# Horticulture Australia Limited

## Papaya Industry Strategic Investment Plan

## 2013/14 - 2017/18

March 2013

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# Executive summary

This Strategic Investment Plan was developed by the Australian Papaya Industry in conjunction with Horticulture Australia Limited (HAL). Its purpose is to guide the national industry's growth and development as well as direct the expenditure of Papaya Levy funds and matching Federal Government R&D support.

The Papaya Industry Advisory Committee (IAC) came together to review the industry's current situation; the past strategic plan and grower feedback received. With this information in mind, the IAC developed a Vision for the industry in 2018; and developing objectives and strategies to achieve that Vision.

***Industry Vision***

*Our vision is for a profitable papaya industry, consistently delivering high quality fruit which exceeds consumers' expectations.*

***Industry Mission***

*Supplying Australian consumers with high-quality Papaya, while delivering a good return on investment for growers and using environmentally sustainable production systems.*

*The industry values the benefits of united activities such as R&D and marketing and encourages grower participation.*

Table 1 below provides a summary of the SIP.

**Table 1 SIP Summary**

| Objectives | Strategies *(Benefit Cost Ratio)* | KPIs |
|---|---|---|
| **1. By 2018 national consumption of papaya will reach 18,000 tonnes** | To maintain relevant and up-to-date consumer research *(18.2)* | ◗ Regular AC Neilson Homescan data and analysis is obtained<br>◗ Qualitative consumer research is updated every three years |
| | To review and implement the Domestic Marketing Plan (*6.2)* | ◗ A market penetration of 14% is achieved (an increase of 5%), based on Homescan data, by 2018<br>◗ The average annual weight of purchase is increased from $16 to $22 per household, based on Homescan data, by 2018 |
| | To improve market access for Australian Papaya*(572)* | ◗ The current level of domestic market access is maintained until 2018<br>◗ National access to WA market is attained by 2018<br>◗ NZ market access issues are investigated by 2018 |
| **2. By 2018 papaya growers will have access to superior champion varieties and be better equipped to manage plant health and fruit quality issues** | To develop champion papaya varieties *(25)* | ◗ 2 superior new varieties are commercially available by 2018 |
| | To deliver ongoing improvement in plant health *(26)* | ◗ Results of Fruit Spotting Bug Project communicated to Industry by 2018, via one article in Papaya Post and coverage at industry field days.<br>◗ Maintenance of current chemicals registered under Minor Use Permits to cover pests and diseases in major growing regions.<br>◗ The knowledge available through R&D of the prevention and management of Phytophthora fruit rot has reduced the impact of the pathogen on production by 2018, based on grower survey results.<br>◗ By 2018 there will be improved control of red spider mite, and reduced chemical resistance, based on grower survey results.<br>◗ The cause, spread and potential treatments of dieback is fully understood by 2018, and communicated via the Papaya Post (1 article) and field days.<br>◗ The impact of post-harvest rot is reduced by 2018, based on grower survey results.<br>◗ Science based information is available to inform the potential risk of exotic incursions by 2018. |

| Objectives | Strategies<br>*(Benefit Cost Ratio)* | KPIs |
|---|---|---|
| **3. By 2018 the papaya industry will have improved communications, extension and industry participation.** | To deliver improved grower communications and extension *(11.1)* | ◗ Papaya post structure reviewed and back catalogue available on internet by 2018<br>◗ Agrilink Growers Manual updated by 2015<br>◗ One field day held annually<br>◗ Annual reports produced<br>◗ Strategic plan reviewed by 2018 |

Figure 1 below shows the indicative expenditure break-down by strategy, while Figure 2 shows the estimated expenditure towards the Federal Government rural R&D priorities. A detailed indicative budget is provided in Appendix C.

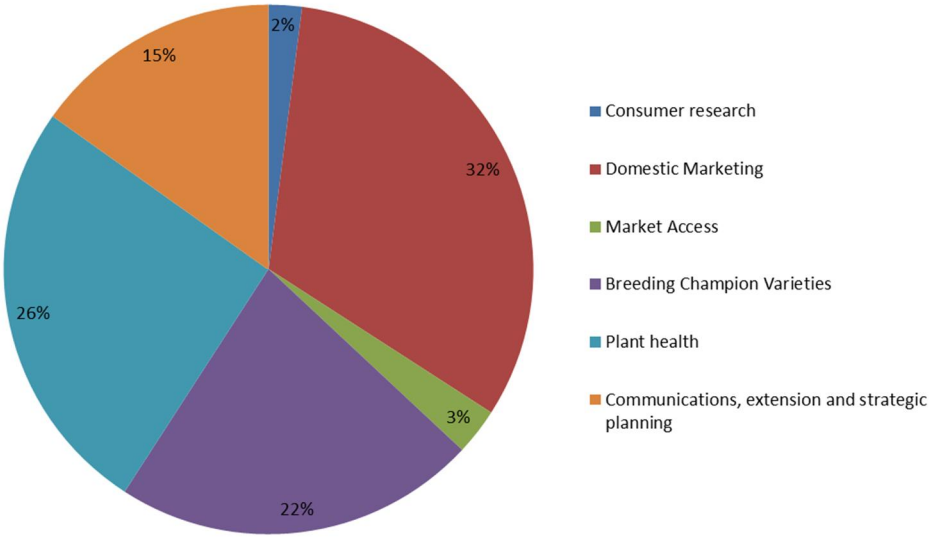


Figure 1 Indicative budget expenditure by Strategy

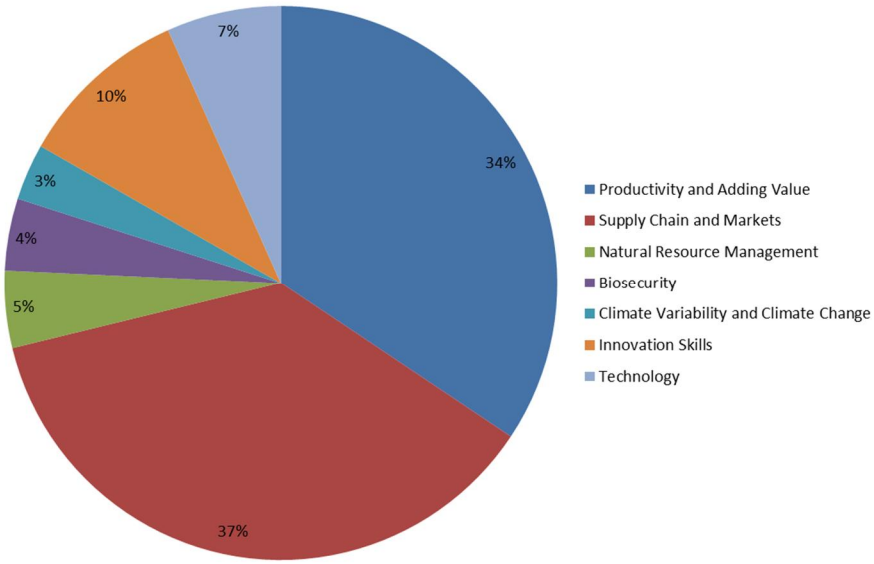


Figure 2 Indicative budget expenditure by Federal Government rural R&D priorities

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# 1. Introduction

The purpose of this Strategic Investment Plan is to guide the development and growth of the Australian Papaya industry, including providing a framework and direction for expenditure of the industry's marketing, and research and development (R&D) levies.

This SIP is the first completed in accordance with the recently established HAL *Strategic Investment Planning Guidelines*. As a result all investment strategies have undergone added scrutiny to ensure that levy-payers and Government investors can be confident that investments offer the best path to growth and profitability for the industry.

## 1.1 Methodology

The SIP was developed by GHD in collaboration with Horticulture Australia Limited (HAL) and the Papaya Industry and the Papaya Industry Advisory Committee (IAC).

The process for developing the plan involved the following steps:

**1.** In mid-2012 papaya growers were invited to assess the previous SIP and provide feedback/suggestions for the new SIP.

**2.** The IAC and key stakeholders met in South Johnstone, Queensland on November 14th for a Strategic Planning Workshop. The IAC reviewed grower feedback and Situation Analysis material before establishing Strategic Objectives, Strategies, Sub-strategies and Key Performance Indicators (KPIs).

**3.** Investment strategies were evaluated using Benefit Cost Analysis (BCA) and prioritisation analysis.

4. The SIP was finalised based on industry and PAL/IAC feedback.

5. The PAL/IAC endorsed the SIP 2013 – 2017 in March 2013.

# 2. Situation Analysis

## 2.1 Product

### 2.1.1 Volumes and Value

Previous forecasts suggested domestic production would exceed 14,000 tonnes per annum by 2011/12. Actual production has been much lower than expected, largely due to the impact of cyclone activity. In recent years production has recovered and in 2010/11 surpassed 12,000 tonnes.

For budgeting purposes PAL/ IAC have set a leviable production forecast of over 16,000 tonnes per annum, by 2018 (Figure 3), representing an average 5% increase per annum. This forecast is for budgeting purposes and is therefore marginally more conservative than the 18,000 tonne consumption target set in this plan (See objective 1).



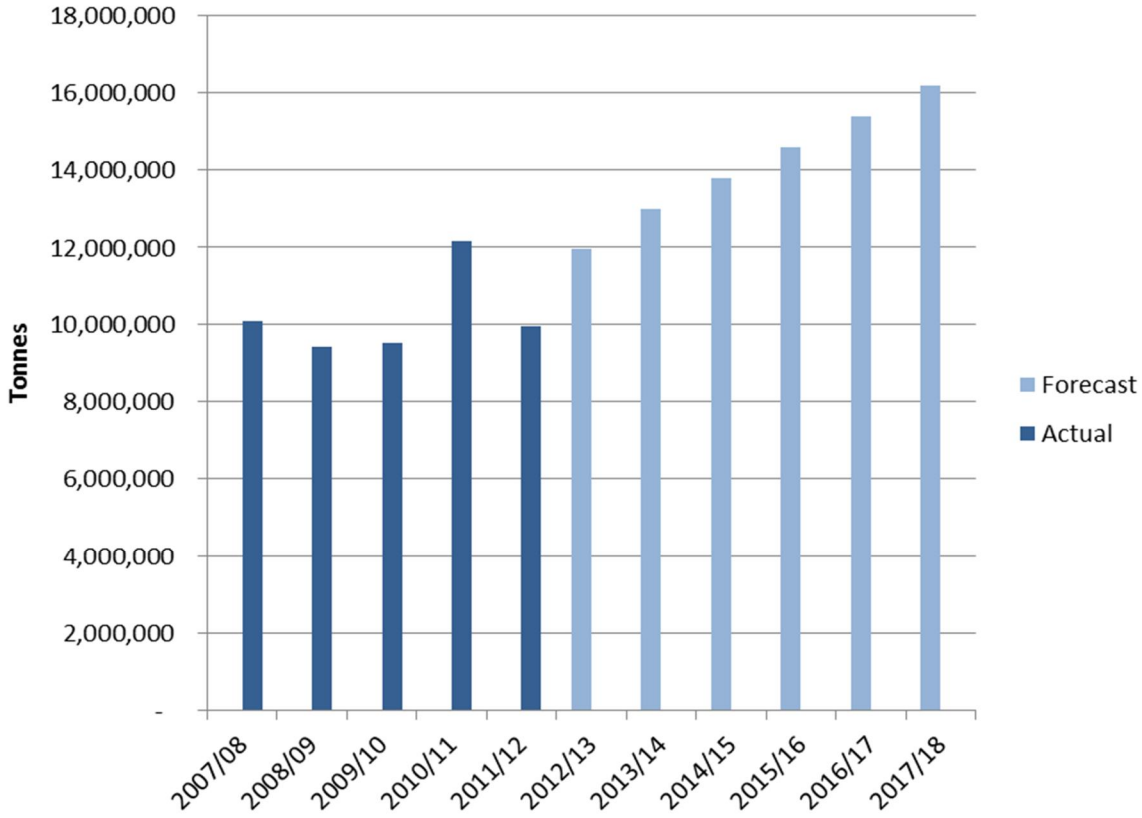


Figure 3 Actual and forecast production (million cartons)

Table 2 below demonstrates the relationship between future production and farm gate value.

Table 2 Future production and farm gate value([1]

| | 2015 | 2020 | 2025 |
|---|---|---|---|
| Area planted (ha) | 500 ha | 600 ha | 700 ha |
| Production (tonnes) | 18,000t | 20,000t | 22,000t |
| Value (farm gate) | $32.4m | $40.0m | $48.5m |

### 2.1.2 Supply and availability

- Papaya grown in North Queensland is available year-round.
- Weather has a significant impact on continuity of supply of good quality product.
- Product from WA and Central/South-East Queensland is usually not available for a period of 2-3 months due to climate conditions.
- In 2006 cyclone 'Larry' devastated the industry, causing a total loss of between 65% and 95% of fruit-bearing trees. Further damage occurred to coastal North Queensland in February 2011 following cyclone 'Yasi'. However, production continued to increase due to increased production in the Atherton Tableland region. Additionally, new blocks planted during 2011 will increase production during 2012 and beyond[2].
- With favourable weather, oversupply can occur in March/April/May and Sept/Oct /Nov.

### 2.1.3 Varieties

- Production of red-flesh fruit has increased to 70% of total production compared to yellow-flesh fruit 30%. Red-flesh varieties are considered to have potential for further growth.
- Over 10 varieties of Papaya are grown in Australia,
- The main shortcomings in current varieties are variability in fruit eating quality, size and appearance.
- Through the assistance of levy funds DAFFQ has developed six lines which they are now in the process of running through semi-commercial trials.
- Currently the Papaya levy program funds PP10005 'Marker Assisted Breeding of Papaya to Develop new Commercial lines'. The program aims to have at least two commercial available varieties at the completion of the next phase of the project.
- Some growers are either breeding or introducing new red varieties into the market.

### 2.1.4 Growing Regions

- Top producing states (in order, highest first) are Queensland (over 90% in North Queensland), NT, WA and NSW (see Figure 4 below)

[1] HAL member report on Subtropical and Tropical fruit industries 2010 – 2025 (2011)

[2] Diczbalis, Y (DAFF, Qld), Williams, B (DOR, NT), Hickey, M (NSW DPI) Papaya Industry Situation Statement, National Horticultural Research Network, 2012

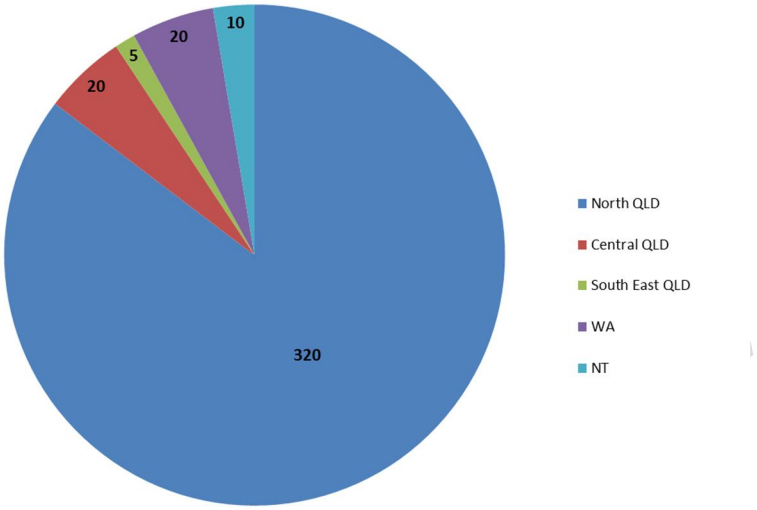


Figure 4 Estimated regional plantings (Ha in production)[3]

- North Queensland has higher productivity levels and 52 week production.
- Tropical Coast red-flesh fruit are generally considered to have better appearance than Tablelands/Mareeba.
- Production has increased in the Ord River Irrigation Area (WA).
- WA production breaks in hot summer months.
- South-East Queensland production breaks in cooler winter months.

## 2.2 Markets

### 2.2.1 Domestic

- Domestic consumption usually occurs on the east coast (Sydney, Brisbane, and Melbourne). Less per-capita consumption occurs in SA and WA. Compared to Sydney and Brisbane, Melbourne is considered to have the most potential for market growth due to its growing population, lower consumer awareness and low per capita consumption.
- Independent retailers dominate the total domestic market for household usage (estimated at 60-70%); with less than 40% of total production sold through retail chains (see Figure 5 below).
- Roadside and off-farm sales are minimal.
- There is some evidence indicates that independent retailers are more familiar with Papaya and more active in marketing and in-store presentation.

[3] HAL member report on Subtropical and Tropical fruit industries 2010 – 2025 (2011)

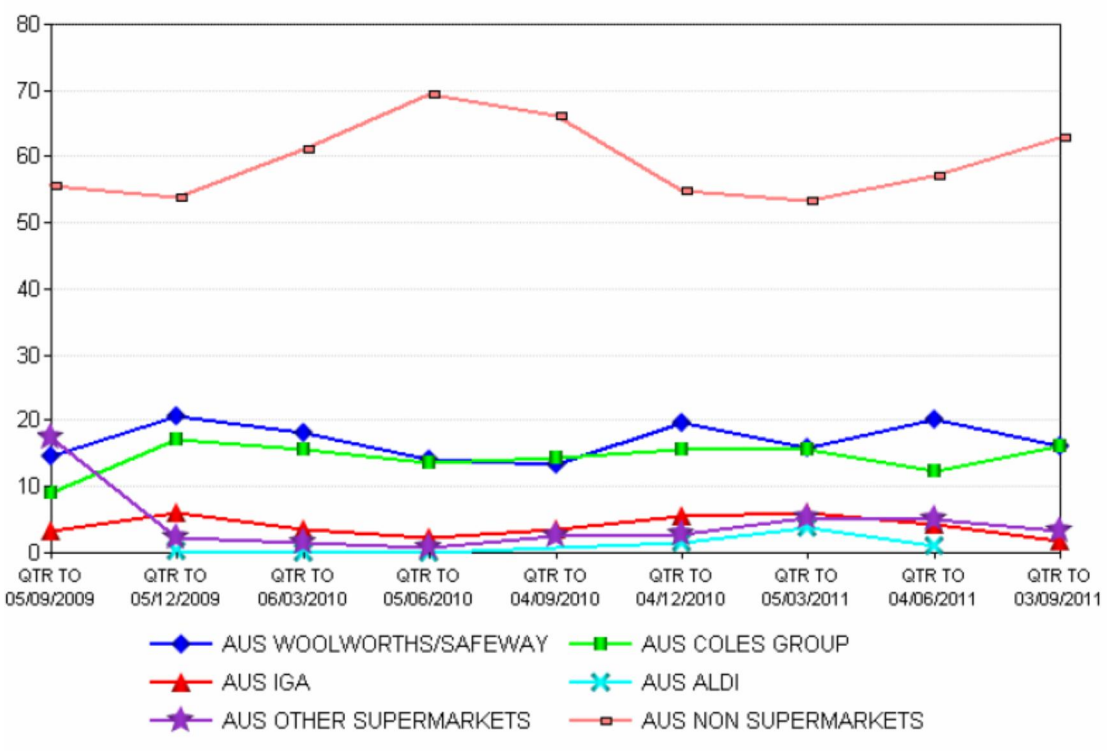


Figure 5 AC Nielsen Data – All Papaya Shoppers – Share of Trade ($-) MAT to 03/08/11

- Papaya consumers make almost 58% of all of all grocery purchases in non-supermarkets, hence the importance of ensuring that the category is maintained within the independents / green grocer (non-supermarket) channel.
- Most Australian shoppers are not loyal to a particular retail channel and tend to spend their grocery budget across a number of different outlets.

### 2.2.2 Processing

- Virtually no processing occurs beyond boutique/cottage industry products, however key retailers tend to have cut and pre-packed products in their stores from time to time i.e. fruit salad bowls etc.

### 2.2.3 Export

- Virtually no Australian product is exported
- The NZ Ministry of Agriculture and Forestry approved access to the NZ market for irradiated Australian papaya in 2006, however only 14 tonnes have been exported to date and none since 2008[4].

[4] Food Standards Australia New Zealand and Biosecurity NZ

### 2.2.4 Import

- Fiji papaya imports into Australia have ceased due to the prevalence of Bacterial Crown Rot. However the Fiji industry and government remain committed to overcoming the biosecurity risk and regaining access to the Australian market.
- Most processed products containing Papaya are imported.

## 2.3 Consumers

### 2.3.1 Purchasing



- Research suggests that papaya consumption is influenced by food fashion and fads. Consumers are increasingly health conscious and are also demonstrating a growing inclination to try new food products/fruits/varieties. These trends are heavily influenced by the media and food service industries.
- Tropical fruit consumption generally declines during times of cold/wet weather.
- Consumer-friendly packaging and presentation has the potential to lift consumption.
- Overall, younger consumers appear to be less adventurous (i.e. new purchasing of Papaya) than older. However younger purchasers appear to prefer the red varieties.
- The average Papaya consumer purchases Papaya every 34 days (compared to an average period of 44 days for the tropical fruit category).
- Like most tropical fruits, there is a high reliance on second time purchasers to drive category growth, with total volume of purchase driven by 10% -20% of the consumer households.
- A significant proportion (43% in 2002) prefer to purchase pre-cut papaya (flesh exposed) – primarily due to preference for smaller portion size, cost and a desire to see the quality and colour of flesh.
- Regular consumers are likely to be older (50+).

### 2.3.2 Preparation/consumption

- Predominantly consumed as fresh fruit either for breakfast or as dessert (e.g. in fruit salad).
- Very small amount of green fruit used in salads and cooking (mainly consumers of Asian descent).

### 2.3.3 Consumer research

- Consumer research suggests that consumers primarily purchase papaya for the following reasons/qualities (see Figure 4 below)

•

Table 3 Consumer likes and dislikes

| Like | Dislike |
|---|---|
| • nutrition,<br>• taste<br>• aiding digestion | • Dislike taste<br>• Variable taste<br>• Unattractive whole fruit<br>• Limited product familiarity/knowledge<br>• Lack of availability<br>• Fruit bruising/lasting |

Consumer research has also uncovered the following insights[5]:

- Overall awareness and knowledge of papaya is limited
- Perceived as not the most expensive fruit, however somewhat exotic.
- Majority of consumers are not aware of the health benefits of the fruits
- Majority of consumers are not aware of how to select and handle papaya.
- Overall the fruit is not top of mind and lack saliency amongst consumers and considered an occasional purchase
- Papaya consuming households tends to be older

## 2.4 Competitors and the Nature of Competition

### 2.4.1 Competing Products

- Primary product competition is other fresh fruit, particularly other tropical/exotic fruits.
- Possibly local fruit competition from Rockmelon.
- Very limited import competition, however there is potential for more sea imports.

Figure 6 demonstrates papayas position within a competition matrix.

[5] Brand Story, 2008

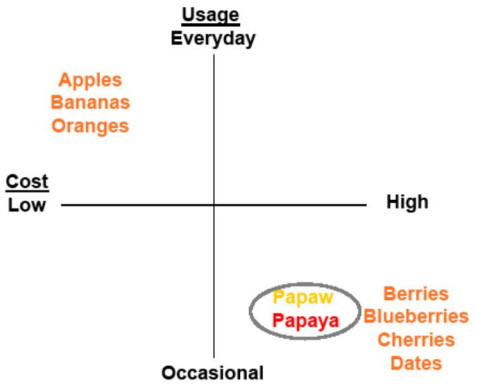


Figure 6 Papaya competition matrix[6]



### 2.4.2 Competing production

- Easy entry into the industry.
- Expected production competition from Sugar Cane farmers did not eventuate. Tableland (North Queensland) production increased during this period.

## 2.5 Competitive Advantage

- Available all year round
- Healthy, exotic, distinctive, versatile fruit
- Australian grown
- Efficient production

## 2.6 Supply and Demand Trends and Factors

Since January 2011, papaya market penetration has generally been declining, this trend was likely due to some occasional consumers dropping out of the market, particularly following Cyclone Yasi.

However over the same period the average weight of purchase (AWOP) has been relatively steady, indicating that regular consumers continue to purchase at a higher quantity and/or price (see Figure 7 below).

[6] Horticulture Australia 2011, *Papaya Industry Situation Analysis.*

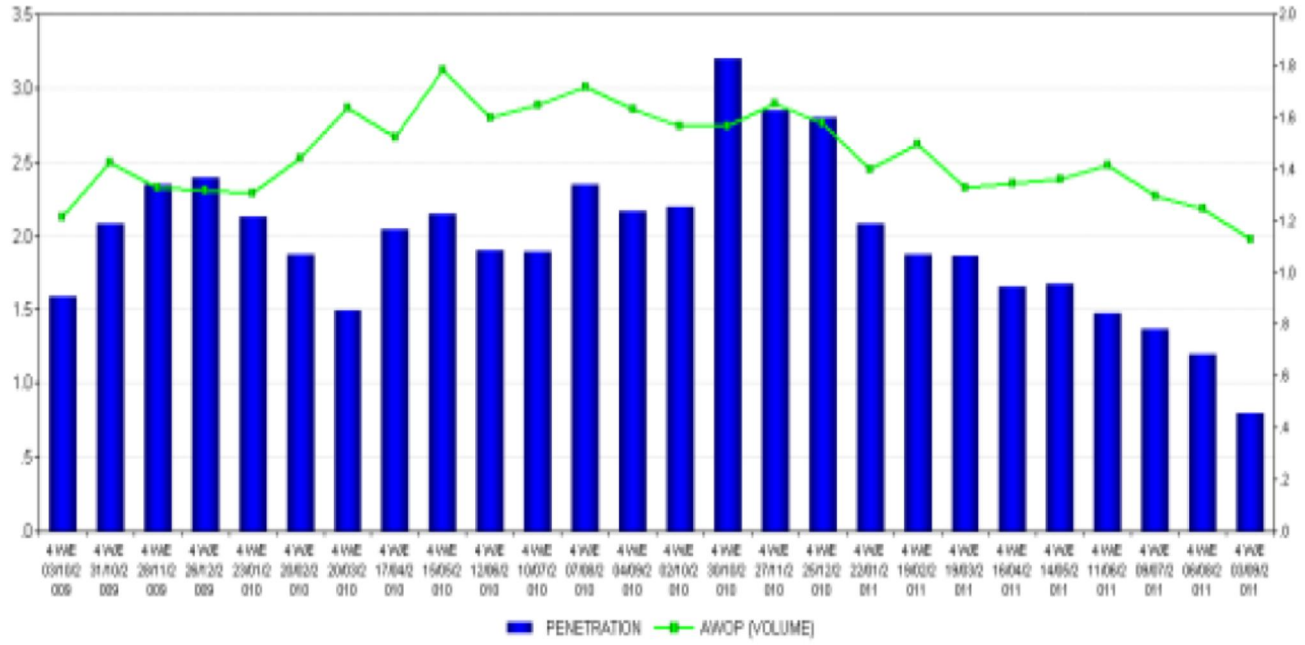


Figure 7 Papaya market penetration and AWOP (AC Nielsen)

## 2.7 Operating Systems

### 2.7.1 Production Systems and Processes

***Production***

- Good production cost information is available, however no production benchmarking has been undertaken
- Industry has invested in ongoing plant health research including the following:
    - Fruit-spotting bug management
    - Development of Miticide resistance management strategies

***Harvesting***

- There is opportunity for innovation in picking/packing, which is highly labour-intensive due to delicate nature of fruit.

***Wholesale/Retail Transport***

- Fruit is predominately transported to wholesale markets via refrigerated road transport.
- Transport from wholesale markets to retail outlets is predominately unrefrigerated road transport.

***Wholesale***

- Product sold almost entirely through market agents.
- There is a relatively poor understanding of the following factors:

- Wholesale market volume and share
- costs and value along the supply chain
- supply chain efficiency or limitations

***Retail***

- There is very little known about retailer's attitudes and practices, and the potential for improvement in retail

***QA***

- QA standards and systems are available, however the level of usage is not well known.

### 2.7.2 Marketing Systems and Structures



***Packaging***

- The large majority of product is sold in 10 or 12kg cartons.

***Branding/identification***

- Virtually all Papaya is sold generically as Red or Yellow and there is evidence that retailers predominantly identify the red varieties as 'Papaya' and yellow as 'Paw Paw or 'Papaw'.
- No clear and established consumer-based branding exists, there is however some identification based on the regional "Innisfail" brand and there may be a degree of consumer and retailer loyalty to it.

***Marketing Programs***

- Current generic campaign marketing campaign coordinated through HAL – mainly PR and media relations, with some in-store sampling and POS materials.
- Campaign theme is "Pawpaw and Papaya – exotic, sophisticated fruit from tropical Australia. Loved by those in the know" and targeted primarily at younger demographic.
- Limited measurement to date of market effectiveness of the campaign.
- Limited non-levy promotion by some market agents.
- Minimal market research conducted looking at new market opportunities.

## 2.8 Industry Organisation and Performance

### 2.8.1 People

- Number of growers estimated at around 130.
- Trend toward larger growing operations and less growers overall.
- Estimated in excess of 60% production is produced by a relatively small number of farms.
- Still significant proportion of production enterprises are family farms.

### 2.8.2 Industry Organisation

- Key industry groups/associations are:
    - Papaya Australia Ltd (National peak body)
    - Innisfail Pawpaw and Papaya Growers Association
    - Mareeba District Fruit & Vegetable Growers Association Ltd
    - Northern Territory Horticultural Association (NTHA) represents horticulture producers in NT
- Industry peak body and IAC operating well with the confidence of growers, however these bodies suffer from a lack of grower participation and succession planning.
- IAC have 2 face to face meetings a year. The Papaya Plant Breeding Reference Group act as an IAC steering group for all plant breeding issues
- PAL chair regularly attends the HAL forums

### 2.8.3 Funding

- Statutory levy on fresh produce, by weight, in place since 2004.
    - Fresh – 2c/kilogram
    - Processing - 0.25c/kilogram
    - Export – 2c/kilogram
- Levy split: 50% R&D; 50% Marketing

**Table 4 Budgeted revenue, non-project and project costs**

| Year | Budgeted Revenue | Budgeted non-project costs | Available project funds |
|---|---|---|---|
| 2013/14 | $391,575 | $66,709 | $324,866 |
| 2014/15 | $410,814 | $62,448 | $348,366 |
| 2015/16 | $430,054 | $63,007 | $367,047 |
| 2016/17 | $449,293 | $63,314 | $385,979 |
| 2017/18 | $482,172 | $63,631 | $418,541 |
| TOTAL | $2,163,907 | $319,109 | $1,844,798 |

### 2.8.4 Technical Information and Communication

- Papaya Post is the industry newsletter/magazine distributed quarterly.
- No formal evaluation of impact/effectiveness.

### 2.8.5 Biosecurity

- Plant Health Australia (PHA) developed a Biosecurity Plan for industry in 2011/12. PHA will develop a Farm Biosecurity plan 2012/13.

### 2.8.6 Environmental Management

- Potential for increased environmental requirements, particularly growing areas near the Great Barrier Reef.

### 2.8.7 Community Relationships

- Industry is very positively regarded by the community in its growing regions.

# 3. Vision and Mission

The IAC has reviewed and amended the industry's vision and mission statements as follows:

## 3.1 Vision

A visions statement is a concise, target for what the industry would like to achieve. The Australian Papaya Industry has the following vision.

***Our vision is for a profitable papaya Industry, consistently delivering high quality fruit which exceeds consumers' expectations.***

## 3.2 Mission

A mission statement defines the industry, its key purpose and values. The Australian Papaya Industry has developed the following mission:

***Supplying Australian consumers with high-quality papaya, while delivering a good return on investment for growers and using environmentally sustainable production systems.***

***The industry values the benefits of united activities such as R&D and marketing and encourages grower participation.***

# 4. Objectives

In order to deliver the industry's vision the IAC developed three objectives, which broadly align to the three broad objectives of HAL (see Table 5 below).

**Table 5 HAL and Papaya Industry Objectives and rationale**

| HAL Objective | Papaya Industry Objective | Rationale |
|---|---|---|
| *Increasing demand for the product* | **1. By 2018 national consumption of papaya will reach 18,000 tonnes** | As papaya production continues to grow, through expansion from current growers and replanting in areas impacted by Cyclones Larry and Yasi, the industry must continue to increase consumer demand, in order to achieve improved profitability.<br><br>Forecasts suggest Australian papaya production will grow to 16,000-18,000 in the coming 5 years. With input production costs generally increasing, the industry must aim to increase demand and therefore consumption by an equal or larger amount in order to improve profitability.<br><br>Some organic growth in consumption will most likely come from population growth in Australia (8% growth in the coming 5 years). However with the largest consumer segment aged 50+ years, the industry must increase market penetration in order to lift demand.<br><br>Understanding the market through consumer research is an essential first step to drive the focus of marketing activities, new variety development and ultimately production.<br><br>Previous consumer research demonstrated the opportunity to lift domestic demand which can be achieved through targeted point of sale marketing, retail education and targeted PR (e.g. columnist articles).<br><br>Research suggests those who consume papaya do so regularly in larger quantities. There is scope to build the consumer base within younger demographics through changing consumer culture (e.g. the use of celebrity chefs) and the development of new varieties.<br><br>It is important to maintain current domestic market access (to all states except WA) and investigate changes to quarantine protocols by Department of Agriculture and Food WA (DAFWA) to allow Queensland papaya entry into the WA market. Additionally, NZ offers an opportunity for export market development, which requires investigation (currently |

| HAL Objective | Papaya Industry Objective | Rationale |
|---|---|---|
| | | only papaya treated with irradiation can be exported to NZ). |
| *Increasing production efficiency* | **2. By 2018 papaya growers will have access to superior champion varieties and be better equipped to manage plant health and fruit quality issues.** | Significant opportunities exist to improve production through breeding and plant health research and development.<br>The industry is currently investing in a program to develop superior varieties with the potential to address both consumer barriers to purchase (e.g. variability in quality and taste), as well as production attributes (e.g. yield and plant disease).<br>Similarly there are a myriad of plant health issues which threaten the industry including:<br>• Maintenance of chemical minor use permits<br>• Phytophthora fruit rot<br>• pythium-related root rot<br>• fruit-spotting bug<br>• red spider mite<br>• die-back<br>• post-harvest rot<br>• exotic disease incursions |
| *Ensuring an effective operating environment* | **3. By 2018 the papaya industry will have improved communications, extension and industry participation.** | Good communications within the industry, at all levels, will maximize the support for and impact of the industry's levy investment and this Strategic Investment Plan.<br>The industry production sector is well-concentrated in certain regions and there are some regional structures in place. At a national level, enhancements to the Papaya Post and Papaya Agrilink, along with updating the industry website will form vital platforms for R&D extension and broader industry communication.<br>Industry extension events, including field-days, help to maintain links between researchers and growers and facilitate sharing of information. |

# 5. Strategies/sub strategies

The industry and IAC established strategies aim to achieve each of the 3 strategic objectives. The strategies are outcome focussed and contain associated rationale, likely sub-strategies or projects and KPIs which will be used to measure success.

Any industry investments over the course of the plan should align and be consistent with these strategies. There is however some flexibility in the sub-strategies and projects which may change depending on the investment opportunities which arise.

**Table 6 Objective 1: By 2018 national consumption of papaya will reach 18,000t**

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| **To maintain relevant and up-to-date consumer research** | Up to date qualitative and quantitative consumer information is critical to inform marketing activities, new variety development and production strategies.<br>In recent years the industry has gained access to AC Neilson Homescan data which indicates consumption patterns | ◗ AC Neilson Homescan data and analysis<br>◗ Qualitative consumer research completed periodically | ◗ Regular AC Neilson Homescan data and analysis is obtained<br>◗ Qualitative consumer research is updated every three years |
| **To review and implement the Domestic Marketing Plan** | With less than 10% of Australian households purchasing papaya, there is considerable scope to increase market penetration. There is further potential to increase consumption by turning occasional consumers into regular consumers.<br>This can be achieved through targeted marketing activities which increase consumer awareness and inform the public about how papaya can be prepared and served. | ◗ Papaya Marketing Program and associated activities | ◗ A market penetration of 14% is achieved (an increase of 5%), based on Homescan data, by 2018<br>◗ The average annual weight of purchase is increased from $16 to $22 per household, based on Homescan data, by 2018 |
| **To improve market access for Australian** | Market access restrictions currently exist for the WA (population of 2.3 million) and New Zealand (population 4.4 million) markets. | ◗ Investigate protocols for national access to the WA market | ◗ The current level of domestic market access is maintained until 2018 |

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| **Papaya** | Obtaining access to these markets would increase the potential market-reach for Australian Papaya by up to 33%.<br>It is in the broad interests of the national industry to investigate and fully understand the import protocols and other issues (economics, transport and fruit quality management) which need to be addressed in order to gain access to these markets. | ◗ Investigate NZ market access issues | ◗ National access to WA market is attained by 2018<br>◗ NZ market access issues are investigated by 2018 |

**Table 7 Objective 2: By 2018 papaya growers will have access to superior champion varieties and be better equipped to manage plant health and fruit quality issues**

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| **To develop champion papaya varieties** | New varieties have the potential to improve plant health and fruit quality, to ultimately increase consumer demand and production margins. | ◗ Marker Assisted Breeding of Papaya to develop new commercial lines | ◗ 2 superior new varieties are commercially available by 2018 |
| **To deliver ongoing improvement in plant health** | Plant health and disease management is an ongoing challenge for papaya growers, which necessitates ongoing industry attention.<br>At present papaya growers are facing a myriad of plant health and disease challenges including;<br>• Phytophthora fruit rot<br>• pythium-related root rot<br>• fruit-spotting bug<br>• red spider mite | ◗ Minor Use Permits<br>◗ Fruit-spotting Bug Control Project<br>◗ Management of Phytophthora fruit rot and Pythium-related root rot<br>◗ Red Spider Mite control | ◗ Results of Fruit Spotting Bug Project communicated to Industry by 2018, via one article in Papaya Post and coverage at industry field days.<br>◗ Maintenance of current chemicals registered under Minor Use Permits to cover pests and diseases in major growing regions.<br>◗ The knowledge available through R&D of the prevention and management of Phytophthora fruit rot has reduced the impact of the |

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| | • die-back<br>• post-harvest rot<br>Additionally, biosecurity and minor use permits require stringent ongoing management at industry level. | ◗ Understanding papaya dieback<br>◗ Post-harvest rot control<br>◗ Managing risk of exotic incursions | pathogen on production by 2018, based on grower survey results.<br>◗ By 2018 there will be improved control of red spider mite, and reduced chemical resistance, based on grower survey results.<br>◗ The cause, spread and potential treatments of dieback is fully understood by 2018, and communicated via the Papaya Post (1 article) and field days.<br>◗ The impact of post-harvest rot is reduced by 2018, based on grower survey results.<br>◗ Science based information is available to inform the potential risk of exotic incursions by 2018 |

**Table 8 Objective 3: By 2018 the papaya industry will have improved communications, extension and industry participation**

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| **To deliver improved grower communications and extension** | Maintaining strong industry communications is considered vital for the ongoing development of the industry, by facilitating sharing of ideas and information.<br>Reviewing the structure of the Papaya Post and making previous articles available on the internet will help provide growers with a more valuable resource. | ◗ Communications Project<br>◗ Review Papaya Post structure, developing library and making available online<br>◗ Update Agrilink Growers Manual<br>◗ Papaya Consultation Agreement<br>◗ Extension activities (field-day etc) | ◗ Papaya post structure reviewed and back catalogue available on internet by 2018<br>◗ Agrilink Growers Manual updated by 2015<br>◗ One field day held annually<br>◗ Annual reports produced<br>◗ Strategic plan reviewed by 2018 |

| Strategies | Rationale | Likely sub-strategies/projects | KPIs |
|---|---|---|---|
| | Similarly the Agrilink Growers Manual is due to be undated.<br><br>Field days or workshops held in conjunction with extension providers (i.e. QDAFF) are considered to be an ideal way to communicate with growers. | ◗ Industry Annual report<br>◗ Papaya Strategic Investment Plan | |

# 6. Analytical Business Case

This section outlines the Analytical Business Case for each of the strategies adopted, which provides justification of why specific strategies were adopted. The Analytical Business Case is composed of the following two types of analysis:

- Prioritisation Analysis and
- Benefit Cost Analysis.



## 6.1 Prioritisation Analysis

Workshop participants were asked to rank the top three strategies (1=top priority, 2=second highest priority, 3=third highest priority) in terms of the urgency, importance, impact and chance of success.

The results (Table 9) show that participants generally believed that in order to get the most from domestic marketing investments (Strategy 2), the industry must first address fruit quality issues, through investments in breeding (Strategy 4) and plant health (Strategy 5).

Table 9 Prioritisation Analysis Results

| Strategies | Urgency | Importance | Impact | Success | Overall Rank |
|---|---|---|---|---|---|
| 1. Consumer research | 3* | - | - | 2 | 4th |
| 2. Domestic Marketing | - | - | - | - | 6th |
| 3. Market access | - | 3 | 3 | - | 5th |
| 4. Breeding Champion Varieties | 1 | 1 | 1 | - | 1st |
| 5. Plant health | 2 | 2 | 2 | 3 | 2nd |
| 6. Communications and extension | 3* | - | - | 1 | 3rd |

1 = Top priority, 2 = second highest priority, 3= third highest priority, * = equal importance.

## 6.2 Benefit Cost Analysis

Each strategy was assessed with a simple Benefit Cost Analysis based on the HAL SIP Guidelines for assessing investments below $500K. The BCA results are based on a range of assumptions which were tested with the industry and the IAC and other specialists.

The results (Table 10) show a large variation in Benefit Cost Ratios (BCR). The highest (572) was calculated for strategy 3 (Market Access) which was due to the high potential return given a modest investment of $10,000 per year. The lowest BCR (6.2) was calculated for strategy 2 (Domestic Marketing) largely due to the short length of time before the benefit decays. All BCRs are well above 1 suggesting a positive return on investment for all strategies. (Calculations and assumptions are detailed in Table 13 within Appendix D).

Table 10 Benefit Cost Analysis Results

| Strategies | Average estimated cost/year | Average estimated benefit/year | BCR |
|---|---|---|---|
| 1. Consumer research | $7,367 | $134120 | 18 |
| 2. Domestic Marketing | $113,710 | $700,000 | 6.2 |
| 3. Market access | $10,000 | $5,719,000 | 572 |
| 4. Breeding Champion Varieties | $78,000 | $1,935,500 | 24.8 |
| 5. Plant health | $81,939 | $216,7200 | 26.4 |
| 6. Communications and extension | $56,503 | $624,960 | 11 |

# 7. Acknowledgements

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Ian MacLaughlin (PA)

Lynton Vawdrey (QDAFF)

Joe Zappala (PA, IPGA)

Shanka Dharmaratne (HAL Marketing Manager)

Jane Wightman (HAL Industry Manager)

# Appendices

Appendix A

# SWOT Analysis

Based on the information in the Situation Analysis the following SWOT analysis was completed for the Australian Papaya industry. Strengths and weaknesses are generally current attributes, while opportunities and threats are generally future considerations.

| Strengths | Weaknesses |
|---|---|
| • Unique, healthy product produced and available year-round.<br>• Short-cycle crop for quick turnover.<br>• Product has specific health/nutritional benefits.<br>• Small, well-organised, profitable industry<br>• Passionate growers<br>• National peak body with widespread industry support<br>• Good communications across the industry<br>• Established statutory levy with federal support of R & D<br>• Mostly family businesses or positive small businesses.<br>• Low labour skill requirement<br>• Exciting products in consumer's eyes<br>• Increases the range offered by retailers to consumers<br>• Versatile fruit (used in cooking and desserts etc)<br>• Low cost of entry | • Inconsistent quality, taste and size of fruit.<br>• Supply chain weaknesses.<br>• Lack of good product knowledge long the supply chain.<br>• Small industry – leading to limited resources and lack of momentum.<br>• Fruit can be fragile, not long shelf life and can be messy to eat.<br>• Inconsistency of plant seed availability.<br>• Production highly sensitive to climate variations.<br>• Consumption highly sensitive to climate variations.<br>• Long distance to major markets.<br>• Low consumer awareness of the product.<br>• Growers not well informed on the market, supply chain, consumer preferences etc.<br>• Labour intensive.<br>• Average age of growers (50+).<br>• Limited availability of R&D service providers.<br>• Niche product category.<br>• Lower sales volumes mean lower visibility in store.<br>• High number of varieties in store (inconsistencies in taste and quality).<br>• Inefficient supply chain forecasting capabilities, inconsistencies in handling and storage within the Supply Chain.<br>• Some products have negative consumer sentiment due to negative past experiences (taste, quality).<br>•<br>• Inconsistent quality and size of fruit in market place (blemishes on fruit skin). |

**Opportunities**

- New/expanded markets – exports to New Zealand and interstate access to WA.
- Hot water as an alternative to or part of a chemical control strategy.
- Post-harvest fruit "Coatings".
- Potential to examine the concept of sending papaya to market mature green and ripening at the market end.
- Gain value chain efficiency through the use of pre farm gate packing shed technology and processes and efficiency through the chain (e.g. in transit ripening provides further opportunities).
- Interact with international researchers through the Australian Centre for International Agricultural Research (ACIAR)
- Labour potential availability in women and over 50's (grey nomads).
- One or two key varieties that address product problems and is widely available and marketed.
- Gather and learn from retailer feedback.
- Market growth in young consumers and the health-oriented.
- Expand the market through new users and increased purchase frequency.
- Promotion in schools to attract young consumers and influence family purchasing.
- Value-adding and processing (pre-cut fruit), presentation at point of sale (i.e. peel & slice), change packaging (e.g. twin pack for service stations).
- Better packaging to suit consumer needs (Cut Papaya, 5-7 Passionfruit bags, smaller size Custard Apples).
- Increasing trend amongst consumers to eating healthier.
- Educate and gain support at store level to better display product
- Increasing consumer education on varieties and usage occasions.
- Cross category promotional opportunities with other products (yoghurt, ice cream etc.).
- Leverage the 'Australian Grown' message and/or local providence.

**Threats**

- Environmental requirements (including the Great Barrier Reef).
- Cyclones and other severe weather events – impact on production.
- Unpredictability of weather (extreme dry and cold periods).
- Fresh product imports (from low labour-cost countries).
- Competition from other fruit categories (Bananas, Apples, Kiwifruit etc.).
- Banana imports – sending banana growers to Papaya and leading to Papaya over-supply and price pressure.
- Oversupply.
- Exotic pest incursion.
- Managed Investment Schemes leading to oversupply.
- Cold/wet weather in major markets – impact on purchase and consumption.
- Increasing costs – Transport, Packaging, Fertiliser etc.
- Animal impact – birds, flying foxes, pigs.
- Lack/loss of agronomic advice.
- The inability to deliver a cultivar with consistent flavour and market appeal.
- Loss of government funded support for the breeding program.
- Small promotional budgets.
- A short lead time to market means not enough time to plan on activity.
- Price is often seen as a barrier to purchasing.
- High substitutability with other fruit.
- Continuing to operate at 'status quo'.
- Lack of market and product intelligence and a market plan to respond.
- Growers not well informed on the market, supply chain, consumer preferences etc.
-

Appendix B

# Implementation Plan

Table 11 below outlines the specific actions required to implement the strategies and sub-strategies of the plan. Also included are the staff/organisations responsible for implementation.

**Table 11 Implementation Plan**

| Strategies | Likely sub-strategies/projects | Implementation actions | Responsibility |
|---|---|---|---|
| Consumer research | ◗ Understanding the purchase behaviour of fresh produce consumers | ◗ Understanding the Purchase Behaviour of Fresh Produce Consumers MT12010 managed by HAL Marketing Services. | ◗ HAL Marketing Services |
| Domestic Marketing | ◗ Papaya Marketing Program | ◗ HAL Marketing Manager (MM) will develop a domestic marketing program with Papaya Australia Limited (PAL) and IAC input.<br>◗ MM will assess potential marketing service providers and make recommendations to the IAC in relation to preferred providers.<br>◗ MM will provide ongoing management of the annual levy funded marketing campaign.<br>◗ Further detail on marketing actions to be provided in domestic marketing program plan. | ◗ HAL MM<br>◗ IAC<br>◗ PAL |
| Market access | ◗ Investigate protocols and obtain access to WA market<br>◗ Investigate NZ market access | ◗ HAL Biosecurity, marketing and R&D Portfolio manager and DAFFQ will assist industry where appropriate to Investigate protocols and obtain access to WA market Biosecurity, marketing and R&D Portfolio manager and DAFFQ will assist industry where appropriate to contact Food Standards Australia New Zealand and Biosecurity New Zealand to investigate NZ market access. | ◗ PAL<br>◗ HAL PM<br>◗ HAL ISM<br>◗ QDAFF<br>◗ IAC |
| Breeding Champion Varieties | ◗ Marker assisted breeding of Papaya to develop new commercial lines | ◗ 'Marker Assisted Breeding of Papaya to develop new commercial lines' PP10005 managed by HAL<br>◗ PAL to work with service provider to evaluate varieties. | ◗ HAL R&D Portfolio manager<br>◗ PAL |

| Strategies | Likely sub-strategies/projects | Implementation actions | Responsibility |
|---|---|---|---|
| Plant health | ◗ Minor Use Permits<br>◗ Management of Phytophthora fruit rot and Pythium-related root rot<br>◗ Fruit-spotting Bug<br>◗ Red Spider Mite control<br>◗ Understanding papaya dieback<br>◗ Post-harvest rot control<br>◗ Managing risk of exotic incursions | ◗ 'Minor use permit for the papaya industry' PP11001 managed by HAL with input from PAL.<br>◗ 'Management of Phytophthora fruit rot and Pythium-related root rot of papaya' PP08000 managed by HAL and QDAFF.<br>◗ Understanding Papaya dieback, post-harvest rot control along with fruit spotting bug and red spider mite control programs managed by HAL and QDAFF.<br>◗ Leverage off ACIAR papaya project (disease control and fruit handling).<br>◗ With the Papaya Industry Biosecurity Plan (IBP) now in place and PHA developing a Farm Biosecurity Plan (2012/13), continue to monitor exotic incursions through communication with Plant Health Australia, QDAFF and other agencies. | ◗ HAL ISM<br>◗ HAL Plant Health R&D Portfolio manager<br>◗ QDAFF<br>◗ IAC<br>◗ PAL |
| Communications and extension | ◗ Communications Project<br>◗ Review Papaya Post structure, make library available and online.<br>◗ Update Agrilink Growers Manual<br>◗ Papaya Consultation Agreement<br>◗ Extension activities (field days etc.)<br>◗ Annual Industry report<br>◗ Papaya Strategic Investment Plan | ◗ 'Papaya communications' PP11000 managed by HAL.<br>◗ Continued funding and support for the Industry Annual Report and Consultation Funding Agreement projects.<br>◗ PAL and the IAC ensure there is continued funding, interesting and relevant content to the Papaya post publication and make available past editions online.<br>◗ PAL/IAC to liaise with QDAFF, to organise appropriate grower events. | ◗ HAL ISM<br>◗ IAC<br>◗ PAL<br>◗ QDAFF |

Appendix C

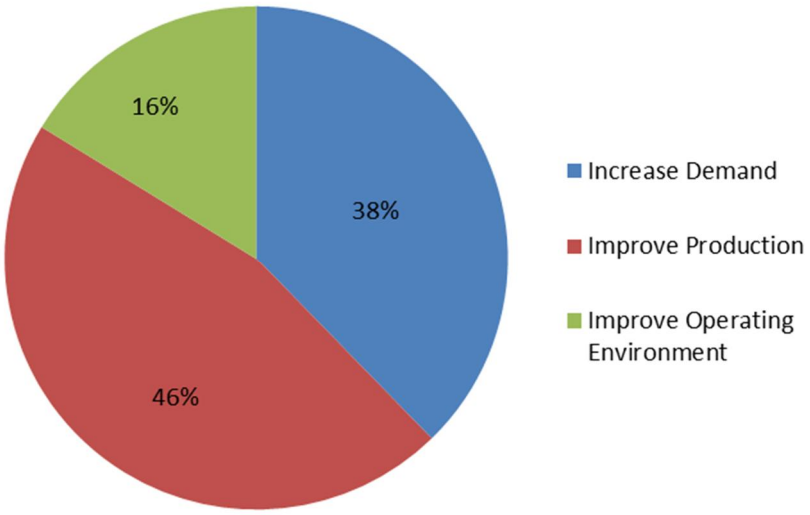
# Indicative budget

An indicative 5 year budget (Table 12) was established based on the estimated revenue, non-project and project costs. The budget takes into account forward commitments for ongoing projects, and estimates costs for new (non-allocated) projects.

The indicative budget is provided as a guide only, and more detailed annual budgets will be provided in the industry's annual report.

## Table 12 Indicative 5 year budget

| Papaya SIP Budget | | | 2013/14 | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| | PRODUCTION | Leviable Production forecast (t) | 12,980,000 | 13,780,000 | 14,580,000 | 15,380,000 | 16,180,000 | 72,900,000 |
| | | | | | | | | |
| | REVENUE | | | | | | | |
| | | R&D (levy + gov contribution) | $ 300,913 | $ 284,488 | $ 290,943 | $ 278,319 | $ 284,997 | $ 1,439,660 |
| | | Marketing (levy) | $ 131,284 | $ 139,284 | $ 147,284 | $ 155,284 | $ 155,284 | $ 728,420 |
| | | TOTAL REVENUE | $ 432,197 | $ 423,772 | $ 438,227 | $ 433,603 | $ 440,281 | $ 2,168,080 |
| | | | | | | | | |
| | NON PROJECT COSTS | | | | | | | |
| | | Levy collection costs R&D | $ 12,869 | $ 13,255 | $ 13,653 | $ 14,918 | $ 15,366 | $ 70,061 |
| | | Levy collection costs Marketing | $ 9,951 | $ 10,249 | $ 10,557 | $ 10,874 | $ 11,200 | $ 52,830 |
| | | Corporate cost recovery-Levies R&D | $ 40,028 | $ 32,819 | $ 37,787 | $ 32,382 | $ 34,132 | $ 177,147 |
| | | Corporate cost recovery-Levies Marketing | $ 12,350 | $ 13,000 | $ 14,300 | $ 14,950 | $ 15,600 | $ 70,200 |
| | | Across Industry Contribution-Levy | $ 5,400 | $ 4,991 | $ 2,907 | $ 2,143 | $ 2,626 | $ 18,067 |
| | | TOTAL NON PROJECT COSTS | $ 80,597 | $ 74,315 | $ 79,203 | $ 75,267 | $ 78,923 | $ 388,305 |
| | | | | | | | | |
| | | | | | | | | |
| | PROJECT COSTS | | | | | | | |
| Objective | Strategy | Sub-strategies/projects | 2013/14 | 2014/2015 | 2015/2016 | 2016/2017 | 2017/2018 | TOTAL |
| 1. Demand | Consumer research | Homescan data, qualitative consumer research | $ 2,835 | $ 13,500 | $ 3,500 | $ 3,500 | $ 13,500 | $ 36,835 |
| 1. Demand | Domestic Marketing | Domestic marketing program | $ 106,148 | $ 102,535 | $ 118,927 | $ 125,960 | $ 114,984 | $ 568,555 |
| 1. Demand | Market Access | Market access activities | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 10,000 | $ 50,000 |
| 2. Production | Breeding Champion Varieties | Marker Assisted Breeding of Papaya to develop new commercial lines | $ 60,000 | $ 90,000 | $ 80,000 | $ 80,000 | $ 80,000 | $ 390,000 |
| 2. Production | Plant health | minor use permits, fruit spotting bug, acaricide resistance management, phytphthora fruit rot, die back, spider mite control, post harvest control, managing risk of exotic incursions | $ 154,917 | $ 91,223 | $ 89,279 | $ 39,279 | $ 35,000 | $ 409,698 |
| 3. Operating environment | Communications, extension and strategic planning | Papaya Post, field-days, annual reports, strategic planning, consultation agreement, review of farm biosecurity manual | $ 49,522 | $ 48,409 | $ 50,796 | $ 78,953 | $ 54,838 | $ 282,518 |




## Figure 8 Budget expenditure by Objective

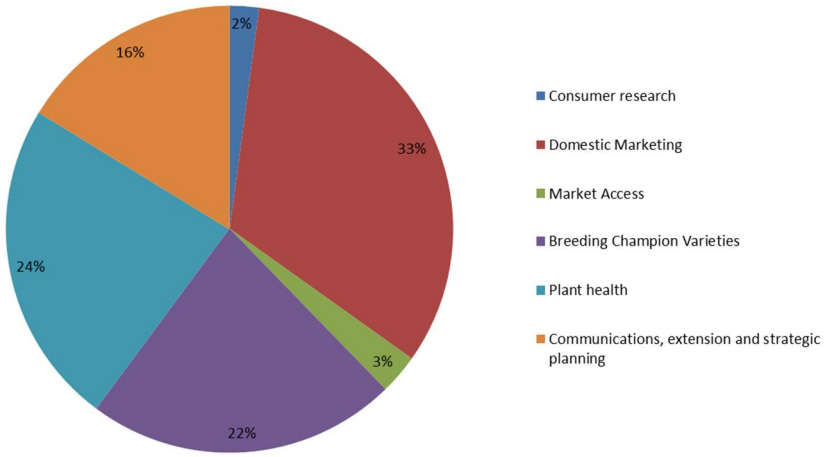



Figure 9 Budget expenditure by Strategy

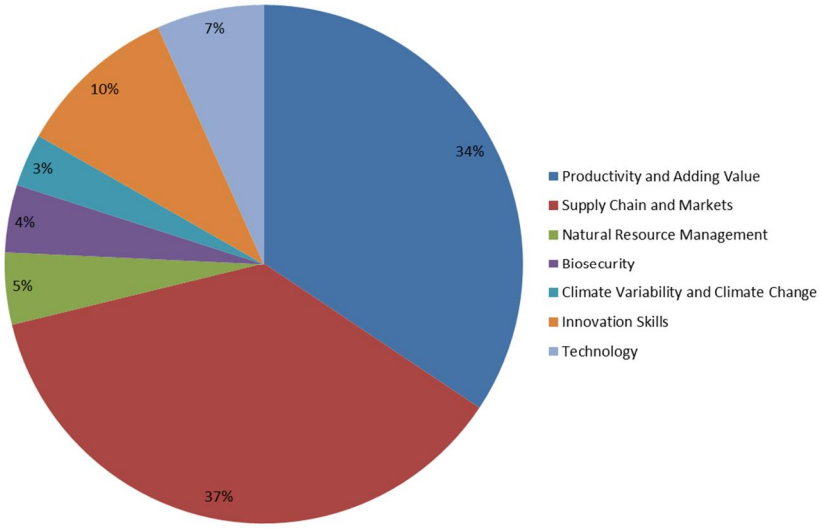



Figure 10 Budget expenditure by Federal Government rural R&D priorities

Appendix D

# Benefit Cost Analysis

## Table 13 BCA calculations and assumptions

| Benefit/Cost Analysis | Consumer Research | Domestic Marketing | Market Access | Breeding Champion Varieties | Plant Health | Communications, Extension and Strategic Planning |
|---|---|---|---|---|---|---|
| What investment is required by HAL | $36,835 | $568,555 | $50,000 | $390,000 | $409,698 | $282,518 |
| What per cent of the industry production base is affected by the proposed investment | 100% | 100% | 95% | 70% | 100% | 100% |
| What is the change in producer profit expected | 0.31% | 6.25% | 6.25% | 3.13% | 3.13% | 1.25% |
| What is the change in producer profit expected (cents per kg) | 0.5 | 10 | 10 | 5 | 5 | 2 |
| What is the probability of investment success | 100% | 100% | 50% | 50% | 60% | 60% |
| What is the lag period before producers receive the benefit (years) | 0.6 | 0 | 2 | 3 | 2 | 1 |
| What is the length of time before the benefit decays (years) | 2 | 0.5 | 10 | 10 | 6 | 4 |
| | | | | | | |
| Cost/year | $7,367 | $113,711 | $10,000 | $78,000 | $81,940 | $56,504 |
| Benefit/year | $134,120 | $700,000 | $5,719,000 | $1,935,500 | $2,167,200 | $624,960 |
| BCR | 18.2 | 6.2 | 571.9 | 24.8 | 26.4 | 11.1 |
| Breakeven BCR | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

| Assumptions and explanations | |
|---|---|
| Average production per year (Kg) | 14,000,000 |
| Farm Gate price | $1.60 |
| Discount Rate | 7% |
| Value of industry | 22,400,000 |

| | Consumer research | Domestic Marketing | Market Access | Breeding Champion Varieties | Plant health | Communications, extension and strategic planning |
|---|---|---|---|---|---|---|
| What per cent of the industry production base is affected by the proposed investment | Improved knowledge of consumers helps the entire industry target marketing, variety breeding and production | Lifting domestic demand will benefit prices across all markets | Broad benefits to insustry, excluding WA production (5%) | There will be a 70% uptake of new varieties | Potential to benefit whole industry | Potential to benefit whole industry |
| What is the change in producer profit expected (cents per kg) | Best estimate based on similar campaigns | Best estimate based on similar campaigns | Best estimate based on similar trade development and theoretical impact from gaining access to NZ and WA markets | Best estimate based on potential production and quality improvements in new varieties | Best estimate based on reduced fruit production due to pests and disease | Best estimate based on the value of industry publications and workshops |
| What is the probability of investment success | High chance that domestic marketing investments will be successful | High chance that domestic marketing investments will be successful | 50% chance that Market Access will be successful | 50% chance that new varieties will prove to be commercially viable | 60% chance that production efficiencies will be achieved | 60% of growers adopting improved management practices |
| What is the lag period before producers receive the benefit (years) | 6 month lag for the results to become available and usable | Immediate impact | At least 2 year lag period between negotiations starting and benefits received | 3 years before varieties are are productive | 2 years on average (historically) across program areas | 1 year lag before investments (Papaya publications, grower events) yield results |
| What is the length of time before the benefit decays (years) | Consumer research effective for 2 years | Domestic marketing effective for 6 months | Market Access a long term benefit assuming no breaches or reversals | New varieties will be available for over 10 years | R&D effective for average 6 years | Communicated information beneficial to growers for average 4 years |

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