state agencies and research organisations, including the Australian Nashi Growers Association, and these have been considered in the development of the nashi SIP where applicable.

TABLE 2. Government and key agency priorities

Australian Nashi Growers Association priorities	Rural RD&E for Profit priorities	Australian Government Science and Research priorities
Build better businesses	Advanced technology	Food
Increase consumption by promotion of fruit attributes	Biosecurity	Soil and water
	Soil, water and managing natural resources	Advanced manufacturing
	Adoption of R&D	Environmental change
		Health

This SIP has been developed alongside the government and key agency priorities listed in **Table 2**, with consideration of issues faced by the nashi 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 nashi 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 nashi 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 invest in specific impact areas to drive innovation and sustainability initiatives.

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

- Advanced production systems
- Health, nutrition and food safety
- International markets
- Leadership.

Partnering with Hort Frontiers on these areas would provide the nashi industry with opportunities for access to world-class research, specialised project management teams and large-scale R&D. Individual investment themes will be agile and responsive to industry transformational priorities.

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 an example of a nashi SIP strategy that illustrates how the industry is already aligning to the framework.

TABLE 3. A nashi SIP strategy example showing how the industry is already aligning to the Australian-grown Horticulture Sustainability Framework

STRATEGY	IMPACT	SUSTAINABILITY GOAL
Identify better and more sustainable packaging and storage options	<ul style="list-style-type: none">• More sustainable packaging• Cheaper packaging• Higher-quality fruit	Less waste



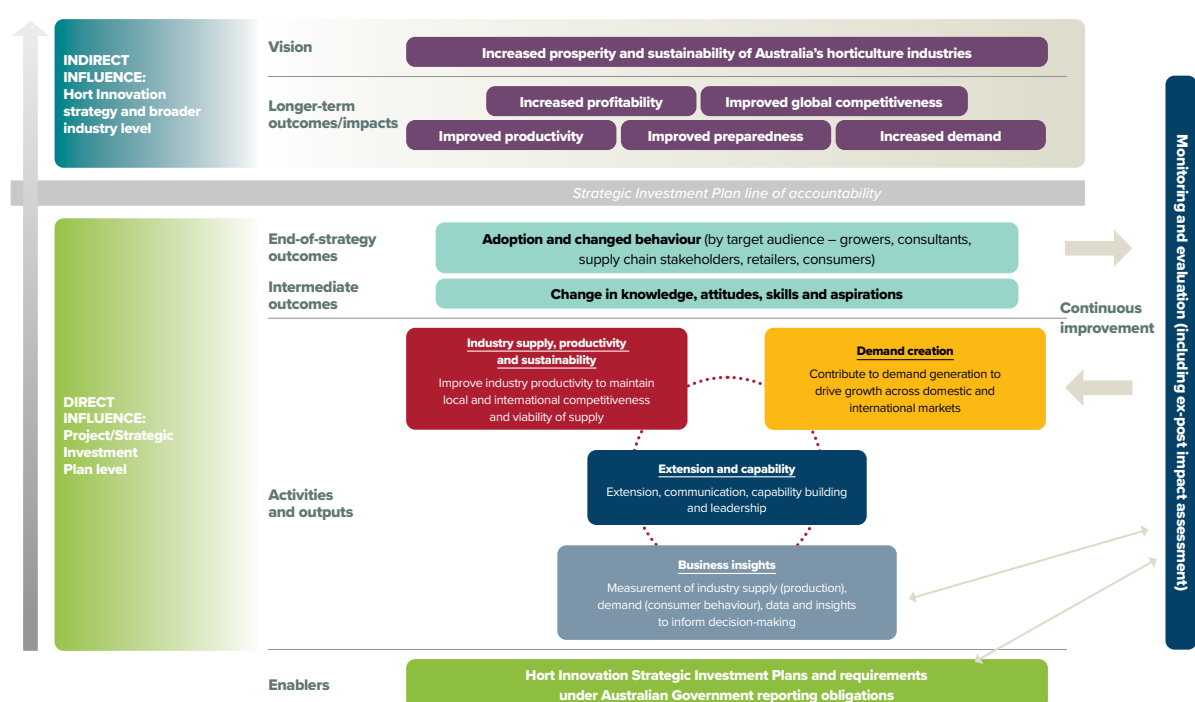
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Strategic Investment Plan logic

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 an 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

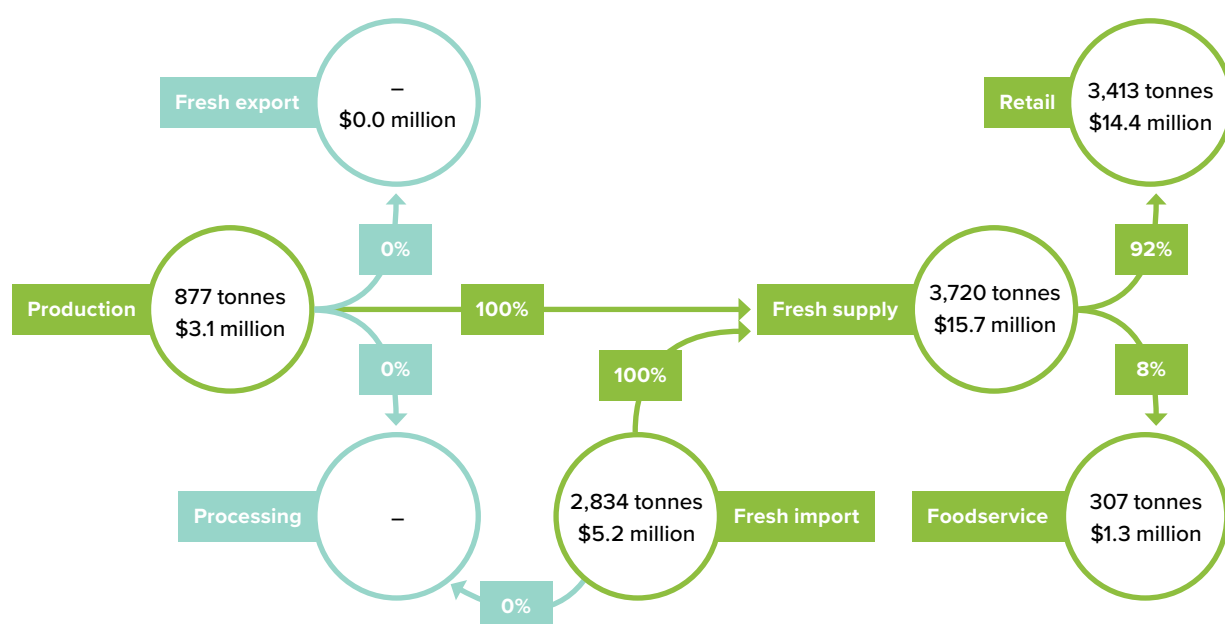


APPENDIX 1: Industry context

Nashi industry overview

Nashi is native to northern Asia and is one of two types of pears (the other being the European pear that is more familiar in Australia). It is sometimes referred to as Asian pear, Japanese pear, apple pear or Oriental pear.

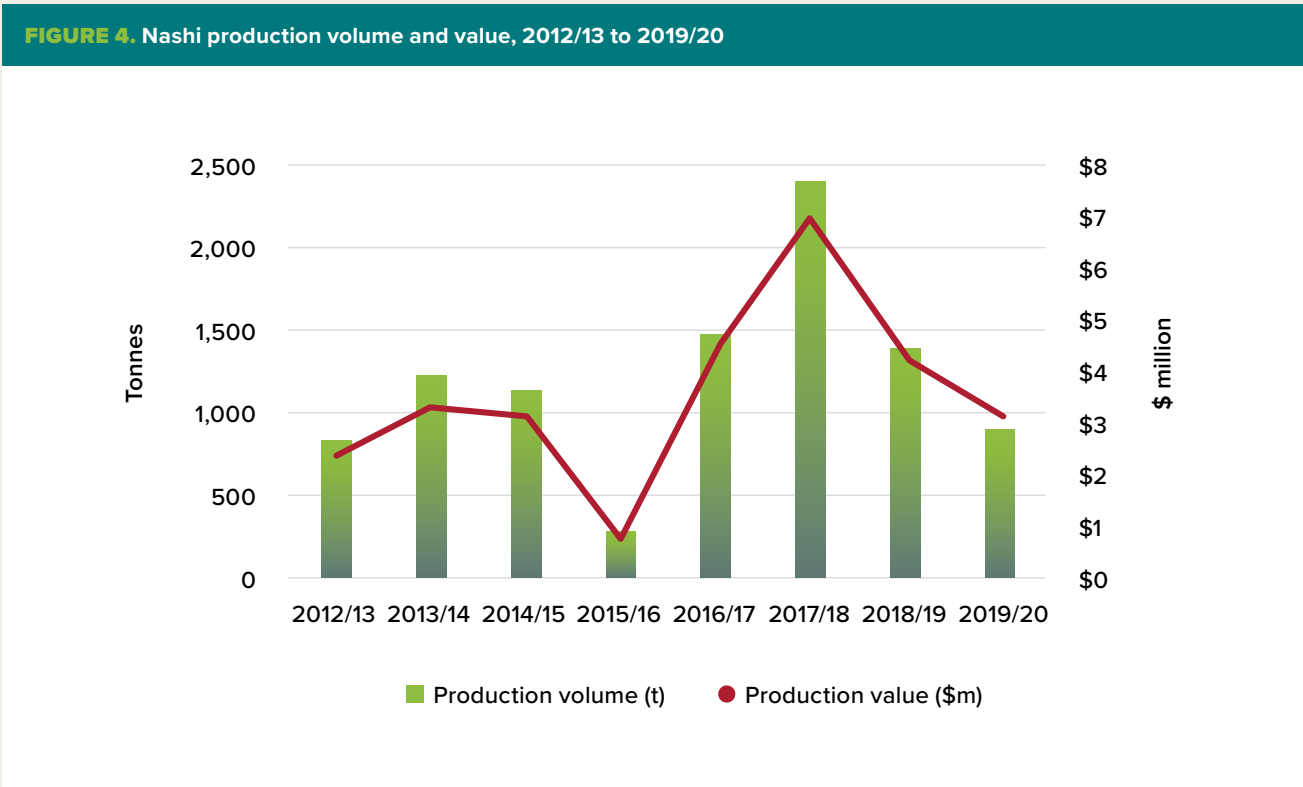
FIGURE 3. Nashi supply chain, 2019/20



Source: Australian Horticulture Statistics Handbook (2019/20)

Figure 3 shows that all nashi production in Australia is sent to the fresh domestic market, with none exported or processed. A small amount is sent to the foodservice sector (8%), which is around the average for all fruit. Domestic production is lower than imports, which makes up 76% of fresh supply.





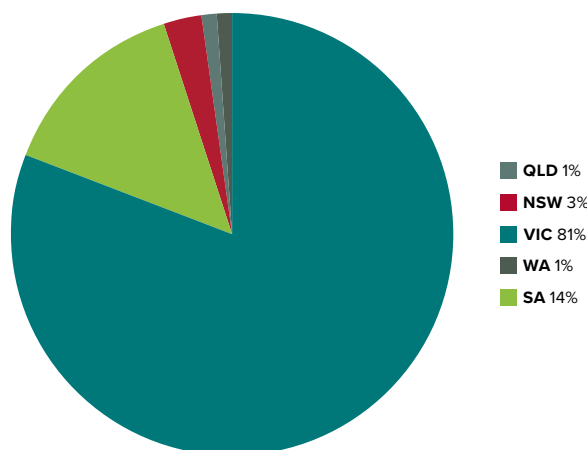
Source: Australian Horticulture Statistics Handbook (2021)

As shown in **Figure 3**, production volume has fluctuated over the past eight years, with a low of 263 tonnes in 2015/16 and a high of 2,370 tonnes in 2017/18. Value has fluctuated in line with production volume, showing minimal movement in prices.

As for pears generally, Australian nashi production is heavily concentrated in Victoria, with 90% of this being grown in the Goulburn Valley area. (Note: the statistics have not captured output from Tasmania, where there are small areas of production.) There are about 20 commercial growers nationally, including one major producer¹.

1 Australian Nashi Growers Association, www.nashiaustralia.com.au/growers.html



FIGURE 5. Share of nashi production by state, 2018

Source: Australian Horticulture Statistics Handbook (2019/20)

The major cultivar of nashi in Australia is Nijisseiki, which is the most popular variety worldwide², although a lesser one by production volume (8%) in Japan³. Numerous other varieties have been released in Australia at various times since 1980⁴.

Reliable statistics on global production of nashis are not available, although China is the dominant global producer. In 2002, China's production of 'Asian pear' was reported to be around 7.25 million tonnes from 0.94 million hectares of orchard, making it third in importance after apples and oranges⁵. Japan produced 247,300 tonnes of 'Japanese pear' in 2015, 6.8% of its total fruit crop⁶. Chinese varieties such as Tsu Li and Ya Li differ in appearance from Japanese and Korean varieties in that they have a distinct 'neck'. The Japanese and Korean varieties are typically round, more like the shape of an apple.

All Australian nashi is sold into the domestic market for fresh consumption. 8% of Australian households purchased fresh nashi in 2019/20, buying an average of 443 grams per shopping trip⁷.

2 Pennsylvania State University, <https://extension.psu.edu/asian-pears-in-the-home-orchard-variety-selection>

3 Saito, T 2016, 'Advances in Japanese pear breeding in Japan', Breeding Science 66(1): 46-59

4 New South Wales Department of Primary Industries, www.dpi.nsw.gov.au/agriculture/horticulture/pomes/other/nashi

5 Jun, W and Hongsheng, G 2002, 'The production of Asian pears in China', Acta Horticulturae, 587: 71-80, www.ishs.org/ishs-article/587_4

6 United States Department of Agriculture, 2018, 'Global Agricultural Information Network report'

7 Horticulture Innovation Australia Limited, 2020, 'Australian Horticulture Statistics Handbook 2020/21'



APPENDIX 2: Nashi industry situation analysis

At the time of refreshing the SIP 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 4 has been used to analyse the nashi industry's strengths, weaknesses, opportunities, and threats (SWOT). The SWOT tool assists the industry to build on what works, observe what is lacking, minimise risks, and take the greatest possible advantage of chances for success.

TABLE 4. Nashi SWOT analysis

The nashi industry	
Strengths	<ul style="list-style-type: none"> • Active industry association • Synergies with the pear industry • Nashi varieties are excellent pollinators of European pears • One major company 'holds the price' • One major company holds good production and financial data • A very good quality product • Product takes on other flavours readily • Not in oversupply • Significant corpus of R&D levy funds and levy in place (currently zero-rated) • Core group of committed growers (although decreasing)
Weaknesses	<ul style="list-style-type: none"> • Not enough data/transparency • High labour costs (thinning, harvesting, packing) • Product is 'boring' compared to other 'unusual fruits' (e.g., black apple) • Lack of consumer awareness/understanding • Lack of access to certain markets (nashi treated differently to pears for sanitary and phytosanitary purposes) • Inferior performance in the perception of retailers • Inferior performance of retailers in marketing the product • Lack of value-add opportunities (e.g., juice) • Lack of critical mass may hinder ability to take advantage of opportunities • Product is easily damaged and needs a protective sock (sustainability issue)

The nashi industry	
Opportunities	<ul style="list-style-type: none"> • Technology, including automation • Benchmarking • Organics • New export markets • International linkages (in everything – such as R&D and marketing) • Linkages with other industries • In-store merchandising/training • New/better varieties, especially to increase resilience • More efficient thinning – identified by the nashi R&D community internationally • Better packaging, especially for sustainability • Better storage • Addressing of fruit darkening • New products (e.g., juice) and varieties • Different distribution channels • Best practice review and packages in production and packing • Market research
Threats	<ul style="list-style-type: none"> • Increasing competition from other ‘unusual’ fruits (e.g., black apple) • Imports – especially from China • Consumer negativity/lack of knowledge • Environment/water • Losing competitiveness for shelf space • Losing critical mass • Biosecurity breaches, disease – mite (endemic), nashi black spot (exotic), fruit fly • MRL breaches • Fruit fly management strategies • Climate change • Bureaucracy

In summary:

- Nashi is an excellent product, and the industry comprises a committed group of growers
- Nashi has been a profitable crop, but margins have declined through static prices and rising input costs
- Declining profitability is affecting confidence to invest
- The nashi is a delicate fruit, requiring very careful handling and transport to avoid damage, which creates cost and a sustainability threat because of the ‘sock’ used to protect it
- Costs, especially of thinning, harvesting and packing are very high – automation is seen as a high priority
- There is a risk that retailers will discontinue stocking nashi because, although it is unique, there is an increasing number of other unusual fruits, and nashi is difficult to handle, and consumers have low awareness of it
- Imports from lower cost countries (especially China) are also a risk, as are climate change, loss of access to chemicals and biosecurity breaches
- Ensuring the consistent high quality of Australian product is a priority.

APPENDIX 3: People consulted

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

NAME	INDUSTRY ROLE	REGION
Richard Bennett	Nashi SIAP; Food Safety Consultant	Victoria
Cameron Carter	Nashi SIAP; PIB; Exporter	Victoria/New South Wales
Michael Crisera	Nashi SIAP; Fruit Growers Victoria	Victoria
Diana Fogliani	Grower and packer	Western Australia
Terry Fogliani	Grower	Western Australia
Mark Hall	Grower	Victoria
David Hunt-Sharman	Nashi SIAP; Grower	Victoria
John Magarey	Nashi SIAP; Grower	South Australia
Shannan Mehmet	Grower	Victoria
Mark Novotny	Isolcell DCA storage installer/sales	Victoria
Steven Singh	Nashi SIAP; Grower	Victoria/New South Wales
Etienne Theart	Grower and packer	Victoria
Shane Ahmet	Grower	Victoria
Josefine Pettersson	Australian Organic Limited	Queensland

APPENDIX 4: Reference material

Footnotes

1. Australian Nashi Growers Association, www.nashiaustralia.com.au/growers.html
2. Pennsylvania State University, <https://extension.psu.edu/asian-pears-in-the-home-orchard-variety-selection>
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6. United States Department of Agriculture, 2018, 'Global Agricultural Information Network report'
7. Horticulture Innovation Australia Limited, 2020, Australian Horticulture Statistics Handbook 2020/21

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Horticulture Innovation Australia Limited, 2020, Australian Horticulture Statistics Handbook 2019/20

Horticulture Innovation Australia Limited, 2021, Australian-grown Horticulture Sustainability Framework

APPENDIX 5: List of acronyms

AIP	Annual Investment Plan
APVMA	Australian Pesticides and Veterinary Medicines Authority
BMP	best management practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFQ	Department of Agriculture and Fisheries, Queensland
FY	financial year
IRB	Industry Representative Body
KASA	knowledge, attitudes, skills and aspirations
KPI	key performance indicator
MOU	Memorandum of Understanding
M&E	monitoring and evaluation
MRL	Maximum Residue Limit
NHRN	National Horticulture Research Network
R&D	research and development
RDC	Research and Development Corporation
RD&E	research, development and extension
SARP	Strategic Agrichemical Review Process
SIAP	Strategic Investment Advisory Panel
SIP	Strategic Investment Plan
SWOT	strengths, weaknesses, opportunities, and threats



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