

Australian Market Analysis – Fiji and Pacific Island Papaya



Project Fiji and Pacific Island Papaya Market Study
A Project Under the EU –Funded Facilitating Agricultural Commodity Trade Project (FACT)

Date July 2009

Authors Kalara McGregor, Andrew McGregor, Lex Thomson and Kyle Stice

Contents

1	The Australian market for Papaya	4
1.1	Introduction	4
1.2	Fiji's papaya exports to Australia	4
1.3	The Australian market	5
1.4	An overview of fresh papaya production and import trends	5
1.4.1	Geographical distribution	5
1.4.2	Production	7
1.4.3	Industry Structure	8
1.4.4	Climatic conditions	9
1.4.5	Varieties	10
1.4.6	Pest and diseases	11
1.4.7	Harvesting and post-harvest handling	12
1.4.8	Marketing	13
1.5	The structure of the Australian papaya market: who are the buyers	13
1.5.1	The major supermarket chains – Woolworths and Coles	14
1.5.2	The speciality fruit and vegetable stores	15
1.5.3	The ethnic shops	17
1.6	Market trends	17
1.7	Prices and seasonality	18
1.8	The competition: how does Fijian papaya compare?	23
1.8.1	An assessment of Fiji's competitive position with respect to Australian papaya	23
1.8.2	The Philippines	27
1.8.3	Other Pacific island papaya exports	27
1.9	The processed papaya market	28
1.9.1	Dried fruit	28
1.9.2	Fruit pulps and puree	29
1.10	Major findings	31
1.10.1	Assessment of the current status of Fijian papaya in the Australian market	31
1.10.2	Opportunities and requirements to expand the Fijian papaya export to Australia	31
1.11	The projected market size for Fijian papaya in Australia	32
1.11.1	The projected market if the Fiji industry continues as is – the status quo remains	32
1.11.2	The projected market with significant improvements by the Fiji papaya industry	33
1.12	Bibliography	41
	Appendix 1. What the buyers say	43

1.12.1	Sydney.....	43
1.12.2	Melbourne.....	50
1.12.3	Brisbane meeting.....	53
1.12.4	The organic buyers.....	54
	Appendix 2: Fijian papaya quality parameters in need of improvement.....	56
	Appendix 3: Woolworths Quality Assurance Standards.....	61
	Appendix 4. Woolworths quality specifications for papaya.....	67
	Appendix 5: The Returns from Growing Papaya in Fiji.....	68
1.13	Appendix 6: The Returns from Growing Sugar Cane.....	70

1 The Australian market for Papaya

1.1 Introduction

The Australian component of the market study comprised visits to Sydney (February 18th - 20th, Kalara McGregor and Andrew McGregor), Melbourne (March 21st– 22nd, Kalara McGregor and Lex Thomson) and Brisbane (May 12th, Kalara McGregor). A visit to the Australian papaya industry in North Queensland, as a part of the ACIAR Fiji Papaya Project, was undertaken from August 24th-29th by Kyle Stice and Sant Kumar. Relevant findings of this visit have been incorporated into the final market study report.

Coordination of trip logistics and arrangements for all meetings with buyers was provided by Ms. Robyn Ekstrom (Coordinator- Export and Enterprise Development Pacific Islands Trade and Investment Commission, Sydney Office). Her assistance and support is gratefully acknowledged. A summary of all meetings is provided in Appendix 1.

1.2 Fiji's papaya exports to Australia

During the 1980s, Fiji was a significant exporter of papaya to Australia. The highest exports were achieved in 1987 when 132 tonnes were shipped. By comparison, in that year only 25 tonnes were exported to New Zealand. At that time, there was no Hawaiian 'Solo' grown in Australia and the only competition was from inferior yellow-fleshed pawpaw grown in northern New South Wales. At the time, the unique 'full flavour' Fiji papaya was highly sought after in the market and received premium prices. A decade later, buyers still spoke highly of the Fiji red papaya (Charles Eaton, Southern Development Company, pers. comm.). Exports to Australia ceased in 1992 when the chemical ethylene dibromide (EDB) was lost as a quarantine treatment. It took 7 years before Fiji's HTFA facility was certified for shipment to Australia. Exports to Australia recommenced in October 2004. In that year, 5 tonnes were shipped. In 2005, exports to Australia totalled 38 tonnes. In 2006, there was a substantial increase in exports to Australia, with 123 tonnes shipped up until the end of June. The severe damage to the North Queensland papaya crop caused by cyclone Larry in March 2006 provided the opportunity for Fiji papaya to enter the Australian market where it has retained a foothold in the market. Papaya exports to Australia for the period 1996 to 2008 are presented in figure 1.

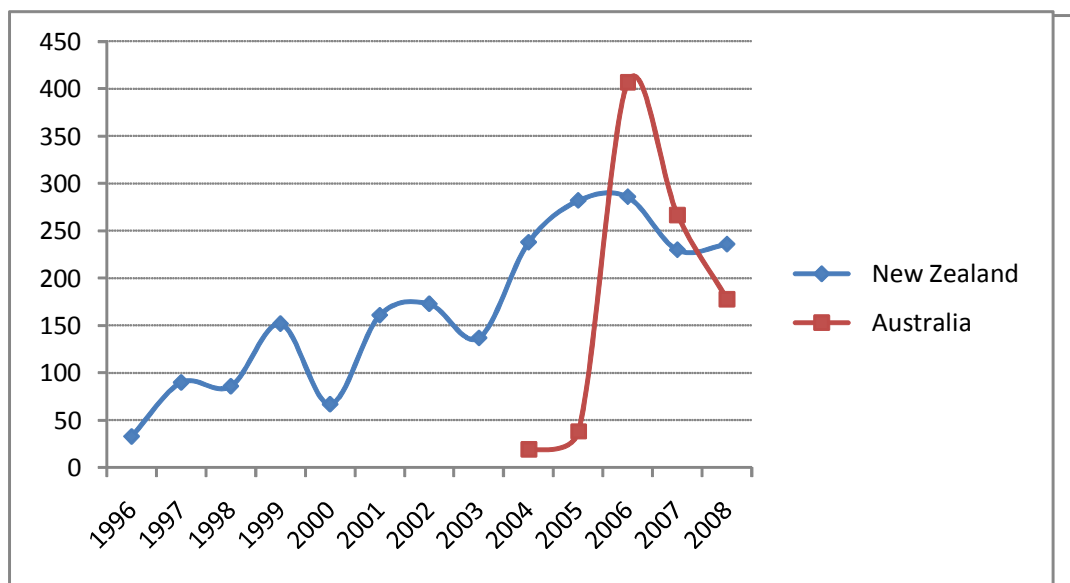


Figure 1. Fiji papaya exports to Australia and New Zealand, 1996-2008

1.3 The Australian market

The Australian papaya market is far larger than New Zealand. Some 6,000 tonnes of papaya are sold annually on Sydney’s Flemington Markets alone (Sydney Market Reporting Service). However, unlike New Zealand, most of the papaya consumed in Australia is grown domestically. In 2007, approximately 12,000 tonnes of papaya was grown in Australia (Horticulture Australia Limited/Papaya Australia 2008). This compares with the 300 tonnes imported that year, with Fiji being the sole supplier. More than 95% of papayas are grown for the fresh produce market with the remainder going to a minor processing industry (Chay-Prove et.al. 2005).

The major types of papaya grown are the yellow-fleshed dioecious lines, known as pawpaw, and red-fleshed gynodioecious (bisexual) lines, known as papaya. The yellow-fleshed lines are usually either F1 hybrids or open pollinated, while the red bisexual lines are usually inbred. More red-fleshed varieties are becoming available and these may be either F1 hybrids or inbred lines, and either dioecious or bisexual types (Chay-Prove et.al.). The various market reporting services also list prices for exotic red flesh types; and culinary (green) papaya.

1.4 An overview of fresh papaya production and import trends

1.4.1 Geographical distribution

Papaya has been grown in Australia for nearly a century. Commercial production of the crop originally began in SE Queensland, where the temperatures were just bearable for the crop to grow and in close proximity to major populations. Papaya is grown in all of Australia’s banana growing areas – and often by the same farmers (figure 2). Around 90% of Australia’s papaya is currently grown in the northern tropics, in the Innisfail and Mareeba areas of North Queensland (table 1). Papaya is also grown in central and southern Queensland, the Northern Territory, principally in the Humpty Doo area, and in Western Australia in the Kununurra and Carnarvon regions. A small amount of papaya is grown in northern New South Wales. Production regions in NT, WA and Central and Southern Queensland are declining. Yellow-fleshed pawpaw

dominates Northern NSW and Southern Queensland production. As such, yellow fleshed pawpaw still constitutes an important but declining share of the Australian papaya market.

Table 1. The farm value of papaya production in Queensland in 2007*

	\$A
Queensland	8,720,219
Brisbane	4,696
Caboolture (S) - Midwest	4,696
Sunshine Coast	28,281
Maroochy (S) Bal	28,281
West Moreton	1,670
Gatton (S)	1,670
Wide Bay-Burnett	164,626
Burnett (S) - Pt B	54,314
Cooloola (S) (excl. Gympie)	26,282
Kilkivan (S)	30,787
Kolan (S)	22,876
Tiaro (S)	30,368
Darling Downs	284,448
Taroom (S)	284,448
Fitzroy	177,432
Calliope (S) - Pt B	175,904
Livingstone (S) - Pt B	1,528
Mackay	78,899
Mackay (C) - Pt B	28,642
Sarina (S)	50,257
Northern	433,451
Hinchinbrook (S)	347,196
Thuringowa (C) - Pt B	76,088
Townsville (C) - Pt B	10,167
Far North	7,546,716
Cairns (C) - Pt B	69,749
Cairns (C) - Trinity	20,971
Cardwell (S)	117,733
Douglas (S)	204,288
Herberton (S)	1,872
Johnstone (S)	4,515,321
Mareeba (S)	2,616,782

*71250DO015_200506 Agricultural Commodities: Small Area Data, Australia, 2005-06 (Reissue) Commonwealth of Australia

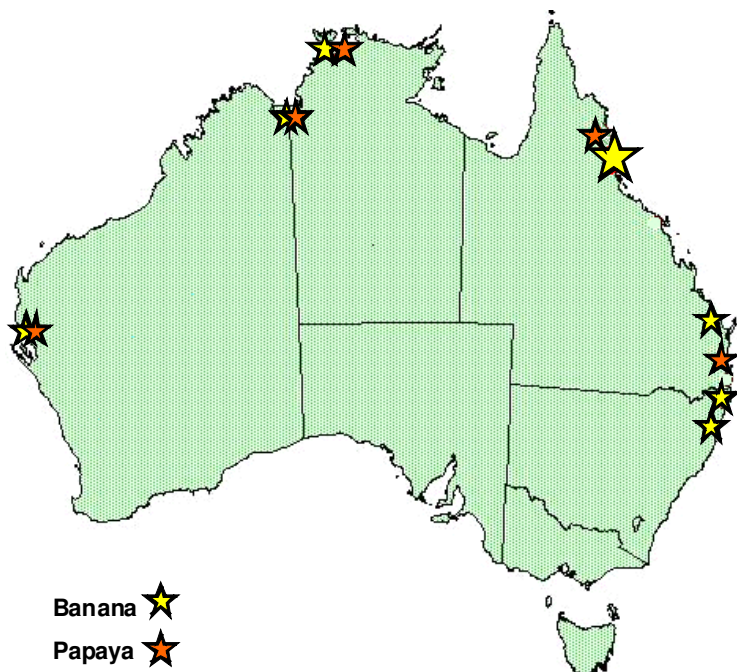


Figure 2. The location of Australia's papaya and banana producing areas (source: Queensland DPI)

1.4.2 Production

At present, the industry consists of around 300 Ha of planted papaya, yielding around 12,000 tonnes per year (DPI staff South Johnstone, pers. comm.). However, accurate papaya tonnage production figures for Australia are not readily available. Recent trends in Australian papaya production can be gleaned from the last two Strategic Plans of the Australian Papaya Industry.

- The Strategic Plan (2003 – 2008)¹ estimated the per capita papaya consumption to be 0.7kg, which would put total production at approximately 12,000 tonnes in 2002.
- The Strategic Plan (2008-2012)² estimated total production to be 12,000 tonnes in 2008/09 and forecast to increase to 14,880 tonnes in 2012/13.

The apparent lack of growth in production 2002-2009 can be attributed to Cyclone Larry's decimating effect on a large area of the main north Queensland production areas in March 2006. In April 2006, Papaya Australia, the papaya and papaw grower's national industry body, described the damage to the industry:

One month since the devastation of cyclone Larry, papaya and papaw growers are still reeling from the effects, with between 60 - 95% loss of bearing trees in Australia's two main growing areas of Innisfail and Mareeba. Damage has seen some papaya and papaw trees completely torn from the ground, but in most cases the trees were snapped off above the base by the 290km/ph winds of cyclone Larry. "This year's crop would have been worth

¹ Horticulture Australia Limited/Papaya Australia, Australian Papaya Industry 2003 - 2008 Strategic Plan

² Horticulture Australia Limited/Papaya Australia, Australia Papaya Industry 2008 – 2012 Strategic Plan

about \$18 - 20 million dollars to the local economy and now it is destroyed,” noted by Papaya Australia representative, Max Bell.

It is only now that production levels are almost back to pre-Cyclone Larry levels. However, there have been structural changes in the Australian industry in terms of where papaya is grown and a steady shift from yellow papaw to red papaya.

1.4.3 Industry Structure

Approximately 95% of the industry is located in the Innisfail/ Mareeba areas. Across these areas, there are an estimated 180 commercial papaya farmers. However until recently, four North Queensland growers (25 to 50 planted ha each) accounted for approximately 50% of the Australian papaya production. Indications are that the Australian papaya industry is in a significant expansion phase with the entry of Mackay's, Australia's largest banana producer, into the industry. Mackay's have begun planting papaya at their farm in Tully, North Queensland. With a significant banana market share in the mainstream supermarket chains, Mackay's begun experimenting with papaya at their request. Mackay's are currently predominantly producing the solo sunrise variety for their markets and the fruit are labelled as such (figure 10). However, the company is investing in a research program to develop a larger, better performing variety for North Queensland conditions.



Figure 3. Young solo papaya trees on Mackay's papaya farm



Figure 4. Entrance Mackay's papaya farm

1.4.4 Climatic conditions

The Innisfail/ Mareeba areas have rainfall and temperature conditions well suited to papaya production. Temperature and rainfall data provided by the QDPI (figure 6) shows significant seasonal fluctuations but falls well within the range of growing requirements for papaya and is similar to that of the western Viti Levu. The area in common with western Viti Levu is highly susceptible to tropical cyclones. This was most recently demonstrated by the devastation caused to the papaya industry by Cyclone Larry in March 2006. It was this event that gave Fiji the opportunity to become a significant exporter to the Australian market

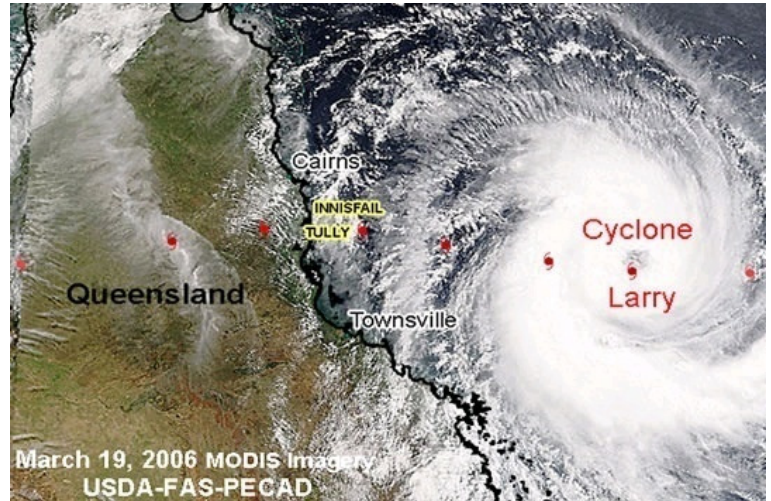
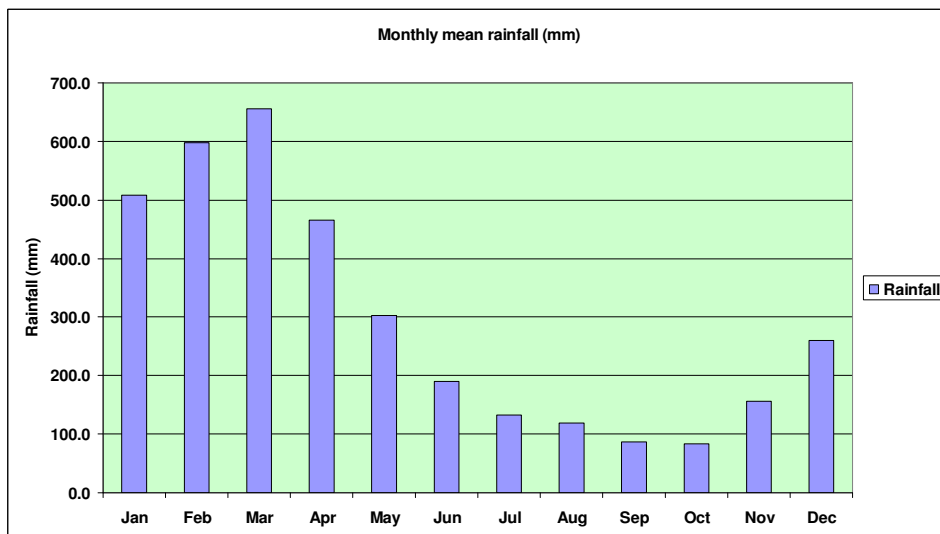
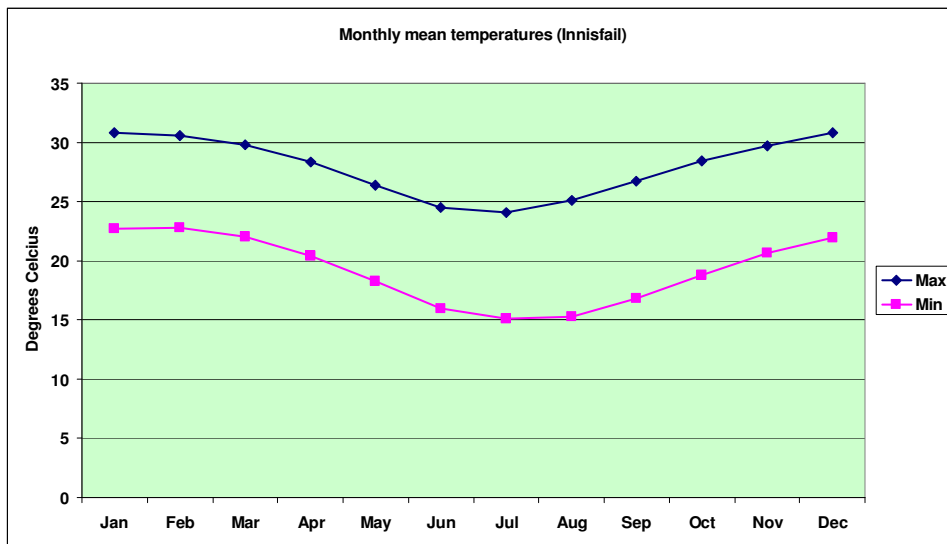


Figure 6. Monthly mean temperature and rainfall (Innisfail – North Queensland)



1.4.5 Varieties

Broadly, there are two distinct types of *Carica papaya* plants: dioecious and gynodioecious.



Figure 7: North Queensland pawpaw ready for the market

Dioecious papayas have male and female flowers on separate trees. Gynodioecious papayas have female flowers on some trees and bisexual (hermaphrodite) flowers on others. Both dioecious and gynodioecious varieties of papaya are grown commercially in Australia. Yellow dioecious varieties are the traditional variety in Australia and are known as 'paw paw' or 'papaw' (figure 7). These varieties have been more prevalent and generally recommended because they have high fruit yields and relatively predictable fruit shape (Drew et al. 1998; Chay-Prove et al. 2000). However, in recent years there has been a shift toward red fleshed gynodioecious varieties (known as papaya).

The main dioecious varieties that are commercially grown in Australia are Hybrid 1B (yellow) (figure 8), Hybrid 11B (yellow), Hybrid 13 & 14 (yellow). These varieties produce only female fruit, which tend to be large in size. The fruit has a characteristic off flavour and off odour that is loved by some and despised by others. Most of the hybrid lines originate from Australian breeding work (www.papayaseed.com.au). The hybrids are the result of crossing 2 'fixed' (stable) parent lines. Hybrids are more vigorous than their parents, produce more fruit and are less susceptible to disease. They have the advantage of being very consistent in fruit shape and size.

Figure 8. Hybrid YD1B specifications

	<p><u>Hybrid YD1B commonly known as 1B</u></p> <p>The most widely grown of all the hybrids in Australia, fruit is oblong, is very clean, flesh is firm, and is a medium yielding tree.</p> <p>Flesh Colour Yellow</p> <p>Sex Type Dioecious</p> <p>Sweetness 8 - 10% Brix</p> <p>Yield 80 kg/tree/year (North Qld)</p> <p>Fruit size 1000 - 2500 gms</p> <p>Flavour Nasturtium</p> <p>Appearance Generally clean skinned</p>
--	--

	<p>Climatic Suitability Tropical, Sub-tropical</p> <p>Seed price \$10AUD/gm</p> <p>source: www.papayaseed.com.au</p>
---	---

The gynodioecious varieties, known as papaya, are inbred lines that produce both hermaphrodite fruit (2/3 of the trees) and female fruit. In the gynodioecious varieties, fruits from hermaphrodite trees are pear shaped, whereas fruits from female plants are spherical. These varieties mostly originate from the Hawaiian solo breeding program. The solo varieties can be both red and yellow and are generally smaller with a sweeter, more pleasant flavour. In Australia, it has been recognised that in gynodioecious varieties, fruit production on hermaphrodite trees may be affected by cool air temperatures leading to decreased yields and/or poorly shaped fruit (OECD 2003). It has also been recognised that these bisexual varieties are affected by a condition known as carpellody or 'cat-facing' which is caused by the fusing of the ovary and stamens during cold weather conditions. The resulting fruit is deformed and unmarketable. These lines are therefore only recommended for coastal north Queensland and the Atherton Tablelands, where the relatively predictable tropical climate does not affect fruit shape unduly. Market preference is for the hermaphrodite, rather than female fruits because they have a thicker flesh. The main gynodioecious variety grown in Australia is red fleshed solo sunrise, which is the same variety grown in Fiji.

1.4.6 Pest and diseases

Numerous insect pests impact on Australian papaya production. Most of these pests can be readily controlled and thus are not considered to be of particular serious consequence. An important exception is fruit flies. North Queensland has a particularly unfavourable fruit fly status. A fruit fly of particular economic significance that is a noted production pest for papaya is the Queensland fruit fly (*Bactrocera tryoni*). Recently eradicated from North Queensland was the Asian papaya fruit fly (*B.papayae*), one of the most damaging fruit fly species. The estimated cost of eradicating this fruit fly, that entered from Papua New Guinea in 1992, was AUD 35 million (Fay et.al. 1997). Because of the presence of Queensland fruit fly all fruit being shipped to New South Wales Fruit Fly Exclusion Zone (FFEZ), Victoria, Tasmania, South Australia and Western Australia is subject to the Queensland DPI's (Plant Health Control) Interstate Certification Assurance Program and requires quarantine treatment. The approved quarantine treatment of choice is dipping in the chemical dimethoate³ (a systemic organo-phosphate insecticide) because of its low cost.

³ According to DPI ICA-01 ww2.depi.qld.gov.au/health/4145/htm/#1

Treatment/Condition - Post-harvest dipping with dimethoate . Full immersion in a mixture containing 40 mg/L dimethoate for not less than 60 seconds

Pest -Queensland fruit fly and banana fruit fly.

Produce Dimethoate - abiu, ambarella, apple, avocado, banana, bell fruit, cactus fruit, cherries, carambola, chilli, citrus, custard apple, date, egg-plant, feijoa, fig, grumichama, guava, hog plum, kiwifruit, loquat, Malay apple, mango, miracle fruit, nashi fruit, papaw (but not defective flower end-type papaw),

The major fungal pathogens of papaya include phytophthora root and fruit rot (*Phytophthora palmivora*), black spot (*Asperisporium caricae*), brown spot (*Corynespora cassiicola*), anthracnose (*Colletotrichum* spp.) and powdery mildew (*Sphaerotheca* spp.) (OECD 2003).

Chay-Prove reports that in Queensland's southern and central districts, there is a high probability of devastating dieback, yellow crinkle and mosaic disease in one in five years and the lethal papaya ringspot virus (PRSV) is also present in south-east Queensland (2005). PRSV has become the limiting factor for commercial papaya production in many areas of the world. Internationally, PRSV has significantly reduced crop productivity in Hawaii, the Caribbean, Brazil, south-east Asia and other papaya growing areas (OECD 2003). PRSV remains restricted in distribution in Queensland. Several outbreaks have occurred in South East Queensland, but these were contained by removing and destroying infected plants. The virus is relatively common in backyards of some northern suburbs of Brisbane, but the rate of spread appears to be low (Persley 2003).

Genetically modified PRSV-resistant papaya was developed in response to the devastating impacts of the disease, particularly in Hawaii and south-east Asia. PRSV-resistant GM papayas are not available in Australia.

1.4.7 Harvesting and post-harvest handling

Harvesting of papaya in Australia is commonly done using specially designed picking platforms pulled by a tractor. This method allows harvesters to handpick the fruit at an appropriate stage of ripeness into field trays (figure 9).



Figure 9. Harvesting from a tractor-drawn harvesting platform

Almost all papaya farmers have their own packhouses. This is identified as a major advantage over Fiji where fruit is passed from the field, to an exporters packhouse, to quarantine treatment and then on to shipment. In Australia, harvested fruit is generally graded in the field and taken straight into the packhouse where it is washed and prepared for further grading and packing. The traditional Australian papaya grading system involved a multi-tiered 'wheel' where fruit was placed and spun around to packers.

More recently, packhouses have adopted a single line grading system, where fruit is placed into a wash in the same harvesting bins and then transferred by conveyor to a series of graders and packers who pack straight into boxes (figure 10). This system is regarded as very effective at minimising postharvest damage, because the fruit is only handled twice from the tree to the box.

passionfruit, pear, pepino, persimmon, pomegranate, quince, rose apple, stonefruit, tamarillo, tomato and wax jambu.

After being packed in boxes, fruit is cooled in readiness for transport by truck to the markets. Time of transport depends on the destination and trucking company but generally fruit that is sent from the Tablelands will take 27 hours to arrive in the Brisbane market. Transportation is by truck with refrigerated containers, designed to maintain the temperature of the product throughout the trip.



Figure 10. Single line grading system packing straight in the carton and minimising handling

1.4.8 Marketing

Discussions with Queensland DPI indicate that 90% of papaya farmers market their own fruit either directly to a retailer or through a wholesale outlet. After being packed on the farmer's property, fruit is either loaded directly into a refrigerated truck bound for the market, or transported to a truck bay where it is loaded with other products in a mixed consignment.

Papaya cartons range in size, net weight and fruit count. Some producers that were interviewed pack standard 10 kg boxes with varying fruit counts whereas other producers pack fruit in 15 kg banana boxes.



Figure 11. On-farm food safety certification

Growers selling directly to retailers are often required to have food safety certification. This is usually satisfied by 'Fresh Care' certification (figure 11), which meets the requirements of Woolworths and Coles and includes a yearly audit.

1.5 The structure of the Australian papaya market: who are the buyers

The consumption of papaya is very unevenly distributed between Australia's population centres. According to data presented by Chay-Prove (2005), around half of Queensland's papaya production is sold within the State, with around 35% sold in NSW, 12% in Victoria and insignificant volumes consumed in other states. This explains why most Fijian papaya is being shipped to Melbourne and presents an untapped market for future development.

Papaya in Australia is sold through three different segments of the fruit and vegetable markets:

- The major supermarket grocery chains
- The speciality fruit and vegetable stores
- The ethnic shops

These segments are described briefly below.

1.5.1 The major supermarket chains – Woolworths and Coles

The dominant supermarket chains in Australia are Woolworths and Coles. Woolworths is Australia's largest supermarket chain and has begun a recent expansion to New Zealand. Accredited fresh produce purchaser for Woolworths, Cameron Carter, has seen steady growth in the sales of papaya, although he could not specify the volumes. However, he was not particularly satisfied with the current supply of papaya from North Queensland, due to inconsistency in quality and supply (pers. comm.).

Woolworths and Coles have significant market power which is exercised openly and indirectly. The two dominant supermarkets operate a tandem system, sourcing direct from growers where practical and where available volumes are sufficient. Where they cannot source directly, Woolworths and Coles use the terminal wholesale markets in Sydney, Melbourne and Brisbane. Both use accredited brokers to source supplies. Agreed prices are subject to a standard discount at settlement of the invoice. Most commonly the discount is 2.5% of invoice – allowances are also made to cover losses, or shrinkage, at approximately 3%.

Efficiencies gained through the bulk buying of dominant Australian grocery retailers significantly benefit the retailers with labelling, packaging, delivery and promotional costs largely borne by the suppliers. Fruit Growers Victoria, the peak industry body for Victorian apple and pear growers in their 2008 submission to the ACCC highlighted the demands of major supermarkets chains whereby, product must 'be delivered on pallets to suit the distribution centre pallet racking sometimes means that truck capacity is wasted and as a consequence the transport cost per kilogram can be inflated'⁴ In the same submission it was claimed that in 'allocating supermarket shelf space, preference is given to high volume lines and restricts low volume lines to minor shelf space.' This has implications for minor fruit products such as papaya. Counteracting this force is the extra service and ranges that independent fruit shops offer consumers.

Both Woolworths and Coles source all their papaya domestically. However, both expressed interest in importing from Fiji, if their requirements can be met. Woolworths have shown particular interest in sourcing Pacific island produce and have been in discussions with a Fijian exporter to supply root crops. In the case of imported produce, Woolworths' preference is to source produce directly from 'trade partners.'

Food safety certification

Australia's major supermarket chains require their suppliers to meet certified quality and food safety standards. The same is true for the other target countries of this market study (NZ, US and Japan). The purported justification for the application of the various certification systems applied is:

⁴[http://www.accc.gov.au/content/item.phtml?itemId=812876&nodeId=210dfc64d0221d8ae62f71b0e5f8762a&fn=071%20-%20Fruit%20Growers%20Victoria%20\(4%20pages\).pdf](http://www.accc.gov.au/content/item.phtml?itemId=812876&nodeId=210dfc64d0221d8ae62f71b0e5f8762a&fn=071%20-%20Fruit%20Growers%20Victoria%20(4%20pages).pdf)

- Better food safety and consumer protection
- Strengthening of consumer confidence
- Integration of a Hazard Analysis Critical Control Point(HACCP) according to Codex Alimentarius
- International recognition guaranteed by the Global Food Safety Initiative (GFSI)

The obligation and cost of meeting these standards rests with the suppliers. These certification requirements pose a major barrier of entry for Fiji papaya exports.

Woolworths apply their own quality and food safety standard, Woolworth Quality Assurance (WQA) standards that all suppliers must comply with (see appendix 3). Product identification and traceability is a significant requirement of the WQA Standard. Allowable Maximum Residue Levels (MRL) for pesticides are specified in these standards. Where products are procured from an international supply base, extensive verification programs must be in place to ensure that the product sourced meets the specified quality and food safety requirements, and complies with all relevant Australian regulatory requirements. Verification programs of International Suppliers must include Micro/MRL product testing, reviews of quality management systems along the supply chain, as well as regulatory quality assessment of the actual product. Similarly, Coles utilises the Global Standard for Food Safety as the basis for its food safety certification system.

With regards to organic produce, the WQA includes provision for organic produce supplied by 'trade partners' specifying approved organic certifiers⁵. Organic suppliers are also required to provide evidence that a HACCP Based Food Safety program is in place.

Food safety certification is provided by third party certifiers, the cost of which must be met by the supplier or trade partner. Trade partners are given a 1-year grace period, following which they must be fully compliant with specified food safety criteria of the WQA. All 'trade partners' are required to have AUD10 million public liability insurance.

Woolworths specifications for their imported product lines are available from their website. Since papaya is currently not imported, its specification for papaya is listed in the general fresh produce section. The details are presented in appendix 4.

Future conflict can be expected between the use of dimethoate dips as a quarantine treatment for Queensland fruit fly and food safety certification requirements. To quote the Horticulture Australia Limited Papaya Industry Report 06/07

The Australian Pesticides and Veterinary Medicines Authority (APVMA) is re-evaluating pesticides as part of its Chemical Review Program. The re-evaluations are undertaken to ensure they meet current standards of safety and performance. As part of this process both Dimethoate and Fenthion are currently being reviewed. Results of this review are expected within two years. It is likely that uses for Dimethoate and Fenthion will become restricted or removed following the review by the APVMA. This situation is particularly critical for post-harvest uses on commodities with edible peel. Indications from preliminary dietary intake calculations show that it is highly unlikely that post-harvest uses with either dimethoate or fenthion are sustainable on these commodities (p, 4).

1.5.2 The speciality fruit and vegetable stores

The last decade has seen rapid growth in speciality fruit and vegetable stores in Australia's metropolitan centres. Leading the way, have been Harris Farms Markets (HFM) in New South

⁵ These certifying agencies are: NASAA (National Association for Sustainable Agriculture Australia); BFA (Biological Farmers of Australia); BRDI (Bio-Dynamic Research Institute); OHGA (Organic Herb Grower's of Australia); OFC (Organic Food Chain); and TOP (Tasmanian Organic-Dynamic Producers).

Wales and Colonial Fruit Company (CFC) in Melbourne. These speciality stores emphasise service and a wide product range to distinguish themselves from the large supermarket chains. Harris Farms in particular, see papaya, including Fiji papaya, fitting into this approach. HFM tends to source produce directly from suppliers, while CFC buys through wholesalers. Sculli and Co, the main importer of Fiji papaya, supplies CFC, amongst others.

The Harris Farm Markets (HFM)

Harris Farm Markets (HFM) was started by the current managing director, David Harris, in 1971. HFM are very interested in sourcing papaya from Fiji and marketing it as Fiji 'red papaya'. HFM's intention would be to import directly, rather than purchase through a wholesaler or importer. The terms of trade would set the price a week before shipment, rather than paying on a consignment basis. HFM stores are like supermarkets, but the emphasis is on fresh fruits, vegetables and nuts. HFM was the first Australian fruit and vegetable company to open in a supermarket style operation and operates 22 stores across Sydney. The stores are fresh and well-maintained, offering a wide range of fresh produce and associated deli products, with a highly

competitive pricing structure. The company is planning to expand, into Queensland and Victoria, and is refurbishing many of its stores. In 2008, HFM was voted the best fruit and vegetable store by the Sydney Morning Herald.

HFM only sells papaya and not pawpaw. The company is not interested in promoting the latter as this is seen as a declining market, due to its lack of flavour. HFM currently source all their papaya from North Queensland. About 10 tonnes a week are purchased directly from the producers. Demand for papaya in the HFM stores is growing and noted to be expanding. This is matched with expanding supply, amongst North Queensland growers. The peak demand period for papaya is in the winter months (June, July and August).

Fijian papaya had been purchased in the past by HFM. However, the company no longer has a supply source that meets their requirements. Mr. Harris saw Fijian papaya as an inherently superior product to Australian papaya. The main complaint was that it was "harvested far too green" (pers. comm.). HFM stores continue to label their papaya as 'Fijian Red Papaya' – product of Australia. This is a surprisingly positive indication of the value placed on the Fiji brand by this up-market outlet. The Australian fruit on offer was observed to be of good quality and well presented with individual stickers and contained in protective sleeves. The fruit sampled was of good taste and texture – although it lacked the more intense flavour and colour of the best Fijian papaya. The continued use by HFM of 'Fiji papaya' branding for an Australian product, is seen by this study as immensely positive (figure 12). The use of the 'Fiji' name to differentiate quality papaya can only benefit the market development of the Fiji product on the Australian market. The HFM Managing Director believed that airfreight was the only way that Fiji papaya could meet their quality requirements, although he was conscious of the cost implications.

The retail price of HFM papaya varied depending on where it was sold – ranging from \$3.99/kg in the outer suburbs of Parramatta, Merrylands through to 7.99/kg in the inner-city suburbs of



Figure12. Top quality Australian papaya marketed as Fiji red papaya

Edgecliff and Mosman. The quality requirements in all the HFM markets are the same – only the price differs. As such, price discrimination by location is practiced.

Unlike the major supermarket chains, speciality fruit and vegetables stores such as HFM do not as yet require quality and food safety certification to purchase Fijian papaya – even bar coding was not seen as necessary by HFM. This removes a significant barrier to entry to the development of this market segment.

The quality standards of the speciality fruit and vegetable stores are nevertheless high. To quote the HFM website:

Harris Farm Markets produce looks better because it is better. Our buyers are extremely discerning about what they purchase, scouring the land for the very best products. We are a major outlet for many family-run regional farms with who we are in regular contact with (www@harrisfarm.au.com).

1.5.3 The ethnic shops

The ethnic stores, particularly in Sydney’s western suburbs, occasionally handle Fiji papaya shipped by exporters, who handle other Indo-Fijian products. These stores tend to be in areas where there is a concentration of Asian and Pacific Island consumers, who have a stronger tradition of papaya consumption. Bula Island Food Supplies (BIFS) is typical of an importer who serves this market. BIFS deals primarily with dry goods which are distributed to ethnic stores in Sydney’s western suburbs. However, BIFS also moves dalo, cassava and cocoa beans from Fiji. The BIFS proprietor, Mr Sonny Naidu, is keen to import papaya from Fiji to sell to the network of ethnic shops that he supplies in Sydney’s western suburbs. The strongest market was identified in the Cabramatta area, but he believes he could extend his marketing network to Melbourne, which he sees as Australia’s largest market (pers. comm.). Sonny believes he could move 8-10 tonnes/week of papaya through these outlets. A winter window, from April through to October has been identified. This is a particularly price conscious market – reflected in the retail price differential in April 2009 between Harris Farm papaya in Parramatta and Merrylands (\$3.99/kg) and Edgecliff and Mosman (7.99/kg). The major constraint to achieving a competitive price at the bottom end of the market is the high cost of airfreight and related quarantine and customs clearance charges. In April 2009, BIFS reported these costs total \$2.27/kg for their operation⁶

1.6 Market trends

⁶ Sonny Naidu provided his costs as follows.

	FJD
Air freight (Air Pacific – LD3)	1.80
Fuel surcharge	0.30
Security fee	0.12
Quarantine clearance charges (based on an AQIS charge AUD72/15min/person) and other costs	0.50
Total	FJD 2.72= AUD 2.27

Papaya consumption in Australia is estimated at around 0.7 kg per capita (Horticulture Australia 2007). There exists a traditional consumer base who buys the dioecious 'paw paw' because this is what they are used to. Interviews with producers and DPI indicate that this consumer base is likely quite stagnant and if anything contracting. This is due in part to the fact that this consumer base is largely comprised of older people. In contrast, the market for red fleshed papaya is growing as indicated by interviews with growers, wholesalers and retailers. Fruit giant Mackay's indicated that the "main stream market does not want paw paw but rather a sweet, red fleshed variety" (pers. comm.). Mackay's believe that there is a great potential to develop solo sunrise product in markets like Melbourne where consumers generally have not tasted 'paw paw' or papaya. David Harris, founder of the speciality fruit company Harris Farms Markets, sees papaya and pawpaw as totally different products – "We sell both products but are not interested in promoting the latter as this is seen as a declining market because of its lack of flavour compared with papaya".



Figure 13. Sunrise solo from Australia's largest banana grower and new entrant to the papaya industry.

While significant demand has been identified for solo sunrise, there are some markets that feel the solo sunrise currently available on the market are too small and the skin is unattractive. Solo sunrise does not perform particularly well in most of Australia's growing areas. With this in mind, growers are asking breeders and DPI staff for a red fleshed papaya that is approximately 1 kg with clean looking skin. Mackay's are doing this breeding work themselves. Producers interviewed believe that if these characteristics can be provided in a high yielding tree than they will have no problem significantly expanding the market.

1.7 Prices and seasonality

The Sydney Market Reporting Service⁷ provided price and volume information for the Flemington Wholesale Market, Australia's largest produce market up until 2001. More recent price data was sourced from Sydney Produce Surveyors Ltd (supplied by PITIC). Price data is provided for a range of papaya types: yellow fleshed papaw (dioecious lines); 'Hawaiian Solo' (red fleshed Sunrise types); exotic red flesh types; and culinary. Total market throughput (1999 to 2001) and annual average annual prices for all papaya (1999 – 2007) are presented in table 2.

⁷ Sydney Market Reporting Service, Stand 30, E Warehouse, Flemington Markets 2129, Mobile 0416 108639: e-mail cqs@accsoft.com.au

Table 2. Annual papaya prices, Sydney Flemington Markets (1999 – 2007)

	Annual market throughput - all types (mt)	Average annual price (\$A/kg)
1999	3,535	2.16
2000	3,845	1.84
2001	5,922	1.44
2006		3.95
2007		2.89

These aggregate figures show a situation of increasing supply until 2001, accompanied by declining price. However, 2006 saw a sharp increase in the average wholesale price to AUD 3.95/kg, due to the impact of cyclone Larry. In 2007, the average price subsided to AUD2.89/kg, which was still well above pre-cyclone Larry levels. Following the May 2009 devaluation of the Fiji dollar, the current feasible wholesale price for Fijian papaya is estimated at around AUD 3.00/kg (derived in table 5).

These average wholesale prices mask the actual prices that an aspiring Fiji exporter might receive. There are large price variations with respect to season, type of papaya and quality. Table 3 plots monthly average prices at the Flemington Wholesale Market and shows the price range in any particular month.

Table 3. Monthly average papaya prices, Sydney Flemington Wholesale Market 2004-2008(AUD/5kg carton)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2004												
Highest	20	20	35	35	35	36	40	36	40	36	30	25
Average	11.7	12.5	17.24	17.79	18.95	18.19	19.02	16.67	18.27	17.28	15.82	14.65
Lowest	6	8	8	10	10	10	10	8	8	10	10	10
2005												
Highest	24	24	26	26	30	30	36	36	36	30	24	22
Average	11.61	13.33	13.1	14.38	16.32	16.14	15.68	19.95	15.17	14.78	12.88	10.24
Lowest	5	5	4	4	12	8	7	12	8	8	7	2
2006												
Highest	24	26	40	45	50	50	45	45	50	50	40	45
Average	7.9	11.05	14.59	26.56	28.32	30.86	38.38	39.5	27.41	25.46	24	21.82
Lowest	2	3	4	12	18	18	26	26	12	12	12	12
2008												
Highest	20	20				30	30	30	30	30	40	35
Average	15	15				24.75	20	20.48	19.86	21	26.84	21.81
Lowest	10	10				16	16	16	11	11	18	12

* Source: Sydney Surveyors Ltd. - supplied by PITIC

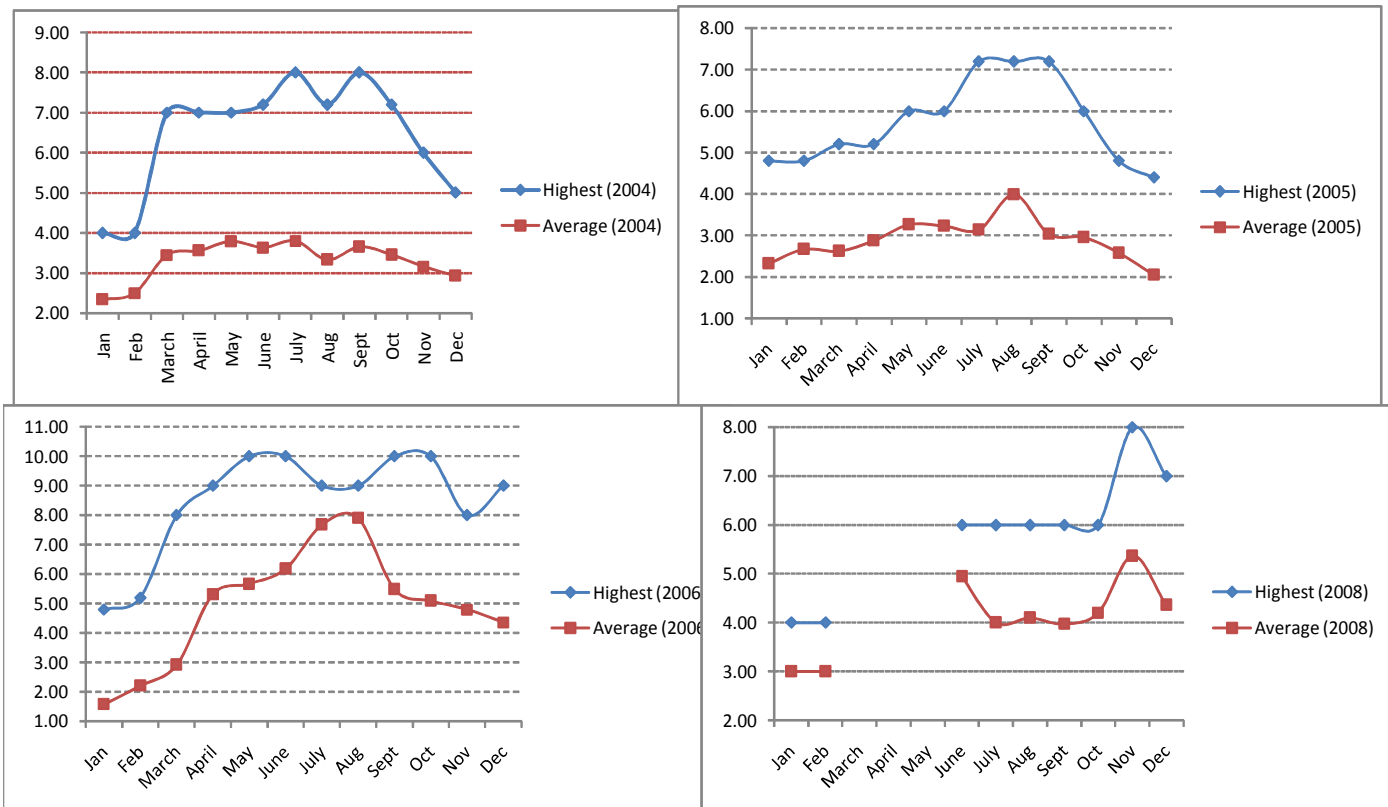
The most relevant comparison for a Fiji exporter is the prices received for Hawaiian 'solo' papaya. Table 4 shows the monthly average prices received for Hawaiian solo papaya over the period January 2004-08. The average and highest per kg wholesale price for Hawaiian solo papaya are plotted over the period.

The highest prices are received during the winter months (July - September). At any one time, there is a huge variation for the price received for any particular type of papaya. Table 4 plots the monthly high and average prices per kg for Hawaiian Solo papaya for 2004-08. What this data reflects is the wide variation between the highest and lowest prices and the considerable seasonal variation in most years. Overall, prices are significantly higher in the winter months. Price variations at any one time are largely a reflection of quality. Fiji's better quality export fruit can certainly match the appearance of the higher price fruit sold at the wholesale Flemington Markets in Sydney. The likely superior taste of Fijian papaya could be expected to enhance its position at the top end of the market.

Table 4. The monthly highest and average papaya price, Sydney Flemington wholesale market, 2004 -2008 (AUD/kg)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Highest (2004)	4.00	4.00	7.00	7.00	7.00	7.20	8.00	7.20	8.00	7.20	6.00	5.00
Average (2004)	2.34	2.50	3.45	3.56	3.79	3.64	3.80	3.33	3.65	3.46	3.16	2.93
Highest (2005)	4.80	4.80	5.20	5.20	6.00	6.00	7.20	7.20	7.20	6.00	4.80	4.40
Average (2005)	2.32	2.67	2.62	2.88	3.26	3.23	3.14	3.99	3.03	2.96	2.58	2.05
Highest (2006)	4.80	5.20	8.00	9.00	10.00	10.00	9.00	9.00	10.00	10.00	8.00	9.00
Average (2006)	1.58	2.21	2.92	5.31	5.66	6.17	7.68	7.90	5.48	5.09	4.80	4.36
Highest (2008)	4.00	4.00				6.00	6.00	6.00	6.00	6.00	8.00	7.00
Average (2008)	3.00	3.00				4.95	4.00	4.10	3.97	4.20	5.37	4.36

Figure 1



The current (post devaluation) feasible wholesale price for Fiji papaya in Sydney is estimated at around AUD 3.03/kg, if papaya is purchased at the farm gate for FJD 0.90/kg (table 5). Thus Fijian papaya is reasonably competitive, particularly in the winter months. The appropriate marketing strategy for redeveloping the Australian market would be to target the July to September winter window with superior quality fruit. Fortunately, this happens to be Fiji's peak supply period. During this period, returns in Australia can be expected to be at least as good as those obtained in New Zealand. Once Fiji papaya has re-established a reputation for quality and reliability, it would be in a position to attract the best prices available at other times of the year.

Table 5: The cost and returns from exporting a tonne of papaya to Sydney (July 2009)

	\$/kg exported	\$/carton	Total shipment(\$)
<u>Fob costs</u>			
Cost of fruit			
1 Papaya purchased (1.2 tonnes @ \$0.90/kg)	1.08	5.4	1,080
Transportation			
2 Farm to exporters shed	0.06	0.3	60
Exporters shed to NWC	0.01	0.05	10
3 Materials (Cartons, sponges, tape and stickers)	0.37	1.835	367
4 Quarantine treatment @ NWC \$0.39/kg (VIP)	0.39	1.95	390
Labor Costs			
Lead Supervisor (8 hours @ \$4/hour)	0.03	0.16	32
Pack house supervisor (5 hours @ \$3/hour)	0.02	0.1	20
Washing (2 hours @\$2.50/hour)	0.01	0.05	10
Grading and packing (3 hours \$2.50/hour)	0.01	0.05	10
Overheads			
Telecommunications (\$150/month spread over 10 t. of produce)	0.02	0.1	20
Electricity (\$210 spread over 10 tonnes)	0.02	0.1	20
Rental of pack house (\$150/month spread over 10 t.)	0.02	0.1	20
Miscellaneous (\$300/month spread over 10t.)	0.03	0.15	30
Total FOB costs (to point of export)	2.07	10.35	2,069
Exporters Gross Margin (15% Fob cost)	0.31	1.55	310
Fob price	2.38	11.90	2,379
<u>CIF costs</u>			
5 Fiji handling fees	0.19	0.95	190
6 Freight to Sydney	1.40	7.00	1,400
7 Australian fees (quarantine inspection)	0.25	1.25	250
Total cif cost (from point of export to point of clearance)	1.84	9.20	1,840
Sydney landed price FJD	4.22	21.10	4,219
Sydney landed price AUD (FJD/AUD exchange rate =0.599)	2.53	12.64	2,527
Australian wholesale price FJD (plus 20% of landed price)	5.06	25.32	5,063
Australian wholesale price AUD (plus 20% of landed price)	3.03	15.16	3,033

Footnotes:

- 1 The exporter buys 1.2 tonnes in order to export just one tonne.
- 2 Assumes the cost of transportation from the farm to exporters shed is \$150.
- 3 Based on carton cost of \$1.50 each (no print) from Golden Manufacturers, Suva.
- 4 For an exporter whose account with Natures Way Cooperative is up to date
- 5 Includes: cooler fees (LD3 \$ 45/hr;LD8 \$65/hr;LD9 \$75/hr; documents and handling (\$35/shipment); terminal fee (\$11.25/shipment);towing (\$24) and shrink wrap (\$45/roll). Information provided by Williams and Gosling
- 6 The Nadi to Sydney freight rate is based on the LD8 (4,175kg) rate of \$1.40/kg plus \$20/shipment security charge. Information supplied by Williams and Gosling.
- 7 Based on an AQIS charge AUD72/15min/person. An exporter with a good track record will not be subject a full inspection on every occasion.

1.8 The competition: how does Fijian papaya compare?

Domestic Australian papaya production is the only competition Fiji papaya currently faces on the Australian market. In the future, competition could be faced from the Philippines and other Pacific islands. The competitiveness of Fiji papaya with papaya from these various sources is assessed below.

1.8.1 An assessment of Fiji's competitive position with respect to Australian papaya

In 1995, the USAID Commercial Agriculture Development Project (CAD) Project conducted an extensive study of the Australian market for Fiji papaya prior to the commissioning of the HTFA facility. The study concluded:

Yellow-fleshed dioecious lines dominate Northern NSW and Southern Queensland production. Yellow fleshed "pawpaw" is still the main papaya sold on Australian markets. The southern production areas have an unfavourable disease status. Since Fiji last exported papaya, Australia has made progress in developing its own domestic industry, particularly in North Queensland. Queensland now grows around 500 ha of papaya, spread from south, east, central and northern Queensland. There is also commercial papaya production in northern NSW, Western Australia and the Northern Territory. However, by and large, Australia has not been particularly successful in growing the popular Hawaiian 'solo' varieties in reasonable proximity to the major southern Australian markets. North Queensland and Northern Territory producers still enjoy transport cost advantages compared with Fiji. Fiji's advantages are in lower labour costs and its ability to produce superior eating quality fruit (USAID CAD 1995).

Papaya growers in northern Australian are now capable of growing the popular Hawaiian 'solo' varieties', despite growing conditions being less suited than those found in western Viti Levu. Considerable private sector resources are now being devoted to developing varieties that have the desirable attributes of solo sunrise but are better suited to the environmental conditions of north Queensland.

Despite the setback from Cyclone Larry, Fiji papaya now faces competition from a significant industry producing for the most part, a quality product. According to the Annual Report of Papaya Australia (2007/08):

The industry suffered some changes over the last two years following Cyclone Larry in March 2006. Production is now returning to normality and yet production dynamics have changed. Producing areas have changed and there is a steady shift from yellow papaw to red papaya. There are good indications that there is growth potential for the industry if the right variety of red papaya can be produced profitably (2008, p.3).

In assessing the competitiveness of Fiji papaya relative to the Australian domestic product, consideration is only given to the red fleshed 'solo' varieties. Yellow flesh pawpaw is seen as an inferior fruit product that is not regarded as a close substitute for Fijian red papaya. The market for yellow fleshed pawpaw is seen to be in decline.

The major advantages of Australian papaya

Domestically grown papaya has a number of major advantages compared with Fiji papaya. These are discussed below.

Substantially reduced marketing costs

Australia's main papaya production areas are in far north Queensland. These growers are located a considerably further distance from the main urban centres of Sydney and Melbourne, relative to Fiji's growers located in western Viti Levu. The transit time of papaya grown in Mareeba in far North Queensland to Sydney, is approximately 3 days in a cooler truck. This compares with a day to airfreight papaya from Nadi to Sydney. However, the marketing costs for

the Queensland producer are considerably less than those of their Fijian counterparts, as shown in table 6 below:

Table 6: Comparison of Fijian and Australian freight rates for papaya (July 2009)

Route	Details (FJD)	AUD/kg
Cairns – Brisbane	1 tonne pallet (min. 6 pallets) \$192.90*	0.19
Cairns – Sydney	1 tonne pallet (min. 6 pallets) \$378.88*	0.38
Cairns - Melbourne	1 tonne pallet (min. 6 pallets) \$447.56	0.45
Nadi - Sydney	LD9 (4,175 kg) \$1.59/kg (airfreight \$1.40/kg plus \$20 and other Fiji handling costs \$0.19)**	0.95
Nadi -Melbourne	2 tonnes @ FJD \$1.78/kg (airfreight \$1.53 plus \$20 and other Fiji handling costs \$0.19)**	1.07
Nadi - Brisbane	1 tonne @ \$1.93/kg (airfreight \$1.74 plus \$20 and other Fiji handling costs \$0.19)**	1.16

* *J.A.T Refrigerated Road Services (3890 4611): The prices are inclusive of GST and fuel surcharge.*

** *Williams and Gosling Nadi*

In addition, Fiji exporters must incur the added costs of quarantine treatment (FJD 0.35/kg for an exporter whose account is current with Natures Way Cooperative) and of quarantine and customs clearance in Australia. The Australian Quarantine Inspection Service (AQIS) incurs a user-pays cost of AUD 72/15 minute/person. It is estimated that the average cost of this inspection is AUD 0.15/kg, however long standing exporters with a good track record may incur less time. Melbourne based Sculli and Co, the largest importer of Fiji papaya, estimates the cost of clearing customs and quarantine averages AUD 1,000/container. A north Queensland papaya shipper does incur some additional costs in moving fruit fly host materials into southern states. Dimethoate dipping is undertaken plus AUD50/ pallet is incurred for fruit fly inspection at the border. However, these costs are considerably less than those incurred by the Fijian exporter. Dimethoate is currently subject to a long standing review as a quarantine treatment in Australia due to food safety concerns (Horticulture Australia Limited 2007). Should the chemical be lost as a quarantine treatment, this cost would raise substantially. Currently irradiation is the only approved alternative treatment.

Infrastructure and marketing system already in place to handle large volumes

Until recent times, papaya-growing in Australia was largely based on smallholder operations – with four larger farms dominating. Many of the entrants into the industry were cane farmers trying to diversify. As such, the industry has much in common with the evolution of the Fiji papaya industry. However, recent years have seen major structural changes in the industry with the entry of major agribusiness entities. Papaya-growing and marketing in Australia is now starting to attract substantial agribusiness investment. The most significant development has been the entry of the Mackay family, which account for 15% of Australian banana production. In 2001, Australia produced 238,000 tonnes of bananas estimated to have a wholesale value of AUD300 – 350 million (Australian Banana Growers Council 2002). In this respect, there is a similarity with the situation in the Philippines, where the entry of Dole, predominately a banana company, has given the papaya industry a major boost. Mackay’s are now making considerable investment in papaya R&D.

The visit to North Queensland revealed that most of the growers had 'Fresh Care' certification which meets the food safety requirements of Woolworths and Coles. This puts the North Queensland growers at a major advantage when compared with Fiji growers.

The general preference of consumers to buy Australian-grown

A consumers' decision to buy fruit is determined by factors such as price, quality (appearance and taste) and where it is produced. Whether or not the fruit is produced in Australia can be the deciding factor for many consumers. A 'buy-local' preference can be driven by a combination of considerations:

- national pride and duty, and an assumption that an Australian product is best
- food safety concerns, driven by the adverse publicity on imported products from China
- environmental factors – the climate change debate has given rise to the concept of 'food miles' and buying locally to reduce greenhouse gas emissions.

Driven by consumer demand, 'buy Australian' is part of the marketing strategy of the major supermarket chains and the speciality fruit and vegetable outlets. The strong preference to source produce locally is reflected in the Woolworths website:

The Woolworths stated position, as a service to its customers, is to procure fresh produce from international sources only during periods of seasonal unavailability in Australia, or where there is a shortfall in local supply. Woolworths also has an active import replacement program, providing opportunities and support for Australian growers to expand the range of domestic crops, to establish new varieties, or to explore new growing regions

(www.woolworths.com.au/wqa+produce)

'Buy Australian-grown' is far less a factor in the ethnic store segment. In fact, it is often the opposite as consumers look to purchase a 'taste of home'. This has been the driving force behind the export of Fiji eggplant to New Zealand.

The advantages of Fijian papaya

Fiji papaya has advantages when compared with domestically grown papaya in the Australian market.

The inherent fruit quality

The soils and climate in the river valleys of Western Viti Levu offer excellent growing conditions for Hawaiian solo 'sunrise' variety papaya. A true type solo 'sunrise' papaya, harvested at colour break or at quarter ripe maturity, consistently produces fruit that combines exceptional sweetness and flavour (high ° brix, at 11-13%), strong red coloured flesh, with good size characteristics (400 to 600 gm) and good keeping qualities. This compares with a brix of 8-10% for the most commonly grown hybrid (YD1B commonly known as 1B) which has a taste described as 'nasturtium,' as referred to in figure 8.

Emeritus Professor Henry Nakasone, the world-renowned University of Hawaii papaya breeder, in his report to the USAID's Commercial Agriculture Development (CAD) in the early 1990s commented on the exceptional high level of sweetness of papaya grown in Fiji from Hawaii sourced seed (Nakasone 1990). However, if Fijian papaya entering the market is to realise this inherent competitive advantage, a number conditions must be met:

- true to type 'sunrise' seed must be used to produce vigorous healthy papaya seedlings for planting by farmers;
- farmers must apply the correct package of practices, with a particular emphasis on good drainage, irrigation and plant nutrition;
- fruit must be harvested at the colour break/1/4 ripe stage of maturity and;
- fruit needs to be correctly handled, graded and packed.

The consequences of not meeting one or more of these conditions more than offset the inherent quality advantage of Fijian papaya.

Fiji image

Fiji retains a favourable image in Australia – associated with friendly people, outstanding rugby players and a familiar and easily accessible holiday destination. This is despite Fiji's political instability of recent decades and the accompanying unfavourable media coverage. The apparent empathy to the people of Fiji allows the opportunity to offset the prevailing 'buy-Australia' sentiment amongst consumers. The spectacular marketing success of Fiji Water has demonstrated that 'product of Fiji' is a brand that sells provided there is a quality product that matches the image. Harris Farms Market has recognised this, as reflected in the brand 'Fijian Red Papaya – product of Australia, used to sell their best quality North Queensland papaya. However, as the Fiji Water experience has shown, the value of the Fiji brand can only be as good as the quality of product, its packaging and marketing.

Absence of Papaya ringspot virus (PRSV)

The absence of Papaya ringspot virus (PRSV) in Fiji provides a major advantage compared with other competing papaya producing locations such as Hawaii, Philippines and Australia.

Papaya ringspot virus-type P (PRSV-P) was identified on pawpaw in Australia for the first time in 1991 (Thomas and Dodman 1993). PRSV remains restricted in distribution to South East Queensland (Queensland DPI 2005⁸). The key strategy is to prevent the introduction of PRSV-P into the major growing areas of central and northern Queensland for as long as possible. The papaya ringspot quarantine legislation prohibits the movement of papaya plants from South East Queensland into the North Queensland quarantine area without the written approval of an inspector. The legislation also prohibits the movement of cucurbit seedlings into the quarantine area unless approved by an inspector. These measures are expected only to delay the spread of the virus into the main papaya growing areas. When and if PRSV arrives in the production areas of far North Queensland, there are three strategies available to the Australian papaya industry:

- adopting management strategies to counter PRSV. This essentially means continually moving plantings away from infected locations, which means shorter rotations and increased costs;
- the adoption of Genetically Modified Organism (GMO) varieties; or
- abandoning papaya production altogether, as was the case with Dole's Hawaii papaya project.

A much more favourable fruit fly status

North Queensland has a particularly unfavourable fruit fly status. A fruit fly of particular economic significance that is a noted production pest for papaya is the Queensland fruit fly (*B. actrocera tryoni*). Recently eradicated from North Queensland was Asian papaya fruit fly (*B. papayae*) one of the most damaging fruit fly species. The estimated cost of eradicating this fruit fly, that entered from Papua New Guinea in 1992, was AUD 35 million (Fay et.al. 1997).

Queensland fruit fly is endemic to North Queensland. Dipping with the pesticide dimethoate⁹ is used as the treatment for papaya under Queensland DPI's Interstate Certification Assurance

⁸ www2.dpi.qld.gov.au/health/4188.htm

⁹ Postharvest full immersion of the fruit in a dip mixture containing 400 mg/L dimethoate or a dip mixture containing 412.5mg/L fenthion for a period of 1 minute (www2.dpi.qld.gov.au/health/4188.htm).

(ICA) Program. The use of dimethoate as a quarantine treatment is currently under review, with the likelihood it will be prohibited or severely restrict (Horticulture Australia Limited 2007 p, 4). The use of dimethoate has long been prohibited in the USA on food safety grounds and its use has been controversial in Australia's cross Tasman trade in tomatoes and cucurbits. The loss of dimethoate as a quarantine treatment would be a major set back for the Australian industry in the absence of an approved alternative at an equivalent low cost.

Papaya grown in Fiji is considered a fruit fly host for two fruit fly species *B. passiflorae* and *B. xanthodes*. These two species are quarantine pest for papaya, but are not production pests. The optimum stage of maturity to harvest papaya for export marketing purposes is ¼ ripe. There is no record of *passiflorae* or *xanthodes* being found in papaya at the ½ ripe stage of maturity let alone the ¼ ripe stage. Thus the minimisation of fruit fly damage is not a consideration in determining time of harvest for papaya in Fiji. However in Australia, as in Hawaii and the Philippines, fruit fly damage is a factor in determining the time of harvest.

Extreme climatic events

In recent times, extreme climatic events have devastated the Australian and Fijian papaya industries. It could be expected that such extreme events will be more frequent and will equally affect both industries. The appropriate strategy for the Fijian industry would be to try and spread the geographic distribution of planting to minimise the disruption and supply to the market. Similarly, Australian papaya buyers are interested in establishing supply sources from Fiji and the Philippines as a strategy to minimise the impact of future natural disasters in Australia.

1.8.2 The Philippines

Currently, Australia only imports papaya from Fiji. In March 2009, Bio Security Australia announced that it would allow bananas from the Philippines to be imported under strict quarantine guidelines. The Australian banana industry is adamant that imports from the Philippines will bring a whole range of exotic pests into the country. The Australian government has for the meantime halted any imports with an ongoing pest risk assessment being carried out. However the Philippines is continuing its appeal to the Australian government to reconsider strict import requirements on bananas¹⁰ and it is possible that imports will commence in the near future. It is also understood that the Philippines has an application with Bio Security Australia for market access for papaya. Presumably, the exporter would be Dole Philippines, the company that has acquired a dominant market share for papaya in New Zealand. Dole's strategy, as it is in New Zealand, would likely be to 'piggyback' papaya shipments with bananas to minimise transportation costs. Dole will provide a formidable competitor for both Australian and Fiji papaya growers and could be expected to take some market share. However, their competitive position would probably not be as strong as it is New Zealand. The New Zealand country study analyses at some length the competitive strengths and weaknesses of papaya from the Philippines.

1.8.3 Other Pacific island papaya exports

No other Pacific island papaya producer has market access to Australia. None are seen as having the scale or the transportation links to be credible exporters to this market.

¹⁰ News article 1 September 2009 /www.radioaustralianews.net.au

1.9 The processed papaya market

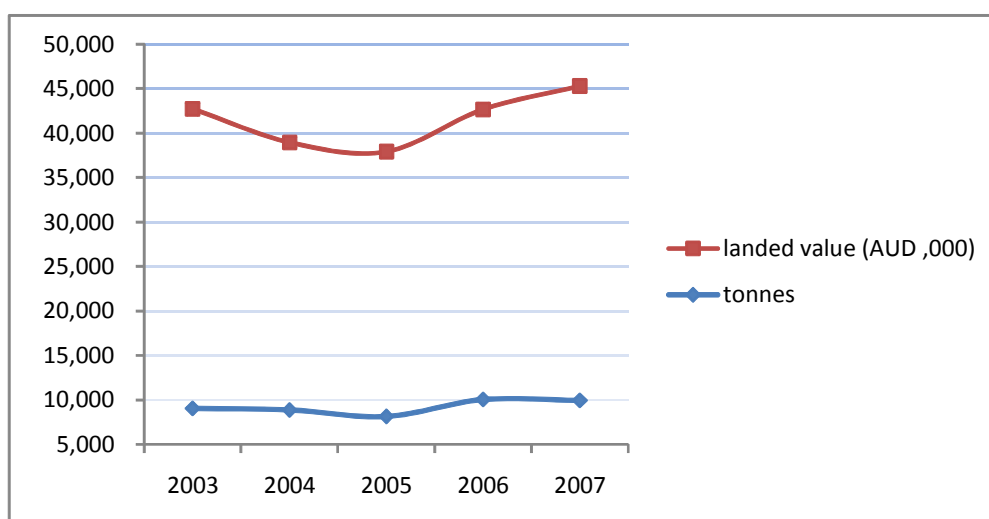
1.9.1 Dried fruit

Australia imports around 10,000 tonnes of dried fruit annually, for a landed value of about AUD 35 million (figure 14). These imports are dominated by apricots and prunes, which account for around 65% of the volume and 60% of the value respectively. The volume and value of total dried fruit has remained fairly static in recent years, with the per tonne value standing at around AUD 3,500 per tonne.

Statistics on dried papaya imports are not available. Tropical dried fruit is included in the other dried fruit category. Dried fruit imports from tropical countries for the period 2003-07 are shown in figure 15. Compared with total dried fruit imports there has been significant growth in tropical dried fruit imports. These imports are dominated by South Africa and Thailand, accounting for over 90% of the volume in 2007. However, the unit value of dried fruit imports from South Africa (AUD 4,800/tonne) were double that from Thailand. The dried fruit from Thailand is mainly mango but includes some papaya. These imports average around 400 tonnes annually. This is a low cost product (AUD2.50 to 3.00/kg), with which Fiji would not be able to compete. However, premium quality naturally dried fruit tropical fruit (mango and papaya) using solar or heat pump drying techniques¹¹ command wholesale prices of AUD30-35/kg, if organically certified (Tandem Trading, pers. comm.). In July 2009, Eco Farms Certified Organic, were paying AUD32/kg for certified organic mango sourced from the Northern Territory and North Queensland (David Como, pers. com). This is the market segment dried fruit from Fiji should target.

Figure 14: Australian dried fruit imports, 2003 - 2007

	2003	2004	2005	2006	2007
tonnes	9,053	8,877	8,128	10,037	9,940
landed value (AUD ,000)	33,662	30,089	29,784	32,611	35,341
value per tonne (AUD)	3,718	3,390	3,664	3,249	3,555

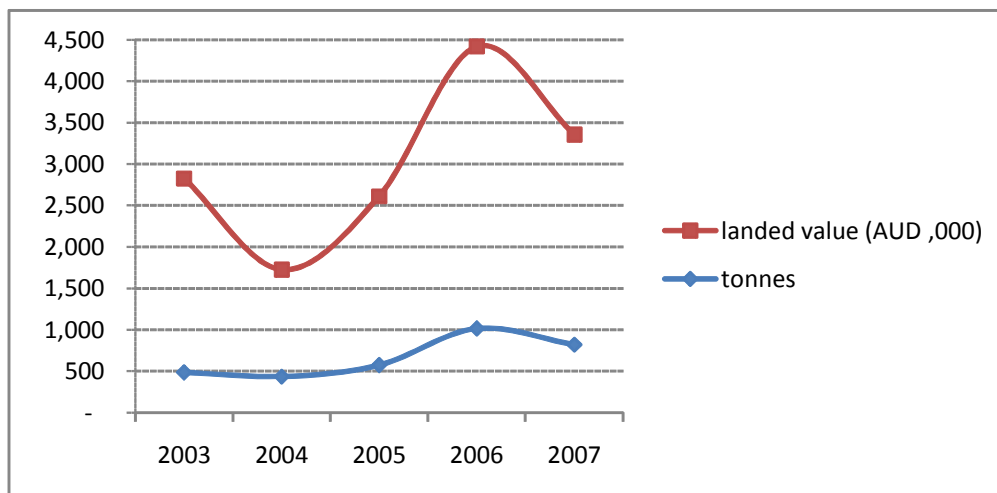


Source: Australian Trade Statistics

¹¹ Heat pump dehumidifier driers allow fruit to be dried at very low temperatures. Fruit subject to normal drying processors is very susceptible to deterioration in colour, flavour and texture, and loss of vitamins through oxidation. Low temperature drying enables flavour and colour to be maintained without the addition of preservatives (Ellyett 1998). These close systems are highly energy efficient.

Figure 15. Australian imports of dried fruit from tropical countries

	2003	2004	2005	2006	2007
tonnes	486	438	575	1,017	823
landed value (AUD ,000)	2,344	1,289	2,040	3,403	2,534
value per tonne (AUD)	4,823	2,943	3,548	3,346	3,079



Overall, there are limited opportunities in Australia for Pacific Island suppliers to sell dehydrated tropical fruit, for the following reasons:

- The market is currently well supplied, and not showing any significant growth.
- Any new supplier looking to sell standard, dehydrated products will have to meet the market on price. As the market is dominated by Thailand, which is a country with a low wage structure, as well as greater economies of scale, Pacific Island processors may find it difficult to compete.

However, there are opportunities to develop a small, but comparatively high value market in the 'health/specialty foods' segment, for organically grown, dried fruit, or for fruit that is processed without added sugar or preservatives (or a combination of the two). However, supplies are inconsistent and organic certification hard to obtain. Any exporter that is able to consistently provide a range of quality certified solar dried fruit would be bound to find interest. Many of the larger importers of dried fruit may not be interested in dealing with such a low volume item. Those who specialise in supplying the retail sector would be more likely to be interested in this type of product, as would companies who sell gourmet food products direct to consumers by catalogue or via the internet.

As Fiji's papaya production increases, so will the availability of low cost raw material suitable for drying. Dr Michael Williamson, the New Zealand based engineer who developed the High Temperature Force Air (HTFA) units in the Pacific islands, is currently working on modifying the HTFA technology to enable it to efficiently produce high quality dried fruit. The combination of low cost raw material and appropriate drying technology can be expected to expand the opportunities for commercial dried fruit production.

1.9.2 Fruit pulps and puree

Tropical fruit pulps are essentially commodities that are traded in large quantities internationally. Quality issues aside, new suppliers have to meet the market price, otherwise they will not be considered. This is particularly true of the most popular fruits such as pineapple, where the end

products are competing in mass consumer markets. Any fruit processing company in the Pacific Islands will find it very difficult to compete with large producers from low cost countries such as Thailand and the Philippines.

Consequently, Pacific Island suppliers need to concentrate on producing products suitable for use in food that is targeted towards the top end of the market. One obvious opportunity is the market for organically grown tropical fruit pulps. This is not to say that there is no potential for Pacific Island suppliers to sell non-organic tropical fruit pulps in Australia. Importers are always interested in talking to new suppliers, particularly regarding those fruit that are prone to seasonal shortages such as passionfruit and mango. However, there is a general perception that Pacific Island suppliers are unlikely to be very reliable and so any new exporter will have to work very hard to counteract this negative reputation.

An important exception has been Agrana Fruit Australia which oversees the management of an operation in Fiji which processes tropical fruit purees. Agrana Fruit (Fiji) produces between 1,000 to 2,000 tonnes of puree products annually (banana, guava and mango), requiring 2,500 to 3,500 tonnes of raw material annually. The main market for these products has been in baby food. For Agrana, organic certification has been critical in gaining market access, in the face of competition with lower cost producers¹². Papaya puree has desirable characteristics as a baby food ingredient, particularly because of its high nutrient content¹³. Agrana are interested in including organic papaya in their product range once sufficient volumes of reject organic papaya are available at a reasonably low price.

Tandem Trading identified a growing market for high pressure processed fruit products including papaya. Managing Director Steve Klung sees this as an appropriate approach for highly flavoured Fiji papaya. High pressure processed (HPP) is a cold pasteurisation of foods at extremely high levels of pressure. The advantages of the technology are:

- Cold pasteurisation (in-pack)
- No heat used
- Inactivation of bacterial cells
- Retention of nutrients
- Retention of natural flavours and colour

The pressure is so great that the food bacteria are killed, while maintaining high flavour with exceptional shelf life. Pressure Fresh Australia has become a major supplier of HPP products, sourcing the technology from Avure Technologies in the United States.¹⁴

¹²End-users of banana puree in the United States can source product for \$US0.30/kg from Central America. The landed cost of banana puree from Fiji is \$US1.10/kg to which has to be added brokerage and duty.

¹³One cup mashed papaya contains; Vitamin A – 2516 IU, Vitamin C – 142 mg, Vitamin B1 (thiamine) - .06 mg, Vitamin B2 (riboflavin) - .07 mg, Niacin - .77 mg, Folate – 87 mcg, Potassium – 591 mg, Phosphorus – 12 mg, Magnesium – 6.9 mg, Calcium – 55 mg, iron - .23 mg. Also contains trace amounts of iron, zinc, manganese and copper.

¹⁴ www.avure.com.

1.10 Major findings

1.10.1 Assessment of the current status of Fijian papaya in the Australian market

The positives

- The overall growth in demand for papaya in the Australian market
- A significant proportion of papaya consumers regard Fiji papaya as superior, in terms of sweetness and flavour. This is particularly true for the growing Asian market segment. The benefits of this inherent advantage are far from realised due to shortcomings in production post harvest handling practices and marketing practices.
- The Melbourne and other southern markets are under supplied. These markets are the greatest distance from far north Queensland suppliers.
- Attractive wholesale prices are available for papaya at the top end of the market, particularly during the winter months.
- The inherent quality of the product and a generally favourable response of the Australian consumer to the Fiji image.
- The interest of a number of papaya importers to handle Fiji papaya to complement supplies from North Queensland. This is seen as an 'insurance policy' against natural disasters in North Queensland.
- The treatment of papaya ring spot virus and frequent natural disasters overhanging the Australian papaya industry
- A very favourable fruit fly status
- A reliable quarantine treatment that does not adversely affect fruit quality and allows for organic certification and which will be able to meet current and future food safety requirements

The negatives

- The relatively high cost of transporting and clearing Fijian papaya compared with the road transport costs incurred by Australian papaya.
- The growth in Australian papaya production and steady improvement in quality.
- The steady shift of the Australian industry from yellow pawpaw to red papaya.
- The generally strong preference of Australian consumers to buy Australian produce.
- The threat of the Philippines becoming a significant supplier.
- Significant variability in Fijian papaya supply, making it difficult to develop markets in the major outlets.
- The quality and food safety certification requirements of the major supermarkets.
- The generally poor grading standards and poor packaging utilised by Fiji's papaya exporters.

1.10.2 Opportunities and requirements to expand the Fijian papaya export to Australia

Opportunities

- To produce a branded Fiji red papaya that is of superior quality in terms of flavour, appearance and presentation
- To directly supply a major speciality fruit and vegetable store
- To supply major supermarket chains looking to diversify their papaya supply source, due to climate risks in Australia
- To simultaneously reduce farm gate prices and increase incomes by increasing yields and reducing reject rates
- To reduce marketing costs

- To capture an increasing market for certified organic papaya, with neither chemicals or irradiation used in Fiji's quarantine treatment.
- To develop quality dried fruit exports, utilising reject fruit

Requirements

- Improved continuity of supply through papaya farming practices (the Fiji Papaya Project and the Taiwan Technical Mission)
- Improved quality and grading- importers demand that fruit be of even size and maturity with very minimal skin blemishes and no disease.
- Ongoing training of farmers and NWC staff (continuation of the FAO papaya value chain approach)
- Coloured wall charts and other training material on the quality requirements and grading standards to be made available.
- The ongoing promotion of the financial rewards to farmers and exporters of improving quality and grading (continuation of the FAO papaya value chain project approach).
- NWC to play a more active role in product grading.
- Establishment of quality assurance and food safety certification programs to provide access to the growing supermarket market segment (technical assistance via EU-FACT recommended).
- Substantial investment by exporters in improving quality and in adopting certification programs.
- Industry negotiation of improved freight rates.
- Establishing pre-export quarantine clearance systems (AusAID's Pacific Horticultural Agricultural Market Access(PHAMA) Project)
- Introduction of certified organic papaya production through the Fiji Papaya Project.
- The introduction of concerted in-store promotion program (support from PITIC and FACT).
- Substantial private sector investment in processing.

1.11 The projected market size for Fijian papaya in Australia

The size of the Australian market is projected under two scenarios:

- The Fiji industry continues as is – the status quo remains
- There is significant improvement in the Fiji industry

1.11.1 The projected market if the Fiji industry continues as is – the status quo remains

The status quo is described as follows:

- Fiji papaya is not sold in the major super market chains.
- Fiji's largest exporter sells to Sculli and Co, an importer/wholesaler who services some of the independent chains and speciality stores in Victoria.
- A few other Fiji exporters mainly sell to Indo-Fijian importers, who sell in their own retail outlets and other ethnic stores.
- The inherent quality of the Fiji papaya is good – however, generally the grading and presentation of the fruit is generally inferior to that of Australian papaya.
- All shipments are by air

Over the last few years, Fiji's papaya exports to Australia have ranged from 180-400 tonnes annually. Somewhat more papaya could have been sold if the supply was available. It is estimated that the market could have absorbed around 500 tonnes of Fijian papaya annually under the present arrangements. Increasing competition from North Queensland papaya and imports from the Philippines can be expected – assuming that the latter industry does not

succumb to PRSV. Offsetting expanding supply is the increasing overall demand of Australian consumers for papaya, thanks largely to the promotion of domestically grown red papaya. Thus the projected size of the Australian market for Fijian papaya is around 500 tonnes, if the current marketing situation remains. This is well short of the 1,000 tonnes estimated in 1995, when the feasibility study was undertaken for the HTFA facility.

1.11.2 The projected market with significant improvements by the Fiji papaya industry

Improvements in the Fiji papaya industry can be achieved in four broad areas:

- price competitiveness
- reliability of supply
- quality
- marketing

Price competitiveness

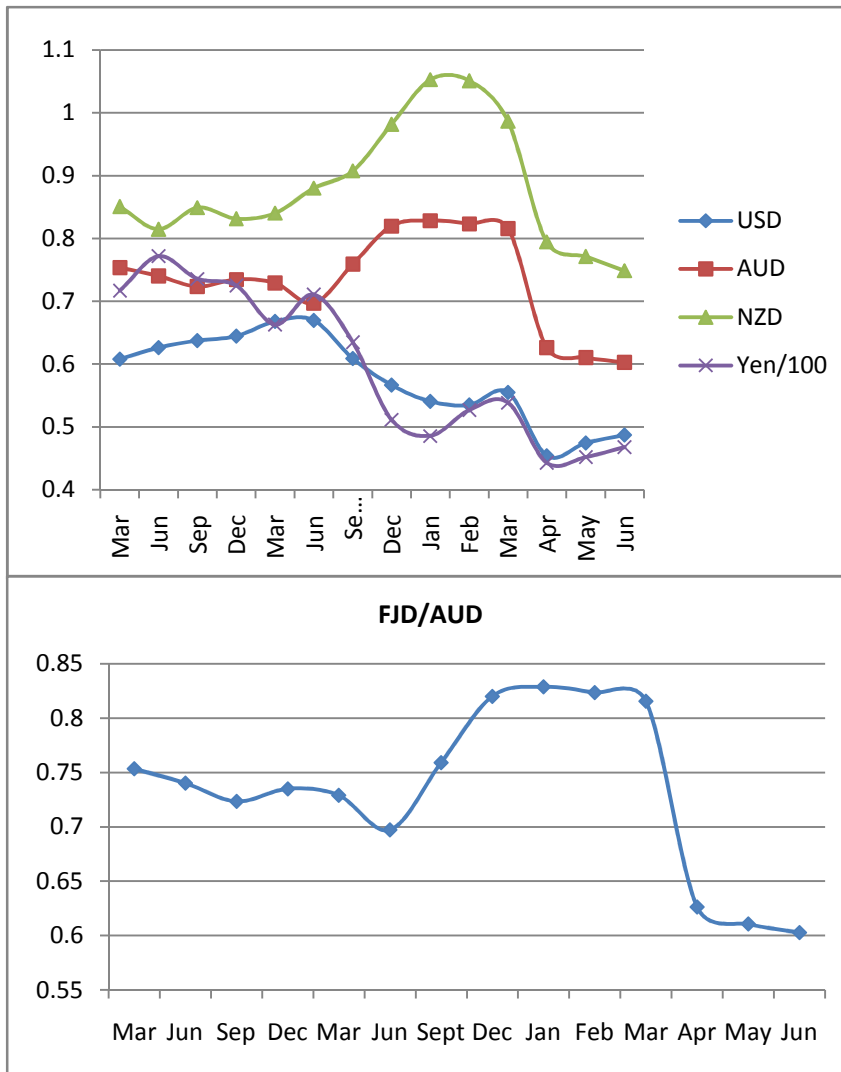
Fijian papaya can be made more price competitive through a combination of the following:

- improvements in the terms of trade between Fiji and Australia
- reducing the price paid to growers
- reducing the cost of quarantine treatment
- reducing the cost of quarantine clearance
- reducing transportation costs

Improvements in terms of trade

On April 15, 2009, there was a 20% devaluation in the Fijian dollar. Over the prior 12 months, the Fijian dollar had appreciated by around 17 % against the NZ dollar and by 12% against the Australian dollar (figure 16). Thus in the lead up to the devaluation, Fiji papaya was losing competitiveness in both markets. With the devaluation, there was significant immediate enhancement in the competitiveness of Fiji papaya on export markets. This improvement in competitiveness is, however, less than 20%. Papaya production and marketing uses significant amounts of imported inputs (fuel, fertiliser and other agro chemicals). The cost of these imported inputs can be expected to increase in the order of 20%. It is estimated that imported items constitutes 40% of the cost of growing papaya and 30% of the cost of marketing papaya (see the detailed papaya growing and marketing budgets presented in the New Zealand country study). The duration of any advantage from the devaluation for papaya exports will depend on how much and for how long grower prices and labour wage rates can be contained. However, the devaluation has certainly given the Fiji industry some breathing space to improve competitiveness through more fundamental efficiency gains.

Figure 16. Exchange rates for the 12-month period June 15th 2008 – June 15th 2009



Source: Reserve Bank of Fiji

Reducing the price paid to growers

Table 6 shows the current returns for growing papaya under two different farm gate price scenarios –FJD 0.90/kg (the price prevailing before the January 2009 flood) and FJD 0.80/kg. The farmer depicted plants 1 acre of papaya for 3 years utilising hired labour. The detailed farm management model is presented in appendix 3.

Table 6: The current returns from growing papaya in Fiji under different price scenarios

Farm gate price (FJD/kg)	Average gross margin over 5 years from 3 acres planted (FJD)	Average gross margin per acre (FJD)
0.90	11,051	3,684
0.80	9,670	3,223

The impact of the FJD .10/kg reduction in the farm gate price for papaya on the landed and wholesale price of Fijian papaya in Sydney is shown in table 7 below.

Table 7: Australian export prices under different farm gate price scenarios

Farm gate price (FJD/kg)	Estimated Sydney landed price (AUD /kg)	Estimated Sydney wholesale price (AUD/kg)
0.90	2.53	3.03
0.80	2.41	2.91

A farm gate price decrease in the order of FJD 0.10 to 0.20/kg could be expected as supply expands with increased plantings. These prices are still seen to provide growers a reasonable return, considering the alternatives available from their labour and land resources. Gross margins for planting sugar in the Sabeto Valley, for farmers wishing to plant papaya, indicated a negative return per acre (Appendix 4).

A decline in the farm gate price does not necessarily mean a decline in farm income derived from growing papaya, if the decrease in price can be offset by increasing yields and reducing reject rates. There can even be an increase in farm income if the gains from increased productivity and improved quality more than offset the decline in price. In essence, the objective of the Fiji Papaya Project is to simultaneously improve the competitiveness of Fiji papaya exports and increase the income derived from growing papaya.

Reducing the cost of quarantine treatment

Natures Way Cooperative (NWC) began treatment operations in October 1996, with the treatment rate set at FJD 0.40/kg. This treatment charge remained unchanged until June 2008. A treatment charge of FJD 0.40/kg was established based on projections that the business would be able cover its operating costs within in a period of 3 to 4 years. Thus sufficient working capital was necessary from the outset to cover the initial short fall in revenue. In recent years, exporters have argued that treatment charges were too high and that it reduces their international competitiveness. In early 2008, in response to demands of exporters, NWC undertook a review of treatments charges.

Table 7 compares treatment charges with other costs over the period 1996 to 2007. Over this period when there was no increase in treatment charges, whereas base wages increased 50%, electricity charges per unit have increased by 6% and the unit cost of gas has increased by some 120%. Airfreight charges to exporters have increased by over 30%.

Table 8. A comparison of treatment rates with other charges over the period 1996 to 2007

		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% increase
treatment charge	(c/kg)	40	40	40	40	40	40	40	40	40	40	40	40	0%
wage (packer and grader)	\$/hr	1.74	1.74	1.74	1.74	1.74	1.9	1.9	2.05	2.05	2.25	2.25	2.25	51%
electricity	\$/kwh	0.18	0.18	0.18	0.21	0.21	0.21	0.21	0.21	0.21	0.24	0.24	0.24	6%
gas	\$/kg	1.1	1.1	1.1	1.38	1.48	1.58	1.58	1.68	2.11	2.11	2.31	2.31	121%
freight (LD8 to Auckland)	\$/kg	0.82						1.1				1.36	1.15	33%

The review found that the NWC treatment charges were more than competitive with equivalent quarantine treatment facilities, for which data was available. These are in the Cook Islands and Molokai (Hawaii). Unfortunately, data could not be obtained for papaya quarantine treatment operations in the Philippines. The rate charged by the Cook Islands facility is NZD0.45 /kg. The Molokai facility is owned and operated by a grower exporter, who treats his own fruit. Thus the treatment charges are not explicit. Most of Hawaii's papaya growers are located on the Big

Island. Fruit exported to the US mainland is treated by a commercial irradiation facility. In 2007, the charge for this treatment was USD 0.17/lb (which was equivalent to FJD 0.61/kg – and at the current exchange rate around FJD 0.80/kg). Thus, the cost of quarantine treatment for Hawaii papaya exporters is about double that of their Fijian counterparts¹⁵. According to a recent issue of the Philippines Agri Business Week, the cost of vapour heat treating of mango for export to China is USD 0.40 /kg. One can assume that the cost for treating mango and papaya with vapour heat would be the same because the energy use and treatment parameters are the same. In Hawaii, the figure for vapour heat treating papaya shipped is generally between USD 0.21-0.32/lb (FJD 0.75 – FJD 1.42/kg) (Dr John Armstrong, pers. comm.). Fiji's exporters have a significant competitive advantage when it comes to the cost of quarantine treatment charges.

A comprehensive review of NWC treatment changes was conducted at the beginning of 2008. Based on the findings of the review, the following treatments charge schedule is now in place:

- A flat base treatment rate of FJD 0.40/kg
- At the end of each month any exporter that has no arrears exceeding 30 days receives a rebate of 5c/kg of fruit treated.
- Rebates are given to exporters who achieve above certain treatment thresholds in a calendar year and who have no arrears exceeding 30 days. The thresholds and rebates that apply are:
 1. 150 tonnes/year receives a rebate of 3% of total treatment charges paid during the preceding year.
 2. 300 tonnes/year receives a rebate of 5% of total treatment charges paid during the preceding year.
 3. 500 tonnes/year receives a rebate of 10% of total treatment charges paid during the preceding year.

This new treatment charge schedule offers the opportunity for exporters to substantially reduce their treatment cost by keeping their account current and by increasing their throughput. It is of note that Fiji's largest papaya exporter currently has a particularly unfavourable arrears status. This company, just by getting it arrears current, would immediately reduce its fob cost of exporting by 5c/kg.

NWC recently completed its second Strategic Plan (2009 – 2014). The Plan, which has been approved by the Cooperative's Board and will be presented at the next AGM for endorsement, recommended that the treatment fees remain at 35c/kg (for exporters whose accounts are current) and 40c/kg for others (exporters with accounts over 30 days) for the foreseeable future. This recommendation was based on the need to maintain a sufficient level of retained earnings to:

- continue a high level of repair and maintenance;
- maintain a high level of 'rainy day' reserves (the value of high level reserves has been proven with consequences of 2009 flood); and
- have sufficient funds to operate a small field service.

Thus exporters should not expect further reductions in treatment charges in the foreseeable future.

¹⁵ The difference between Hawaii and Fiji treatment rates can be explained by two main factors:

- The capital cost of irradiation quarantine treatment is some \$FJD 5 to 7 million, compared with less the FJD 1 million for an HTFA facility.
- Hawaii's labour costs are substantially higher than those in Fiji (USD 10 – 12/hour compared with FJD 2.15/hour).

Reducing the cost of quarantine clearance

The Australian Quarantine Inspection Service (AQIS) incurs a user pays cost of AUD.72/minute/person. Sculli and Co estimate that it costs an average of AUD1,000 per container for quarantine and customs clearance (pers. comm.).

A substantial export industry should look to obtaining certification from Bio Security Australia for pre export quarantine clearance. There is international precedence for pre-export quarantine clearance. Obtaining such certification would no doubt be a long drawn out process requiring considerable technical assistance. However, the expected reduction in quarantine clearance costs would well warrant the effort. The needed technical assistance might be provided under the newly announced Pacific Horticultural and Agricultural Market Access Program (PHAMA), funded by AusAID.

Reducing the cost of transportation

There is ample airfreight capacity available to export substantial volumes of papaya to Australia (table 9). Air Pacific currently has a total 17 flights weekly to Sydney, Brisbane and Melbourne. On these flights, there is a total of 150 tonnes of unused freight capacity per week (table 9). However airfreight costs are high (FJD 1.59/kg to Sydney July 2009, table 6).

Table 9. Air Pacific freight capacity to Australia (June 2009)

Destination/ Aircraft type	# flights per week	Capacity per flight (tonnes)	Capacity utilised per flight	Excess capacity available per flight	Weekly capacity available (tonnes)	
<u>Sydney</u>	747	7	19	9	10	70
<u>Brisbane</u>	737	5	2	0	2	10
	767	2	17	0	17	34
<u>Melbourne</u>	763	3	17	5	12	36
Total	17					150

Source: Air Pacific

There could be some scope for negotiating better freight rates, particularly considering the excess freight capacity available. Air Pacific has adopted a policy of maximising freight charges, which may not necessarily result in a maximisation of freight revenue. Such a policy, particularly for a national airline may not be in the best interest of Fiji or the airline. It would be in the national, and in Air Pacific's long term interest, to expand the volume of produce shipped by offering more competitive freight rates. Table 9 suggests that Air Pacific currently has significant excess freight capacity available. The critical role a national airline can potentially play in horticultural export development is illustrated in the example of Thailand's Thai Air. In the past, the Government of Thailand has utilised the IATA regulation allowing for Government Ordered Rates (GOR) to stimulate its horticultural export development. The Fiji government needs to give serious consideration to making similar interventions with respect to Fiji's national airline.

NWC, as a representative of the Fiji fresh produce export industry, is particularly well placed to negotiate more competitive air freight rates on behalf of the industry.

Airfreight will always be required to place a premium quality papaya product at the top end of the New Zealand market. However, substantial increases in papaya exports will require the use of sea freight if Fiji is to be price competitive with the North Queensland and in the future, the Philippines. The current (July 2009) cost of shipping a reefer (cooler) container from Lautoka to Sydney via Brisbane is FJD 3,737¹⁶. A reefer container could be expected to carry around 1500 cartons at 5 kg per carton, giving a freight cost of FJD 0.50(AUD 0.30) per kg. This is less than the cost of trucking papaya from far north Queensland (AUD 37.9 /kg) (table 6).

The usual shipping route is Lautoka – Brisbane – Sydney – Melbourne. The voyage time from Lautoka to Brisbane is 4 - 5 days. As such, sea freight to Brisbane is seen as readily achievable considering it takes 2 weeks to sea freight papaya from the Philippines to Auckland. From Fiji, it would take a further 2 ½ days to reach Sydney and a further 5 days to reach Melbourne.¹⁷ Thus shipment to Sydney and Melbourne is probably also achievable, but there would be loss of quality. It is recommended that simulated sea freight shipment trails for papaya be undertaken.

Reliability and consistency of supply

Reliability and consistency of supply is likely the key criteria that Fiji must meet in order to expand in the Australian market. One of the main reasons that the large Australian supermarket chains are now interested in sourcing papaya from Fiji is that they wish to diversify their supply base as a result of the frequent disruptions to the Australian industry due to natural disasters. To be able to take advantage of this opportunity, the Fiji industry needs to seriously consider measures to mitigate against the threat of these natural disasters. Some measures to cushion Fiji's papaya exports from the devastation in a natural disaster include:

- spreading out the geographic distribution of papaya plantings
- using the January 2009 flood as a benchmark for the flood line and only plant in areas above this flood line.
- spread planting throughout the year, one planting immediately after cyclone season (April) and one planting in August – so that trees are small enough not to be affected by strong winds in the event of a cyclone.

Quality

From consultations with importers and from physically inspecting fruit in the market, it is clear that Fiji papaya has major quality issues. Fiji growers and exporters need to improve the quality of their product if they are to compete with North Queensland production and possible future imports of Dole papaya from the Philippines.

The quality parameters in need of improvement include:

- control of postharvest diseases on the farm
- harvest and postharvest handling
- grading
- packaging and labelling

¹⁶ This cost is derived as follows: FJ2400 plus 45.31% cost and bunker adjustment fee plus 250% port charges and documentation (Williams and Gosling, Lautoka)

¹⁷ Information provided by Williams and Gosling Lautoka

These quality parameters are discussed in some detail in appendix 2.

Marketing

Branding of Fiji Red

Twenty years ago Fijian red papaya was a unique product in the Australian market. At that time, there was no Hawaiian 'solo' grown in Australia and the only competition was from inferior yellow-fleshed pawpaw grown in northern New South Wales. At the time, the unique 'full flavour' Fiji papaya was highly sought after in the market and received premium prices. Today, red fleshed solo varieties dominate Australian papaya production. Yet, today Fiji red papaya still retains an positive image on the Australian market as reflected in the branding of Harris Markets (figure 16). Such a marketing strategy should be adopted by Fijian exporters, providing the quality of their products matches the image of the brand.



Figure 16: A loyal devotee of Fiji red papaya

Food safety and quality certification

If Fiji papaya is to significantly expand its market in Australia and elsewhere, the product must be on offer in the major supermarket chains. Those exporters who wish to sell in this expanded market will need to have in place food safety and quality certification that meet the requirements of the supermarkets. As Ken Nalder CEO of NZ Producer Importers Association reminded the study team for the New Zealand market study:

Fiji papaya exporters, directly or indirectly will need to meet these standards if they are to capture a share of the supermarket trade, which currently they don't. This trend has led to a differentiation in the market between those that supply the larger supermarkets (accredited suppliers) and those that don't. The former ground is expanding, while the latter is contracting. The challenge for Fiji papaya exporters to get into the accredited supplier group. This requires establishing export standards and controlling compliance (how was the product harvested, post harvest handling etc.). The key is consistency – both in terms of supply and quality.

The situation in Australia is exactly the same, as discussions with Woolworths and Coles revealed. Fiji's main domestic produce competitors have the required certification and so do Dole papaya from the Philippines. Fiji's exporters will need to follow suit or they will remain on the 'other side of the fence'. EU's Facilitating Agricultural Commodity Trade (FACT) and the ACIAR Fiji Papaya Project have an important role to play in assisting the industry achieve the necessary compliance.

Estimated market with improved price competitiveness, quality and marketing

Horticulture Australia Limited (HAL) forecast per capita papaya consumption to reach 0.7 kg in 2012 (HAL Papaya – Annual Industry Report 07/08). The achievement of this forecast would result in total papaya consumption of around 15,500 tonnes, with an estimated population of 22 million. This is consistent with 5-year papaya consumption forecasts for New Zealand of 2,200 to 3,300 tonnes. In the case of New Zealand, Fiji papaya has seen have an inherent competitive advantage. Thus a market share 50 to 70% over the next 5 years is seen as a reasonable expectation if the price competitiveness, quality and marketing improvements discussed above are put into place. In the case of Australia, similar improvements could be

expected to lead to a market share of 10 to 20%. This would translate to a papaya market of 1,500 to 3,000 tonnes.

A summary of market projections for Fijian papaya

A summary of the market projection under the two scenarios are presented in table 10 below:

- The status quo of the Fiji industry remains
- There are significant improvements in the Fiji industry (price competitiveness, quality and marketing)

Table 10: Projected Australian market for Fijian papaya (tonnes)

Year	1	2	3	4	5
Status quo - Fiji industry remains the same	490-500	500-510	510-530	530-550	540-580
A substantially improved Fiji industry	500-520	530-560	600-700	1,000-1,500	1,500-3,000

1.12 Bibliography

Australian Banana Growers Council (2002). Australia Banana Industries Strategic Plan 2002-2005. Horticulture Australia: Sydney.

Australian Pesticides and Veterinary Medicines Authority (2004). The Reconsideration of Approvals and Registrations Relating to Dimethoate and Omethoate. REVIEW SCOPE DOCUMENT Canberra

Chay-Prove Patricia et al (2005) Growing papaya: Before you start. Queensland Horticulture Institute, Queensland Department of Primary Industries, DPI note

source: www2.dpi.qld.au/horticulture/5326.htm

date accessed:

Chay-Prove, P., Ross, P., O'Hare, P., Macleod, N., Kernot, I., Evans, D., Grice, K., Vawdrey, L., Richards, N., Blair, A., Astridge, D. (2000). Agrilink Series: Your Growing Guide to Better Farming. Papaw Information Kit. Queensland Horticulture Institute and Department of Primary Industries, Qld: Nambour.

Drew, R.A., O'Brien, C.M., Magdalita, P.M. (1998). Development of interspecific *Carica* hybrids. Proceedings of the International Symposium on Biotechnology of Tropical and Subtropical Species, part II, Brisbane, Queensland, Australia, 29 September to 3 October 1997 285-291.

Fay, H.A., Drew, R.A.I., Lloyd, A.C. 1997. The eradication program for papaya fruit fly (*Bactrocera papayae* Drew and Hancock) in North Queensland. pp. 259-261 in: Allwood, A.J., and Drew, R.A.I. 1997. Management of fruit flies in the Pacific. ACIAR Proceedings No 76. pp267-.275.

Horticulture Australia Limited/Papaya Australia (2002), Australian Papaya Industry 2003 - 2008 Strategic Plan. Sydney.

Horticulture Australia Limited/Papaya Australia (2007), Australia Papaya Industry 2008 – 2012 Strategic Plan. Sydney

Horticulture Australia Limited Papaya (2007) Industry Report 06/07. Sydney

OECD (Organisation for Economic Co-operation and Development) (2003). Draft Consensus Document on the Biology of *Carica papaya* (L.) (Papaya). Report No. 5 February 2003, OECD, France.

Padovan, A.C., Gibb, K.S. (2001). Epidemiology of phytoplasma diseases in papaya in northern Australia. *Journal of Phytopathology* 149: 649-658.

Papaya Australia. Australian Papaya and Pawpaw: Down, But on Out. April 17th 2006.

Papaya Australia. Annual Report 2007/08

Persley, G.J. (2003). DPI note: papaya ringspot disease.
source:www.dpi.qld.gov.au/horticulture/5333.html
date accessed:

Nakasone, Henry (1990) Technical Report #1 on the Fiji Papaya Industry to the USAID Commercial Agricultural Development (CAD) Project: Suva.

Nakasone, H.Y., Paull, R.E. (1998). Tropical fruits. CAB International: Wallingford.

Thomas JE and RL Dodman (1993) The First Record of Papaya Ringspot Virus-Type P From Australia. *Australasian Plant Pathology* 22(1) 2 – 7

Appendix 1. What the buyers say

1.12.1 Sydney

Top Class Fruit Supply

Tony Chiefari 0418 294 645 tony@topclassfruit.com.au

In 2007, 2008 purchased from Fiji AgroMarketing (AMA). A unsatisfactory experience. Top Class claim that the AMA marketing performance was poor:

- Shipments were irregular and without notification
- Cartons contained fruit of different sizes and maturity

The AMA asserts that they have not been paid for several shipments made to Top Class.

Top Class currently buy papaya from Innisvale North Queensland, with their main market being the Asian Grocers. Sells on consignment from which is taken a 12 ½ % commission. Current wholesale price (Feb 2009) \$2.50/kg. Has some interest in organics, particularly in Melbourne where he sees a growing market.

Interest in Fiji product. Remains interested in handling Fiji product – but definitely not from AMA. Would like to start with air freight starting with a container every second week. In the winter months (May-October) would take a container a week. Would like to receive the container on Thursdays to assure maximum trade. It would be important to improve grading (size and maturity) compared with performance of the AMA to develop the market. Would continue to move this product through the Asian Grocers – says the supermarkets have an “anti-import” bias. Would like a 5kg pack – two piece carton branded as a product of Fiji.

Exotic Fruit Traders (EFT)

Rick Costa,

0414 767 653 rick@exotic.com.au

EFT purchases red fleshed papaya from 4 growers in Innisvale North Qld and on-sells to the major supermarket chains (Franklins, Coles and Woolworths). Purchase from these suppliers in accordance with the Fresh Specs Standard. He says that suppliers have Hazard Analysis and Critical Control Points (HACCP) certification for food safety and undergo maximum residue levels (MRL) for pesticides. The fruit has bar code and brand stickers. He sells on consignments and takes a 10% commission.

Maintains that current retail prices range from \$2.50/kg in Western Suburbs (Cabramatta) to upwards of \$7.99/kg in the speciality fruit stores in the Eastern Suburbs. Says that there is about an equal market for papaya and pawpaw. Not interested in organics.

Interest in Fiji product. EFT are interested in importing from Fiji provided there is sufficient volume at the right price. He needs 9 day shelf life for the fruit. Innisvale has a 3 to 4 day delivery time and is sceptical if Fiji could match that.

LR Moss (LRM)



Phillip Bower 9746 5600 (he buys only Australian product but was willing to discuss Australian market and product)

Buys mainly from Innisvale from 8-9 growers, who all supply red papaya hermaphrodite (bell shaped) fruit. The main supplier are the Mackay family – Australian largest banana grower and ec.

Normally moves around 22 tonnes/week (currently down a bit because of the recent floods and resulting *Phytophthora*). Sees the Atherton tablelands as a growing area.

Main market is the general fruit shops all on the Eastern seaboard – sells for \$25-

35 carton sometimes up to \$40. Papaya vs. Pawpaw: like chalk + cheese. Round female fruit sells for almost ½ price, and very hard to move. LRM did not require bar coding because they were selling in general fruit shops. Not interested in organics.

Fiji prospects: LRM unlikely to want to buy from Fiji. However saw a 'winter window' for Fiji papaya. Suggested significant quantities could be imported "at colour break and then gas ripened as with bananas"

Albert Nathan, Katoomba Trading

0417 680 683 9764 2055

Major distributor of dry goods (Island and Indian) also handles root crops from Fiji (buys dalo and frozen cassava from Waisali Farmers). Has invested in a substantial new warehouse facility at Flemington markets. Owns 9 Asian stores in New South Wales (including Wollongong and Canberra) and four outlets in Melbourne.

Fiji prospects: Sees a strong market. He would like to import papaya from Fiji and to distribute through his own stores.

Harris Farm Markets (HFM)

David Harris

Managing Director 9349 3111

The company was started by the current managing director, David Harris, in 1971. HFM group operates fresh food supermarkets in New South Wales. Its stores are like supermarkets, but the emphasis is on fresh fruits, vegetables and nuts. HFM was the first Australian fruit and vegetable company to open in a supermarket style operation and operates 22 stores. The stores are fresh and bright to look at and the prices are very keen. The company is planning to

expand, perhaps into Queensland or Victoria, and it is refurbishing many of its stores. In 2008 HFM was voted the best fruit and vegetable store by the Sydney Morning Herald.

All papaya is currently purchased from North Queensland. The value of purchases is around



\$20,000 per week. This papaya is labeled “Fijian Red Papaya”. HFM purchases directly from the producers and not through wholesalers and would be the same if they were to source papaya from Fiji.

HFM report a peak market for papaya is in the winter months (June, July, August). Demand for papaya is growing quite fast but so is supply. The McKay family in North Qld, Australia’s biggest banana growers, with 15% of the banana crop, have now moved into papaya in a big way.

Papaya sold at all HFM outlets, in keeping with all fruit sold, was observed to be of good quality and well presented with individual stickers and contained in protective sleeves. The fruit was labelled “Fiji Red Papaya – Product of Australia. There was some mixed maturity papaya, with a few excessively green fruit on offer. The fruit sampled was of good appearance and texture. While the fruit was flavoursome but lacked the more intense flavour of colour of the best Fijian papaya. The retail price of HFM papaya varied depending on where it was sold – ranging from \$3.99 lower end (Parramatta, Merrylands etc.) to 7.99/kg at the upper end (Edgecliff, Mosman, etc). The quality requirements in

all the HFM markets is the same – only the price differs.

David Harris sees papaya and pawpaw as totally different products. HFM sell both products but is not interested in promoting the later as this seen as a declining market because of its lack of flavour compared with papaya.

Fiji prospects: HFM are very positive regarding the prospects for Fijian papaya. Mr Harris indicated that he was well aware the superior inherent superior quality of Fijian papaya and believed that Fiji continued to have a good marketing image in Australia. The attitude of the company is reflected in that “Fijian Papaya” is used as a brand. HFM had purchased Fijian papaya in the past – his main complaint was that it was harvested too green. David Harris believed that airfreight was the only way that Fiji papaya could meet their quality requirements – although he was conscious of the cost implications.

HFM would not require quality and food safety certification to purchase Fijian papaya – even bar coding was not seen as necessary. Their quality standards would nevertheless be high. To quote the HFM website:

Harris Farm Markets produce looks better because it is better. Our buyers are extremely discerning about what they purchase, scouring the land for the very best products. We are a major outlet for many family-run regional farms with who we are in regular contact (www@harrisfarm.au.com).

HFM’s intention would be import directly and not to purchase through a wholesaler or importer. The terms of trade would be set the price a week before shipment rather than paying on a consignment basis. An indication of HFM’s interest was that the principal market researcher received a follow-up phone call in Fiji a month following the initial interview.

Bula Island Food Supplies (BIFS)

Sonny Naidu 9682 5800

BIFS deals primarily with dry goods which are distributed to ethnic stores in Sydney's Western Suburbs. - but also moves dalo, cassava and cocoa beans from Fiji.

Fiji prospects. BIFS would like to import papaya from Fiji to sell through the network of shops BIFS supplies. Sonny believes thinks he could move 8-10 tonnes/week of papaya. Identifies the winter window to be April through October (a longer window than other identified). The strongest market was identified in the Cabramatta area – but believes he could extend his marketing network to Melbourne, which he sees as Australia's largest market.

Selling around 500 tonnes of papaya annually to the ethnic stores in western Sydney at economic prices would seem to be an excessive estimate. However, given Naidu's enthusiasm sales of 50 to 100 tonnes annually might be realistic, particularly if he can extend sales to Melbourne where he has identified outlets. The major constraint is seen to be the cost of airfreight and related charges. BIFS estimates these costs in April 2009 to be for an LD3 container (800 kg to 900 kg):

	\$FJD
Air freight (Air Pacific)	1.80
Fuel surcharge	0.30
Security fee	0.12
Quarantine clearance charges (based on an AQIS charge AUD72/15min/person)	0.50
Total	2.72

Naidu believes that the exporters, through the newly re-established Fresh Produce Exporters Association, need to negotiate with Air Pacific lower horticultural exports freight rates. He also proposed that Fiji Quarantine initiate discussions with the Bio-Security Australia for pre-shipment quarantine clearance for papaya. This development of pre-shipment quarantine systems would a worthwhile activity for AusAID's proposed Pacific Regional Agricultural Regional Market Access Program (PRAMA).

Woolworths

Cameron Carter

Accredited fresh produce purchaser for Woolworths through the "Fresh Produce Group"

ccarter@woolworths.com.au

Woolworths is Australia's largest supermarket chain and has begun a recent expansion to New Zealand. There is an interest in sourcing product from the Pacific islands. Woolworths have been in discussions with Balthan (Western) Ltd (Graeme Thorpe) for the importation of root crops. Balthan did not proceed with negotiations due to the high cost of meeting the compliance requirement of Woolworths.

Woolworths preference is to source produce directly from growers or 'trade partners' in the case of imported produce. However, this is often done through Woolworth accredited

brokers such as Cameron. This is not always feasible due the volumes not being sufficient as is the case of root crops and coconuts from the Pacific islands.

Woolworths have their quality and food safety standard, Woolworth Quality Assurance (WQA) Standards that must be complied with, which is described in their website (www.woolworths.com.au/wqa+produce) and summarised in appendix 1. After successfully completing the WQA Certification Audit, the supplier is certified as a Woolworths Trade Partner. The certification will be specific for: the products the Woolworths Business Team have nominated you to supply; the individual premises from which these products are supplied; Third Party Certifiers, such as NCS International, will also provide the Trade Partner with a HACCP Certificate.

Specifications for all Imported lines are available on the Woolworths website. As papaya is currently not imported, its specification for papaya is listed in the general fresh produce section: This is as follows:

PRODUCT : PAPAYA
TYPE : Male / Female
VARIETY : Various
GRADE : One

GENERAL APPEARANCE CRITERIA	
COLOUR	<i>Greenish yellow to golden yellow skin, often with small green / brown skin spots over the surface; slightly mottled salmon pink to red flesh.</i>
VISUAL APPEARANCE	<i>Smooth skin with moderate gloss; free from foreign matter.</i>
SENSORY	<i>Smooth, melting flesh; sweet and juicy; thin, slightly waxy skin; large number of small, round black seeds in central cavity; free from foreign smells or tastes.</i>
SHAPE	<i>Oval to slightly pear shaped; larger fruit distinctly five sided; not misshapen.</i>
SIZE	<i>As per Woolworths pre-ordered size requirements; "male" fruits >10cm long, >6cm wide, "female" fruits >12cm long, >10cm wide, evenly sized within carton.</i>
MATURITY	<i>Firm, full bodied fruit.</i>
MAJOR DEFECTS	
INSECTS	<i>With evidence of live insects eg scale.</i>
DISEASES	<i>With evidence of sunken brown spots (anthracnose), grey scarred areas (powdery mildew), water soaked lesions, stem end softening or other symptoms of bacterial or fungal infection</i>
	<i>With evidence of discolouration or disfigurement from viruses.</i>
PHYSICAL / PEST DAMAGE	<i>With unhealed wounds, pest damage or latex leakages at the stem end.</i>
SKIN MARKS / BLEMISHES	<i>With deep seated bruises.</i>
	<i>With unhealed cuts, holes or splits (that break the skin) wounds or pest</i>

	<i>damage.</i>
TEMPERATURE INJURY	<i>With skin pitting, hard / water soaked areas in flesh, and/or skin scald (chilling injury).</i>
	<i>With spongy flesh, uneven ripening or sunken areas (heat injury).</i>
PHYSIOLOGICAL DISORDERS	<i>With excessive softening of fruit (over ripe)</i>
	<i>With soft, translucent flesh (softening disorder)</i>
MINOR DEFECTS	
PHYSICAL / PEST DAMAGE	<i>With superficial bruising or abraded areas > 2sq cm</i>
SKIN MARKS / BLEMISHES	<i>With healed scars > 6sq cm.</i>
	<i>With winter freckling covering > 50% surface area of fruit.</i>
CONSIGNMENT CRITERIA	
TOLERANCE PER CONSIGNMENT	<i>Total minor defects (within allowance limit) to be < 2 defects per item Total minor defects (outside allowance limit) must not exceed 10% of consignment. Total major defects must not exceed 2 % of consignment. Combined Total not to exceed 10%.</i>
PACKAGING & LABELLING	<i>Packaging as per Woolworths requirements. Labelling to identify grower or agents name/brand (plus growers name/code if via an agent), address, contents, grade/class, size and minimum net weight. Bulk Loose Product to identify 'Packed On' date (eg. Pkd DD/MM/YY) on outer carton.</i>
RECEIVAL CONDITIONS	<i>Compliance with Quarantine Treatments (if required) for Interstate Consignment. Stacked to Ti Hi specifications onto a stabilised pallet as pre-ordered. Refrigerated van with air bag suspension, unless otherwise approved. Pulp Temperature 14 – 16 °C for Receival.</i>
CHEMICAL & CONTAMINANT RESIDUES	<i>All chemicals used pre/postharvest must be registered and approved for use in accordance with the requirements of the NRA regulatory system. Contaminants and Heavy Metals to comply to the FSANZ Food Standards Code A 12 – A 14 MPC's and MRL's.</i>
<i>Specifications reviewable: eg. to account for specific regional effects or adverse seasonal impacts on quality or early or late seasonal variances as agreed with each state operation and communicated formally in writing by Woolworths.</i>	

Woolworths have prescribed labelling requirements for both retail to ensure maximum traceability. Product Identification and Traceability of Produce is a significant requirement of the WQA Standard. Woolworths needs to be assured that produce is readily traceable through the produce chain back to the grower. “Our customers have an expectation that we can provide a safe, quality product and if food safety is compromised, we as retailers need to be able to identify and trace product to its origin” (www.woolworths.com.au/wqa+produce)

Exporters are given a 1 year grace period but following that must be up to speed, meeting specified food safety criteria of the WQA. An exporter would be required to have \$10 million public liability insurance.

Woolworths sell both papaya and pawpaw and they sell the same of both products. Says growth has been steady – but could not specify the volumes. They are not particularly satisfied

with the current supply of papaya from North Queensland – the main concern is the inconsistency in quality and supply.

Fiji prospects: Woolworths interested in developing an alternative source of supply from Fiji. This is despite Woolworths “purchase locally” policy¹⁸. Woolworths level of interest is reflected in their willingness to give a 1 hour appointment to the study team. Fiji and Fiji papaya have a good market image. Australian consumers much more respectful to South Pacific brands compared with negative reaction to “product of China”.

Sourcing from Fiji would fit well with Woolworths “no GMO” and ethical sourcing (no child labour) policies. However, the “trade partner” would need to be able to meet WQA within a year time frame. Carter could see the trade starting with 1 LD3 (700kg) per week starting through Sydney and Melbourne (Brisbane too difficult because of quarantine issues). If successful this could grow to 5 to 10 containers a week. A Fiji “trade partner” would have to be able to supply year round.

Carter is sceptical about developing sea freight, particularly if the produce was routed through Brisbane, with the difficulties of quarantine. This trade might be done through a Woolworths broker such as himself. Carter is interested in working with a Fiji “trade partner” on developing this market through the “Fresh Produce Group”.

Terms of trade envisaged: Woolworths don't buy on consignment. The price would be set on weekly basis prior to shipping. It would be a fob price, with the sellers responsibility ending with fruit placed in the container. Woolworths meet transportation and quarantine costs. There would be a 21 to 30 day payment cycle from the time of shipment – usually a 3% rebate for shrinkage.

The “trade partner” would be required to meet the cost of in store promotion and this would be on an ongoing annual cost of around \$10,000 to \$20,00, depending on the number of stores involved.

For product specifications are presented on the Woolworths website which are largely based on ‘Produce International Quality Manual.’ Woolworths would repackage the papaya on arrival thus they have no standard of packing for their suppliers – thus the choice of packaging should be based on what best protects the product.

Tandem Trading Pty Ltd.

SUITE 1 , 47 – 49 THE CENTRE, STARKEY STR., FORESTVILLE NSW 2087 AUSTRALIA
TEL: (61) (2) 9402 0893 FAX: (61) (2) 9402 2250 Email: info@tandemtrading.com.au

Stephen Klug. Managing Director. Tracy Parker. Business Manager.

Tandem Trading specialises in frozen fruits and vegetables, dried and processed fruits and vegetables. Tandem exports juice concentrates, health bars, grains, cereals and nuts. Tandem is actively involved in product development and new project development. Involved with importing dried fruit.

¹⁸ The preference for local produce is clearly marketed on the Woolworths website. As stated:

2,000 to 3,000 tonnes of dried tropical fruit imported from Thailand. Mainly used in muesli and breakfast cereals. Most of the dried fruit is chemically preserved with metabisulphite with added sugar. This is a low cost product \$2.50 to \$3.00/kg, with which Fiji would not be able to compete. However, premium quality naturally dried fruit tropical fruit (mango and papaya) using solar or heat pump drying techniques¹⁹ command wholesale price of \$30-35/kg if organically certified. This is the market segment dried Fiji should target.

Tandem Trading identified a growing market for high pressure processed fruit products including papaya. GM, Steve Klung, believes this a appropriate approach for highly flavoured Fiji papaya. High pressure processed (HPP) is cold pasteurisation of foods at extremely high levels of pressure. The advantages of the technology are:

- Cold pasteurization (in-pack)
- No heat used
- Inactivation of bacterial cells
- Retention of nutrients
- Retention of natural flavours and colour

The pressure is so great that the food bacteria are killed maintaining high flavour with exceptional shelf life. Pressure Fresh Australia (www.pressurefresh.com.au) has become a major supplier of HPP products. Pressure Fresh Australia sourced the Avure Technologies in the United States (www.avure.com).

1.12.2 Melbourne

Sculli and Co

Dean Sculli

Managing Director 0418 355 772 Email: sculli@sculli.com.au

SC are major Melbourne based fruit wholesalers, who supplies Melbourne and Sydney markets. They are the main importer of papaya from Fiji. Importing from PSL for last 5 years. Prior to the January flood were importing an average of two containers a week. Papaya sales mainly to independent retailers mainly in Melbourne but sometimes ships to Sydney. Has supplied Coles. Does not see feasible to sea freight papaya to Melbourne or Sydney.

Was not handling Fiji papaya at the time of meeting because of the flood. Was at the time handling red papaya and yellow pawpaw from North Queensland. Brix (sweetness reading) were obtained for North Queensland papaya that were held in stock at SC were:

- Red papaya: **13** (*'Sweet Amazon', from Dimbulah, North Queensland*) - good
- Yellow pawpaw: **9** (*Rocky top "Exotics from Dimbulah, North Queensland* - poor

Experience with Fiji papaya: Has a good relationship with PSL. But quality has been very variable. Within in some shipments up to 60-70% has been damaged stock, with 5 % shrinkage. Suggests the problem mainly lies in pre and post-harvest handling. SC reports that boxes often crushed in transportation. Sees the damage mainly occurring in pre and post-

¹⁹ Heat pump dehumidifier driers allow fruit to be dried at very low temperatures. Fruit subject to normal drying processors is very susceptible to deterioration in colour, flavour and texture, and loss of vitamins through oxidation. Low temperature drying enables flavour and colour to be maintained without the addition of preservatives (Ellyett 1998). These close systems are highly energy efficient.

harvest handling, with boxes also getting crushed in freight. See improvements on-farm vital, pre and post-harvest handling of fruit. Stronger boxes would also reduce damage to stock.

The product currently yields a low profit margin. Paying PSL from \$15-16/5 kg box and wholesales these for \$20/5 box. The cost of clearing customs and quarantine averages \$1,000 per container. Would be good to develop pre-clearance systems. Pays for Minimum Residue Level (MSL) testing twice a year – which SC pay for. Most of SC buyers are requiring MSL certification. However, not interested organic papaya but would be interested in handling dried fruit if it was available.

The main buyers for Fijian papaya are the Asian community – was selling 100-150 boxes/week (80% of sales) to this segment compared with 20 to 30 boxes to non-Asian buyers. Also sells pawpaw, which is more popular with the non-Asian market. “The non-Asian consumers buy on appearance and they like the golden yellow appearance of pawpaw”. Both papaya and pawpaw command the same price.

Fiji prospects: Saw good projects for expanding the market for Fiji papaya if the quality and consistency of supply can improved – could readily secure a three fold increase in sales. Basic view was to ‘improve and build on what you’ve got.’ Major improvements reiterated were getting pre and post harvest handling right, as discussed above. Stronger boxes are needed to decrease damage to fruit. Also there was a need to increase the overall size of Fiji fruit. Would like to see shipments standards at 8 to 10 counts in a 5kg box (600 gm fruit minimum). The advantages he sees as follows:

- Consumers see better value for money.
- More efficient for growers (they pick less)
- More efficient for exporter (packs less)
- Wholesaler sells the product quicker and gets a faster turn around and has less packaging to deal with.

Thinks the branding of the Fiji product is a good idea – “but get the quality and consistency right first.”

Rainfresh Co

Daren

Rainfresh buys papaya off the floor from Sculli and others – but not a big buyer of papaya. The price is around Sculli and co at approx. \$25-30/5 kg box and the price never drops below \$20. On-selling price to these was generally \$50-60/8kg box. They supply fruit shops, including the Colonial Chain (Melbourne’s version of Harris farm). Rainfresh is the only buyer for Colonial. Rainfresh pack also pack for Independent Growers Association (IGA) stores. The IGA stores are owned independently, each store determines their own prices. They don’t have the range of fruit + veg that Coles, Woolworths have.

Papaya was also not a major product line for Colonial – much less than Harris Farms (although we saw red papaya in their store at \$8.99/kg and poster near check-out describing the difference between pawpaw and papaya. The papaya purchased from a Colonial store less sweet than Fiji papaya

There are not many Asians in the areas that Rainfresh supply and he felt that there was not a real preference for tropical fruit in Melbourne. He thought papaya could only sell in summer (when customers want something cool and refreshing: Nov- Jan), his take was that tropical fruit generally didn’t move very fast in winter (when customers opt for warmth, soups, etc). Daren generally wasn’t a ‘tropical fruit man/’ fairly conservative in his fruit palette, which would have influenced his buying/statements.

Daren reiterated what Sculli had mentioned re: fruit size, having a preference for 10/12's. He won't go smaller than a 9.

Views of Fiji papaya: Fiji papaya that he has bought from Sculli in the past has had sap running down sides of fruit and also been too green –there has also been a large variation in color within a box. Daren would buy by the box from Sculli, swapping out 1-2 (the wholesalers, like Sculli, don't like it when you mix and match fruit stock, hence why quality must be consistent within boxes.) Daren will only buy if all 9 in carton are good colour (i.e ½ color). Didn't think Fiji branding was a good idea - his view was that his clients (Colonial) would buy local first.

Coles Supermarket

Susan Demarkis, Purchasing manager (Australia)

03 9829 3713

Coles don't have a specialized produce import person like Woolworths. Red Solo papaya is a new product for Coles – handling it for only 6 months. This has been entirely sourced from north Queensland. Moving 300-400 cartons/week. Coles are now moving toward Global Standard for Food Safety (BRC)²⁰.

They don't see consumers distinguishing greatly between papaya (red) and pawpaw (yellow) Coles, unlike Woolworths, were not willing to provide any information and did not seem interested in importing papaya.

²⁰ **Global Standard for Food Safety (BRC) Food safety through certification of the GLOBAL STANDARD FOR FOOD SAFETY from BRC**

What does the product offer?

- Better food safety and consumer protection
- Strengthening of consumer confidence
- Integration of HACCP (Hazard Analysis Critical Control Point) according to Codex Alimentarius
- International recognition guaranteed by GFSI (Global Food Safety Initiative)

Target groups

Manufacturers of own brand food products for the retail trade (main focus CH, DE, UK).

Customer's benefit

- Improved product safety
- International recognition
- Minimisation of supplier audits
- Validation through BRC logo and the assessment work of registered auditors

Certificate validity

- 6-12 months depending on the level achieved
- International

Possible combinations

- [ISO 9001](#); [ISO 14001](#); [OHSAS 18001](#); [IFS International Food Standard](#)

Retail markets for pawpaw in Coburg Melbourne (18 March 2008)

No pawpaw (papaya) in Safeway (Coburg), Piedmont/IGA (Coburg) and Coburg fresh food markets

Mondo Fruit – 409 Sydney Road, Coburg. Some whole and cut pieces of pawpaw. One cut piece (370 g) cost \$2.95 (A\$7.97 per kg) Source: Rocky Top exotic paw paw : Dimbulah, north Queensland (seasonally dry?) Orange flesh (over-ripe) BRIX = 10 -11; good taste but one section was starting to go mushy.

Coles – 451 Sydney Road, Coburg.

Whole pieces of pawpaw – some rather green, one mature/overripe. One fruit weighing 0.978 kg cost \$7.81 (\$A7.99 per kg)

Source: Innisfail Red papaya: Innisfail, north Queensland (high rainfall)

Dark orange/reddish flesh – sweet, similar (but slightly inferior) to Fiji papaya in taste. BRIX = 12.

Victoria Market (some samples of papaya on offer)

- Smallish bullet shape fruit. From Sandy Creek Tropical fruits - Dimbulah N Qld (5492).

Dark yellow to Mid-orange coloured flesh. BRIX 9.2. Average to below average (somewhat unpleasant) pawpaw taste.

- Red papaya – green skin (immature) with pale reddish flesh. Hermaphrodite shape (like a large Fiji Solo). BRIX range 7 – 7.8 Insipid sweetish taste.
- Two ladies who said that people liked Fijian papaya (and kept coming back after trying)
- Huon Gold Red papaya - \$A 6.99 per kg. Large, rounded shape – dark orange/reddish flesh BRIX 11.6-11.8. Reasonably good flavour (although a little bland/insipid) – taste not as good as Fiji Solo.
- Tropical Coast pawpaw Orange flesh – typical pawpaw flavour/taste – i.e. not very pleasant. BRIX 9.8

1.12.3 Brisbane meeting

Carter Spencer (CS)

Andrew Christodoulou, Business Manager

40 Curzon Street, Tennyson Email: andrew.christodoulou@carter-spencer.com

Claudia Bianchi, Sales and Procurement Coordinator

Email: Claudia.bianchi@carter-spencer.com

Brisbane is the Carter Spencer's distribution centre for tropical fruit (banana, mango etc) across the Eastern sea board. CS supply the major super market chains. Product is sited, quality assurance undertaken and dispatched daily. Fruit can be cleared as quickly as 2 hours, to a maximum of 24 hours, taking approx. 6 days, from grower to supermarket. Papaya makes up 5% of the tropical fruit handled, which is dominated by banana.

Saw local papaya production expanding particularly on the Atherton Tablelands with the McKay brothers. However, interested in importing Fiji papaya as there has been some supply issues relating to the Australian with sourcing Australian papaya

The marketing of Fiji papaya: Saw appearance of the fruit as critical – more important than taste (“buy with their eyes - it most look good). Some short comings with the appearance of the Australian product (referred to spotting)

Exporters would be required to contribute towards promotional activity (as indicated by Woolworths and Coles). This can be as an in-kind contribution (provision of fruit for in-store sampling) or as a financial contribution. With their existing local infrastructure, Carter Spencer would work with grower group by coordinating the in-store activity, assisting to compile literature. ‘Quality, Taste and Flavour’ were the 3 variables that Carter Spencer emphasized.

Didn’t see Fiji branding was a good strategy.

Winter window’ was the likely opportune time to introduce the product but this could also change with extreme weather events (i.e. floods earlier in year).

They would work off pre-determined prices. Once a relationship has been developed with the grower group/importer, a percentage payment will be set – this amount will be dependent on volume/risk associated. He talked about coming in with “small quantities, sell for cheap to gain market access, only then could price be increased”.



CS saw organics as a relatively minor focus for the Australian market – not enough consumers willing to pay the extra price.

What would CS like to get out of this market study

- Listing of exporters and grower groups (with an outline of existing infrastructure arrangements) and their current ‘capabilities’
- Expansion rate (how is this being planned – will it be controlled growth? How will they govern commercial activity? How will it be managed? Levy or otherwise?)
- Other varieties of papaya (what R+D work is being done)
- Government support? (or can growers drive the process)
- Shipping schedules

1.12.4 The organic buyers

Eco Farms Certified Organic

David Como

Product Purchasing Manager, dcomo@ecofarms.com.au(02) 9764 2833

Eco Farm the largest organic fresh produce wholesaler in NSW. On sells to premium speciality Supermarkets like Thomas Duck and Macro as well as main supermarkets (Woolies and Coles). Sales are divided almost 50/50 between these. Dealing with the main supermarkets has its problems – everything has to be packaged (costs) and involves high transport costs. You also can cut fruit in ½ for main supermarkets- thus discouraging customers who may have preference for seeing fruit flesh, smaller piece of fruit at the high/kg price.

Occasionally received supplies of organically certified red papaya from North Qld (none in stock at the time of our visit). Organically certified (Australian Certified Organic) mango much more

common and there was a good supply in stock. The mango product moves well at a price premium price. They don't undergo quarantine treatment – but pay a \$50/pallet fruit fly inspection at the border.

Fiji prospects

Believes there would be a good opportunity for a regular supplier of certified organic fresh papaya from Fiji. Believes they could move 120 6kg cartons per week, particularly during the May-October months. An indicative price would be \$16 to \$17 per 5kg carton.

Particularly interested in organically certified naturally dried papaya. Currently purchasing organically certified dried mango for \$32/kg from NT and N QLD. Currently only working with wholesale markets, have yet to move into supermarket lines

Melba Organics

Mick

Buys off the floor, he doesn't import. Two organic wholesalers in the market. The market for organic papaya is slow. This product is sourced from N. Queensland (Atherton Tablelands, Stannery Hill Farms) there was none in stock when we visited. He buys 1 pallet/week (which includes 40-60 cartons, of 5 kg boxes. He pays \$30/5 kg box, on selling at \$35/15 kg box (those prices don't sound right, for the quantity, will recheck with him.ACO' is the generic organic standard, the current stock from N. Qld is treated via a 'dipping' method, which allows the fruit to still qualify as organic

Victoria Market (Organic section)

Rose's Organic Fruit producer 4304A (ACO standard). Rounded oval shape – like rugby ball with flat ends. Light mid-orange flesh – Nice appearance and taste reasonably OK for pawpaw. BRIX 10. Not 'consumer-friendly' as whole fruit. The inside was mushy around seeds while the outer flesh was firm. This pawpaw flesh tasted nice when pureed with plain yoghurt and some grapefruit juice (ruby red) and a little sugar into a smoothie or lassi.

Appendix 2: Fijian papaya quality parameters in need of improvement

Control of postharvest diseases on the farm

Damage by disease infection is a leading cause of post harvest losses in papaya. Like physical damage, the effects are often not seen until the fruit begins to ripen. Therefore fruit can be shipped looking nice and clean but arrive infected with disease which creates a particularly bad impression in the market place.

Anthracnose (*Colletotrichum gloeosporoides* L.) disease is one of the most common post harvest diseases of papaya in Fiji. The disease is present on unripe papayas but is difficult to detect because it is latent (not visible). As the fruit starts to ripen, circular spots begin to appear and gradually enlarge and may become sunken into the fruit.



Phytophthora stem-end rot (*Phytophthora nicotianae* var. *parasitica*) is another major post harvest problem affecting Fiji papaya. Phytophthora is characterised by circular spots (lesions) which develop with grey and white 'fungus' (mycelium) growing on the surface. Infection of phytophthora is particularly apparent around the stem end.



There are number of measures that can be taken to reduce the impact of post-harvest diseases of papaya; including

- Good site selection (avoid locations that have poor airflow and poor drainage)
- Good farm management practices (good hygiene, monitoring and chemical control as necessary)
- Control by various pre and post-harvest chemical treatments
- Careful handling to minimize physical damage.
- Keep fruit in a cool place with a low relative humidity.

Harvest and postharvest handling

The Fiji papaya export supply chain involves a large number of actors and fruit is handled/graded up to five times before being packed in cartons. It is through this rigorous handling that fruit is subject to significant bruising and scratching. The post harvest damage to fruit is compounded by the condition of roads from the farm to the packing house and NWC.

Physical damage to papaya fruit at the green stage will not show up until the fruit ripens. Physical damage can occur from the time of harvest through to final packing and at all of the steps in between.

Physical damage on the farm usually occurs as a result of the harvesting implement, dropping into crates, over-filling of crates and excess movement of fruit during transport.

Similar effects can occur as a result of poor handling during washing, grading and transportation. These actions will result in latex staining, punctures, scars and bruises. During ripening, bruised areas will develop into dark soft regions which become affected by secondary diseases such as anthracnose and *Phytophthora*.

Most physical damage occurs when staff are trying to work to fast. Because the damage is not immediately seen, staff are often not aware that they are doing anything wrong.



Bruising and scratching damage from improper handling on the farm.



Stem end damage from dropping fruit into the bins.

There are number of measures that need to be adhered to in order to reduce the damage caused to papaya during harvest and postharvest handling; including;

- Always practice good harvesting techniques and do not rush.
- Stems should be removed in the field to prevent puncturing or scratching of other fruit in the crate.
- Foam or newspaper should be placed in the base of field crates and crates should contain only one layer of fruit.
- Fruit should never be dropped or thrown into crates or bins.
- Vehicles used to transport the fruit should be driven slowly and with care.

Grading

In order to be competitive the grading of the fruit for export must be improved. Importers demand that all exports are of even size and maturity with very minimal skin blemishes or diseased fruit. Currently Fiji exporters have very poor grading which means that importers, wholesalers and retailers have to do this grading on their end at a much higher cost.

For this very reason it is critical that farmers, exporter staff and NWC handlers understand that the market wants each box to be the same in terms of:

- size (weight)
- sex (shape – female, round; hermaphrodite bell shaped)
- stage of ripeness.

At present NWC staff use scales in order get fruit of the same size for final packing. The performance here is mixed and should improve significantly with the installation of the grading machine that is currently being purchased with NWC's Enterprise Challenge Fund grant.

What is much more difficult is trying to get fruit of the same stage of ripeness – this is where our competitors are doing a much better job.

It is the importers request to an exporter that dictates what should be packed in a box, therefore the onus is on the exporter to strive to meet the exact requirements of his order and to achieve consistency within every box.



Dole papaya in Auckland, February 2009



Fijian papaya in Auckland, February 2009

Packaging and labelling

In order for Fiji papaya to secure a significant share of the main stream papaya market (supermarket chains) in New Zealand it is necessary to have appropriate packaging and labelling. The improvements in packaging and labelling that are described will inevitably require additional costs to the exporter.

The packaging and labelling requirements for the NZ market can be summarised on three levels;

1. What packaging will ensure that the fruit arrives to the customer in the best possible condition?
2. What labelling is necessary to comply with importers/retailers standards?
3. What packaging and labelling will serve to promote Fiji papaya as a high quality product?

A critical component of maintaining fruit quality through transportation is the carton. In Fiji the quality of cartons varies significantly between different exporters. Physical inspection of Fiji papaya in NZ saw the difference in the two types of cartons and how they hold up.



A more durable waxed carton of Fijian papaya that remains in good shape in an exporters cooler, Auckland (February, 2009)



A much thinner, unwaxed carton of Fijian papaya that has collapsed and started to come apart, Auckland (February, 2009)

Some Fiji exporters also use individual fruit socks to protect fruit from rubbing up against each other. This, or a similar measure is considered critical to ensure the fruit arrives at the market in the best possible condition.

It should be noted that papaya is rarely displayed at the retail level with the fruit sock. This is usually taken off by the stocker at the supermarket. If socks were deemed to be cost prohibitive an exporter could consider use of paper to individually wrap the fruit as is seen in papaya exports from Hawaii and the Philippines below.



Papaya individually wrapped in newspaper from Kumu Farms, Molokai, Hawaii, ready for export to the US mainland. (March, 2009)



Dole papaya from the Philippines individually wrapped in newspaper at MG Marketing packhouse, Auckland. (February, 2009)

Labelling requirements for papaya cartons entering the mainstream market in NZ must contain the following information;

- Country of origin
- Weight of the carton (The papaya carton exported from Fiji has an average net weight of 5 kg.)
- Fruit count in carton (How many fruit are within the carton).

Individual importers retailers might also require other labelling or packaging; including,

- Individual stickers on each fruit with bar codes
- Printed boxes with promotional text
- Other appropriate labelling

Appendix 3: Woolworths Quality Assurance Standards

WQA : Product Category Requirements (www.woolworths.com.au/wqa+produce)



PRODUCE TRADE PARTNERS

PRODUCE TRADE PARTNERS

Woolworths are proud of their fresh food and have specific requirements for Trade Partners who supply Fresh Produce to our supermarkets. These requirements support the WQA standard elements and Trade Partners are required to implement all areas as part of the certification requirements. Woolworths Trade Partners as part of our trading terms are required to maintain compliance to all Government regulatory requirements related to the relevant business category.

SCOPE & WQA CERTIFICATION

All direct suppliers of produce and packers of Woolworths branded products will be required to become certified to the Woolworths Quality Assurance Standard (WQA). The scope of the WQA system shall cover the product from planting, harvesting, processing, packing, storage, distribution and delivery into the Woolworths Supermarkets and Distribution Centres.

The scope of the system shall cover the following processes:

GROWER: Planting, Growing, Harvesting, Processing, Packing & Distribution

BROKER: Procurement, Warehousing and Distribution

MARKET AGENT: Procurement, Warehousing and Distribution

PACKER: Procurement, Receiving, and Packing Operations to Distribution

PROCESSOR: Procurement, Receiving, Processing Operations to Distribution

WQA Certification is product specific. If a Trade Partner requests to supply a new line to Woolworths which is outside the current scope of the certification then the documentation for the new product must be forwarded to the certification body for audit as per the requirements of the WQA standard. The product scope should be clearly defined as to the origin of the product, if the product is imported this should be clearly indicated on the scope of certification.

PRODUCT REQUIREMENTS

All products must meet the current commonwealth, state or territories food regulations both in the state of origin and the state where the product is sold, including:

- Labelling Requirements of the Food Standards Code , States and Territory's
- Trade Weights and Measurements and the ACCC – Country of Origin.

April 2005 Produce Requirements Page 1 of 8

WQA : Product Category Requirements

PRESCRIBED NAMES

Product names on packs or cartons must conform with the names listed in the Woolworths Produce Specifications or as per approval from the Woolworths Produce Business Team.

SPECIFICATIONS

Produce Specifications have been developed to ensure that our Trade Partners understand our food safety and food quality requirements. These documents form an integral part of the Woolworths Quality Assurance programs and it is expected that all Trade Partners will adopt and implement the criteria defined in these specifications. These specifications are confidential between your company and Woolworths and must not be reproduced other than to assist your company in the supply of produce to Woolworths.

Possession of these specifications does not imply that Woolworths will purchase these products from your company and any commercial arrangements should be discussed with the relevant Business Manager or their state representative.

In addition, specification criteria may be reviewed from time to time by the relevant Business Manager taking into consideration seasonal variation, adverse weather impacts or changing customer demands.

Product Assessment of incoming produce at the Distribution Centres will be conducted by the Distribution Quality Control Team. If a product is found to be non-compliant to specifications this will result in rejection of the product. These rejections will be detailed in writing to the Trade Partner.

LABELLING

Woolworths have prescribed labelling requirements for both retail and outer product packaging to ensure maximum traceability. Product Identification and Traceability of Produce is a significant requirement of the WQA Standard.

Woolworths needs to be assured that produce is readily traceable through the produce chain back to the grower.

Our customers have an expectation that we can provide a safe, quality product and if food safety is compromised, we as retailers need to be able to identify and trace product to its origin.

April 2005 Produce Requirements Page 2 of 8

WQA : Product Category Requirements

In addition to the labelling requirements defined in the individual produce specifications, the following will also apply, unless otherwise specified in writing from Woolworths. All labelling should be clear and legible.

Bulk Loose Product

A label/ tag with the following is to be attached to each carton / crate :

- Product Name
- Product Weight / Item Number/ Order Multiple
- Name and Address of the direct supplier
- Name and Address of the grower / packer
- Bulk Loose Product to identify 'Packed On' date (eg. Pkd DD/MM/YY) on outer packaging. It is the grower / packer responsibility to apply the 'PACKED ON DATE' on each order multiple (carton, crate, etc)

Woolworths Branded Prepack Lines

- Product Name
- Number of Units / Net Weight / Order Multiple
- The name and address of the direct supplier and the packer is to be labelled on the outer packaging containing the inner prepack units
- The WW Branded inner packs will be identified with a vendor code which is pre-printed on the WW artwork
- Pre Packed Product to identify 'Best Before' or 'Use By' (eg. 09/02/00, 09 FEB 2000) date on retail unit and outer pack. (As specified in the Woolworths Specifications)

Prepack Lines

- Product Name
- Number of Units / Net Weight/ Order Multiple
- The name and address of the direct supplier and the packer must be clearly identified on the outer produce packaging containing the inner prepack units
- The name of the direct supplier and the grower / packer must be clearly identified on the inner prepack units
- Pre Packed Product to identify 'Best Before' or 'Use By' (eg. 09/02/00, 09 FEB 2000) date on retail unit and outer pack. (As specified in the Woolworths Specifications)

April 2005 Produce Requirements Page 3 of 8

WQA : Product Category Requirements

- All prepack products shall be labelled in accordance with the Food Standards Code (FSANZ) and the ACCC labelling requirements.

Note that the Woolworths supplier is responsible for ensuring traceability back to the grower and an internal coding system may be applied to satisfy this requirement where the grower is neither the packer nor the direct supplier.

Product Crate Labels

Black crates shall be implemented by state as per the requirements of the Produce Business Team. Where the requirement is implemented the crates shall be labeled as follows :

Tags shall be placed on the crate in the designated location, stickers are not to be used to label crates. The tag shall be 80mm (L) x 85mm (W).

Labelling information on the tags shall be clear and legible.

April 2005 Produce Requirements Page 4 of 8

WQA : Product Category Requirements

Product Pallet Labels

Product Pallet labels shall be implemented by state as per the requirements of the Produce Business Team .Where this requirement has been implemented the label shall take the following format.

Qty per Pallet

GTIN No.

SSCC No.

Prongs on a crate to hold the produce pallet label in the panel if a Chep crate is used
(BACKING PAPER MUST STAY ON LABEL)

Other information relevant to the vendor can be placed here if space permits

Note that the Woolworths supplier is responsible for ensuring traceability back to the grower and an internal coding system may be applied to satisfy this requirement where the grower is neither the packer nor the direct supplier.

April 2005 Produce Requirements Page 5 of 8

WQA : Product Category Requirements

RISK CATEGORY

Produce is classified as High Risk and Low Risk products under the Woolworths Quality Assurance Program.

High Risk products are, but not limited to: Fresh Cut Salad Products; Ready to Eat Precut; Salads/Vegetables Precut Fruit; Mushrooms; Sprouts & Shoots; Berries; Herbs

APPROVED SUPPLIER PROGRAMS

For Produce Trade Partners sourcing product from growers, wholesalers, brokers and importers evidence of supplier third party certified Quality Assurance program must be provided.

Examples of acceptable Certification includes Freshcare, SQF1000 (level 3), SQF2000 (level 3), WQA, HACCP, Eurepgap and BRC. This must demonstrate certification all the way back to grower.

TRADE PARTNERS DIRECT : Trade Partners (local and international) who supply Woolworths direct must have an Approved Supplier Program in place for all suppliers which supply product which is packed, processed or distributed to Woolworths via the Trade Partner .This program shall ensure that all growers who supply product directly or indirectly have third party Quality Assurance Certification. The Approved Supplier Program shall ensure that all products comply with the state or federal regulatory requirements. All suppliers of Woolworths Branded product must be WQA certified this includes any contract packing operations who contract pack WW Branded lines on behalf of the direct supplier. It is the responsibility of the direct supplier to ensure that these contract packers achieve WQA certification.

Where the direct Trade Partner purchases from another direct Trade Partner who has WQA, the Trade partner must supply information which demonstrates that the growers used to supply all have Third Party Certification in accordance with the WQA requirements for Approved Supplier Programs for Produce.

INTERNATIONAL SUPPLIER: Where products are procured from an International supply base, as a minimum extensive verification programs must be in place to ensure that product sourced is safe from a food safety perspective, meets the specified quality requirements, complies with all relevant Australian regulatory requirements.

April 2005 Produce Requirements Page 6 of 8

WQA : Product Category Requirements

Verification programs of International Suppliers must include Micro/MRL product testing, reviews of quality management systems that are in place and regulatory quality assessment of actual product.

BROKER / MARKET AGENT: In the case of business activities through a brokerage arrangement, approved suppliers to the broker / market agent must have Quality Assurance Certification to a recognised standard.

ORGANICS APPROVED SUPPLIER PROGRAMS

A Trade Partner supplying Organic Produce must ensure that they are approved or have an approved supplier program in place that ensures that organic certification from one of the following bodies is in place for product supplied to Woolworths:

- NASAA (National Association for Sustainable Agriculture Australia)
- BFA (Biological Farmers of Australia)
- BRDI (Bio-Dynamic Research Institute)
- OHGA (Organic Herb Grower's of Australia)
- OFC (Organic Food Chain)
- TOP (Tasmanian Organic-Dynamic Producers)

Organics suppliers are required to provide evidence of a HACCP Based Food Safety program being in place.

PRODUCT ASSESSMENT

All Produce must meet the general appearance criteria, tolerance levels for major and minor defects and consignment criteria defined in the product specifications. The Trade Partner shall ensure that they implement a product assessment program for all products supplied to Woolworths. The program shall demonstrate that all products supplied to Woolworths are compliant for product quality and food safety criteria as documented in the Woolworths Specifications and these WQA Requirements.

PRODUCT TESTING

Microbiological and chemical (MRL and approved chemical usage) testing, must be undertaken where potential hazards are identified in the process or where current information, (such as overseas or trade literature), indicates potential hazards may exist. Where potential microbiological and chemical hazards are identified, testing must be carried out at least annually on each growers product (or product type), as part of the verification activity to show those hazards are in control. Where potential hazards have been identified in the process inputs, it may also be appropriate to conduct random testing on these inputs (eg water etc).

April 2005 Produce Requirements Page 7 of 8

WQA : Product Category Requirements

A market wholesaler / packer may verify effective chemical and microbiological compliance through information gathered from their suppliers provided that, the market wholesaler also has a percentage of product checked, at random, based on risk and volume.

It is the responsibility of the Trade Partner to justify the frequency of testing. The auditor must agree to the frequency or a major non conformance may be raised. All Produce must meet the microbiological, pesticide residues, heavy metals, food additives, chemical and contaminants criteria prescribed for the product in the Australian Food Standards code or other regulatory codes.

CHEMICAL & CONTAMINANT RESIDUES

All chemicals used pre/postharvest must be registered and approved for use in accordance with the requirements of the NRA regulatory system. Contaminants and Heavy Metals to comply to the FSANZ Food Standards Code MPC's and MRL's.

MICROBIOLOGICAL CRITERIA

All Trade Partners shall ensure that they have a microbiological testing program in place for High Risk products that ensures that they meet the requirements of the microbiological criteria listed below. Where a Woolworths Specification has been developed for a product the microbiological criteria specified in the specification is to be adhered to.

HIGH RISK PRODUCTS

Maximum Limits: Escherichia coli < 10 per g; Faecal coliforms < 100 per g;
Listeria monocytogenes < 10 per g; Coagulase + ve Staphylococci < 100 per g; Salmonella Absent per 25g

RETENTION SAMPLES

Retention samples shall be retained for all Prepacked Woolworths Branded produce lines supplied. Retention Samples shall be retained for the shelf life of the product under the recommended storage conditions. The number of samples retained shall be determined based on the volume of product supplied and risk, associated this shall be documented within the retention sample procedure.

April 2005 Produce Requirements Page 8 of 8

Appendix 4. Woolworths quality specifications for papaya

PRODUCT :	PAPAYA
TYPE :	Male / Female
VARIETY :	Various
GRADE :	One

GENERAL APPEARANCE CRITERIA

COLOUR	<i>Greenish yellow to golden yellow skin, often with small green / brown skin spots over the surface; slightly mottled salmon pink to red flesh.</i>
VISUAL APPEARANCE	<i>Smooth skin with moderate gloss; free from foreign matter.</i>
SENSORY	<i>Smooth, melting flesh; sweet and juicy; thin, slightly waxy skin; large number of small, round black seeds in central cavity; free from foreign smells or tastes.</i>
SHAPE	<i>Oval to slightly pear shaped; larger fruit distinctly five sided; not misshapen.</i>
SIZE	<i>As per Woolworths pre-ordered size requirements; "male" fruits >10cm long, >6cm wide, "female" fruits >12cm long, >10cm wide, evenly sized within carton.</i>
MATURITY	<i>Firm, full bodied fruit.</i>
MAJOR DEFECTS	
INSECTS	<i>With evidence of live insects eg scale.</i>
DISEASES	<i>With evidence of sunken brown spots (anthracnose), grey scarred areas (powdery mildew), water soaked lesions, stem end softening or other symptoms of bacterial or fungal infection</i>
	<i>With evidence of discolouration or disfigurement from viruses.</i>
PHYSICAL / PEST DAMAGE	<i>With unhealed wounds, pest damage or latex leakages at the stem end.</i>
SKIN MARKS / BLEMISHES	<i>With deep seated bruises.</i>
	<i>With unhealed cuts, holes or splits (that break the skin) wounds or pest damage.</i>
TEMPERATURE INJURY	<i>With skin pitting, hard / water soaked areas in flesh, and/or skin scald (chilling injury).</i>
	<i>With spongy flesh, uneven ripening or sunken areas (heat injury).</i>
PHYSIOLOGICAL DISORDERS	<i>With excessive softening of fruit (over ripe)</i>
	<i>With soft, translucent flesh (softening disorder)</i>
MINOR DEFECTS	
PHYSICAL / PEST DAMAGE	<i>With superficial bruising or abraded areas > 2sq cm</i>
SKIN MARKS / BLEMISHES	<i>With healed scars > 6sq cm.</i>

Appendix 5: The Returns from Growing Papaya in Fiji

Farmer planting papaya on a one acre farm for the first three years using hired labor 17/07/09

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
REVENUE							
1	Total number of trees	480	960	1,440	960	480	4320
2	Total marketable production @ 1.5kg/tree/month	1440	20160	47520	28800	5760	103680
3	2/3 for export	959	13427	31648	19181	3836	69051
4	1/3 for local market	480	6713	15824	9590	1918	34525
5	Revenue from exports (@ 0.90c/kg)	863	12084	28483	17263	3453	62146
6	Revenue from local sales (@ 0.70c/kg)	336	4699	11077	6713	1343	24168
	Total Revenue	1199	16783	39560	23976	4795	86314
Costs							
Non Labor Cash Expenses							
7	Land rental @ \$1068(spread over 1 year)	600	600	600	600	600	3000
8	Seedlings @ \$0.50 x 480plants	240	240	240			720
9	Land Preparation						
	Ploughing x 2 @ \$90.00/acre	180	180	180			540
	Harrowing x 2 @ \$60.00/acre	120	120	120			360
	Ridging x 1 @ \$50.00/acre	50	50	50			150
	Subtotal	1190	1190	1190	600	600	4770
10	Fertilizer & other Agri - Chemicals						
	NPK 16:16:16 @ 80grams/bearing tree/month	384	768	1152	768	384	3456
	Urea - 10grams /seedling hole @ \$0.10	48	48	48			144
	Poultry manure @ \$3.00/bag (120bags/acre)	360	360	360			1080
	Glysohate Weedicide- 20ltr @ \$280/acre/year	280	560	840	560	280	2520
	Irrigation Equipment and labor	500	500	500	500	500	2500
	Knapsack - 20ltr @ \$435	435	435	435	435	435	2175
	Subtotal	2007	2671	3335	2263	1599	11875
	Total Non Labor Cash Expenditure	3197	3861	4525	2863	2199	16645
11	Labor inputs (person days)						
	Land clearing	6	6	6			18
	Lining and digging holes	2	2	2			6
	Planting (5 persons x 2days)	10	10	10			30
	Fertilizer application @ once/month x 2 persons	12	24	36	24	12	108
	Hoeing / Ring weeding x 5 persons	45	45	45			135
	Pest control and sanitation x 2 persons	24	24	24	24	24	120
	Harvesting and packing in field bins x 2 persons	16	56	88	80	32	272
	Grading and packing for sale x 2 persons	16	56	88	80	32	272
	Total Labor input	131	223	299	208	100	961
12	Imputed cost of labor @ \$15.00/day	1965	3345	4485	3120	1500	14415
	Average labor days/annum	192.2					
	Total costs (non labor costs + labor costs)	5162	7206	9010	5983	3699	31060
	Gross margin (Total Revenue - Total Cash expenditure)	-3963	9577	30550	17993	1096	55254
	Average gross margin over 5 years	11051					
	Average gross margin /acre	3684					

Footnotes

- 1 Assuming the farmer plants 1 acre of papaya trees every year for the first three years
- 2 Total marketable fruit @ 1.5kg per tree/month (Average)
- 3 Exportable fruit account for 70% of total production which mostly include hermaphrodite
- 4 The other 30% accounts for female fruit, undersized , deformed and non exportable
- 5 Farm gate price for exportable fruit is @ \$0.90
- 6 Current local market price is @ \$0.70
- 7 Land rental is based on the (NLTB) First Class (UCV) Unimproved Capital Value for the Province of BA @ \$2476.56/ha .
Note that papaya on the ground accounts for only 3acres of the whole 12acre lease
- 8 The seedlings are sourced from TTM @ \$0.50/seedlings(for growers outside the group) TTM growers pay \$0.40/seedling
- 9 Land preparation quote is the standard quote used by tractor drivers in the Sigatoka valley (03/03/09)
- 10 Fertilizer and other Agri chemicals are sourced from any Hardware department while poultry manure is sourced from various poultry sheds in the Eastern Division. Irrigation pumps are hired from the Agricultural Department and shared amongst the farmers i.e. one water pump among a group of 8 -12 farmers
- 11 The total non labor cash expenditure
- 12 The total labor input during the five year period

Summary table of farmer planting 1acre for the first three years using hired labor

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Revenue	1199	16783	39560	23976	4795
Total non labor cost	3197	3861	4525	2863	2199
Total labor cost	1725	3345	4485	3120	1500
Net margin	-3723	9577	30550	17993	1096

Appendix 6: The Returns from Growing Sugar Cane

Gross margin from planting 1 acre of sugar cane (updated May 2009)*

	unit	no of units	rate/unit (\$)	total/acre(\$)
Plant crop				
Land preparation				
Ploughing	application	3	90	270
Harrowing	application	3	60	180
Drilling	application	1	30	30
Sub-total				480
Seed cane	tonnes	5	53.5	268
Land rental	yearly	1	260	260
Fertiliser and agrichemicals				0
Blend A fertiliser	50kg bags	2	31.5	63
Blend B fertiliser	50kg bags	5	31.5	158
Pre-emergent herbicide	4litre	1	30	30
Post - emergent herbicide	4litre	1	30	30
Sub-total				281
Cultivation				
Tiller	application	3	75	225
Transporation	trip	1	50	50
Sub-total				275
Labour inputs				
Cutting and loading seed cane	person days	5	20	100
Planting	person days	10	20	200
Fertiliser application	person days	3	20	60
Hoeing	person days	5	20	100
Spraying of herbicides	person days	2	20	40
Weed thrashing	person days	10	20	200
Subtotal				700
Harvesting costs	tonnes	45	21	945
Other costs				
SCGC levy	tonne	45	1	45
Drainage and Cane access road levy	tonne	45	2	90
rice advance	yearly	1		240
sugar advance	yearly	1		140
Subtotal				515

Total plant cane cost				3,723
Plant cane revenue	tonnes	45	61.5	2,768
Gross Margin (revenue - cost)				(956)
<u>Ratoon crop</u>				
Land rental	yearly	1	260	260
Fertiliser and agrichemicals				0
Blend A/ B fertiliser	50kg bags	0	0	0
Blend C fertiliser	50kg bags	5	31.5	158
Pre-emergent herbicide	4litre	0	0	0
Post - emergent herbicide	4litre	1	30	30
Sub-total				<u>448</u>
Cultivation				
Tiller	application	3	75	225
Transporation	trip	0	0	0
Sub-total				<u>225</u>
Labour inputs				
Fertiliser application	person days	3	20	60
Hoeing	person days	5	20	100
Spraying of herbicides	person days	2	20	40
Weed thrashing	person days	10	20	200
Subtotal				<u>400</u>
Harvesting costs	tonnes	40	21	840
Other costs				
SCGC levy	tonne	40	1	40
Drainage and Cane access road levy	tonne	40	2	80
rice advance	yearly	1		240
sugar advance	yearly	1		140
Subtotal				<u>500</u>
Total ratoon cane cost				2,673
Plant cane revenue	tonnes	40	61.5	2,460
Gross Margin (revenue - cost)				(213)

*Source: Data supplied by Livai Tora Sabeto Valley

