# Custard apple

## STRATEGIC INVESTMENT PLAN

2017-2021

Hort Innovation
Strategic levy investment

CUSTARD APPLE FUND

# Content




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# Introduction

**This Strategic Investment Plan (SIP) is the roadmap that helps guide Hort Innovation's oversight and management of individual levy industry investment programs. The SIP lays the foundation for decision making in levy investments and represents the balanced interest of the particular industry from which the levy is collected. The very important function of the SIP is to make sure that levy investment decisions align with industry priorities.**

Hort Innovation is the not-for-profit, grower-owned research and development (R&D) and marketing company for Australia's $9 billion horticulture Industry.

As part of the role Hort Innovation plays as the industry services body for Australian horticulture, the organisation is tasked by the Australian Government with working alongside industry to produce a strategic plan for investment of levies in industry R&D and marketing activities.

Each individual levy industry investment strategy also speaks to the future growth and sustainability of the Australian horticulture industry as a whole. The SIPs are produced under the umbrella of the Hort Innovation Strategic Plan, which takes a whole-of-industry view in setting its direction, as it considers broader agriculture government priorities for the advancement of Australian horticulture.

The process of preparing this SIP was managed by Hort Innovation and facilitated in partnership with Industry Representative Bodies and Strategic Investment Advisory Panels (SIAPs). Independent consultants were engaged to run the consultation process, to gather the advice from stakeholders impartially and produce a plan against which each levy paying industry can be confident of its strategic intent.

Hort Innovation has valued the support, advice, time and commitment of all stakeholders that contributed to producing the SIPs, especially custard apple growers.

## The custard apple SIP

Producers in the custard apple industry pay levies to the Department of Agriculture and Water Resources (DAWR), who 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 is payable on custard apples produced in Australia where the producer either sells the product or uses it in the production of other goods.

For packaged custard apples, the levy rate is 40 cents per tray/box and for bulk custard apples, the levy rate is $50 per tonne. Hort Innovation manages the custard apple levy funds directed to R&D and marketing investments. In 2015/16, total custard apple levy receipts were approximately $85,000 being $57,000 in R&D levies and $28,000 in marketing levies.

Hort Innovation has developed this SIP to assist in strategically investing the collected custard apple levy funds in the priority areas identified and agreed by the industry. The ability to deliver on all the articulated strategies (and investments) in an impactful manner will be determined by the ability of the statutory levy to provide the resources to do so.

This plan represents the Australian custard apple industry's collective view of its R&D and marketing needs over the next five years (2017 to 2021). This plan has been developed in consultation with Australian custard apple levy payers through a synthesis of direct consultation, workshops with Hort Innovation's custard apple SIAP, and widespread industry consultation. This consultation was used to prepare a draft SIP that was then validated through further consultation with industry through existing communication channels.

The custard apple SIAP has responsibility for providing strategic investment advice to Hort Innovation. Both Hort Innovation and the panel will be guided by the strategic investment priorities identified within this plan. For more information on the custard apple SIAP constituency please visit Hort Innovation's website at www.horticulture.com.au.

***Appendix 1*** includes individual stakeholders consulted in the preparation of this SIP.

# Custard apple

## STRATEGIC INVESTMENT PLAN 2017-2021 AT A GLANCE

### POTENTIAL IMPACT OF THIS PLAN

**$5 Million**

Based on an estimated investment of $577,000 over the next five years.

| OUTCOMES | STRATEGIES |
|---|---|
| Measurable growth achieved in domestic consumption and improved consumer satisfaction | Develop consumer education programs |
| | Increase on-farm knowledge and skills |
| | Improved quality and consistency |
| | Educate retailers on best-practice |
| Measurable growth in production volumes, improved production efficiency, and product consistency leading to increased grower profitability | New rootstocks and varieties |
| | Increase knowledge and adoption of best practice |
| | Improve irrigation, nutritional and environmental management |

### Major opportunities

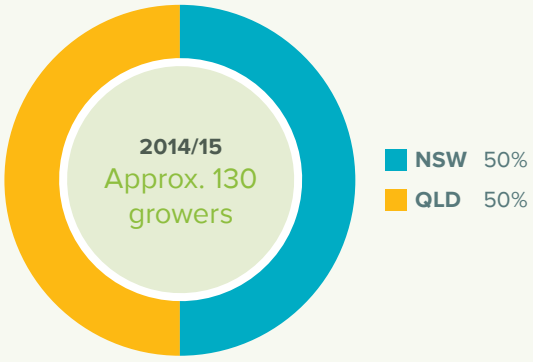
- Improve access to growing Asian markets
- Ability to improve market share/consumption
- Reduce waste through prior use of second grade fruit for value-added products
- Capitalise on low competition in winter months
- Improvements to efficiency and encourage new growers.

### Major challenges

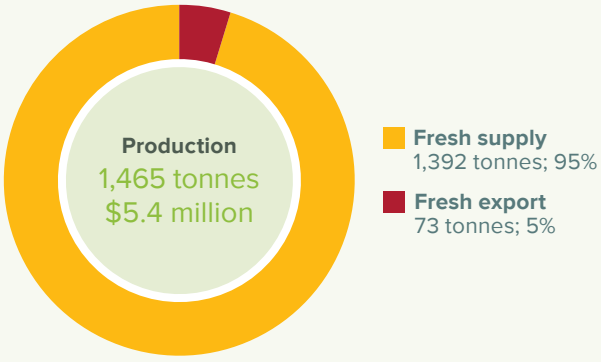
- Loss of chemical access
- Ageing trees
- Lack of reliable, comprehensive statistics
- Low production per hectare
- High production costs
- Increasing pressure on access to water
- Lack of new growers entering the market
- Lack of organisation may lead to loss of market share
- Exotic pests and diseases introduced into Australia.

| OUTCOMES | STRATEGIES |
|---|---|
| Informed business decision making through access to baseline data and extension material | Encourage collaboration with similar industries |
| | Deliver extension activities |
| | Gather and maintain reliable statistics |

### Industry size and production distribution




### Custard apple supply chain and value 2014/15



SECTION ONE

# Context

## The Australian custard apple industry

### Location and extent of production

Custard apples are predominantly produced in Queensland and on the Northern New South Wales coast. Market throughput data indicates production is increasing due to the maturing of plantings of KJ Pinks.

Pinks Mammoth custard apples were first grown in the Redland Bay area of Queensland in the late 1880s. African Pride custard apples were introduced into the Bundaberg region from East Africa in the 1950s. The industry was seen as a cottage type industry until in the late 1970s to early 1980s when there were large plantings of African Pride in Northern New South Wales and Central Queensland. The industry grew steadily and tree numbers peaked in the mid 1990s. There were about 450 growers at this time. Many of these were very small growers with only up to 100 trees. Many were also growing other crops and custard apples were a secondary crop.

In the 1980s, a small group of growers in New South Wales attempted developing a cherimoya industry. Fino de Jete and El Bumpo were the main varieties planted. Unfortunately, at about 10 years of age, the trees developed an uncontrollable anthracnose and died.

The majority of custard apple growers are in the 46 to 55 age range, followed by the 56 and over age range. Some new younger growers have entered the industry and some have taken over family farms.

**Custard apples are predominantly produced in Queensland and on the Northern New South Wales coast.**

### Products marketed

Varieties of custard apples grown in Australia include Pinks Mammoth (Hilary White, KJ Pinks) and African Pride. Of the total custard apple production, African Pride and Pinks Mammoth make up approximately 50 per cent each. Since the release of new varieties by the former Queensland Department of Employment, Economic Development and Innovation (DEEDI) in 2000, there have been small plantings of Maroochy Gold. There have been significant plantings of KJ Pinks, a self-pollinating sport of Pinks Mammoth, controlled by the Australian Nurserymen's Fruit Improvement Company (ANFIC).

Increased plantings of KJ Pinks have resulted in increased volumes of Pinks Mammoth on the market. While appropriate growing strategies are still being developed and implemented (restricting fruit numbers per tree), it is anticipated that there will be increased volumes of smaller Pinks Mammoth on the domestic market.

An ongoing breeding program hopes to produce better varieties with self-pollinating characteristics, disease resistance, smooth skin, sweet and large fruit, blemish resistance and longer shelf life.

Products marketed are whole fresh fruit only. Currently there is no large scale commercial processing of custard apples, although there are small volumes of processed custard apple marketed locally in Central Queensland.

Two major marketing groups exist for custard apples – The National Jadefruit Custard Apple Marketing Association Inc (J-CAM) and The Avocado Marketing Co-op (AMCL), more commonly known as Sunfresh. Both are discussed in detail later in this plan.

**Table 1: Number of trays per market and production volume of custard apples 2008 to 2014**

*(Source: Extrapolated from Levies Revenue Service levy collection figures and industry data)*

| Market | 2008 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| Sydney | 150,115 | 126,341 | 71,202 | 64,658 | 85,174 | 101,632 |
| Melbourne | 49,907 | 42,003 | 23,672 | 30,396 | 41,379 | 51,705 |
| Brisbane | 61,264 | 51,562 | 29,058 | 31,207 | 18,960 | 33,956 |
| Adelaide | 4,230 | 3,560 | 2,006 | 4,042 | Inc. In Vic. | 4,155 |
| Perth | 4,427 | 3,726 | 2,100 | 13,625 | 7940 | 9,798 |
| **Total trays** | **203,374** | **227,192** | **128,038** | **143,928** | **153,453** | **201,246** |
| **Total tonnes** | **1,423** | **1,590** | **896** | **1007** | **1074** | **1408** |

## Domestic markets

As custard apples were first planted in Queensland, the fruit was sold mainly on the Brisbane market or locally where it was grown. With the increase in Asian immigration during and after the 1970s, the demand in other cities has increased.

Production has increased since 2012. ***Table 1*** shows the change in production and market distribution based on Levy Revenue Service (LRS) levy collection figures and industry data. In the 2014 season, Sydney received 50 per cent of the fruit, Melbourne 25 per cent, Brisbane 17 per cent and Perth and Adelaide received seven per cent. The removal of the Interstate Certification Assurance (ICA) requirement to enter Victoria has increased demand in Melbourne. Brisbane's reduction is due to poorer returns for growers through this market.

The *Australian Horticulture Statistics Handbook 2014/15* states that the production volume of custard apples was 1,465 tonnes for the year ending June 2015.

Production increase in the last four years is due to young trees coming into production and more favourable weather conditions ***(Table 1)***.

In the Melbourne market, demand has strengthened and prices slowly increased over the last four years. Pinks Mammoth are preferred and African Pride returns good prices when the Pinks Mammoth supply is finished.

In the Sydney market, Pinks are definitely preferred and African Prides only return good prices at the end of the season when Pinks supply is very low. In the Brisbane market, demand and supply have slowly decreased over the last four years. Pinks Mammoth are the preferred variety and prices for African Pride are quite low when Pinks are available. However, as soon as Pinks are not available, the demand increases for African Pride and prices rise substantially. Some fruit is sold on roadside stalls and in local farmers markets, although many of this fruit is classified as third grade and would return very little at the wholesale market. Some fruit would be sold directly to local fruit shops but the vast majority is sold through the main wholesale markets. Little if any is sold directly to the chain stores.

While the volume of fruit sold to chain stores is minimal in comparison to wholesale markets, this has increased over the last few years. Chain stores have difficulty differentiating between Pinks Mammoth and African Pride, and make purchase decisions based on the lower price that they are prepared to pay. The outcome is that fruit that is available in chain stores is typically African Pride – the variety that is preferred less by consumers is offered more frequently to them.

Wholesaler/retailer market research conducted a few years ago revealed only about 20 per cent of custard apple product was sold through supermarkets. 80 per cent was sold through fruit barns and small fruit shops.

- Custard apple fruit has a low profile at retail level – consumers prefer Pinks, however, African Pride is usually supplied
- Storage and handling problems are prevalent in domestic supply chains resulting in poor quality fruit available at retail outlets
- Prices fluctuate throughout the season and from market to market.

## Export markets

Quantities exported by J-CAM are lower than five years ago, but prices are higher. Over the last two years the gap between export and domestic prices has increased. This can be attributed to the expansion of direct export customers, as well as third party exporters. African Pride is no longer exported by J-CAM although it was in the past. This is a result of insufficient order sizes, irregularity of orders and the prices paid were only marginally above domestic market prices. Pinks and African Pride are both bought off the market floor in small quantities and exported by third parties.

The main export market is Singapore, which is considered fairly saturated. Newly developed export markets include Malaysia with Hong Kong starting to take regular small consignments of fruit. Small volumes of export have also started in the United Arab Emirates.

Other potential countries for export have quarantine restrictions due to Queensland Fruit Fly (Qfly). Market access into the United States, New Zealand and Taiwan using irradiation has been instigated. Trials have been conducted using irradiation through a nuclear facility with little success. Quarantine restrictions could potentially be overcome through the use of microwave irradiation, however at this stage there is no such facility available in South-East Queensland. Until such a facility is available, and trials conducted, irradiation is not considered a viable method. Therefore, market access applications are at a standstill until further research can be conducted.

The *Australian Horticulture Statistics Handbook 2014/15* states that exports for the year ending June 2015 were 73 tonnes, with a value of $0.3 million.

## Consumers and consumer research

Consumer research conducted in the 1990s found:

"Awareness and knowledge of custard apple is low in many parts of Australia. A quarter of people outside Queensland do not recognise the fruit and 37.5 per cent have never tasted it."

Key findings from this 1990s consumer survey were:

- Generally, consumers have poor knowledge of how to buy, ripen and prepare custard apples. The exception is consumers with an Asian background who "ripen them in the rice"
- Consumers cannot identify different varieties but there is a general preference for Pinks Mammoth
- There is significantly higher consumption among the Australian Asian population and older demographic
- The majority of consumers see the fruit as an occasional purchase and 62 per cent consume no more than once a month
- It is consumed as a fresh fruit and in used as a recipe ingredient across a broad range of times and occasions
- It is considered a high risk, impulse purchase.

In 2014/15, five per cent of Australian households purchased fresh custard apples at an average of 301 grams per shopping trip. The consumption per capita was 59 grams based on the volume supplied (*Australian Horticulture Statistics Handbook 2014/15*).

## Consumer benefits

Custard apple is predominantly a 'cold season' fruit that is available from March to October, peaking from April to August.

- Custard apples provide variety from common fruits on offer during the colder months
- It is a soft fruit with an intensely sweet flavour
- It is easy to digest, has low GI, contains plenty of vitamin C and has low acidity
- It is different to the usual winter fruits.

**Awareness and knowledge of custard apple is low in many parts of Australia. A quarter of people outside Queensland do not recognise the fruit and 37.5 per cent have never tasted it.**

## Competitors and the nature of competition

### International custard apple producers

Taiwan is the largest producer of custard apples, producing about 5,000 tonnes per year. About 50 per cent of these are sugar apples and 50 per cent are atemoyas. Almost 100 per cent of the crop is sold in Taiwan and the supply is counter-seasonal to Australia. Taiwanese crop increase would result in potential export markets of China and South-East Asia. Taiwanese production is believed to be stable at present.

- Spain, Brazil and Chile produce cherimoyas with Spain exporting to Europe
- A small quantity of atemoyas is produced in Chile and Brazil with the Brazil industry expanding
- Chile exports to the United States and Japan, but the industry is believed to be contracting
- The cherimoya industry in New Zealand is almost extinct
- An atemoya industry exists in southern China. It is unknown if there is any commercial production Southern Africa.

### Alternative products

Competitors include other winter tropical and exotic fruits, as well as sweets and desserts. These include early and late season mango, early season summerfruit, papaya, mangosteen, persimmon, durian, ice cream, yoghurt and more.

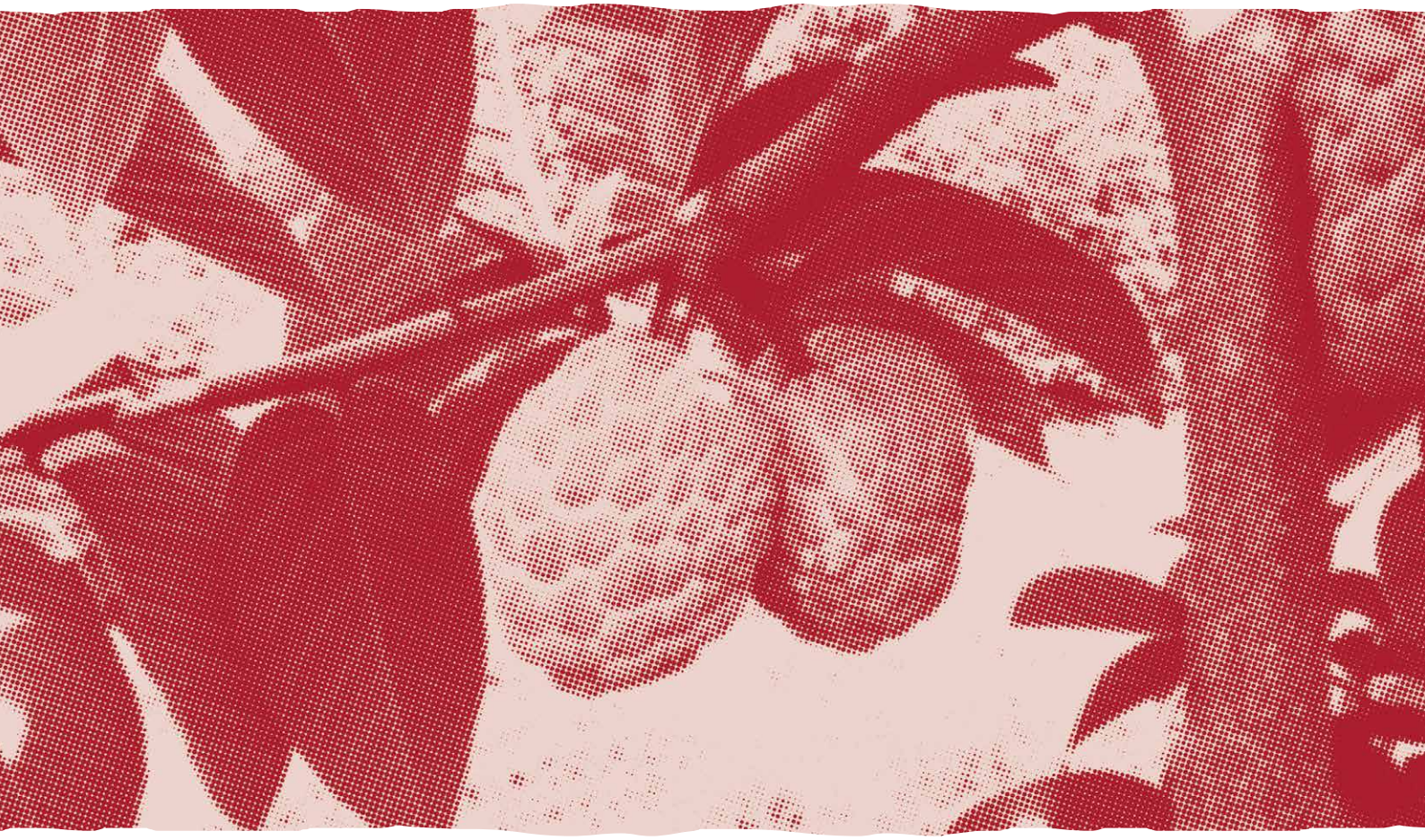
### Barriers to consumption

Custard apples are considered a high-risk purchase by consumers as they take a degree of commitment to prepare.

- Being an exotic fruit, they make a change from what is considered 'boring' fruit on offer during the colder months
- When not handled correctly at retail level the fruit is troubled by issues of skin blackening and short shelf life
- The fruit is often not available in chain stores and 'run-of-the-mill' fruit and vegetable shops
- Consumers are not sure of when the fruit is ready to eat, and how to prepare and serve.

### Ease of entry

Entry into the industry is relatively easy. However, planting material is in limited supply due to lack of rootstock. Capital infrastructure required is low compared with other industries. However, more growers are trellising their KJ Pinks and this adds considerably to infrastructure costs.



## Operating systems

### Production systems and processes

Custard apple production is highly labour intensive. Minimal mechanisation is possible due to the delicate nature of the product. Consequently, production units are relatively small and intensive.

The recent development of the KJ Pinks variety is expected to result in a significant improvement in production efficiency.

An R&D project funded by Horticulture Australia Limited (HAL) during 2005 to 2010 compared various tree training methods. This project was very successful resulting in both new and existing growers moving to high density plantings using both hedgerow and trellis systems.

### Marketing systems and structures

Custard apple producers are price takers. The industry is dominated by smaller growers who pack their own fruit and market them through wholesalers.

Two major marketing groups exist and are outlined below briefly.

**The National Jadefruit Custard Apple Marketing Association Inc (J-CAM)**

J-CAM formed in 1999 and is an umbrella group for the Sunshine Coast (SSC) J-CAM Association Inc and NSW J-CAM Association Inc.

The SSC J-CAM has members from Central Queensland and the Sunshine Coast. The group deals primarily in Pinks Mammoth. Growers pack their produce in J-CAM branded cartons under specific quality assurance (QA) requirements. The domestic brand is named “Sweet Nature” and the export brand is named “Jadefruit”. Both of these brands are trademarked.

The services of an independent auditor have been maintained to ensure that strict quality assurance standards are maintained.

The New South Wales J-CAM has members from the Alstonville/Lismore region of Northern New South Wales. They have their own marketing co-ordinator who concentrates on the domestic market. The group deals in African Pride and Pink Mammoth varieties.

**The Avocado Marketing Co-op (AMCL)**

AMCL is based on the Sunshine Coast and has a custard apple marketing section under the brand “Sunfresh”. They pack their own fruit to a set standard and have a marketing co-ordinator that directs where the fruit is sent. They export Pinks Mammoth.

### Promotion and market development

Prior to the implementation of the marketing levy in 2002, the only custard apple promotional activity was conducted by the New South Wales custard apple group of the Exotic Fruit Growers Association. A voluntary levy from New South Wales growers funded supermarket taste tests and merchandising programs for about six years from 1988 to 1994.

When HAL was formed, it became economically viable for small industries to run marketing programs. A custard apple marketing levy of 20 cents a carton was implemented in 2002 and a marketing program commenced in 2002 consisting of consumer point of sale marketing material, public relations and retail development programs.

HAL, and now Hort Innovation, have managed the marketing programs that have been funded by the custard apple national marketing levy. The custard apple levy was adjusted in 2004 so that more funds went to R&D and less to marketing to fund the retail development program. A public relations program has had excellent results. An ‘influencer program’ has had positive feedback but the long-term benefits of the program are in question.

The amount of levy funds collected for marketing limits the scope of promotion activity. Liaison and collaboration with similar sized industries may be an important consideration in the future.

**Custard apple production is highly labour intensive. Minimal mechanisation is possible due to the delicate nature of the product.**

## Operating environment

An analysis of the industry's strengths, weaknesses, opportunities and threats (SWOT) was undertaken by the custard apple industry through the roadshows and the SIAP.

| The custard apple industry | | |
|---|---|---|
| **Strengths** | • Sweet, unique, tasty product<br>• Niche product<br>• Limited competition in the cooler months<br>• Unusual appearance<br>• Healthy product – high vitamin C and low GI<br>• Low acid | • Soft fruit – suitable for babies and the elderly<br>• Small unified industry<br>• Good cohesive industry organisation<br>• New high-yielding, precocious variety (KJ Pinks) |
| **Weaknesses** | • Price takers<br>• Lack of value adding/processing<br>• Impulse purchase<br>• Short shelf life<br>• Difficulty handling/sensitive product<br>• Lack of consumer knowledge handling/using<br>• Limited access to export markets<br>• Lack of volume to service export markets | • Lack of adherence to quality assurance standards<br>• Lack of awareness of product<br>• African Pride – market acceptance problems<br>• Low production per hectare<br>• High production costs<br>• Lack of mechanical grading<br>• Poor disinfestations treatments<br>• Lack of funds to address industry issues |
| **Opportunities** | • New varieties – seedless/colour<br>• Market access – domestic and export<br>• Value adding/processing<br>• New packaging/products<br>• Room to increase market share/consumption<br>• Expand production<br>• Better rootstocks<br>• Removal of second grade product through value adding | • New varieties and training systems<br>• To improve efficiency<br>• To encourage new growers<br>• Increasing older demographic with time and dollars<br>• Capitalise on market window in the cooler months<br>• Get the consumer-preferred variety (Pinks Mammoth) into supermarkets |
| **Threats** | • South African KJ Pink production<br>• Consumer/market turn-off from poor quality fruit<br>• Flooded domestic market if export not developed<br>• Cost of regulation/red tape<br>• Exotic pests and diseases<br>• Ageing growers leaving the industry<br>• Overproduction due to downturns in other industries<br>• Ageing trees<br>• Increasing costs/lower profit margins | • Decreased production leading to decreased levies and R&D<br>• Loss of chemicals<br>• Lack of access to new chemicals<br>• Increased public resistance to new chemicals<br>• Traditional markets eroded by more organised industries<br>• Pest and disease resistance<br>• Bad publicity<br>• Water restrictions<br>• Climate change<br>• Industry disunity |

SECTION TWO

# 2

# Custard apple industry outcomes

## Industry outcomes

The strategic intent of the custard apple industry is to provide consumers with a unique product, utilising innovative production systems thereby maximising grower profitability and sustainable industry expansion.

**OUTCOME 1**

**Measurable growth achieved in domestic consumption and improved consumer satisfaction through marketing initiatives**

Growth in overall consumption of custard apples will underpin the success and ensure longevity of the market for growers. To ensure this growth in consumption the industry will need to focus its resources into both demand and supply. Achievable growth will see 10 per cent of households purchasing a fresh custard apple each year. Furthermore, retailer engagement will be required to provide a superior and consistent product to a growing consumer base through best-practice in-store product handling.

**OUTCOME 2**

**Measurable growth in production volumes and improved production efficiency and product consistency**

To achieve this outcome the industry needs to ensure industry-wide consistent supply chain practices. This includes rootstock management, on-farm and postharvest practices. Achievable growth will see production levels around 1,800 tonnes in five years' time. Improving the consistency of product coming off-farm will also contribute to improved consumer satisfaction.

**OUTCOME 3**

**Informed business decision making through access to baseline data and extension material**

Targeted information products will assist in improving knowledge amongst growers on farm best practice. This will provide growers with information to assist their business decision making in terms of production practices and postharvest management. Enhanced industry data is needed to fully understand the industry and assist in on-farm and industry planning.

SECTION THREE

# 3

# Custard apple industry priorities

## Industry investment priorities

Investment priorities or strategies were developed with the custard apple industry, these have been prioritised. The ability to deliver on all the articulated strategies (and investments) in an impactful manner will be determined by the ability of the statutory levy to provide the resources to do so.

| OUTCOME 1 – Measurable growth achieved in domestic consumption and improved consumer satisfaction | |
|---|---|
| **STRATEGIES** | **POSSIBLE DELIVERABLES** |
| Develop promotion and consumer education programs in target markets to increase awareness and demand for Australian custard apples | • Increase consumer awareness of the different varieties<br>• Customers understand when the fruit is ripe, how to ripen and how to serve custard apples |
| Increase on-farm knowledge and skills and in all sectors of the supply chain to deliver custard apples with improved quality and consistency | • Consumer feedback show an increase in satisfaction when consuming custard apples<br>• Supply chain and retailer stakeholders are engaged to stock preferred varieties<br>• Supply chain best practice processes are documented and implemented |
| Educate retailers on best-practice in-store handling for optimum presentation to consumers | • Retailers are trained on preferred handling practices<br>• Consumer feedback shows that the presentation of the fruit has improved with consumers also more aware of product availability |

| OUTCOME 2 – Measurable growth in production volumes and improved production efficiency and product consistency leading to increased grower profitability | |
|---|---|
| **STRATEGIES** | **POSSIBLE DELIVERABLES** |
| Development of rootstocks and varieties that produce consistent crops of high quality fruit by 2018 and subsequently undertake commercial evaluation | • Plan to roll out high quality variety is established<br>• Cost benefit analysis of changing to the new variety has been developed and communicated to growers |
| Improve irrigation, nutritional and environmental management for production efficiency gains and consistent, higher yields | • Undertake gap analysis to determine best practice<br>• Develop best practice resources |
| Increase knowledge and adoption of best practice postharvest management on farm to maintain product quality and consistency | • Hold grower field days<br>• Develop best practice resources |

| OUTCOME 3 – Informed business decision making through access to baseline data and extension material | |
|---|---|
| **STRATEGIES** | **POSSIBLE DELIVERABLES** |
| Encourage collaboration with similar sized industries to address across-industry issues | • Joint marketing strategies and events<br>• Collaboration on pest and disease management research |
| Gather and maintain reliable statistics on grower numbers, tree plantings, varieties, production, returns and cost of production for benchmarking and industry planning | • Data that can underpin decision making is accurate and available to industry |
| Deliver extension activities (including communications and an updated best practice manual every three years) to growers to increase knowledge on new technology and practices | • Hold grower field days<br>• Develop best practice resources<br>• Disseminate best practice via multiple channels |

## Being an exotic fruit, custard apples make a change from what is considered 'boring' fruit on offer during the colder months.

## Aligning to Hort Innovation investment priorities

In establishing investment priorities, Hort Innovation analysed both historical and current levy and co-investment portfolios and priorities. From this analysis we identified 11 cross-sectoral investment themes. We consolidated these themes further and considered their alignment with the Australian Government's Rural RD&E Priorities and National Science and Research Priorities, to arrive at five investment priorities outlined in ***Figure 1. Figure 1*** also shows how each cross-sectoral investment theme relates to the five investment priorities.

**Figure 1: Hort Innovations' investment priorities**

The alignment of custard apple SIP outcomes to the Hort Innovation investment priorities and as a consequence the Australian Government's Rural RD&E Priorities and National Science and Research Priorities is shown in ***Table 2***.

**Table 2: Alignment of custard apple SIP outcomes to the Hort Innovation investment priorities**

| Hort Innovation investment priorities | Custard apple SIP outcomes |
|---|---|
| **Support Industry efficiency and sustainability** | Measurable growth in production volumes and improved production efficiency and product consistency |
| **Improve productivity of the supply chain** | |
| **Grow the horticulture value chain capacity** | Informed business decision-making through access to baseline data and extension material |
| **Drive long-term domestic and export growth** | Measurable growth achieved in domestic consumption and improved consumer satisfaction |
| **Lead strategically to enhance the development of the Australian horticulture industry through operational excellence** | Enabler |

4

SECTION FOUR

# Custard apple industry monitoring and evaluation

## Custard apple SIP monitoring, evaluation and reporting

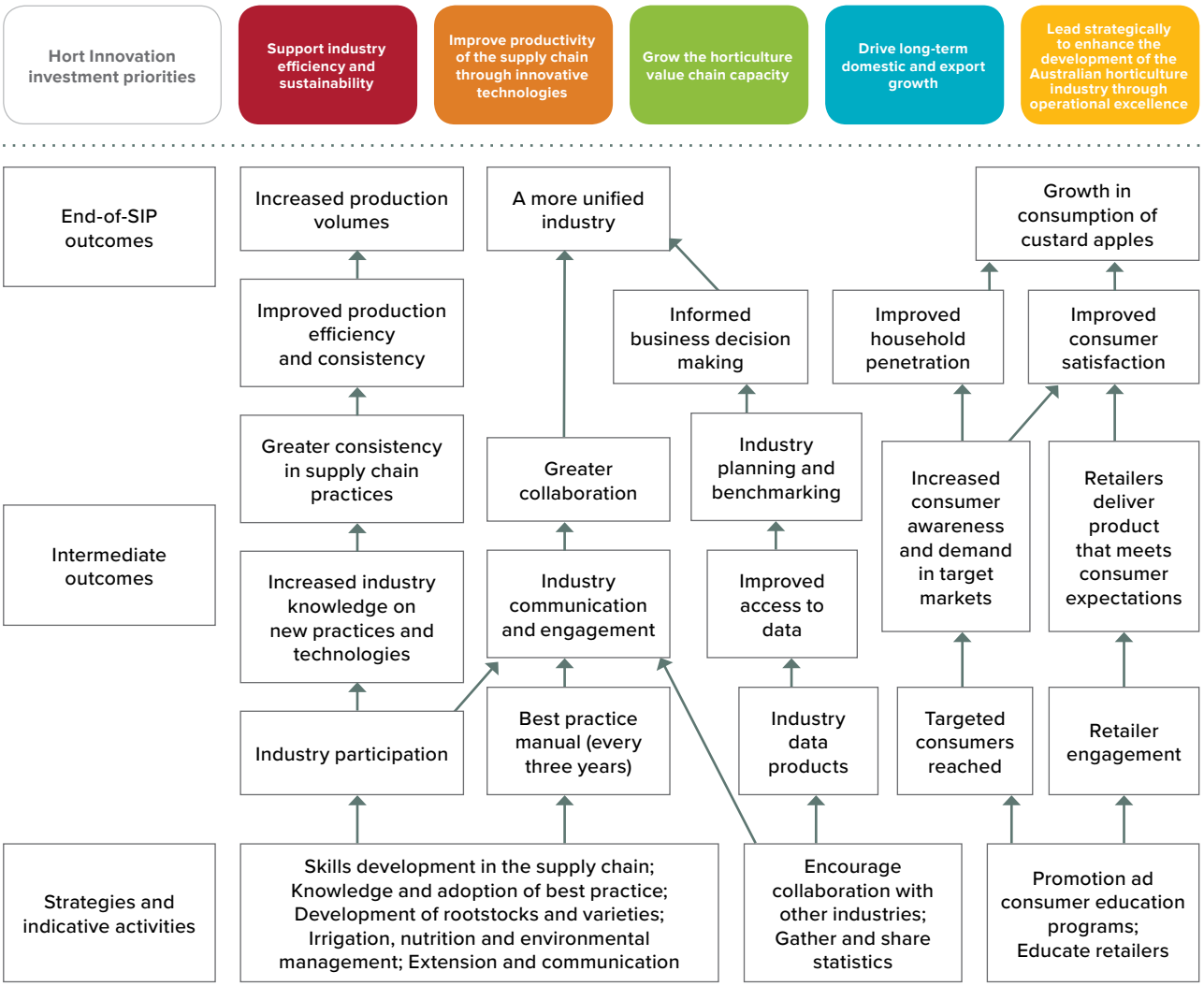
A SIP program logic and monitoring and evaluation (M&E) plan has been developed for the custard apple SIP. These are informed by the Hort Innovation Organisational Evaluation Framework. The logic maps a series of expected consequences of SIP investment. The M&E plan shows the performance measures that will be measured to demonstrate progress against the SIP and what data will be collected. Progress against the SIP will be reported in Hort Innovation publications and at industry SIAP meetings.

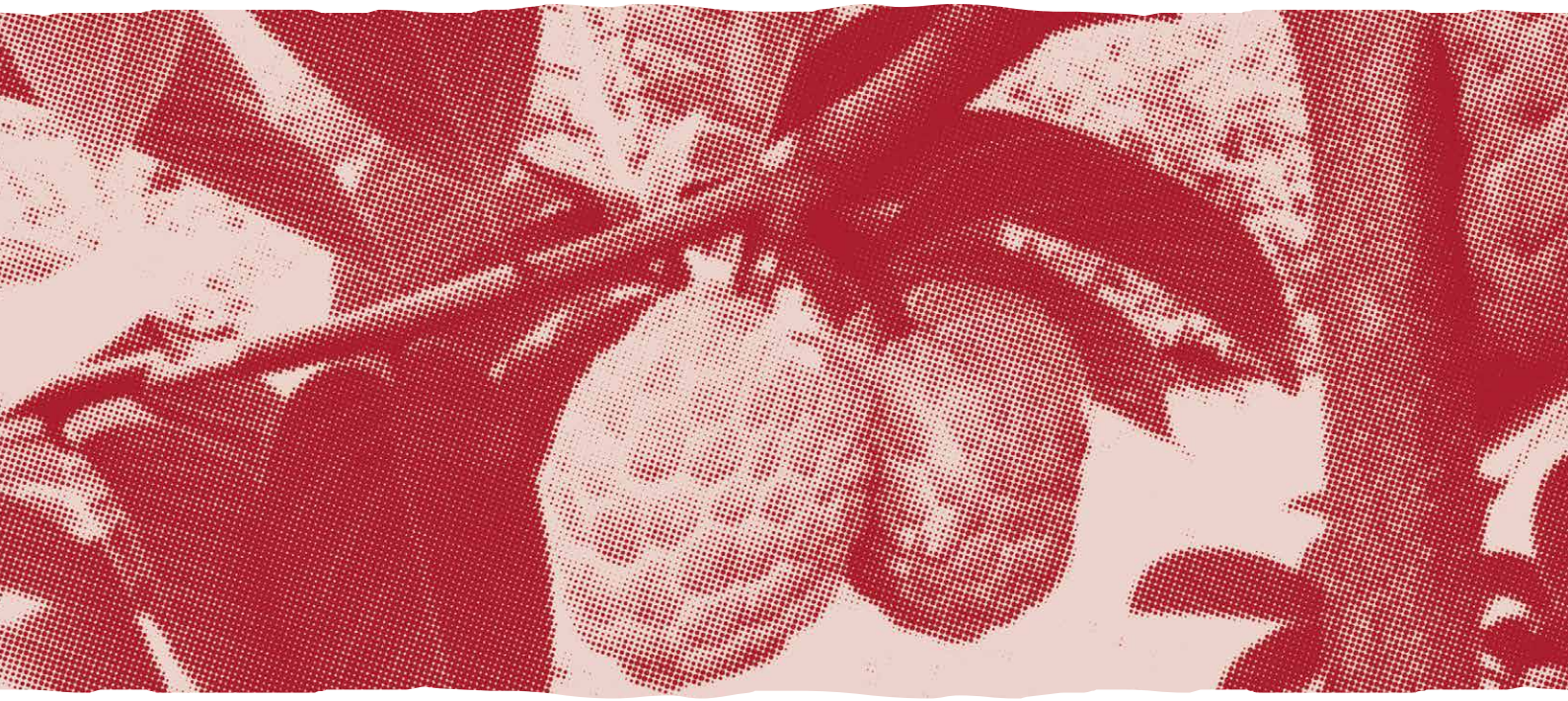
The SIP outcomes and strategies will be used to inform investments in individual projects to deliver on the SIP. The results of M&E will be used to reflect on the results of investments and in decision-making. Hort Innovation will facilitate the regular review of SIPs to ensure they remain relevant to industry.

## Custard apple SIP logic

An indicative custard apple SIP program logic is shown in ***Figure 2*** on page 17. The logic is based on the Hort Innovation SIP logic hierarchy (***Appendix 2***).

Figure 2: Custard apple SIP logic



## Custard apple SIP M&E plan

The custard apple monitoring and evaluation (M&E) plan is shown in ***Table 3*** updated below in accordance with the indicative logic model. The table includes key performance indicators (KPIs) and data collection methods both at a macro/industry (trend) level and at more specific SIP level/s.

**Table 3: Monitoring and evaluation plan for the custard apple SIP**

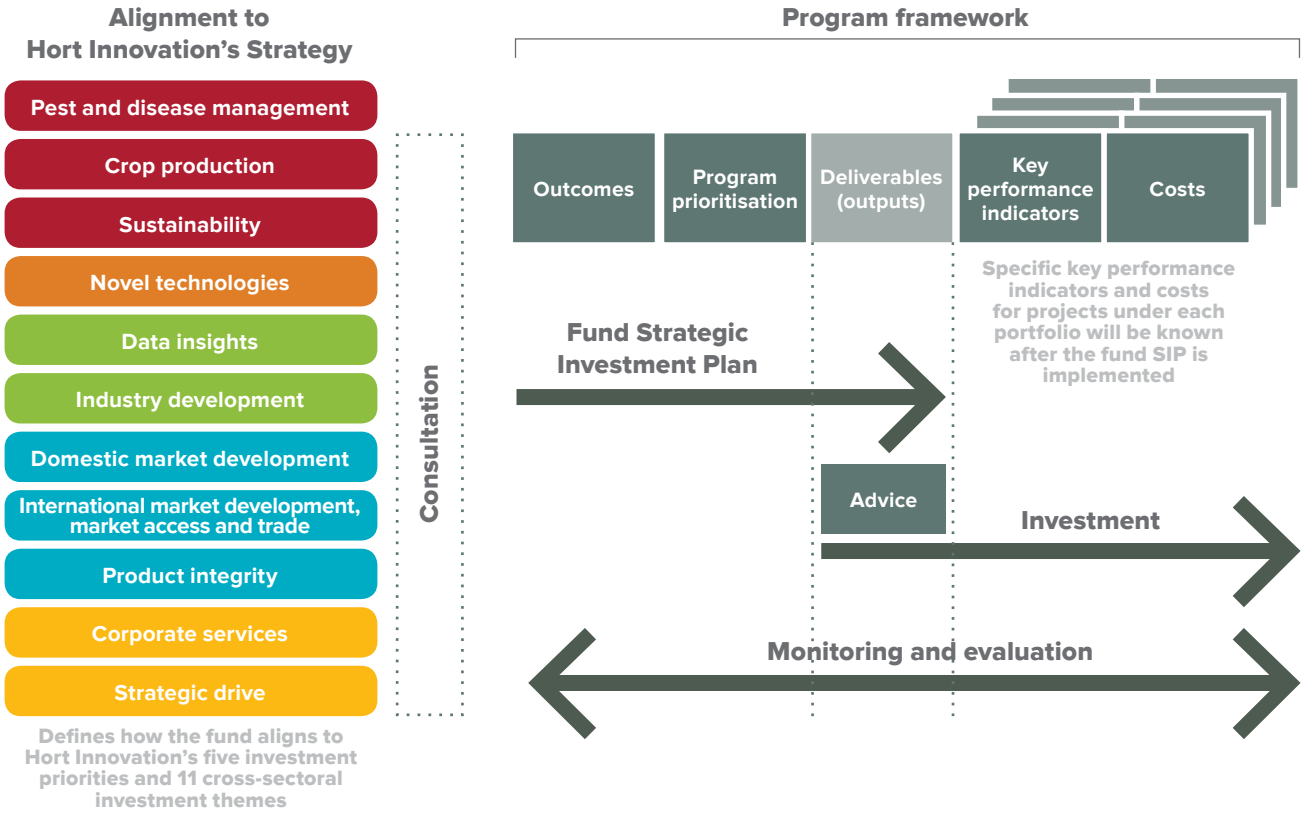
| Outcome | Strategies | KPIs | Data collection methods and sources |
|---|---|---|---|
| **OUTCOME 1:** Measurable growth achieved in domestic consumption and improved consumer satisfaction | Develop promotion and consumer education programs in target markets to increase awareness and demand for Australian custard apples<br><br>Increase knowledge and skills through all sectors of the supply chain to deliver custard apples with improved product quality and consistency<br><br>Educate retailers on best-practice in-store handling for optimum penetration to consumers | • Increased consumption level of 10 per cent of households purchasing a fresh custard apple each year by 2021<br>• Increased awareness of custard apples in all markets as measured<br>• Increased awareness and usage of custard apples<br>• Increased domestic sales (at stable prices) by at least CPI year on year<br>• Fruit despatched and arriving within temperature range appropriate for variety 90 per cent of time in domestic markets (recorded independently through monitors) by 2021<br>• Development of best practice protocols including harvest and cool chain protocols for growers and wholesalers | • Industry consumption and consumer behaviour data<br>• Digital statistics (website and social media)<br>• In-store consumer surveys<br>• CADS data<br>• Project records |
| **OUTCOME 2:** Measurable growth in production volumes and improved production efficiency and product consistency leading to increased grower profitability | Finalise development of rootstocks and varieties that produce consistent crops of high quality fruit by 2018 and then focus on these for commercial evaluation<br><br>Improve irrigation, nutritional and environmental management and efficiencies for consistent, higher yields updated by best practice manuals every three years<br><br>Increase knowledge and adoption of best-practice postharvest management on-farm to maintain product quality and consistency | • Increased adoption of IPDM<br>• Improved irrigation and nutrition management<br>• Improved product quality at retail level<br>• Production volumes increased to 1,800 tonnes per annum by 2021 from a baseline to be determined<br>• Market insights reach within industry | • Field day surveys<br>• Comparison of volume to price returns<br>• Supplementary interviews or industry survey as appropriate<br>• Industry production data |
| **OUTCOME 3:** Informed business decision making through access to baseline data and extension material | Encourage collaboration with similar sized industries to address across-industry issues and leverage resources<br><br>Gather and maintain reliable statistics on grower numbers, tree plantings, varieties, production, returns and cost of production for sound industry planning<br><br>Maintain communications to growers to encourage industry involvement and keep up with new developments | • Similar sized industry collaboration established by 2017<br>• Formalised cross-industry engagements, such as workshops, meetings and events to address common issues<br>• At least one grower presentation at each field day on a relevant topic or on their experience in their orchard<br>• Communications outputs (products)/ reach of communications outputs<br>• Industry planning output informed by baseline data | • Industry engagement records<br>• Event records<br>• Industry reporting |

## Reporting

The program framework below is the mechanism that links Hort Innovation's strategy and investment priorities to the investment process through the industry SIP. SIPs assist Hort Innovation to prioritise and implement the specific industry research, R&D, extension and marketing programs.

Hort Innovation will use dynamic reporting against our monitoring and evaluation framework to report on investment progress. The contribution of investments to each industry outcome will be reported regularly, including through industry Annual Reports, Hort Innovation's Annual Report and Hort Innovation's Annual Operating Plan.

**Figure 3: Hort Innovation's program framework**

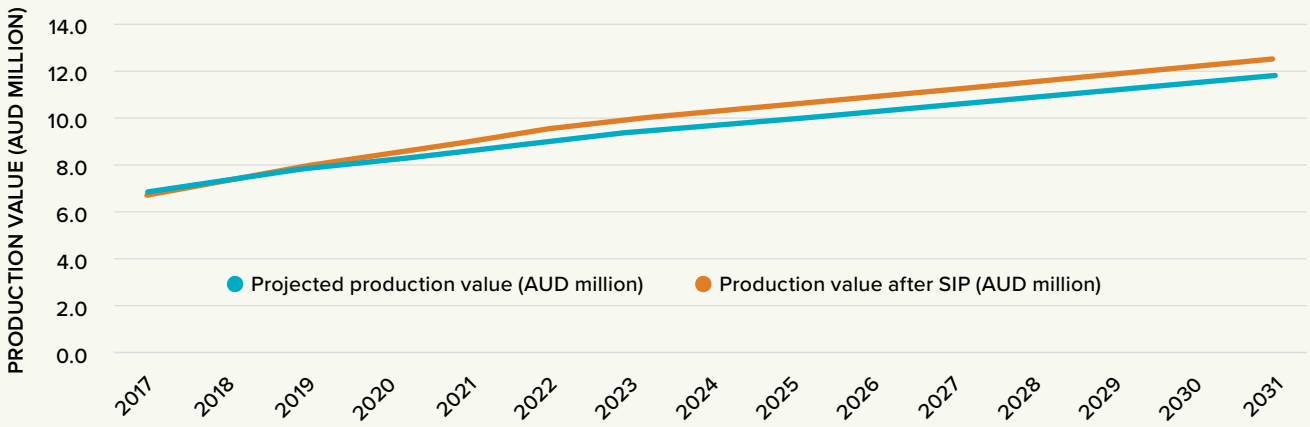


SECTION FIVE

# 5

# Impact assessment

Figure 4: The economic impact of SIP investment over and above projected industry growth




An independent assessment of the potential economic impacts from investment into the custard apple SIP indicated a positive return on investment for the industry (***Figure 4***). The anticipated investment of $576,855 over the next five years in R&D, extension and marketing activities is expected to generate $5.08 million in net benefits for the industry, representing a benefit cost ratio of 8.8 times to growers and service providers along the value chain.

The assessment draws from a wide range of available data sources, and projects economic impacts over a 15-year period starting from 2016/17. A five per cent discount rate has been applied and all values are adjusted for inflation and presented in 2016/17 dollar terms. The assessment takes a highly conservative approach and the presented figures have been adjusted to account for risks associated with achieving research outputs, expected adoption and impacts.

The assessed impacts are derived predominantly from two sources. One is through a potential program that has the net effect of waste reduction as a result of improvements in consistency, handling, supply chain and retail display. Industry experts suggest that 15 per cent of custard apples are wasted. Through improvements in these aspects of the supply chain -– consistency, cool chain management, handling a reduction from 15 per cent to 10 per cent – is expected to generate benefits of $4.13 million to the industry. This represents approximately 80 per cent of the benefits of the SIP.

The other impact focuses on improved farm practices. These initiatives including, cross-sector collaborations, promotion and support for the adoption of best-practice and improved skills and knowledge along the supply chain. Impact modelling has assumed that smaller growers will receive a greater benefit from these initiatives as they have greater opportunity for improvement. Growers are expected to improve their productivity by six per cent on average as a result of SIP initiatives, with much of these gains to be made with smaller growers. These gains are over and above productivity gains they may otherwise achieve. Over the 15-year modelling period, economic benefit equates to $0.95 million. It accounts for approximately 20 per cent of benefits of the SIP and represents approximately 40 per cent of the levy funds.

It should be noted there is an estimated 20 per cent of levy funds being invested in areas that include improved retail presentation methods and more reliable industry data that require additional baseline data to quantify economic benefit. Where appropriate, these benefits have been included in the first two impacts to demonstrate overall benefit to growers. It has been assumed that production volumes will reduce as new planting resulting from cyclone destruction come on line but prices will broadly remain in line with inflation.

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SECTION SIX

# Risk management

The purpose of this risk section is to highlight any unique or specific risks that qualify the SIP.

This is not intended to be an exhaustive risk review of the industry risks which in part are considered in the SWOT.

This is also not general investment risks which will be considered in the project investment process.

The underlying risk of this plan is the minimum funds that are available through the levy mechanism. There have been a number of historical projects funded under the former voluntary contributions (VC) mechanism and the custard apple industry will need to look into alternative funding sources, or consider collaboration with similar industries. Co-investment opportunities that are relevant to the custard apple industry will need to be harnessed and alternative funds such as the Australian Government's Rural R&D for Profit maximised where appropriate.

## APPENDIX 1:
## Consultation and validation

The following people are acknowledged for their contribution to the Australian custard apple SIP process.

| Name | Role | Growing Region |
|---|---|---|
| Ros Smerdon | CAA President, grower | Glasshouse Mountains |
| Patti Stacey | CAA Secretariat, grower | Northern New South Wales |
| Ali Randall | Northern New South Wales CAA representative, grower | Northern New South Wales |
| Paul Thorne | CAA, Vice President, grower | Brisbane |
| Wayne Stewart | North Queensland CAA representative, grower | North Queensland |
| Peter Trebbin | Wide Bay grower | Wide Bay |
| Astrid Hughes | Hort Innovation, Relationship Manager | NA |
| Grant Bignell | DEEDI/DAFFQ | Sunshine Coast |
| David Bruen | DEEDI/DAFFQ | Sunshine Coast |
| Northern New South Wales growers | Field day attendance ~ 40 people | Northern New South Wales |
| North Queensland growers | Field day attendance ~ 25 people | North Queensland |
| Sunshine Coast growers | Field day attendance ~ 30 people | Sunshine Coast |

## APPENDIX 2:
## Logic hierarchy

| | | | | | | |
|---|---|---|---|---|---|---|
| **Vision** | | | To grow the future of Australia's horticulture industries | | | Common for all Investment |
| **Mission** | Increased profitability of Australia's horticulture industries | | Increased productivity of Australia's horticulture industries | | Increased global competitiveness of Australia's horticulture industries | |
| **Hort Innovation end-of-strategy outcomes** | **Support industry efficiency and sustainability** | **Improve productivity of the supply chain** | **Grow the horticulture value chain capacity** | **Drive long-term domestic and export growth** | **Lead strategically** | |
| **End-of-SIP outcomes** | *The industry-specific outcomes of the SIP. The final desired result of SIP investment but may be achieved after the SIP time-frame. SIP investment may be just one contributing factor to the achievement of these outcomes. For example, incremental productivity, profitability and competitiveness improvements stimulated through R&D, changes in consumer awareness, marketing campaign reach and influence and increased recognition of Australian horticulture products.* | | | | | SIP specific |
| **SIP intermediate outcomes** | *Short- to medium-term changes brought about through the SIP, which will support the achievement of end-of-SIP outcomes. For example, practice changes, adoption, changes in grower knowledge, attitudes, skills and aspirations (KASA) and marketing reach.* | | | | | |
| **SIP activities and outputs** | *What is directly delivered by the SIP (R&D, extension and marketing activities and outputs, for example, products and services, and events and engagement) across the 11 horticulture cross-sectoral investment themes: Pest and Disease Management, Crop Production, Sustainability Improvements, Novel Technologies, Data Insights,Industry Development, Product Integrity, International Market Development, Market Access and Trade, Domestic Market Development, Strategic Drive and Corporate Services.* | | | | | |
| **Foundational activities** | *Preliminary or preparatory activities that are conducted before and during SIP delivery. Includes industry processes, infrastructure and resources that enable the SIP to be developed and delivered. Includes SIP planning, consultation, advisory meetings etc.* | | | | | |

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