Pineapple

STRATEGIC INVESTMENT PLAN

2017-2021

Hort Innovation
Strategic levy investment

PINEAPPLE 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 in preparing each SIP was managed by Hort Innovation and facilitated in partnership with Industry Representative Bodies and Strategic Investment Advisory Panels (SIAP). 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 pineapple growers.

The pineapple SIP

Producers in the pineapple industry pay levies to the Department of Agriculture and Water Resources (DAWR), 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 is payable on pineapples that are produced in Australia and either sold by the producer or used by the producer in the production of other goods. The levy rate on fresh and export pineapples is $5 per tonne and processing pineapples is $2 per tonne.

Hort Innovation manages the pineapple levy funds proportion directed to R&D (fresh and export $2.90 per tonne and processing $1.90 per tonne) and marketing ($2.00 per tonne). Separately, Plant Health Australia (PHA) manages plant health programs ($0.10 per tonne). In 2015/16 total pineapple levy receipts were approximately $259,000: $172,000 of R&D levies and $86,000 of marketing levies.

Hort Innovation has developed this SIP to assist in strategically investing the collected pineapple levy funds in the priority areas identified and agreed by the pineapple 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 pineapple industry's collective view of its R&D and marketing needs over the next five years (2017 to 2021). The intent is for this plan to provide the blueprint out to 2025 to accommodate crop cycles. This plan has been developed in consultation with Australian pineapple levy payers through a synthesis of priority-setting exercises, direct consultations and workshops with Hort Innovation's pineapple industry SIAP.

The process to develop this plan is fully described in ***Appendix 1***. The people consulted in the preparation of the plan are listed in ***Appendix 2*** and the documents referred to are listed in ***Appendix 4***.

The pineapple 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 pineapple industry SIAP constituency please visit Hort Innovation's website at www.horticulture.com.au.

Pineapple

STRATEGIC INVESTMENT PLAN 2017-2021 AT A GLANCE

POTENTIAL IMPACT OF THIS PLAN

$7.17 Million

Based on an estimated investment of $1.79 million over the next five years.

OUTCOMES	STRATEGIES
Improved pest and disease management and best practice adoption increases grower productivity, profitability and sustainability	Ensure that growers have continued access to effective chemical treatments to help manage pests and diseases and include in the development of their integrated pest and disease management (IPDM) practices
	Minimise biosecurity risks by helping growers adopt practices outlined in the industry's biosecurity plan
	Minimise the industry's environmental impact through effective R&D and adoption to feed into an IPDM strategy and existing BMP approaches
Increased product quality and consistency increases returns to growers through increased consumer demand	Improve the consistency and quality of fruit reaching the consumer
	Drive growth and demand through targeted marketing initiatives
Product quality and consistency improves returns to growers through increased consumer demand	Foster and support new pathways to help growers adopt continuous improvement practices
	Improve industry understanding of the potential for automation
	Continue to build on industry production benchmarking and supply chain data initiatives to support decision making
The attraction of new growers and retention of current growers through demonstrated profitability will lead to industry sustainability	Support industry growth with a focus on attracting and developing new and innovative industry leaders

Pineapple
STRATEGIC INVESTMENT PLAN 2017-2021
AT A GLANCE

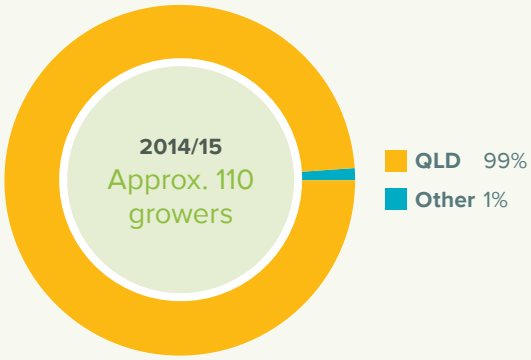
Major opportunities

- Greater mechanisation may help reduce dependence on labour
- Increasing consumer health consciousness and 'wellness' campaigns
- Potential fresh export markets
- Broader adoption of BMP approaches and the development and adoption of IPDM practices to reduce the dependence on chemical controls
- Increasing health focus on gut health
- Availability all year.

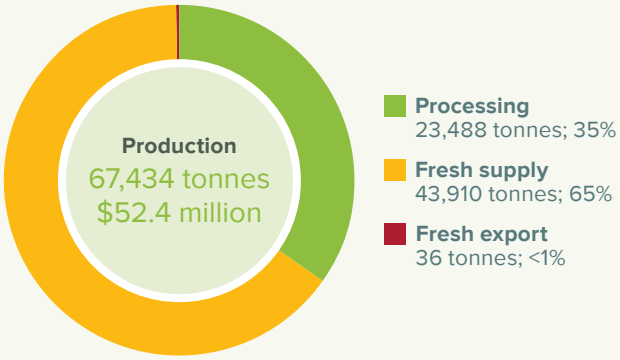
Major challenges

- Low cost imports to competing processed product
- Labour cost increases
- Biosecurity constraints and challenges
- Dietary trends focusing on low sugar/fructose
- Regulatory changes removing the availability of specific chemical controls
- Variable supply with seasonality peaks causing low sale price
- Potential loss of experience within the industry with the retirement or loss of experienced agronomists.

Industry size and production distribution



Pineapple supply chain and value 2014/15



SECTION ONE

Context

The Australian pineapple industry

The Australian pineapple industry is predominantly made up of growers whose families have been growing pineapples for generations. There are three major pack houses/marketing groups, each with a number of growers supplying them directly.

The industry has moved from one where the majority of fruit was grown for processing to one that is moving towards fresh supply due to the increased competition from cheaper imports of processed fruit.

Current farm management practices are used in accordance with Australian standards and seasonal conditions. There is an appreciation of the need to adopt best management practice (BMP) approaches and to develop and adopt integrated pest and disease management (IPDM) practices to move away from this dependence. Many in the industry have adopted BMP approaches and acknowledge the compliance required through adopting farming practices that conform to the regulatory protection of the Great Barrier Reef.

There is cohesion across the growers which has been built over many years of cross-farm education and interaction during the period when much of the industry was supported by the Golden Circle cannery through its agronomists and field days. Although much of the experience of the growers is retained through the multi-generational family unit, there is a potential for this specialist knowledge to be lost with the retirement of many of the agronomists from the industry.

The industry is heavily labour dependent and although attempts have been made to automate the industry there has been little success. Labour cost and availability is a major impact and this could drive investigation into developing automated practices, especially focused on harvest.

Although pineapples are available year-round, the consumer perceives them to be a summer fruit and the majority of fresh product is purchased through an impulse buy. Issues of over-supply and poor quality can impact the market at different times of year dependent on weather conditions, heat and flowering events. With the long growth cycle, methods to control flowering would help smooth supply volatility while developing a non-invasive quality test would provide the certainty required to maximise return.

Location and extent of production

Varieties of pineapples grown in Australia include Smooth Cayenne, 73-50, MD-2, Aus Jubilees and Queen[1]. Smooths are mainly used for processing as canned or juiced pineapples with the other varieties presented to the fresh market[1]. Approximately 60 per cent of pineapple plantings are Smooth Cayenne and Queen (Rough leaf) varieties, and 40 per cent of plantings are of hybrid varieties[1]. Pineapples are available year-round.

Pineapples are grown predominantly in Queensland with the major growing regions in Mareeba (North Queensland), Yeppoon, Bundaberg (Central Queensland) and the Sunshine Coast[2].

Whilst Queensland remains the largest production region, the Northern Territory has increased it production significantly. Whilst exact numbers are unknown, production is expected to continue this trend.

Figure 1: Major growing areas

Adapted from:
http://www.aussiepineapples.com.au/about/growing.html

Increased plantings of hybrid varieties are expected. These have higher sugar to acid ratios and greater consistency and are marketed under proprietary brand names, including Aus Jubilee and Aus Festival[1]. Aus Jubilee, released earlier in the decade, has been bred in Australia and has twice the vitamin C content compared to Smooth Cayenne. It is less prone to internal disorders or pathogens[3].

Approximately 60 per cent of pineapple plantings are Smooth Cayenne and Queen (Rough leaf) varieties, and 40 per cent of plantings are of hybrid varieties. Pineapples are available year-round.

Production volumes

Levy collection figures from the Levy Revenue Services indicate significant fluctuations in production over the past four years.

Planting plans for the industry in 2017 show that North Queensland and Northern Territory growers aim to increase planting by 11 per cent, Central Queensland to increase by three per cent, Wide Burnett to decrease by five per cent and South-East Queensland to decrease by three per cent compared to figures in August 2016[4].

Production value

Data collected by the Queensland Department of Agriculture and Fisheries below highlights the fluctuations in production and also demonstrate the variability in data sources for the industry.

	2012/13	2013/14	2014/15 forecast April 2015	2015/16 forecast October 2015	Change from April 2014/15 to October 2015/16 forecast	Average for past five years	Difference between 2015/16 forecast and average past five years
Commodity GVP	**AUD million**	**AUD million**	**AUD million**	**AUD million**	**Per cent**	**AUD million**	**Per cent**
Pineapples	83	73	72	71	–1	69	3

Domestic markets

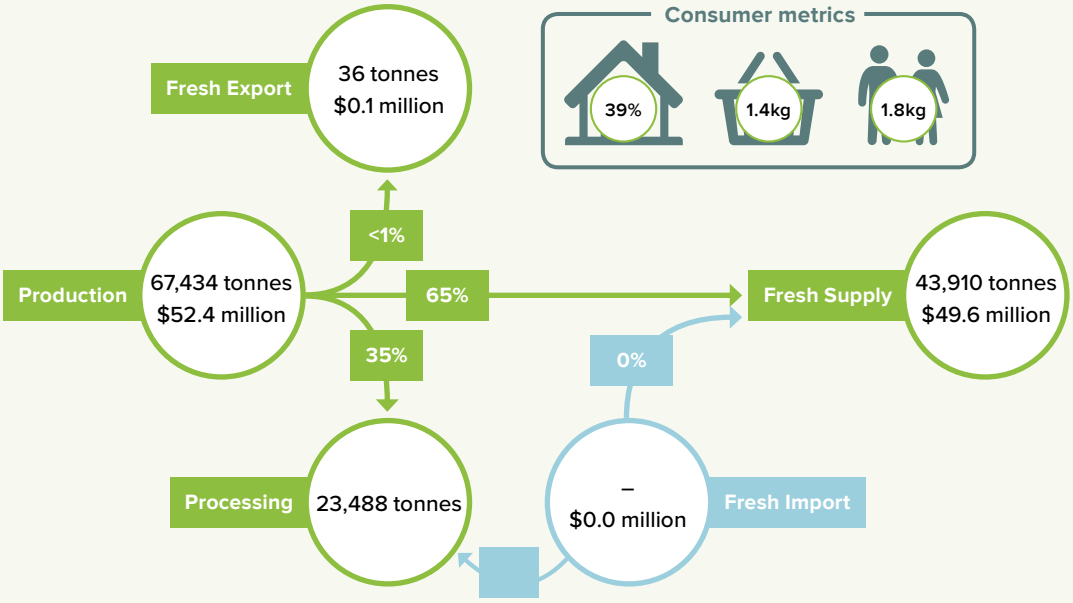
The *Australian Horticulture Statistics Handbook 2014/15* that incorporates the department's data states that the production volume of pineapples was 67,434 tonnes for the year ending June 2015[2] and area under cultivation has increased from 1,392 hectares to 2032 hectares from 2013 to 2015. Most significantly fresh supply has remained steady around 48,000 tonnes. The data published in the Horticulture Statistics Handbook adopts a modelling approach that centres on determining the fresh market value and volume and is based on a number of collated collection points. It will be updated with improved accuracy as more hard data becomes available. The estimated area under cultivation for pineapples is ~3,500 hectares.

	2012/13	2013/14	2014/15
Production volume (tonnes)	88,484	78,384	67,434
Production value (AUD million)	67.1	61.9	52.4
Fresh imports volume (tonnes)	41	52	36
Fresh imports value (AUD million)	<0.1	0.1	0.1
Fresh exports volume (tonnes)	–	–	–
Fresh exports value (AUD million)	–	–	–
Fresh supply volume (tonnes)	47,740	48,235	47,391
Fresh supply wholesale value (AUD million)	55.2	54.5	50.3
Consumption per capita (kilograms)	2.09	2.06	1.99

Source: Horticulture Innovation Australia, Australian Horticulture Statistics Handbook 2014/15[2].

Diagram 1: Fresh pineapples supply chain, year ending June 2015

(Source: Horticulture Innovation Australia, Australian Horticulture Statistics Handbook 2014/15[2])



The Australian pineapple processing sector has been in decline since 2012/13 when it produced 39,000 tonnes of fruit for canning and juicing, worth $12.5 million. At 44 per cent of production volume, the 2014/15 year sent 36,516 tonnes for processing which still represents a significant proportion of pineapple production. The decline is mainly due to competition from cheaper imported product and the move to the delivery of fresh product. This may also explain why the number of processed growers in the industry has decreased over the last five years from 114 in 2011 to around 30 in August 2016[1,3,9].

In contrast, the fresh sector has expanded considerably over the past 15 years, due mainly to the adoption of better quality of the new hybrid varieties by the domestic market, with an estimated farm-gate value of $52.4 million[2].

Consumption – Domestic demand and prices for fresh pineapples

Significant events affecting processed pineapple in recent years

The reduction in processing of Australian pineapples, coupled with issues of processed pineapple imports from lower cost producers overseas, have had a major impact on the balance between fresh and processed pineapples for Australian growers.

Australian-produced pineapples, already only 10 per cent of the market in 2013, fell to five per cent in 2015. Even the local industry processor Golden Circle (a subsidiary of Heinz Australia since 2008) currently sources more pineapples for processing from overseas than from Australia. The result is a decrease in price of processed pineapple in Australia and difficulty for others to compete.

Consumers and consumer research

According to the *Australian Horticulture Statistics Handbook 2014/15*, in 2014/15, 39 per cent of Australian households purchased fresh pineapples. The consumption per capita was 1.8 kilograms, based on the volume supplied[2].

Consumer research from 2011 found that:

- Although available year-round, most consumers perceive pineapples as a summer fruit
- The market requires certain characteristics in terms of flavour (including sweetness, acidity, volatiles, texture and juiciness), fruit size, shell colour, general appearance and shelf life[1]
- Consumers are also known to seek value, availability, convenience, health benefits and provenance with the purchase drivers being: price, quality, colour, smell, appearance[7]
- Consumers see pineapples as an exciting and attractive fruit. However, there is clear lack of engagement with 69 per cent of consumers making the decision to purchase at point of sale (POS)[7].

The consumption preferences are that[7]:

- The majority of consumers prefer eating the fruit fresh
- Pineapple consumption is positively correlated to low involvement meals, for example, fruit salad and as a snack.

Over the four years to 2015, the marketing focus was on female, main grocery buyers aged between 35 to 60 years, families and high income households[7].

To increase demand of fresh pineapple, the future focus of marketing initiatives for the next three years is on individuals aged under 45 years in households of up to four people.

It is worth noting that MD2 has replaced Smooth Cayenne as the preferred variety in every major European market because of its sweeter taste, higher vitamin C content and longer shelf life[3].

Consumer benefits

Pineapples are available all year with a peak in October to November and May to June, however, they are seen by the consumer as a summer fruit[7].

The main health benefits of pineapples, which can be used for marketing, are:

- High levels of vitamin C, vitamin B6 and potassium
- An excellent source of manganese, great for bone and skin health
- Bromelain to treat indigestion and reduce inflammation (*The Pineapple Press*, September 2015)
- High in both soluble and insoluble fibre.

The main barrier to consumption is the effort required to prepare the fresh fruit and the perception that there is a lot of waste when removing the skin.

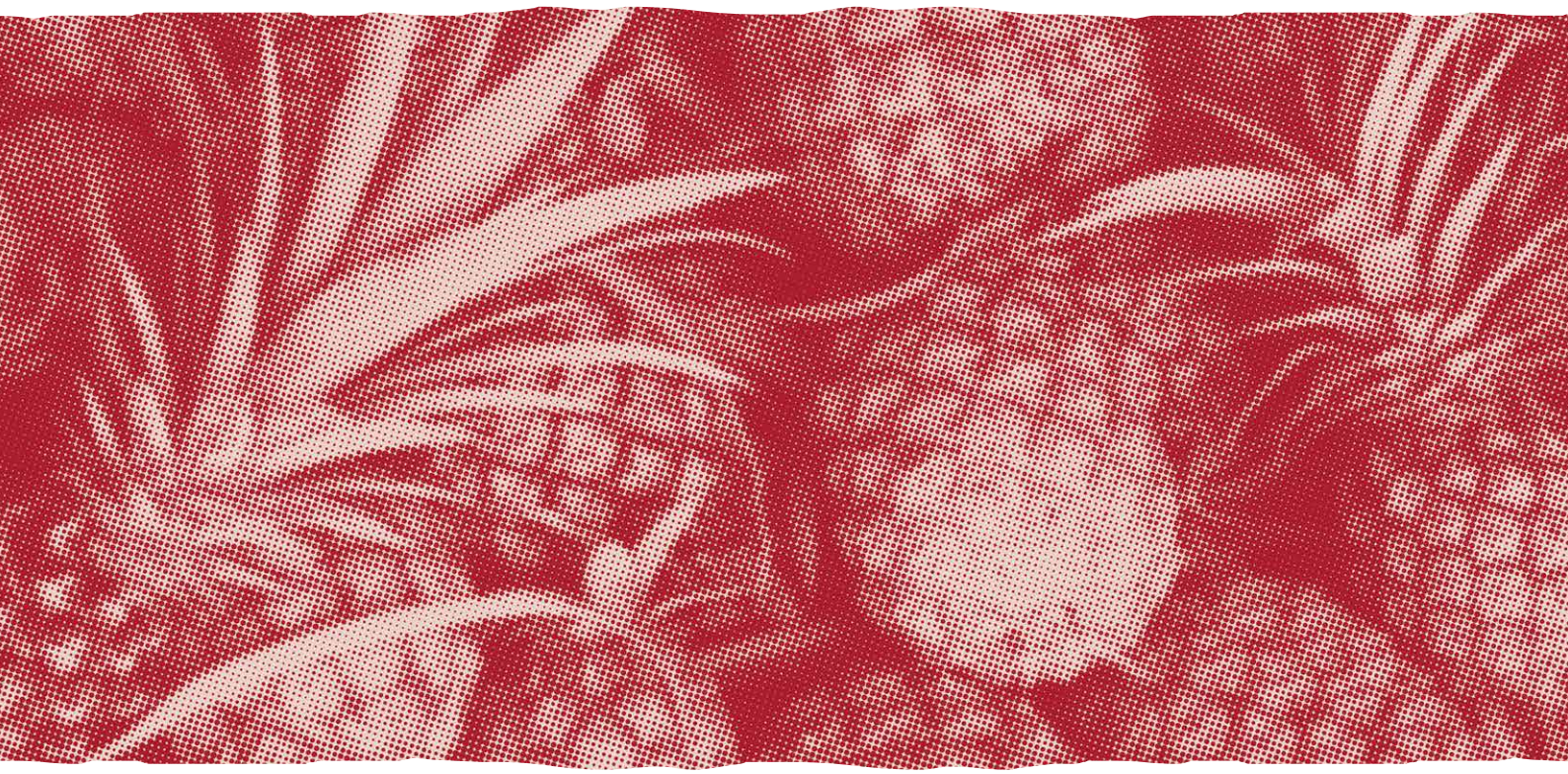
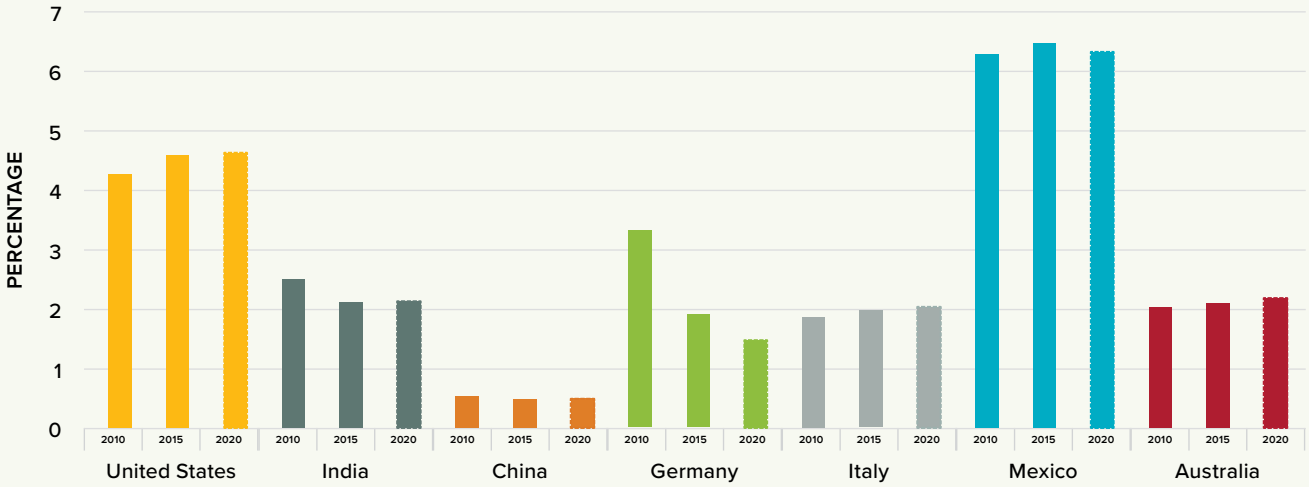


Figure 2: Proportion of pineapple sales vs total fruits sales by country, 2010, 2015 and 2020 projection

(Source: Euromonitor International, Fruits in US, India, China, Germany, Italy, Mexico and Australia (2016))



Export markets

The size of exports was limited to only 36 tonnes of fresh product in 2015 (0.1 per cent of production). The majority of fresh export is to New Zealand (81 per cent) with less amounts sent to New Caledonia (12 per cent), Nauru (four per cent), Singapore (three per cent) and others[2]. Significant investment is required to ship a heavy and limited shelf life product internationally and price remains a significant barrier. Despite these challenges for exporting fresh product there is an opportunity to export processed or value-added product.

A total of 91 tonnes of processed fruit and 2.2 megalitres of juice were exported in the same period although the destination country is unknown[2].

Consumption – International demand

In terms of percentage of pineapple sales from total fruit sales (***Figure 2***), Australia has shown an increase from 2010 to 2015, which is expected to continue toward 2020. United States and Italy are among the countries that will also see an increase in pineapple consumption toward 2020. As ***Figure 2*** shows, Australia is expected to rank third in pineapple consumption against total fruit consumption by 2020, behind Mexico and United States.

International pineapple producers

Australian importation of fresh pineapples was not allowed until 2004. Imported processed fruit is a significant part of the market, however, there have been limited quantities of fresh imports. Countries that are currently able to import fresh pineapple include the Philippines, Sri Lanka, the Solomon Islands and Thailand[5].

Processed products have an increasing market penetration because of the lower price that cheaper labour costs in the country of origin bring. Further investigation of the reasons this occurs considering the low volume may highlight a lack of locally available fruit at certain times of the year (although pineapples are available all year), a difference in price or a market that has a loyalty to an imported product.

Costa Rica accounts for nearly 50 per cent of total world exports of pineapple with significant growth in the Philippines and Mexico[9]. Costa Rica supplied 87 per cent of Europe's pineapples in 2014[10]. Examples of global pineapple related businesses are:

- Del Monte (United States)
- Dole Food Company (United States)
- Fyffes (Costa Rica and Panama)
- Chiquita.

Operating systems

Production systems and processes

The pineapple industry is labour intensive and generally reliant on casual employees during peak periods. For Australian growers to be able to compete with imported products, investment in automation technology needs to be considered to reduce the costs of production and harvest. Any automation needs to be cognisant of the need to avoid internal flesh bruising. The skin is hard and resilient compared to other tropical fruit such as bananas or custard apples.

Pest and disease management is an ongoing challenge for the industry with a significant allocation of research investment identifying better management and integration of the challenges with improved crop production systems. All future investments into pest and disease management will face increased scrutiny with compliance to Australian Standards and assurances of regulatory impact. Environmentally sustainable control measures and the industries Integrated Pest and Disease Management (IPDM) plan will be investigated for the long-term viability of the industry.

In March 2014, Growcom[11] reported that during the Reef Rescue Water Quality grants program for 2009 to 2013, growers received a financial incentive to improve the efficiencies of their spray application systems, nutrient application equipment, irrigation water efficiency, and cultivation.

The equipment farmers purchased included low volume spray technology, GPS systems, constant injection fertigation equipment, mulchers and weed seeking sensing eyes for spray rigs[11]. The next stage, The Reef Water Quality Program, is designed to assist farmers accelerate the adoption of BPM in the areas of nutrients, chemicals and soils.

The availability of financial incentives and on-farm agronomic training and support is being used as the model to accelerate adoption[12], however, with the retirement of many agronomists the loss of this experience represents a risk to the industry with really only one agronomist now active full time in the industry. Although there are study groups and field days, since the takeover of Golden Circle by Heinz, the program of on-the-job training of agronomists and sharing of information across the industry has reduced. It is estimated that because of the long growing cycle of pineapple, it takes five to 10 years to train an agronomist in the specifics of the industry.

Harvested pineapples need to be stored between 12° and 15° Celsius to avoid cold store damage which affects palatability and therefore opportunity to market. Although growers know when a pineapple is ripe, the challenge exists in training the seasonal workers. The development of a non-invasive maturation test would help deliver more quality fruit to the market more consistently as pineapples must be picked when ripe.

Translucency, which is a function of the water movement into the spaces between cells and permits fermentation of the juice, is also important as it leads to a water soaked appearance and unpleasant flavour. This occurs under certain environmental conditions within six weeks of harvest. Translucent fruit can be identified in the pack house through the use of flotation grading protocols[1].

Major improvements in consistency of product quality, continuity of supply and efficiency of production are necessary to remain competitive with imported product and other consumer items. The development of new varieties has the potential to satisfy all these requirements and is considered essential for the continued growth of the fresh pineapple industry[13].

Marketing systems and structures

The largest suppliers of fresh pineapple are Piñata and Tropical Pineapples. Tropical Pineapples has 20 growers providing product and four packing sheds in North, Central and South Queensland. Pineapples are sent in bins to the closest packing shed where they are unloaded onto the production line. They are then sorted by colour, size and quality before being packed into cartons, trays or larger commercial-size hexagonal cardboard bins. Pineapples are tested for quality by assessing their internal and external colour, taste, sugar content and shelf life expectancy before being packed and sent to market[14].

Fruit is distributed through wholesale fruit and vegetable markets located in Brisbane, Newcastle, Sydney, Melbourne, Adelaide and Perth.

The main processor of pineapples is the Kraft Heinz Company which acquired Golden Circle in 2008[4].

Promotion and market development

The marketing levy expenditure averaged $81,000 for the four years to 2015[7]. During this time, data showed that consumers were buying pineapples at a slightly higher price, however, pineapple consumption has failed to increase in line with a general increase in tropical fruit consumption[4]. Papaya and raspberry were identified as industries with similar all year seasons and similar size.

The current marketing initiative has three main strategies, which cover the growing seasons from 2016/17 to 2018/19[4]:

- An 'asset refresh', updating the image of Australian pineapples portrayed in the media, aiming to build consumer engagement and improve perceptions of pineapples
- An 'awareness program', designed to reduce the misconception that pineapples are a seasonal product and to promote fresh pineapples as a healthy product fitting with current consumer dietary trends and as a snack option. Another aim of this strategy is to increase knowledge of when a pineapple is ready to eat
- Improve the frequency of purchase by partnering with similar industries in joint merchandising programs, with the aim of educating consumers at the point of purchase. This strategy is also aimed at educating consumers on when a pineapple is ready to eat.

Ongoing analysis of the marketing expenditure and balance of investment across activities ensures that the marketing campaign is maximised. Market research is considered important and should be continued to underpin the direction of new marketing activity.

Alternative products

Pineapples are available all year, however, they are seen as a summer fruit. Competitive products would change through the year with all fresh seasonal fruit that enters the market including stonefruit, melon, mango and berry.

The size and need for preparation of fresh pineapple make it difficult to compete as an alternative to snack foods. However, campaigns positioning it as a healthy alternative targeting the 18 to 29 years of age market have been proposed in the United States[16] and in Australia[7].

Opportunities to extend the current production are limited with many in the southern growing regions now at full capacity on their available land. Expansion would require the purchase of expensive land, scale up of associated production capacity and labour. Labour represents the highest cost of production. Faced with increasing imports, the focus would continue to be planting the newer varieties to supply the fresh market.

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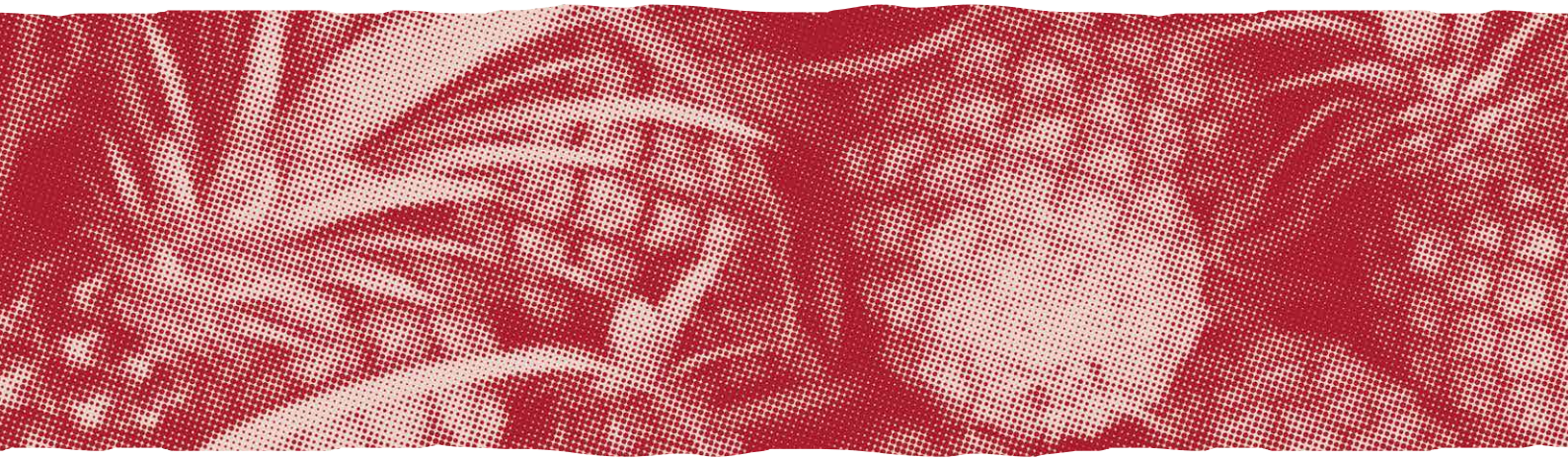
Operating environment

The pineapple industry	
Strengths	• Quality fresh product • Good representative support from Growcom and Queensland government • Coordinated efforts between growers and packing organisations • Strong information channels within the industry through *The Pineapple Press*, Growcom and Hort Innovation. The Australian Pineapples website is useful but needs updating (an update is due in 2017) • Grower co-ordination and co-operation and information sharing networks between growers • Australia seen as a benchmark producer in regards to yield and growing practices.
Weaknesses	• Processing industry dominated by single enterprise • Reducing grower numbers reduces the capacity of the industry to expand • Variable supply due to seasonal conditions coupled with outdoor growing conditions, with peaks impacting prices • Loss of experience within the industry with the retirement or loss of experienced agronomists • Lack of a reliable quality measure that is non-invasive • High cost of capital required to enter the industry.
Opportunities	• Greater mechanisation may help reduce dependence on labour • Increasing consumer health consciousness and 'wellness' campaigns • Varietal improvement including disease resistance and natural flowering • Broader adoption of BMP approaches and the development and adoption of IPDM practices to reduce the dependence on chemical controls • Availability all year.
Threats	• Low cost imports to competing processed product • Labour cost increases • Biosecurity incursion from tropical pests and diseases • Urban encroachment • Regulatory changes removing the availability of specific farm management controls • Increasing production costs including water, electricity and transport • Climate variability.



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SECTION TWO

Pineapple industry outcomes

Industry outcomes

OUTCOME 1

Improved pest and disease management and best practice adoption increases grower productivity, profitability and sustainability

Pest and disease management requires ongoing investment into maintaining and improving crop production systems. The industry currently allocates a significant amount of its R&D budget on trials, registrations and permits to ensure that they can continue to operate. This is limiting the ability of the industry to invest in other areas of research.

The pineapple industry is looking to develop an IPDM strategy to include in their BMP plan and will be considered continuous improvement documents to help growers increase productivity and sustainability. In conjunction with the industry's biosecurity plan, the guides help the grower to reduce runoff, optimise chemical and nutrient inputs and improve plant, water and soil management and ensure that biosecurity risks are minimised. A focus on industry wide adoption of these practices will help to minimise the impact of environmental regulation and biosecurity threats.

OUTCOME 2

Adoption of continuous improvement and automation technology increases grower productivity and profitability

The pineapple industry is labour intensive, and with the difficulty of finding suitable staff and the high cost of labour, the industry's ability to compete globally is reduced. The adoption of continuous improvement approaches and research into automation technologies to increase pre-harvest and postharvest efficiencies could help the industry become more globally competitive and increase returns to growers.

Access to reliable industry data is essential for good decision making and engagement with industry stakeholders. The continued improvement to the collection and reporting of data from the grower level up on production, distribution and pricing as well as biosecurity and best practice adoption, will help the industry drive change and improve productivity and profitability.

OUTCOME 3

Product quality and consistency improves returns to growers through increased consumer demand

The marketing plan for 2016 to 2019 focuses on three areas: asset refresh, consumer engagement and cross-industry collaboration. The plan's objectives are to increase awareness, increase penetration in the months leading to summer and boost the frequency of pineapple purchases.

To support marketing initiatives, it will be important to ensure that consumers have consistent access to quality pineapples. This will require effective engagement with growers, supply chain and retailer stakeholders to identify and address issues affecting quality and consistency.

OUTCOME 4

The attraction of new growers and retention of current growers through demonstrated profitability will lead to industry sustainability

To support industry sustainability, training and support needs to be established for new growers and growers that are innovative, as well as the development of viable pathways for them to enter the industry including innovative forms of grower extension and information sharing focusing on the successes of the industry.

The retention of current growers is also paramount to ensure that the industry continues to drive industry engagement. Demonstrated profitability will lead to greater retention and improved farm sustainability.

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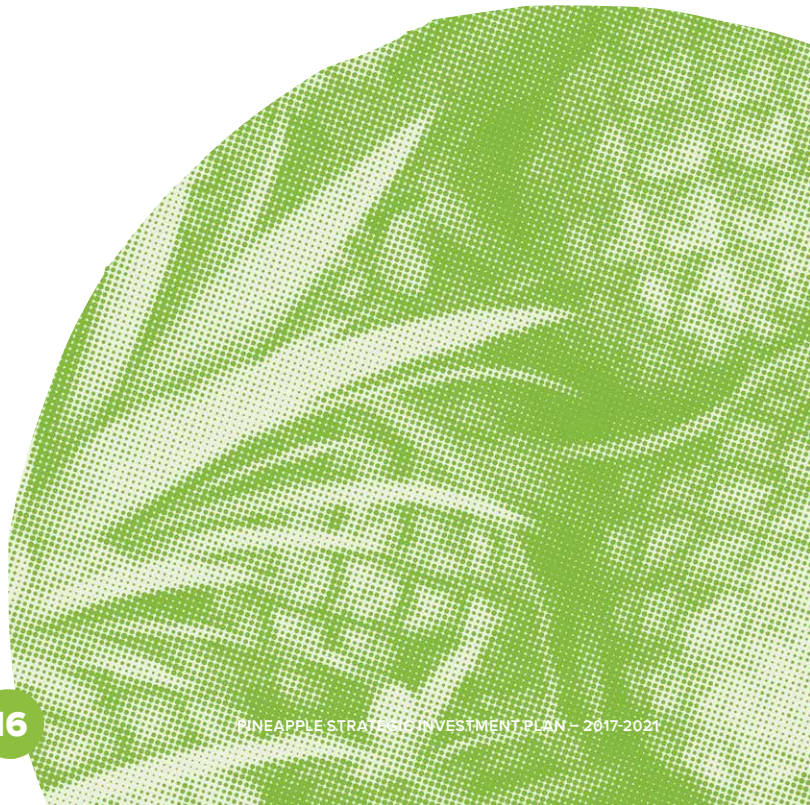


SECTION THREE

Pineapple industry priorities

Industry investment priorities

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 – Improved pest and disease management and best practice adoption increases grower productivity, profitability and sustainability	
STRATEGIES	**POSSIBLE DELIVERABLES**
1.1 Ensure that growers have continued access to crop management systems to help manage pests and disease and include in the development of their IPDM	• Chemical use permits are maintained • Investigate resistant varieties
1.2 Minimise biosecurity risks by helping growers adopt practices outlined in the industry's biosecurity plan	• Identify and address grower barriers for adoption • Develop education tools, training and support for growers to adopt biosecurity practices
1.3 Minimise the industry's environmental impact through effective R&D and adoption to feed into an IPDM strategy and existing BMP approaches	• Continue to support the development of an IPDM strategy • Ensure continuous improvement of the BMP plans for the Australian pineapple industry • Continue to help industry develop and adopt an IPDM strategy and the BMP plan

OUTCOME 2 – Adoption of continuous improvement and automation technology increases grower productivity and profitability	
STRATEGIES	**POSSIBLE DELIVERABLES**
2.1 Foster and support new pathways to help growers adopt continuous improvement practices	• Develop awareness and training on how continuous improvement methods can improve productivity and reduce waste • Develop industry case studies to illustrate how continuous improvement has successfully applied • Benchmarking systems to gain understanding of possible efficiencies
2.2 Improve industry understanding of the potential for automation	• Research feasibility of mechanised planting and harvest systems • Investigate feasibility of remote sensing/robotic technology for pest and disease management
2.3 Continue to build on industry production benchmarking and supply chain data initiatives to support decision making	• Information that is provided to growers and industry is relevant and timely • Benchmarking is presented in a format that encourages growers to improve productivity • Supply chain data supports engagement with supply chain and retailer stakeholders

OUTCOME 3 – Product quality and consistency improves returns to growers through increased consumer demand	
STRATEGIES	**POSSIBLE DELIVERABLES**
3.1 Improve the consistency and quality of fruit reaching the consumer	• Development of non-invasive quality and maturity tests Identifies gaps to improve the shelf life of pineapples through the supply chain • Identify opportunities for varietal improvements
3.2 Drive growth and demand through targeted marketing initiatives	• Refresh the Australian Pineapples brand • Improve consumer understanding about pineapples availability • Identify reasons for impulse buying behaviour • Conduct research and create consumer awareness of the uses of pineapple

OUTCOME 4 – The attraction of new growers and retention of current growers through demonstrated profitability will lead to industry sustainability	
STRATEGIES	**POSSIBLE DELIVERABLES**
4.1 Support on-going industry success with a focus on attracting and developing new growers and growers that are innovative	• Develop training, mentoring programs and support networks to lift technical agronomic and business management capability among existing and new growers

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 3***. ***Figure 3*** also shows how each cross-sectoral investment theme relates to the five investment priorities.

Figure 3: Hort Innovation's investment priorities

The alignment of the pineapple SIP outcomes to the Hort Innovation investment priorities, and consequently, the Australian Government's Rural RD&E Priorities and National Science and Research Priorities is shown in ***Table 1.***

Table 1: Pineapple SIP outcomes alignment to the Hort Innovation investment priorities

Hort Innovation investment priorities	Pineapple SIP outcomes
Support industry efficiency and sustainability	Improved pest and disease management and best practice adoption increases grower productivity, profitability and sustainability The attraction of new growers and retention of current growers through demonstrated profitability will lead to industry sustainability
Improve productivity of the supply chain	Adoption of continuous improvement and automation technology increases grower productivity and profitability
Grow the horticulture value chain capacity	
Drive long-term domestic and export growth	Product quality and consistency improves returns to growers through increased consumer demand
Lead strategically to enhance the development of the Australian horticulture industry through operational excellence	Enabler

4

SECTION FOUR

Pineapple industry monitoring and evaluation

Pineapple SIP monitoring, evaluation and reporting

A SIP program logic and monitoring and evaluation (M&E) plan has been developed for the pineapple 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.

Pineapple SIP logic

An indicative pineapple SIP program logic is shown in ***Figure 4***. The logic is based on the Hort Innovation SIP logic hierarchy (***Appendix 3***). The shaded boxes are not fully explicit in the SIP but necessary conditions for the achievement of expected outcomes.

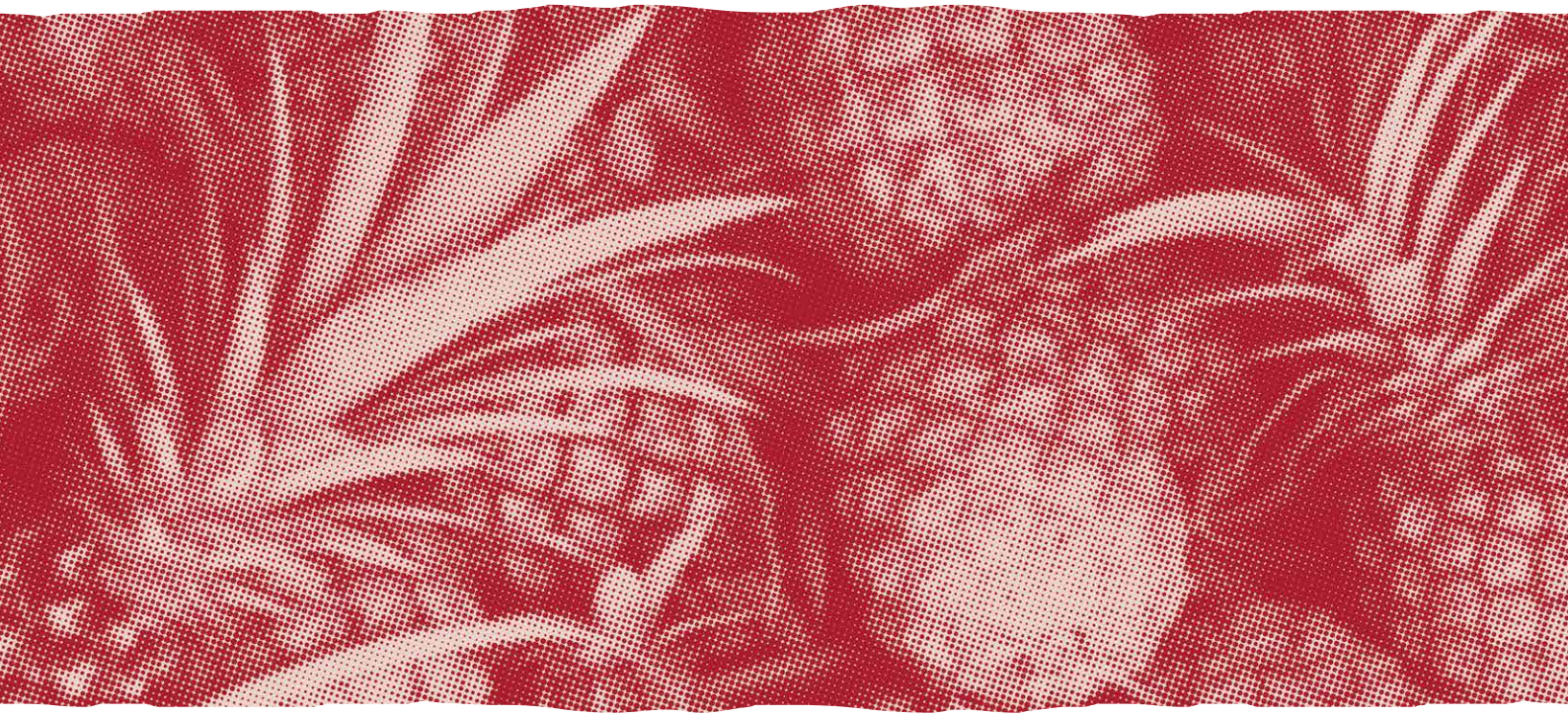
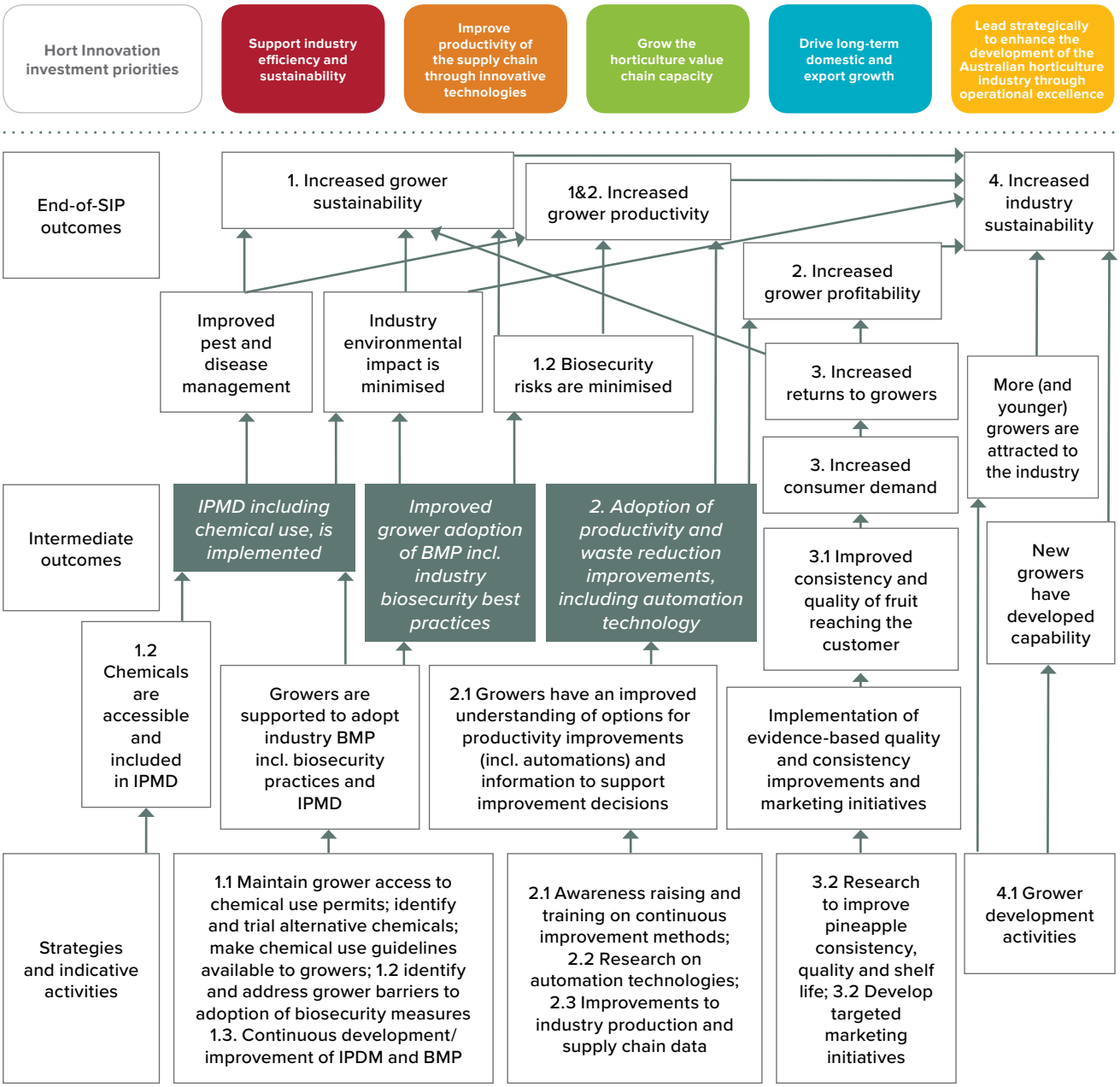


Figure 4: Pineapple SIP logic



Pineapple SIP M&E plan

The pineapple monitoring and evaluation (M&E) plan is shown in ***Table 2***. 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 2: Monitoring and evaluation plan for the pineapple SIP

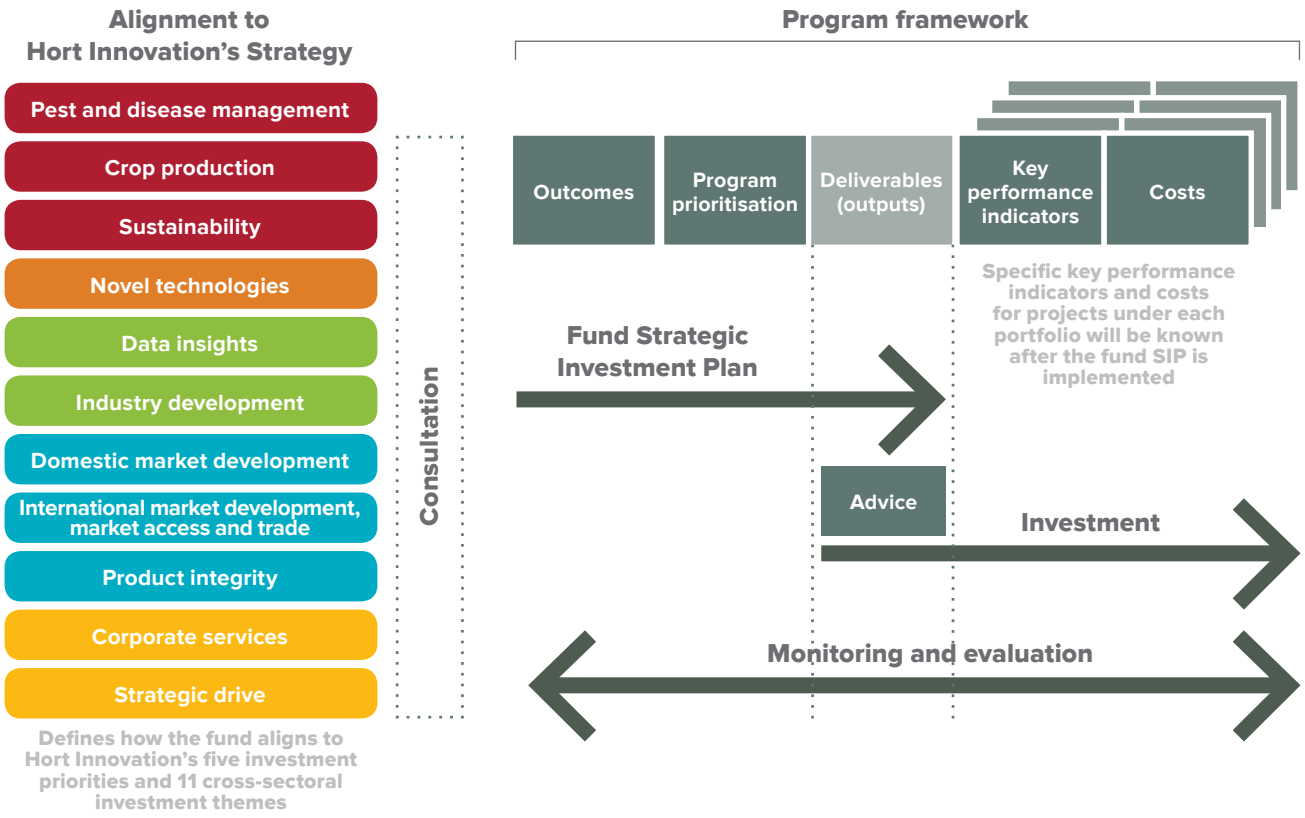
Objectives	Strategies	KPIs	Data collection methods and sources
Improved pest and disease management and best practice adoption increases grower productivity and sustainability	1.1 Ensure that growers have continued access to crop management systems to help manage pests and disease and include in the development of their IPDM practices 1.2 Minimise biosecurity risks by helping growers adopt practices outlined in the industry's biosecurity plan 1.3 Minimise the industry's environmental impact through effective research and adoption to feed into an IPDM strategy and existing BMP approaches	• Effective IPDM strategies which reduce dependence on chemical controls • Evidence of increased understanding of biosecurity risks, IPDM practices and BMP approaches amongst growers and number of growers/percentage of production adopting best practices • Evidence of new R&D outcomes being incorporated into IPDM practices and BMP approaches	• Grower survey/ Chemical use data • R&D project records • Growcom data on compliance with *Reef Rescue Water Quality* program
Adoption of continuous improvement and automation technology increases grower productivity and profitability	2.1 Foster and support new pathways to help growers adopt continuous improvement practices 2.2 Research the potential automation technologies to improve productivity 2.3 Continue to build on industry production benchmarking and supply chain data initiatives to support decision making.	• Evidence of a move from understanding automation technologies to actual automation options for the industry • Evidence of adoption of continuous improvement practices (number of growers/percentage of production) • Evidence of increased understanding and uptake of industry data in decision making	• Industry benchmarking • Grower/industry survey • R&D project records
Increased consumer demand, product quality and consistency increases returns to growers	3.1 Improve the consistency and quality of fruit reaching the consumer 3.2 Drive growth through targeted marketing initiatives	• Greater understanding of requirements for a non-invasive quality test to be developed • Established quality benchmarks • Percentage of increase in demand and consumer satisfaction (from benchmarks to be established)	• Quality data captured at wholesaler and retailer level • Retail and consumer data • R&D project records
The attraction and development of new growers to improve industry sustainability	4.1 Support on-going industry success with a focus on attracting and developing new growers and growers that are innovative	• Production and implementation of an evidence-based plan for improving innovation and grower retention within the industry • Number of growers involved in leadership/sustainability development events • Engagement and participation in grower events by new and existing growers	• Grower feedback from leadership/ innovation activities • R&D project records

Reporting

The program framework in ***Figure 5*** 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 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 5: Hort Innovation's program framework



SECTION FIVE

Impact assessment

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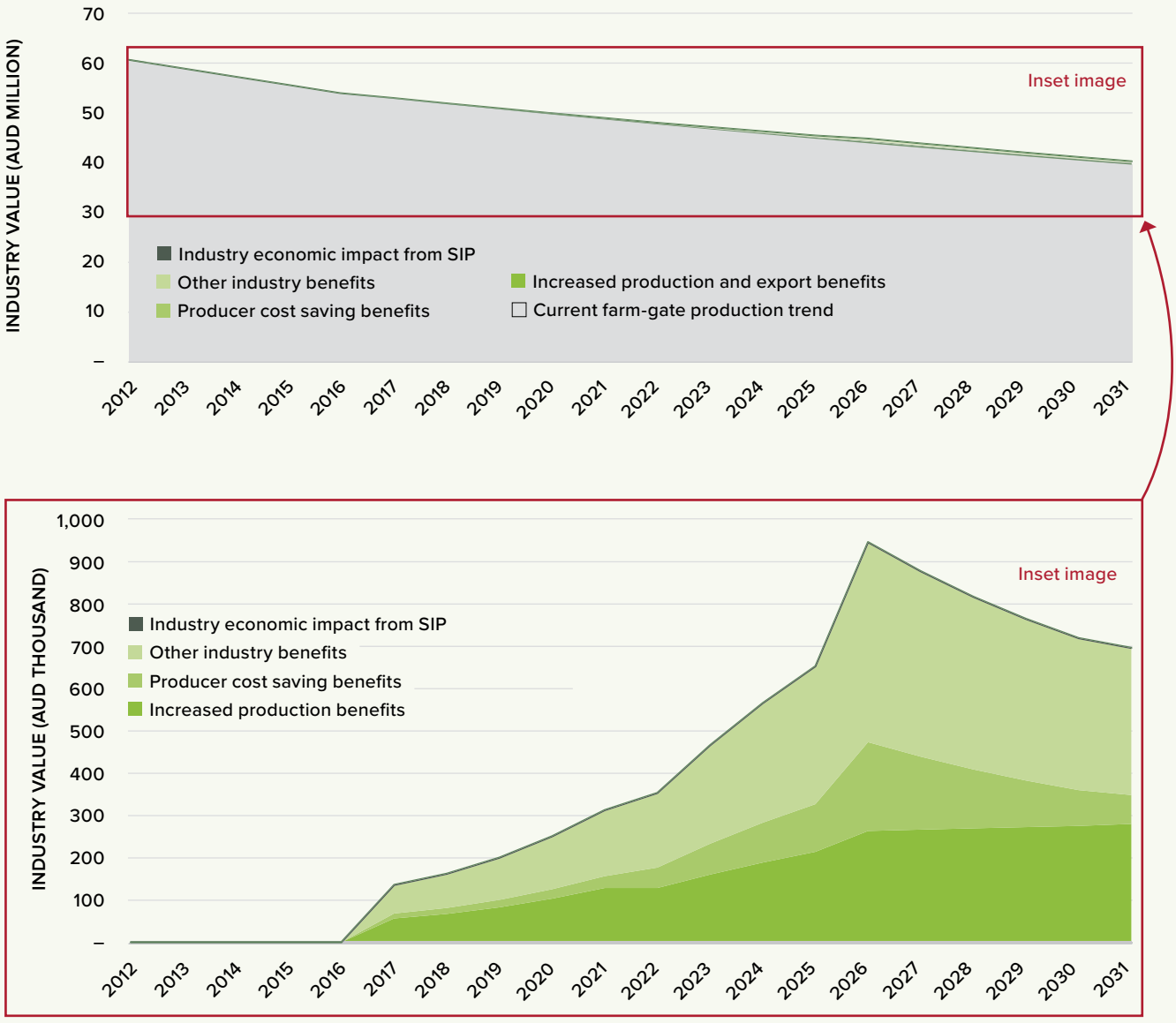
Figure 6: Economic benefit from investment in the SIP



An independent assessment of the potential economic impacts from investment into the pineapple SIP indicated a positive return on investment for the industry (***Figure 6***). The anticipated investment of $1.79 million over the next five years in R&D, extension and marketing activities is expected to generate $7.17 million in net benefits for the industry, representing a benefit cost ratio of 4.02 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.

Table 3 provides a summary of the assessed impacts for each outcome identified in the SIP, the anticipated deliverables, net economic benefits and benefit cost ratio.

Table 3: Summary of assessed impacts for each SIP outcome

Outcome	Expected deliverables *Refer to section 3 for further details*	Anticipated SIP investment (over five years)	Net benefits (over 15 years)	Benefit cost ratio
Improved pest and disease management	• Minor use program and chemical use guidelines • Education tools, training and support for growers to adopt biosecurity practices • Development of new IPDM technologies including education and extension	$446,301	$1,579,050	3.54
Adoption of continuous improvement and automation technology	• Pathways and training for continuous improvement • Automation technologies to improve productivity • Industry production benchmarking and data	$446,301	$2,178,279	4.88
Increased consumer demand	• Technologies to improve quality and shelf life of products • Targeted marketing initiatives	$446,301	$1,857,552	4.16
Attraction and development of new growers	• Training and mentoring programs • Succession planning innovation and initiatives	$446,301	$1,558,944	3.49

The quantified impacts associated with Outcome 1 include:

- Increases in yield and reductions in crops lost from greater access to chemicals through a minor use program for the industry
- Reduced impact from biosecurity threats from the use of new education tools, training and support for growers to adopt biosecurity practices
- Increase in yield and reductions in crops lost from greater adoption of IPDM practices through the development of new IPDM technologies including education and extension for industry.

The quantified impacts from Outcome 2 include:

- Increase in production yields, reduction in production costs from the implementation of best practices and continuous improvement on-farm
- Reductions in the cost of production from the adoption of new automat techniques such as mechanised planting and harvest systems, remotes sensing/robotic technology for pests and diseases
- Market expansion, price premiums and reductions in cost from better decision making through the use of industry production benchmarking and data to support operations.

The quantified impacts from Outcome 3 include:

- Increase in consumption per capita and reductions in waste from new technologies to improve product quality and shelf life across the supply chain
- Market expansion and price premiums from the implementation of new marketing initiatives for the industry.

The quantified impacts from Outcome 4 include:

- Market expansion and price premiums from the delivery of training, mentoring and succession planning programs to improve technical and business management capability for the industry
- Human capital improvements from the delivery of the training and mentoring programs to improve grower skills for the industry.

SECTION SIX

6 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 reflective of the general investment risks which will be considered in the project investment process.

The pineapple industry is characterised by challenges to obtain accurate production and quality data. Biosecurity is a major risk with a growing unease about the likelihood of a new uncontrollable disease becoming apparent. If such an outbreak occurs then all funds will need to be focused on containment. However, it is essential that agronomic practices be adopted to reduce the dependence on chemical control. The experienced agronomists are leaving the industry generally through retirement and the loss of this knowledge will be detrimental to the industry. Attempts to capture this knowledge is important to enable advances in production.

Attempts to automate the industry have happened in the past including the development of prototypes. There is scepticism of the success of future R&D programs into automation however the industry would adopt it if the research was funded from elsewhere.

APPENDIX 1:
Process to develop this plan

The process to develop the SIP was as follows:

1. Strategy discussions at the inaugural SIAP meeting on July 20, 2016
2. Vision and task identification exercises were conducted at a grower workshop on October 28, 2016
3. The context was developed through desktop research and engagement with growers and researchers between October and December 2016
4. An industry-wide online survey was issued to gain greater feedback on identified outcomes and to identify any gaps in the industries requirements
5. The draft outcomes and strategies were validated with one-on-one phone calls to key growers, industry stakeholders and SIAP members in December 2016
6. The monitoring and evaluation analysis was conducted by Clear Horizons
7. The impact assessment analysis was conducted by Consulting & Implementation Services (CIS).

APPENDIX 2:
Consultation and validation

The following individuals contributed to the development of this SIP and their contribution is greatly appreciated:

Name	Industry Role
Joe Craggs	Vice Chair of PMA Australia and Tropical Pines Marketing Director
John Cranny	Grower and SIAP member
Doug Jones	Heinz, Grower Integration Manager
Rachel Mackenzie	Growcom, SIAP member
Simon Newett	Horticulturist, DAFF
Stephen Pace	Grower, President Australian Pineapple Association, and SIAP member
Jodie Pedrana	Hort Innovation R&D project manager
Garth Sanewski	Senior Horticulturist, DAFF
Col Scott	Agronomist, Tropical Pines
John Steemson	Grower and SIAP member
Les Williams	Grower and SIAP member Growcom Director
Tim Wolens	Agronomist, SIAP member
Georgie Townsend	Growcom, Industry Development Officer
Astrid Hughes	Hort Innovation

APPENDIX 3:
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.*					

APPENDIX 4:
Reference documents

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