



Australian Government

**Rural Industries Research and
Development Corporation**

Exotic Tropical Fruits and Vegetables

Category Marketing Opportunities

A report for the Rural Industries Research and Development Corporation

by Chris Horsburgh and Judy Noller

August 2005

RIRDC Publication No 05/112
RIRDC Project No DAQ-310A

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ISBN 1 74151 175 5
ISSN 1440 6845

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Project No: DAQ-310A

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Published in August 2005

Foreword

This report outlines the potential for a category approach to market development for exotic tropical fruits and vegetables.

A number of fruit and vegetable crops have been commercially emerging in Australia's tropical regions in the past decade, providing traditional foods for ethnic consumers, potential new foods for the mass market, and diversification options for producers.

A 2003 RIRDC Exotic Crop Review Workshop found that a 'category' approach to market development, supported by supply chain development, potentially offers some significant benefits to a number of exotic tropical fruit and vegetable industries.

The project was carried out under RIRDC's New Plant Products Program and was funded from RIRDC Core Funds which are provided by the Australian Government.

This report, an addition to RIRDC's diverse range of over 1000 research publications, forms part of our New Plant Products R&D program, which aims to facilitate the development of new industries based on plants or plant products that have commercial potential for Australia.

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Dr Peter O'Brien
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Acknowledgments

Special acknowledgement is made to the management and staff of Albert Park Fruit Palace, Melbourne, in particular Richard Rossiter. Also the contribution of Ian Kikkert and Yan Diczbalis is acknowledged.

Other major contributors were:

David Harris, Darryl Wallace, Michael Batycki, Lindey Milan, John Barker, Ross Barker, Joe Costa, Joe Brancatisano, Mark Kelly, John Cuthbertson, Brendan McConnell, Graham McConnell, Patrick Toscano, Sue Dodd, Nola Craig, Craig Squire, Sue Stephens, Gerry McMahon and Vic O'Keefe.

The input of the project steering committee is gratefully acknowledged.

The Rambutan Tropical & Exotic Growers Association and the Australian Commercial Bamboo Corporation also contributed to the project.

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Executive Summary

An opportunity exists to develop a category approach for marketing exotic tropical fruits. No commercial opportunities were identified for an exotic tropical vegetable category. The key recommendations from this research are:

1. Exotic tropical fruit industries should conduct further detailed research into the needs of wholesale and retail buyers, and consumers before attempting to develop category marketing. Improved understanding of the critical success and failure factors for category marketing of these fruits is needed.
2. Category marketing of exotic tropical fruits should be carried out leveraging the established demand and consistent supply of more well known tropical fruits as 'anchor products'. These anchor products are more recognised and widely available, but complement exotic tropical fruits, and may include custard apples, red papaya, pineapples, exotic bananas and mangos. Anchor products will provide a more stable market presence for the category.
3. Funding needs to be developed for promotion of these fruits, especially for fruit tastings and demonstrations, and for product usage information, including recipe cards.
4. Increased communication and information-sharing is needed between growers (ideally via industry associations) and marketers. This market information system (MIS) should initially aim to provide for the following key information:
 - seasonal crop forecasts, including peak supply periods
 - product handling and storage recommendations
 - quality information including out-turn reports
 - market performance indicators

A priority list of the emerging crops to be considered in the research was developed through workshops, industry interviews, market surveys and with input from the industry steering committee.

The crops selected for consideration were bamboo shoots, carambola, guava, jackfruit, longan, mangosteen, pitaya, pomelo, rambutan, star apple and taro.

The research found that strong demand exists for exotic and new food tastes, with an emerging market of higher earning consumers interested in new and different foods, but having poor awareness and low experience of the selected crops.

While commercial interest in developing an exotic tropical fruit category exists, the category lacks supply and promotional capabilities compared to more established commodities. Developing such a category would require better co-operation along the marketing chain, led by primary producers and their industry associations engaging wholesalers and retailers in collaborative marketing activities.

The report defines two types of category with potential for these emerging exotics - a supplementary products category where products are grouped together because they are used as ingredients or consumed together, and a complementary products category in which similar products are grouped because together they comprise a small niche.

There is evidence that a complementary category is currently being explored commercially for exotic tropical fruits, with strategies such as an exotic tropical fruit basket and an exotic tropical fruits display stand already in evidence in the marketplace, to a minor degree. Both strategies require substantial coordination along the supply chain, increased promotion, and a supply program that guarantees continuity of product at agreed quality standards before they could be developed significantly further.

The preliminary research identified tropically grown vegetables as more clearly fitting within the scope of the Asian vegetables category and that a commercial strategy for exotic tropical vegetables

could not be developed within the scope of this research. As a result, no detailed category investigation of exotic tropical vegetables was undertaken.

A complementary exotic tropical fruit category was trialled in a Melbourne greengrocer's outlet to gauge the impact of a category approach using seven different fruits. The category trial involved the retailer, wholesaler and growers. The store already sold some exotic tropical fruits targeted at the higher income-earning market of the local area. Following trade recommendations, the trial grouped the fruits on a display bench with integrated signage, point-of-sale information and tastings.

The trial evidenced that:

- Consumers and retailers recognised a grouping of various exotic tropical fruits as a category, although they usually did not recognise the individual fruits.
- Consumers were more likely to notice the category if signage and product information were present, and to read product information but not necessarily take it home.
- “Exotic tropical fruits” was a meaningful category to consumers, and had a positive image.

Developing markets for exotic tropical fruits will require developing vertical supply chains to involve the whole distribution channel in delivering quality product and product information to consumers seeking new foods and value for money. A market category for these small industries will also require horizontal supply chain alliances in order to pool limited resources for more effective and efficient market development activities.

1 Introduction

1.1 Background

In July 1997 a national workshop for emerging tropical crops was held in Cairns. This workshop brought together representatives of various sectors of the emerging tropical crops industry to combine information and develop an understanding of the commercial potential for many crops, which were considered to be commercially underexploited. An important outcome of this workshop was the development of a priority list of five crops that at that time warranted further research and development.

These five crops were:

- Rambutan
- Mangosteen
- Durian
- Longan, and
- Abiu

Some significant research and development of production and marketing systems for these crops has occurred since 1997 with the exception of abiu which, subsequent to the workshop, was determined to have far less commercial potential than the other four crops, due to difficulty in handling the crop and getting it to distant markets in good quality.

In September of 2002, RIRDC convened a meeting of exotic tropical crops researchers and industry representatives in Cairns to review the industry development impact of the research and development activities that had occurred and the commercial performance of these five crops. Other exotic crops which had commercially developed since 1997 were also reviewed. It was determined that a subsequent national industry workshop for exotic tropical crops should be held in February 2003. Trade development staff from Department of Primary Industries and Fisheries (DPI&F) were asked to present a paper on the market performance of a selected list of crops including the original five selected crops.

At the 2003 workshop it was identified that strong demand exists for exotic and new food tastes and that some crops have and will continue to commercialise faster than others. Many of the wholesalers and retailers contacted in preparation for the workshop by DPI&F staff commented that the individual commodity approach to promotion was unlikely to work for these exotic tropical crops since they were competing with the greater market presence and promotional power of more established commodities. It was suggested that there was some merit in marketing them as a category rather than individually, notwithstanding the difficulties of limited supply and limited funding for marketing development and promotional activities.

As a result of the February 2003 workshop a project proposal submission was invited by the RIRDC New Plant Industries program, which was subsequently approved as project DAQ-310 – ‘Building Supply Chain Partnerships in Emerging Tropical Plant Industries’.

1.2 Research problem definition

The key problem to be dealt with through this research project is to determine whether exotic tropical fruits and vegetables can be successfully category marketed rather than as individual commodities.

1.3 Objectives

The overall aim of this project is to research and define the potential for a category approach to market development for exotic tropical fruits and vegetables through achieving the research objectives. These are:

- Identify tropical plant product industries that could be included in the project.
- Map the supply chains for selected crops
- Define the market category concept and investigate commercial category strategies for exotic tropical fruits and vegetables.
- Test specific category marketing strategies developed for tropical fruits and vegetables.
- Increase awareness of new market opportunities for exotic tropical fruits and vegetables.
- Support a more cohesive approach to market development.
- Strengthen supply chain linkages and commercial partnerships.

1.4 Methodology

This project was approached with an applied rather than theoretical focus. Commercial processes and practices were relied upon extensively. The nature of the problem and the key objectives necessitated working closely with commercial partners and approaching the research in ways that paralleled these organisations' capabilities and commercial environments.

1.4.1 Identify products to be included in the project and analyse their supply chain readiness

Given the large number of potential crops and the limited scope of this project, the first phase of the project is designed to immediately short-list those crops with the greatest commercial potential to succeed as part of a category marketing strategy.

Initially the list of crops from the 1997 workshop and the crops assessed at the 2003 workshop will be used to define the range of 'exotic tropical fruits and vegetables' to be considered. The short-listing process will be based on:

- Currently available secondary market research and readily available commercial information regarding product performance in the marketplace.
- Industry consultation focussing on input from industry development associations regarding the individual crops.
- An analysis of distribution channels and supply chains through interviews with wholesalers, retailers, growers, transporters and food marketers.
- A review by the industry steering committee of the above research information.

1.4.2 Define category concepts relevant to emerging tropical fruits and vegetables and develop possible commercial category strategies

In phase two of the research, category management and its marketing implications for exotic tropical fruits and vegetables will be discussed. Through consultation with various organisations involved in the marketing of these products, conclusions will be drawn about the commercial relevance of category marketing for tropical fruits and vegetables. This will include a discussion of any commercial attempts at category marketing.

The key strategy options relevant to category marketing of tropical fruits and vegetables will also be outlined and discussed.

1.4.3 Test market a commercial strategy in partnership with the distribution channel

Phase three of the research is to conduct a commercial trial of one category strategy. This phase of the project is dependent on a number of factors and principally dependent on commercial organisations being willing to undertake the trial in cooperation with the researchers. It is therefore an optional stage to the project.

If suitable partnerships can be developed then a trial will be planned and carried out to investigate the impact of a category approach to marketing emerging tropical fruits and vegetables.

The implications of the trial and observations by industry representatives will also be presented.

1.5 Scope and limitations

While considerable effort was devoted to a thorough study of the topic relevant to the research, the following limitations on the scope of the research need to be noted by the reader in considering the implications of this report:

- Industry consultation was limited to the North Queensland and Northern Territory industry associations. These are the main production centres for many exotic tropical fruits and vegetables in Australia.
- The research focussed on market segments other than the dominant ethnic Asian market segment. Therefore, the findings may have limited applicability within this segment.
- Seasonality and a short window of supply limited the ability of researchers to gather timely information on many of the crops. Both supply and demand outside ethnic Asian market segments are limited, and there is a dearth of current and relevant market research. As a result, much of the research was dependent on respondents' recollection for those crops not in season at the time. This information was sometimes unsubstantiated and incomplete.
- Poor linkages exist amongst growers, and between growers and their distribution channels. Also, currently industry associations have limited ability to bridge these gaps. This restricted the information flows along the marketing chain and created some knowledge gaps.
- The project scope was limited to one year and was resource constrained in terms of more fully supporting the systems development required for commercial category development.
- Research activities were focused on Sydney and Melbourne markets. These are the main markets in Australia with established distribution channels for these products. The implications and conclusions may be less applicable in other geographic markets.

2 Research And Category Trial

2.1 Identification of products to be included in the project and analysis of their supply chain readiness

2.1.1 Selection of crops for inclusion in the project

To determine which exotic tropical fruits and vegetables could potentially be included in the project, the list of tropical produce discussed at a 1997 tropical industries workshop (Ross 1997) was reviewed (Table 1).

Table 1: List of crops from 1997 workshop for “Opportunities for Commercially Under-exploited Tropical Fruits, Vegetables and Nuts”

Abiu	Granadilla	Plantain
Betel nut	Grumichama	Pomelo
Black sapote	Guava	Rambutan
Breadfruit	Jaboticaba	Rollinia
Camito	Jackfruit	Salak
Canistel	Jujube	Sapodilla
Carambola	Kava root	Sour sop
Cassava	Longan	Sugar apple
Ceylon spinach	Malay apple	Tannia
Chemadek	Mamey sapote	Taro
Coconut (green)	Mangosteen	Wax jambu
Duku/langsat	Pili nut	Winged bean
Durian	Pitaya	Yam
Galap nut		

Source: Ross, 1997

This was refined to include only those crops known to currently have significant commercial production and markets. Several other crops were added, on the advice of industry representatives (Table 2).

Table 2: List of crops for further consideration

Abiu	Finger lime	Native Tamarind
Bamboo shoots	Galangal	Pitaya
Black sapote	Guava (green or pink)	Pomelo
Cedar Bay Cherry	Horsfieldia australiense	Rambutan
Claude River Apple	Jackfruit	Rosellas
Coriander	Johnstone River Apple	Soursop
Curry leaves	Kaffir lime	Taro
Davidson Plum	Longan	
Durian	Mangosteen	

A mail questionnaire was sent to 20 food industry specialists to assess the market potential for these crops. Information provided by 11 respondents (Appendix 2) was used to refine the crop list (Table 3). This list was presented to the 2003 workshop.

Table 3: List of crops presented to 2003 workshop

Abiu	Longan
Bamboo Shoots	Mangosteen
Black Sapote	Pitaya
Carambola	Pomelo
Durian	Rambutan
Guava	Soursop
Jackfruit	Taro

The Project Steering Committee, along with industry representatives in north Queensland and the Northern Territory, reduced the crop list further, resulting in the final list of crops for inclusion in the stage one of the study (Table 4). These industries were considered to be capable of developing supply chains and participating in category marketing initiatives, and had reasonable supply.

Table 4: Project crops for investigation

Bamboo shoots	Pitaya
Carambola	Pomelo
Guava	Rambutan
Jackfruit	Star apple
Longans	Taro
Mangosteen	

2.1.2 Distribution and supply chains

This section of the report describes the major distribution channels that were identified for emerging tropical fruits and vegetables within Australia. It also outlines the current framework for supply chain management, and examines the extent to which supply chain management systems have developed.

Distribution and supply chains

The main distribution channels were mapped for these emerging tropical fruit and vegetable industries (Figure 1).

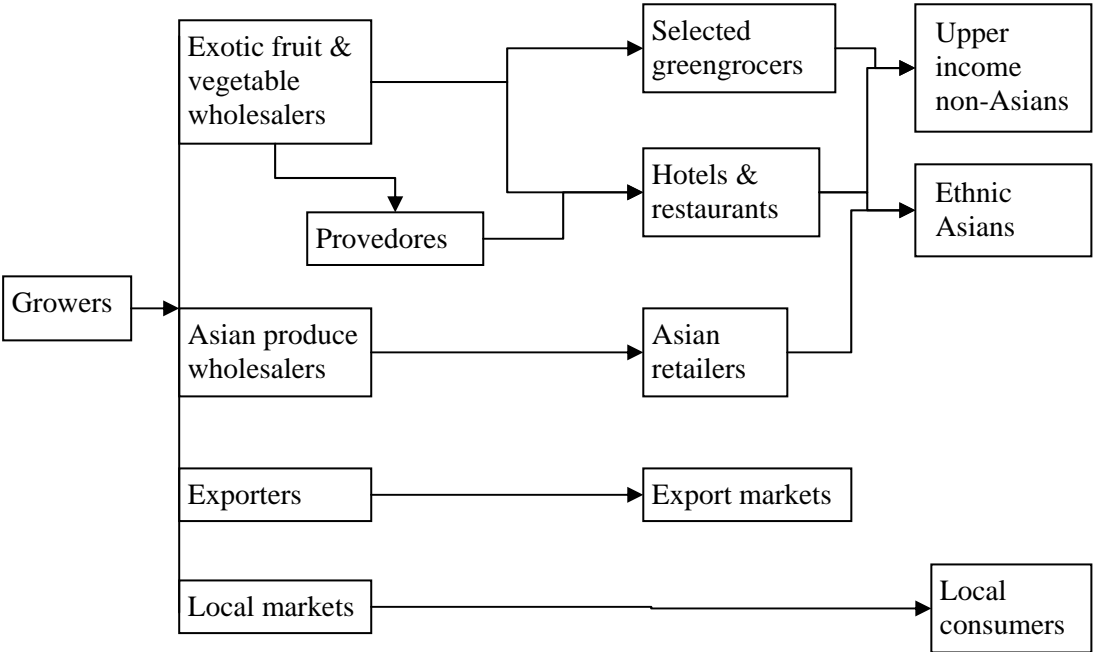
Food markets have become increasingly demand-led, with consumers' requirements expanding and becoming more specific, including the need for:

- An interesting product assortment that changes and provides variety.
- High quality.
- Production and distribution systems to assure food safety.
- Freshness and longer shelf life.
- Convenience.
- Environmental sustainability.
- Value for money.

(Newton 2000 p6)

Meanwhile food retailers are striving to compete in an increasingly competitive marketplace by using strategies that focus on better satisfying the consumer's requirements. Demand driven retail marketing strategies include maintenance of a complete cool chain, managing HACCP quality assurance with traceability from retailer to producer, and managing stock by category while supplying the quality that consumers want.

Figure 1: Distribution of emerging tropical fruit and vegetables



Meeting these demands requires greater co-ordination along the entire distribution channel from ‘producer to plate’.

The supply chain model enables such consumer-focussed strategies, as well as the transfer of best practice along the channel. It enables all channel members to comply with consistent quality standards that everyone understands (and ideally negotiates). It provides the opportunity to explore new ideas, share the risk of marketing experiments, and to explore other organisations’ strategies and benefit from their experience. At the same time it reduces the risk of price fluctuations, quality variation, fluctuating volumes and food safety problems, and allows handling efficiencies and cost reduction. (Gifford et al 1998)

Participants in a supply chain have a common interest i.e. delivering value to the customer and improving their supply chain processes.

A supply chain is of particular benefit where a limited number of specialised products are targeted at a specific customer base.

In a supply chain, the increasing requirements and demands of the consumer “pull” the product from the producer through the tiers of vendors. (Newton 2000, p7) This reverses the traditional supply system whereby the producer consigned product into the distribution channel to the market, and the market was driven by supply and price (Table 5).

Developing a supply chain requires all participants to continuously learn and improve in order to adapt and deal with changing environments. Establishing and maintaining trust between chain partners is also critical. (Newton 2000) It is this shared understanding along the chain that enables it to be a competitive entity.

Table 5: Traditional distribution channel versus supply chain orientation

Factors	Traditional distribution	Supply chain
<i>Level of information shared</i>	Transaction data only	Management information and strategic knowledge
<i>Primary focus</i>	Cost/price	Value/quality
<i>Orientation</i>	Commodity	Differentiated product
<i>Power relationship</i>	Product push	Market pull
<i>Organisational structures</i>	Independent	Interdependent
<i>Philosophy</i>	Self interest	Chain optimisation
<i>Time focus</i>	Short term	Long term

Source: Modified from “Traditional versus chain orientation”, Frank Engelbart, Rijinconsult (Newton 2000 p7 & p12)

Case study – Botman International BV

Netherlands company Botman International BV exported mainly fresh vegetables (particularly greenhouse tomatoes and bell peppers) of speciality varieties, to Japan and other countries, both directly and through market agents. It led an alliance of producers and producer organisations, wholesale agents and retail chains.

The company was the supply chain leader, having assumed responsibility for a number of marketing functions. These included co-ordinating negotiation of freight prices, movement of goods, services and funds along the supply chain, meeting end user requirements and boosting chain efficiency, and developing counter-seasonal supply from a New Zealand joint venture for a year-round market presence. Customers were provided with guarantees of year round supply, fixed season prices, delivery on time, packaging innovations, promotion and input into merchandising, and advised of any issues affecting production. Producers were involved in negotiations with retailers to ensure such information was available to chain members, and informed of market and value-adding opportunities.

A typical integrated program negotiated with the Japanese buyer included season pricing contracts, guarantees of supply, advertising program planning and alignment with supply, and promotional activities such as signage and tastings which are funded by the grower organisations.

One result was that the company increased its margins by shifting buyers’ focus from the lowest priced supply towards the benefits of a reliable supply of quality Dutch produce. (Gifford et al, pp21-34)

Supply chain management cannot be said to exist to any obvious degree within these exotic tropical fruit and vegetable industries and no examples were identified within the scope of this research that could be presented as a case study of supply chain development. Importantly, the capability and technology are present, but the specific systems and management initiatives have not been developed.

2.1.3 Market research findings

Market observations and comments by wholesalers and retailers on the exotic tropical fruits and vegetables considered in the research are compiled and are presented under the headings below.

Markets

- Current markets consisted almost entirely of ethnic Asian consumers eating the products at home or in Asian restaurants. This market was familiar with these mainly Asian foods, and strongly preferred certain cultivars.
- Young ethnic Asians were considered a market segment with the most potential for development.

- Consumer awareness and understanding of exotic fruits and vegetables was very low for both consumers and the trade in the mass market.
- Some sophisticated and innovative urban consumers, and the better restaurants they patronise, used these products, and it was recommended that initial development of the mass market focus on this consumer segment.
- Other possible users included commercial catering and food service.
- Exotics had potential to be more than novelty products but were unlikely to become mainstream.
- Demand had not grown for some products after several years in the marketplace. Low demand resulted in high shrinkage, high prices, and poor profitability for retailers.
- Exotic fruits and vegetables were versatile and useful.
- Quarantine requirements inhibited development of interstate markets and potential Pacific region markets.
 - Retail chain customers were becoming more knowledgeable of exotic tropicals, and more experimental, so large retailers saw the need to provide them with a choice, and to train their staff to handle them.
 - Restaurants were likely to use exotics for ingredients.

Supply

- Insufficient and erratic supply, and lack of commitment to the one buyer, meant that products could not be promoted or easily marketed as a category. Wholesalers had difficulty supplying supermarkets with reliable quantities, and several retail promotions had inevitably collapsed in the past due to inconsistent supply.
- Producers often opted to maximise price rather than support a regular buyer, so wholesalers could not provide consistent supply to customers, promote, or meet growing demand.
- Timing of promotions needed to coincide with reasonable supply, e.g. at peak season, but short seasonal windows did not allow time to promote. Often, just as demand starts to build up momentum, there is no more product.
- Communication between growers and wholesalers was limited regarding critical issues of supply. Producers were not providing the availability and seasonality forecasts needed for forward preparation of marketing activities.

Market development issues

Product

- Product quality was generally satisfactory.
- Products ranged from high to low in consumer appeal.
- Suitable fruits were small and a convenient size for snacking,
- Many exotic fruits and vegetables had distinctive external and internal appearance and shape, and were novel and decorative. However, external browning, bruising, scarring and poor shape detracted from appearance, and flesh that browned when cut was difficult to demonstrate. Products with unappealing appearance, such as longans on the stem, needed to be displayed creatively.
- Often internal appearance was very different to external, so the product needed to be presented cut to encourage initial tasting.
- Tasting was critical before consumers would consider a new food. Most exotics had appealing and unique flavours and were fragrant and refreshing, although some varieties produced poor eating quality. Products that were an acquired taste, such as durian, would need repeated trial.
- Texture was usually appealing, but could make eating difficult for some products, such as jackfruit.
- Restaurants would not use strongly smelling products (i.e. durian).
- Wastage could be high for products with thick skins.

- Consumers needed educating on when an unfamiliar fruit or vegetable was ripe and ready to eat.
- Some products were inconvenient to prepare, e.g. hard shells that required opening with a knife, or latex that made handling and eating difficult. New consumers needed information on how to peel and prepare.
- Presentation and packaging standards were often poor, and needed improving.
 - Retailers and wholesalers often felt they did not understand the product well with regards to handling practices.
 - While marketing groups and central pack-houses were more effective at producing standardising products, there was still wide variation in packaging and standards. Industries needed to develop product standards and a packing standard per box.
 - Packaging needed to be more presentable for retail display. Some products might suit punnets. Some products were too large to eat impromptu or buy for initial trial, and heavy and awkward to handle – if sold in sections consumers could buy to try and the trade would handle them more.
 - Many exotics were fragile, and required packaging and transport systems that would provide protection.
 - Education was needed on handling and storing, both commercially and in the home, due to relatively short shelf life for many exotics. This information could be included on the box.
 - Better storage systems were needed to exclude fruit fly.
- Having good varieties and consistent quality, supported with point of sale material and promotion has accelerated market development for the Queensland strawberry industry. Exotic crops could adopt similar strategies.
- While there is strong demand for interesting new tastes in food and plenty of consumer interest in exotic fruits and Asian vegetables, sales for individual varieties were growing more as a result of increased supply than product specific demand.

Pricing

- Pricing was expensive and inconsistent, with quality problems affecting consumers' perception of value for money.
- Once fallen, prices could not be raised again within short seasonal supply windows.
- Various margins along the distribution channel made exotics expensive.
- Exotics would need to be affordable to potential new markets.

Distribution

- Exotic fruits and vegetables were handled mainly by specialist tropical, exotic and Asian produce distributors, who supplied Asian stores, specialist greengrocers, retail chains (often for selected stores), and provedores to restaurants, hotels and caterers. Some growers supplied direct to retail chains.
- Innovative retailers monitored what ethnic Asian consumers were buying, and their buying criteria (e.g. preferred varieties and product attributes such as flavour and seed size), then offered the same products.
- Expanding distribution of exotics could depend on a retail chain being prepared to promote over an extended period.
- Using one distribution channel reduced the likelihood of several agents competing on price.

Promotion

- Developing new markets would require market research, consumer education, promotion (including media), taste-testing and educating retailers, particularly supermarkets, as the frontline for customer enquiries.
- There was very little promotion of exotics.

- Exotic industries were not working together to jointly promote similar products.
- Consumers needed to be educated on how a new product tasted, and how to prepare and use it. This would require demonstrators to cut and serve the product for free tastings, while providing informative point of sale material. Tastings typically started a cycle of word of mouth, attracting restaurants, consumer magazines, then supermarket magazines, resulting in consumers demanding exotics from their greengrocer.
- Demonstrations have been very effective and resulted in rapid growth in consumption for products such as raspberries, and should be part of any promotion to new markets. Sample product and funding for demonstrators needed to be supplied by growers or industry associations.
- Promotion to new buyers needed to be timed for when volumes were up and prices down.
- Food critics were particularly influential in promoting new foods. A media campaign could promote usage ideas to food critics and also consumers, e.g. a newspaper food feature at the start of season.
- Internet sites provided the market with a useful source of product information.
- Promoting by brand rewards the producer with brand recognition.
- Retailers needed point of sale material, with information on product description and place of production, how to prepare, easy uses, recipes, nutritional content and seasonal availability.
- Stores would place flyers in varying locations, such as on the fruit stack, on recipe boards (such as sold by Sydney Wholesale Markets), or at the checkout.
- With better information, specialist stores with sufficient staff could provide tastings and educated advice to consumers.
- Where stores cut and plastic-wrapped product to display its interior, this led to trial and purchase.
- Supply chains would be needed for market development, and provide a framework for marketing. It was suggested that a ‘tropicals’ association, that included merchants, could fund promotions using contributions from along the chain.

2.2 Category management and concepts

Various category concepts are relevant to emerging tropical fruits and vegetables. These offer a basis for developing effective commercial category strategies.

2.2.1 Category management

Category management is the process of developing market-based systems to manage a product category. The combined implementation of category management and supply chain management increases the ability of organisations to respond to customers needs effectively and competitively. (Europa 2005)

In practice, category management is implemented by degrees and could involve a broad range of activities and systems. Category managers create production and marketing efficiency and are usually employed by the manufacturing or production organisation. They have a coordinating and integrating role in production planning and marketing program development, as well as developing strong ties to key intermediaries and customers.

The category manager ensures that to the greatest extent possible, the marketing system for a category of products is functional and effective. The role necessitates being the category’s ‘strategic champion’ and managing outside of the operational silos that constrain production, marketing, logistics and sales managers within organisations.

The following examples describe forms of product category management currently in use.

Supplementary products category

The first type of product category comprises supplementary products. These products are grouped together because they are used as ingredients or consumed together.

Products in this type of category are often produced or manufactured by different organisations. The category approach in these cases may only be relevant to a limited number of market channels and may be driven by the producer of one product, with the others receiving a 'free-rider' benefit. Usually, this occurs because the benefits of the category to the driver's product outweigh the free-rider costs they may absorb. For example, the other products in the category may have established brand names or demand that the category driver wants to leverage, by associating those products with their own.

Example - Shepard Avocados

Shepard avocados are a 'green-skinned' variety of avocado; it is the only variety whose skin does not darken when the fruit ripens. 'Shepard Australia' is a grower organisation for the Shepard avocado variety which is actively engaged in the promotion of the Shepard via The Harvest Company, which acts as its marketing agent for various retailers and markets.

Importantly, Shepard Australia and The Harvest Company maintain the driver role in a category approach to marketing Shepard avocados with various supplementary products. Where possible, cooperative arrangements are fostered with these other product's manufacturers. This proactive approach has maintained a strong position in the market for the Shepard variety and has developed the market perception of Shepard avocados, so that they are positioned as part of various eating experiences, rather than simply another fresh produce commodity.

Following this category strategy, Shepard avocados have been marketed in the past as 'guacamole' alongside 'CC's' brand of corn chips and tomato salsa, in the fresh produce sections of Woolworths supermarkets. These products are normally in quite separate locations within the supermarket and this approach created strong unplanned trial and purchase of Shepard avocados and the other products.

Currently, Shepard avocados are being marketed with pasta in cooperation with a pasta manufacturer in Coles supermarkets, to widen the market perception of avocados from snack, salad and lunchtime uses towards the main meal menu.
(Grosert, 2005)

Complementary products category

The second type of category is comprised of complementary products. These products are grouped together because they fill a similar niche or are used similarly by the market. While they may compete with one another at some level, their presence as a category builds market recognition and awareness and promotes their use against other competitor products, which do not fit within the category.

Example - Asian Vegetables

The term 'Asian vegetables' describes a category of many complementary products that have traditionally been used in Asian cuisine and grown in various parts of Asia. These vegetables are now grown and used widely in Australia.

There is considerable recognition of Asian vegetable varieties as a category and most of the retail fresh produce outlets visited as part of the research were displaying Asian vegetables as a category and providing free point of sale material for them, such as recipe cards. Some stores indicated that they also provided product demonstrations at their own expense, because of the strong interest by their customers in these new types of produce.

The current industry research and development plan for the Asian foods industry in Australia indicates that the Asian vegetable category is strong and growing. As a category it is generating market presence, sales growth and profit for supermarkets and other fresh produce retailers. Importantly, the marketplace is quickly sorting out which Asian vegetable products will develop as core drivers of the category and which products will only have niche demand. (RIRDC Asian Foods Plan 2005)

Tropical Fruits - Examples of Category Marketing

Two commercial initiatives aimed at category marketing of tropical fruits were highlighted during the research. Each is described here in order to emphasise that category marketing is currently being explored commercially.

Example One - Exotic Fruit Traders and Woolworths

Exotic Fruit Traders in Sydney is a wholesale supplier of many varieties of exotic fruits and produce including rambutan, pitaya (dragonfruit), guava, longans, mangosteen, black sapote and carambola. The company has developed a limited program and supplied a category of exotic tropical lines to Woolworths supermarkets in Sydney. (Costa 2005)

Woolworths have expressed commercial interest in exotic tropical fruits for some time, but inconsistent supply and quality create considerable barriers. The supermarket chain communicated to Exotic Fruit Traders their need for a more reliable and consistent in-store presence of exotic tropical fruits before they could consider promoting them. In response, Exotic Fruit Traders developed a supply program for a number of fruit lines that included exotic tropical fruits such as rambutan and mangosteen as well as fruits with more established demand that were still regarded as 'exotic', such as tamarillos.

For this category, Woolworths provided an in-store presence in six stores for display of six fruits at a time. Exotic Fruit Traders provided fruits they were already sourcing in Queensland and the Northern Territory. In some cases they involved growers in this process. Only those growers who were considered to be reliable and suppliers of the best quality lines for each commodity were involved directly. They were given a Woolworths product specification for these orders and packed fruit to that standard for Exotic Fruit Traders. For other commodity lines, Exotic Fruit Traders sourced the product, at the quality standard they required, from whatever fruit was available on the market.

This program into Woolworths operated for several months in 2003 and 2004. While commercially the initiative was a success and resulted in increased sales, it was discontinued on both occasions due to inconsistent supply.

Example Two - Piedmontes

Piedmontes is a specialty medium sized independent supermarket supplying fresh produce and other grocery lines in the inner suburb of Brunswick in Melbourne. Their customers provide a small but established demand for exotic tropical fruits. To service this demand, Piedmontes have created a 'stand' that these products are displayed in. There are spaces for several different fruits, with the actual range varying according to what is seasonally available. Other fruits considered exotic are also displayed in this stand, such as passionfruit and limes.

Piedmontes' customers recognise this stand and look there for exotic fruits. They know that these fruits are more expensive, but the display stand and the grouping of these products together give their customers buying cues that these are special fruits and worth more.

No supply chain management systems are currently in place for Piedmontes. Product is sourced 'on the day', based on what is available at the quality and price points they require.

2.2.2 Commercial Strategies for Category Marketing of Exotic Tropical Fruits and Vegetables

Exotic Tropical Vegetables

No commercial strategy for exotic tropical vegetables could be developed within the scope of this research. The major reason for this was that no commercial interest at the wholesaler or retailer level could be identified. Wholesalers and retailers indicated that many tropically grown vegetables such as taro and bamboo shoots, as well as turmeric, galangal and ginger, more clearly fit within the scope of the Asian vegetables category that is already being commercially developed. As a result, no further investigation of an exotic tropical vegetable category was undertaken.

Exotic Tropical Fruits

Two primary strategies were identified as having commercial potential in developing an exotic tropical fruit category. They are:

- An Exotic Tropical Fruit Basket – prepacked combinations of exotic tropical fruits
- An Exotic Tropical Fruits Display Stand – point of sale displays that showcase different exotic tropical fruits, giving them a stand out in-store presence

Both strategies are complementary product strategies, as outlined previously in this report. No supplementary product strategies for exotic tropical fruits were identified as being commercially feasible.

These strategies require a considerable degree of coordination along the supply chain before they could be implemented commercially. Increased promotion, including point of sale material (POS), is also required. These will need to be developed in partnership with wholesalers and retailers involved in the distribution and marketing of the targeted products. In addition, a supply calendar that guarantees continuity of product availability at agreed quality standards will be required before retailers and wholesalers are likely to make any contribution of their own to the cost of developing and implementing these strategies commercially.

An Exotic Tropical Fruit Basket

Fruit is a fashion product as well as a food, and many exotic tropical fruits provide plenty of visual appeal. Commercial fruit baskets often contain a wide range of fruits, including exotics and novelty fruits (often promoted as "exotic" and "luxury" fruits as well as the better-known tropical fruits). Standard and customised fruit baskets are often sold by flower delivery specialists. One supplier offered a seasonal mangosteen and custard apple basket in its range. The store where this category trial was held prepared customised fruit baskets for its customers.

Exotic tropical fruit baskets could meet a specific demand for household 'fruit bowl' displays, as well as for corporate gift 'fruit baskets'.

It is unlikely that many of the exotic tropical fruits included in this project would be individually included in either of these. High prices and low product knowledge are significant barriers to them being included with more traditional fruits. However, a range of high quality exotic tropical fruits could be used for specialty higher priced fruit baskets and positioned with appeal to the increasing need for 'something different' in the market.

In this display and gift market the major competing products are flowers. The flower market is more clearly segmented into price ranges than the fruit market and as a result, exotic tropical fruit baskets could be positioned effectively in the upper price range. There are currently very few alternatives to expensive flower arrangements that are a living natural product, rather than a manufactured good. Exotic tropical fruit has an additional advantage of also providing a new, novel and exciting eating experience.

Detailed product usage information, including storage recommendations, would be essential for these fruit baskets, since they represent a high risk expenditure on a new product that the purchaser will be unlikely to have had any significant experience with. The choice of fruit combinations would need to create display appeal, but will also need to deliver a consistent and reasonable storage life.

An Exotic Tropical Fruits Display

A point of sale presence or fixture where exotic tropical fruits could be displayed along with product usage information would enable fruit retailers to promote these fruits more effectively. Integrating this display with a retailer education kit for a range of exotic tropical fruits would also enable the staff in these stores to become familiar with the fruit and to advise and recommend them to customers.

By integrating these initiatives, retailers would be able to promote exotic tropical fruits as 'new products'. New foods generally need to be demonstrated and tasted by inexperienced buyers before they will have the confidence to make trial purchases.

The actual physical display could take many forms, based on the variety of store layouts encountered. Practically, it may be difficult to design a single display with universal appeal. Supermarket chains if targeted, will have specific design requirements and temperature zones.

Retailers indicated their commercial interest in new products such as exotic tropical fruits as part of a seasonal promotion strategy. Many responded that they would position this type of display in a prominent place in their stores and initiate their own publicity and promotions to leverage the sales effect as much as possible. Most retailers and wholesalers felt that product demonstrations would be needed as well.

2.3 Category trial

The possibility of conducting a trial for one of the identified market category strategies was included within the scope of this research to provide commercial relevance and context for the category.

2.3.1 Developing the category marketing trial

Retailers were considered the most appropriate chain leaders and co-ordinators for a trial. Several commercial issues impacted on the feasibility of a trial, such as who should provide and fund a tasting demonstration, and whether to source product through one or several wholesale agents.

Retailer interest ranged from providing space for product sampling to participating in an integrated category trial.

Trade recommendations were that the trial consist of displaying the fruits together, with samples on a table in front of the display. Customers were considered more likely to sample from a group of unusual fruits than try an individual unknown fruit. Recommended timing for tastings were when supply was sufficient and prices down, preferably in warmer months, and at various times and days for different retailers.

While retailers supported the concept of category trial, retail chains had found it difficult to assemble a number of products. One retailer with a tropical fruit stand was displaying custard apple, lime, passionfruit and tamarillo, as well as small sized pears and nashi.

Recommendations for a trial included:

- A dedicated display of exotics, together with other fruits including mangoes, lychees and custard apple, pineapple, stonefruit, seedless melon e.g. bambino melons, custard apple, papaya and possibly even avocados.
- A tropical fruits category to include pitaya, rambutan, mangosteen, longan, crunchy jackfruit, and maybe finger limes.
- A category that cycled approximately six seasonal exotic fruits at a time.

Retailer activities were evidence that such a category had potential:

- Large retailers were interested in selling like products together.
- These large retailers considered exotic tropical fruits could form potential categories.
- A few greengrocers in wealthier suburbs were using exotic tropical fruits to differentiate their stores.
- Some innovative fruit and vegetable retailers had individually developed limited category strategies.
- Retailers suggested exotics could be anchored with better known tropical fruits such as mangoes, lychees, pineapples and red papaya.

2.3.2 Test Marketing Strategies for a Tropical Fruit Category

Albert Park Fruit Place in Melbourne's inner southern suburbs was selected to conduct a category trial. This retailer met the project criteria, in that:

- It sold exotic fruits.
- It was located outside the main ethnic Asian shopping areas of Melbourne.
- The store had a narrow focus on an affluent market that already had some exposure to products being trialled.
- Its management were willing to commit to and participate in a category trial.
- Management believed that there was potential to increase consumption in its customer base.
- The store's small size was manageable within the scope of project.
- The store layout permitted discreet observation.
- The store had a prominent position in which to display the category.

This store, considered by the trade as one of Melbourne's leading fruit and vegetable retailers, was in an affluent inner suburb and it operated 24 hours a day, seven days a week. It was supplied with exotic tropical fruits by two exotic fruit specialists at Melbourne Wholesale Markets. The store had some Melbourne Markets fruit brochures on a stand at the front, and regularly cut fruit for tastings. Staff used reference books to answer customers' questions about new produce.

The trial category was displayed on a bench mid-store, and clearly visible from throughout the store. While the display took up most of the stand, strawberries, mandarins and juice remained at the sides.

The objectives of the physical category trial were:

- To observe whether consumers and retailers could recognise a grouping of various exotic tropical fruits as a category.
- To observe whether consumers were more alerted to an exotic tropical fruits category if signage and product information was present.
- To investigate whether “exotic tropical fruits” was a meaningful product category to consumers.
- To explore how retailers would manage a tropical fruit category.

There were four stages to the trial, which took place between Saturday and Tuesday in early May 2004. Over various intervals, customers were observed to gauge the impact of the various promotional elements and activities on their purchasing behaviour. The flow of customers was constant, and heaviest on the weekend,

Stage 1.

On the Saturday, a “Exotic Tropical Fruits from Sunny North Queensland” banner, with a sun symbol, was hung over the display bench, and price cards in a matching style placed with the respective fruits. Interviews with customers exiting the store determined that none had noticed the promotion, or bought fruits from it.

Stage 2:

Also on the Saturday some fruits were cut in half and sealed with plastic wrap, to display their interior. Recipe cards were placed with the fruits, and cut samples arranged on a board in front of the bench. Observations of customers indicated no awareness of the promotion.

Stage 3:

On the Sunday, with all point of sale material in place, a demonstrator (an exotic fruits producer) handed out samples for tasting. Observation of 40 customers noted that 12 customers became involved in the demonstration and five made nine purchases from the exotic fruits.

Stage 4.

On the Monday, observations were done with point of sale in place and cut samples on a board, but no demonstrator. Of 11 customers observed, none bought fruits from the promotion.

Other observations:

- Most customers had never tasted the fruits, and usually did not know what they were, although familiar with some of the names.
- Several trays of some fruits sold during the promotion, requiring re-orders.
- Approximately a dozen recipe cards were taken for some fruits (guava, pitaya and custard apple).
- Customers often read the cards, without taking them.
- When asked, several customers said they agreed the fruits were tropical, and “made sense” when grouped together, and saw them as very colourful and attractive as a group.
- Most customers tried no more than four of the fruits.
- Several commented such fruits needed to be tasted before buying.
- One customer noted the fruits had similar tastes so were suited to a category.
- Store staff noted repeated purchases from some customers who bought fruit during the promotion.
- The store manager saw the exotic fruits as suited to the fruit baskets they frequently made up for customers.
- Consumers’ understanding of “exotic tropical fruit” varied, from no comprehension, to broadly including other minor fruits such as tamarillo, feijoa and quinces. Comments also suggested that for some consumers, the word ‘exotic’ suggested an expensive product.

3 Conclusions

3.1 Key Conclusions

It is apparent that an opportunity does exist to develop a category approach to marketing exotic tropical fruit. This category has relevance for increasing consumer understanding and demand for emerging exotic tropical fruits outside the traditional ethnic Asian market.

No commercial opportunities were identified for category marketing of exotic tropical vegetables. However, the tropical vegetables considered within the scope of this research were already in the Asian vegetable category which is commercially developing.

3.2 The opportunity for category marketing

The opportunity for category marketing of exotic tropical fruits includes:

- Building on current and past attempts at marketing several of these fruits together.
- Establishing new markets outside of traditional ethnic Asian segments. The mass market's likelihood of purchasing these fruits is considered to be higher when they are retailed together rather than separately.
- Leveraging synergies between different products. A complementary product strategy such as an exotic tropical fruit display is more likely to be supported by the trade.
- The possibility of a more year-round market presence because various exotic tropical fruits are seasonally available throughout much of the year, and more established tropical fruits could anchor the category.

3.3 Major constraints to category marketing

Some major barriers to the development of a category approach to marketing exotic tropical fruits include:

- The commercial systems and capabilities to implement category marketing have not been developed at present.
- Supply of fruits that would comprise an exotic tropical fruit category is inconsistent in quality and unreliable in quantity.
- Trade awareness of best practice for handling, storage and transport of these emerging fruits is low.
- In general, marketing activities have been ad hoc to date. There are no ongoing industry based promotion programs. Wholesalers and retailers expressed limited commitment to promoting exotic tropical fruits due to high product risk. Price discounting was the only strategy used widely to influence sales and this was generally used to move older stock or low quality product.
- No supply chain management systems were identified for any of these commodities.

4 Recommendations

1. Exotic tropical fruit industries should conduct further detailed research into the needs of wholesale and retail buyers, and consumers before attempting to develop category marketing. Improved understanding of the critical success and failure factors for category marketing of these fruits is needed.
2. Category marketing of exotic tropical fruits should be carried out leveraging the established demand and consistent supply of more well known tropical fruits as 'anchor products'. These anchor products are more recognised and widely available, but complement exotic tropical fruits, and may include custard apples, red papaya, pineapples, exotic bananas and mangos. Anchor products will provide a more stable market presence for the category.
3. Funding needs to be developed for promotion of these fruits, especially for fruit tastings and demonstrations, and for product usage information, including recipe cards.
4. Increased communication and information-sharing is needed between growers (ideally via industry associations) and marketers. This market information system (MIS) should initially aim to provide for the following key information:
 - seasonal crop forecasts, including peak supply periods
 - product handling and storage recommendations
 - quality information including out-turn reports
 - market performance indicators

Appendices

Appendix 1 – Seasonal calendar

Seasonal Supply of Tropical Fruits and Vegetables in Australia

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bamboo												
Carambola												
Durian												
Guava												
Jackfruit												
Longan												
Lychee												
Mangosteen												
Pitaya												
Pomelo												
Rambutan												
Star apple												
Taro												

(Sydney Markets Wholesale prices 2003; Trade interviews 2004)

Appendix 2 – Interview list

Schedule A - Mail questionnaire

Craig Squire, Proprietor, Red Ochre Grill, Cairns
Darryl Wallace, National Fresh Merchandising Manager, Coles Myer
Graham O'Connell, Express Fruit, Wholesaler, Sydney Wholesale Markets
John Barker, Barkers, Wholesaler, Melbourne Wholesale Markets
John Cuthbertson, Roy Cave & Sons, Wholesaler, Sydney Wholesale Markets
Lindey Milan, Food Director, Australian Consolidated Press/Woman's Weekly
Michael Batycki, Senior Business Manager, Woolworths
Nola Craig, Marketing Manager, Australian Tropical Foods, Cairns
Patrick Toscano, Toscano's (fruit & vegetable retailer), Kew, Melbourne
Sue Dodd, Marketing Consultant to Sydney Wholesale Fruit & Vegetable Markets

Schedule B – Trade interviews

David Harris, Harris Farm Markets, Sydney
Joe Brancatisano, V.B. Brancatisano, Melbourne Wholesale Markets
Joe Costa, Exotic Fruits Traders, Sydney Wholesale Markets
John Barker, Barkers, Melbourne Wholesale Markets
John Cuthbertson, Roy Cave & Sons, Sydney Wholesale Markets
Manager, Fruit-Ezy, retailer, Chatswood, Sydney.
Piedmontes, Brunswick
Reliable Fruit & Vegetables, retailer, Prahran Markets, Melbourne.
Richard Rossiter, Albert Park Fruit Palace, Albert Park, Melbourne
Toscanos fruit and vegetables, Kew, Melbourne

Appendix 3 – Observations by industry representatives who participated in the store trial

The general comments of Ian Kikkert and Yan Diczbalis, two industry representatives selected to participate in the commercial category trail have been collated below:

This boutique store was seeking new lines to promote for “trendy eating”. It had strong relations with some clients.

The industry representatives observed customer reaction and offered interested shoppers a dish of cut fruit samples for tasting. A visit to fresh produce markets in the Melbourne suburb of Footscray, which has a large ethnic Vietnamese population, provided an opportunity to compare this market with the boutique Albert Park store.

Their observations were:

- The market for exotics is almost non-existent outside of the ethnic Asian segment.
- Despite the store regularly carrying lines of “exotic” tropical fruit in limited quantities, random interviews with customers found almost no awareness or understanding of the rambutan, longan, pitaya, pink guava, carambola and custard apple on display.
- Some had heard of one or two of the fruits. Custard apple was more likely to be recognised if the consumer was given its name.
- A low percentage recognised some fruits and made reference to seeing them while travelling in Bali, Malaysia or some other location in SE Asia.
- Many could not distinguish rambutans and longans from lychees (which were not on display).
- Customers made the association between guava (poorly known) and guava juice which was well-known.
- Carambola was often recognised from being used to garnish fruit platters.
- They seemed to only buy small quantities of individual fruit to make up a unique platter for that special occasion or dinner party, e.g. 2-6 Rambutans, with similarly small amounts of other tropical fruits.
- Some shoppers were interested in trying these new exotic tropical fruits. Most of these shoppers responded positively to the concept of the “Exotic Tropical Fruit Category”. The cluster of new fruits and associated signage drew their attention to the products on offer. Their interest was genuine and they happily sought out the new experience. They usually had very little background knowledge of the fruits they tried except for the introduction given to them prior to tasting.
- Consumers commented that rambutan and pitaya had good presentation, display and novelty. These were the most favourable attributes noted for pitaya. Quality, packaging and presentation are important for early buyers.
- Consumers principally wanted to know what to do with the various fruits and how to serve them e.g. with cheese or wine, etc.
- Consumers saw rambutans as one of many fruits that could be used for a special occasion platter, and guava suited to a fruit display. Fruit platters were seen as a healthier alternative to a fancy cake.
- The response to fruit tastings were generally positive and a high percentage of tastings resulted in follow up sales of at least one or more of the fruits on offer, particularly custard apple, and rambutans to mothers with children. Longans were generally accepted as good eating, while pitaya was more acceptable when sprinkled with lemon juice.
- Price did not matter, with customers paying up to \$20/kg.
- After tasting, customers usually wanted to know where to obtain the fruit.

The small volumes of displays and fruit sales in this boutique store were a marked contrast to the large volumes and huge array of produce (almost every exotic fruit and vegetable in season or from overseas, much of it of high quality) competing for the attention of Asian shoppers at Vietnamese greengrocers and markets in Footscray.

This ethnic market had high awareness of exotic tropical fruits, and competitive pricing. Ethnic Asian shoppers know their tropical fruit and will specifically hunt out particular products at the cheapest price (bulk sells). It does not require promotion but the large purchase sizes presented some opportunities for bulk packing.

An exotic tropical fruit category had promise for introducing the mass market to exotic tropical fruit, especially overcoming the fear factor of trying an unknown fruit. “Mangosteen”, “durian” or “rambutan” may not be tangible, but “Tropical Fruit” is. A category should be an early strategy, although its impact may not be apparent in the short term. It would be less useful in markets with established demand for individual fruit products, so ideally would not be needed in the long term when consumers would have demand and anticipation for individual tropical fruits as they come into season, as in current ethnic Asian markets, and supply would be more organised.

The category would provide consumers with a consistent market interface, despite the composition of individual tropical fruits changing from season to season. A category could revolve around year round produce such as Red Papaya, Sugar or Lady Finger Bananas. A category would reduce the cost and effort of coming up with distinctive promotions for individual fruits.

Appendix 4 – Photographs



Exterior of Albert Park Fruit Palace, Melbourne



Interior of Albert Park Fruit Palace



Basket of fruit used in category trial



Category trial, with signage, fruit basket and tasting fruit



Asian vegetables category, Fruit-Ezy, Chatswood, Sydney



Exotic fruits display, Piedmonte's, Brunswick, Melbourne

Appendix 5 – Crop profiles

A broad range of crop specific market information was gathered during the research. This collated information is presented here for general reference as a series of crop profiles.



Abiu (*Pouteria caimito*)

Markets

Abiu has a limited presence in major southern markets and no indication of the market trend has been obtained. If market growth is occurring, it was not perceived as significant. Market growth and market potential are restricted by limited availability of good quality fruit to meet current demand.

Abiu quality is affected by easy bruising, rapid discolouration once cut, latex around the flesh and poor shelf life. (Market survey 2003)



Bamboo shoots

Production

Bamboo tolerates a wide range of climates and altitudes. Commercial production extended from the Northern Territory to Victoria and is concentrated mainly in Southern Queensland and northern NSW, with an emerging industry in Far North Queensland and the Northern Territory. Australian plantings exceed 60,000 plants, with estimated production of 2,700 tonnes by 2005. (Keilar & Collins 2004)

Most commercial growers belong to the Australian Commercial Bamboo Association (ACBC).

Markets

The main markets are in the major cities, and are almost exclusively ethnic Asian consumers. They use bamboo at home in traditional dishes. The market regarded fresh shoots as having superior flavour, less odour, and lower prices than canned. Fresh product competed with large volumes of processed bamboo imported from mainly Thailand and China and sold through Asian food stores. Leading imports were canned whole and sliced shoots, dried whole and sliced shoots, sliced or whole shoots in liquid, and sliced or whole salted, with good demand also for minimally processed product, particularly chilled shoots.

While Asian restaurants used canned bamboo, a small segment of discerning chefs was using fresh shoots to differentiate their menu, with market development being hampered by inconsistent supply.

The mass market in Australian does not understand how to use or store fresh bamboo. However, retailers indicated that some consumers had asked how to use fresh shoots, and there was considered to be a potential market of keen home cooks likely to use fresh shoots in stir-fries and other Asian dishes. Fresh bamboo shoots were a new product to the Australian market. Developing the Australian market will require educating consumers on how to use and store the product.

Good quality product sold well, and market demand was growing, but would be unlikely to cope with the rapid increase in production as new plantings come on-line. (Onley 2003)

Supply

The market is supplied with fresh commercial and wild-harvested domestic product, as well as 4,000-10,000t/year of imported canned and bulk shoots in brine. (Trade interviews 2004; Keilar & Collins 2004)

Most fresh bamboo shoots supply was co-ordinated by the Australian Commercial Bamboo Corporation Ltd (ACBC).

Bamboo shoots were rarely seen fresh in the market place outside ethnic Asian shopping areas in major cities. Improved availability would be needed if the Australian market was to be developed. (Trade interviews 2004)

Product

Demand varied across various ethnic markets for the main edible varieties: *Dendrocalamus Asper*, *D. Latiflorus*, *D. Brandsii*, *Phyllostachys Pubescens* – *Moso*, *Bambusa Oldhamii* and *Gigantochloa*.

The markets, particularly the ethnic Chinese segment, required fresh appearance and medium to large sized shoots only, with crisp texture. Ethnic Vietnamese shoppers preferred some dark external colour. The preferred cultivar was *Laterflorus*, followed by *Asper*, with little demand for *Old tameii*. *Asper* was considered sweeter and less bitter, with the preferred large sized shoots.

Product quality was generally good, except for early season wild-harvested shoots supplied from the Northern Territory. But some product deteriorated during transport, and some suppliers were not using good crop 'hygiene' and packing. To ensure sufficient shelf life for marketing, wholesalers recommended shoots be individually wrapped, preferably in heat-sealed bags, with a block of ice, in styro boxes with removable lids to permit inspection and addition of fresh ice. A range of carton sizes was accepted, with 5kg boxes preferred by restaurants. (Onley 2003)

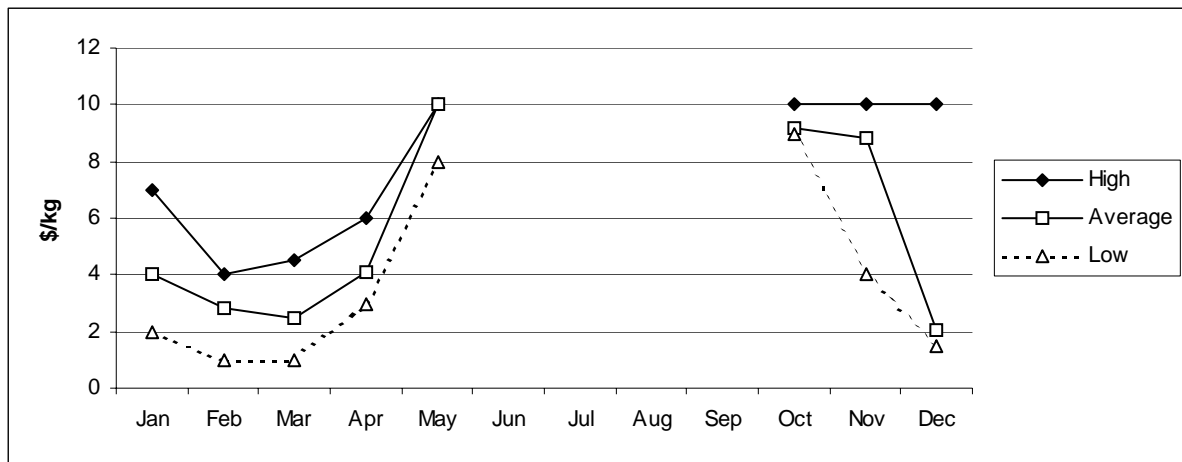
As fresh bamboo shoots contained potentially toxic cyanogenic glycosides which break down to hydrogen cyanide, the Food Standards Australia and New Zealand (FSANZ) food standard required raw bamboo shoots to be labelled with directions on food preparation, i.e. peeling, slicing and cooking. Canned bamboo shoots already complied, having been treated during processing. (Food standards Australia and New Zealand 2004)

Fresh shoots needed time-consuming preparation to remove toxins, e.g. peeling, trimming, slicing and boiling, and this was considered a major impediment to market development. To compete, fresh shoots would need to have key uses where they were distinctly better than canned. While some product was sold with instructions for preparation, significant market growth would depend on development of a semi-processed product with such benefits.

Retailers were interested in a minimally processed Australian product, such as pre-boiled and chilled 'cryovac' bagged whole or sliced shoots. Domestic product was likely to have a better safe food image than equivalent imports from China. (Onley 2003)

Pricing

Figure 2: Bamboo shoot prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Produce, Cut Flowers & Foliage, 2002*, by Sydney Market Reporting Service

Prices reached \$6/kg from September to November, but for good quality product remained stable for most of the year at \$3 to \$5 per kilogram. This indicated either inelastic demand or limited price competition between wholesale agents. Prices peaked for early season product from the Northern Territory (Figure 2).

According to the trade, wholesale prices in Sydney, Melbourne and Brisbane were \$2 to \$6/kg, with good sales at \$4–5, and a price ceiling at around \$9/kg for most markets. The ethnic Chinese segment was the most price sensitive, with resistance from around \$3/kg. (Onley 2003)

Promotion

No consumer information had been provided, although this was considered essential to developing new markets. Recommended promotion included media programs such as “Landline”, pamphlets, point of sale material with usage instructions and recipes, and in-store demonstrations, particularly for retail chains. (Onley 2003)



Black sapote (*Diospyros digyna*)

(also called “Black Persimmon”)

Production

Black sapote is produced mainly in coastal areas, from Far North Queensland to northern NSW and tolerated a range of climates, being frost-tolerant. North Queensland had a few small commercial plantings, typically around 20 trees within a mix of exotic fruit crops and is often planted as a windbreak. (Onley et al 2005)

Sapote has the advantage of being a strong cyclone-proof tree that is tolerant to frost, with relatively few insect pests and a lengthy harvest season. The main issues affecting production were poor fruit appearance, fruit blackening before ripening, and flying fox attack. It also has the advantage of a July-October harvest, when there is less competition from other exotic fruits.

The main cultivars are Bernecker and Maya. (Zappala, 2004)

Industry Size

The North Queensland crop equated to approximately 60 tonnes of black sapote in 2002. Producers often left fruit on the trees because of poor market demand and limited availability of freight for small consignments. (Onley et al 2005)

Markets

The market size was estimated at 40 tonnes, mainly for processing.

A small segment of ethnic South American consumers who were familiar with sapote bought it at speciality greengrocers in Brisbane and Sydney. Demand fluctuated and the market was easily flooded, so producers consigned only small amounts.

There was a small and easily saturated market for fresh fruit in Far North Queensland. (Onley et al 2005)

The industry anticipated no growth in demand in the medium term. The fruit’s appearance when ripe detracted from its positive qualities (Zappala, 2004). While the mass market had no awareness of how to use sapote, tasting demonstrations generated sales, indicating potential for market development.

Most fruit was used in processing. North Queensland chefs used sapote in restaurant desserts, ice creams and other dishes, and were seeking more reliable supply. The emerging tropical fruit wine industry was purchasing rapidly increasing volumes of sapote for wines and ports, and some manufacturers were interested in using it in dairy products. Sapote was considered to have more potential as an ingredient than for fresh eating. Market development was constrained by a lack of reliable supply of fruit. (Onley et al 2005)

Product

Sapote was picked before it matured, as mature fruit drops off the tree and is spoiled. It was transported to market when mature but still green and firm. The fruit ripened in around 10 days at room temperature, and could be held for a few days in cold storage. Once fully ripe, sapote was too soft to handle. (Onley et al 2005)

Pricing

Sydney prices were typically \$20-25 for 12 fruit in a tray (tray weight can vary). North Queensland prices ranged from \$2–8/kg in fresh produce markets. (Onley et al 2005)

Promotion

There has been little promotion, although sapote was included in a Sydney based promotion of a range of exotic tropical fruits. Some fruit had been provided to agents for promotion during peak supply. (Costa, J. 2004; Onley et al 2005)



Carambola (*Averrhoa carambola*)

(also called “Star Fruit” and “Five Corner”)

Production

The Australian industry is based in northern NSW, central and southern Queensland, and around Darwin. 2002-3 production exceeded 76 tonnes, with a market value of around \$320,000

(Diczbalis & McMahon 2004; Trade interviews 2004)

The main commercial cultivars were B2, B10, B17, *Arkin*, *Fwang Tung* and *Giant Siam* (Diczbalis & McMahon 2004).

Carambola was easy and reliable to produce, although prone to birds, flying foxes, fruit fly, fruit piercing moths, mealybugs and scale. Coombs 1995 Fruit was often disposed of because of insect stings and damage to the “wing” edges (Trade interviews 2004).

Markets

Consumer and food service markets use carambola for fresh eating and as a garnish. Both markets had potential to expand.

Carambola has established demand, and is considered a versatile, decorative, colourful and flavourful fruit when quality was good, and particularly suited to fruit salads for its crisp texture and to fruit platters as a decoration or garnish because of its attractive star shaped cross-section. Usage was limited by the fruit bruising easily, and rust forming on cut surfaces which detracted from its appearance. (Market survey 2003)

Supply

Market demand was constrained by inconsistent supply. Demand was price sensitive, with competition from cheaper substitute fruits, and prices quickly dropped in response to increased volume. Many growers only picked when the prices were sufficiently high, and a lot of fruit was left to drop.

Market growth had tracked slow expansion of supply. A number of growers supplied fruit in varying quantities. Some further market growth was possible provided quality and supply were consistent. (Trade interviews 2004)

Product

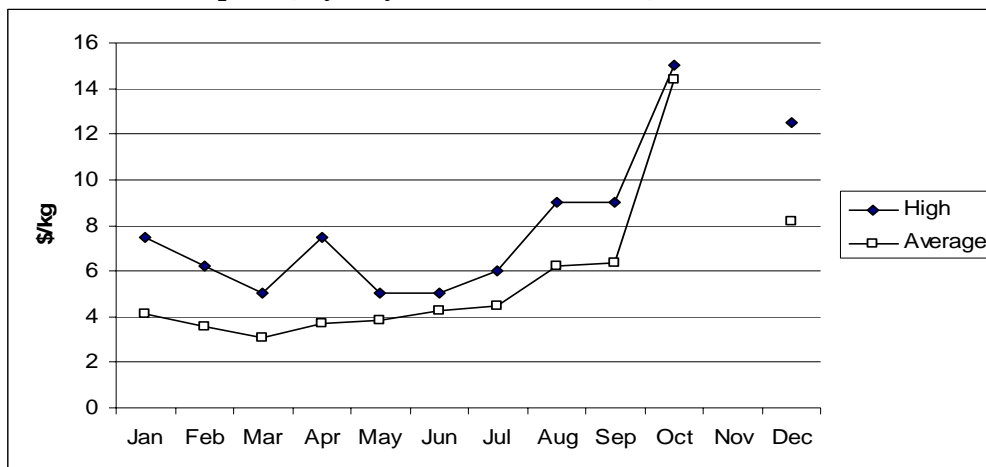
Product quality ranged from average to very good, with no standard quality (Trade interviews 2004).

Carambola needed to be hand-harvested at the mature stage, i.e. with a yellow tinge over less than 25% of the fruit surface, or, for some cultivars, pale whitish-green. The fruit could be stored mature green for up to ten weeks at 10°C before allowing to ripen if wrapped in paraffin paper or netted socks for protection in foam lined cartons to avoid bruising the wings. (Diczbalis & McMahon 2004)

Pricing

Wholesale prices ranged from \$4–\$6/kg, reaching \$10 in the early season and \$6-8/kg at end of season.

Figure 3: Carambola prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service

Promotion

Carambola had been included in a retail chain exotic fruit promotional trial (Trade interviews).



Durian (*Durio zibethinus* Murr.)

The industry is based in the North Queensland coastal wet tropics region, producing around 50 tonnes of fruit a year, with some production in the Northern Territory. In 1998 there were 4,000 trees planted (Diczbalis 2004)

There was no evidence of substantial production growth, largely because of damage from cyclones and phytophthora, the long lead time before commercial production, and quality problems with fruit from the initial cultivars. (Diczbalis 2004)

Better cultivars have yellow to deep yellow arils with firm creamy texture; small seed, and flesh recovery of at least 30%. (Lim 1998)

Market

Almost all fresh durian is consumed locally in the production region. The national domestic market was based on frozen imports, estimated at up to 1,000 tonnes per year and growing. (Diczbalis 2004)

The market is mainly older ethnic Asian consumers who were accustomed to frozen durian. Demand for durian was established, but not growing strongly. There was good demand and a premium for fresh fruit in this ethnic Asian market.

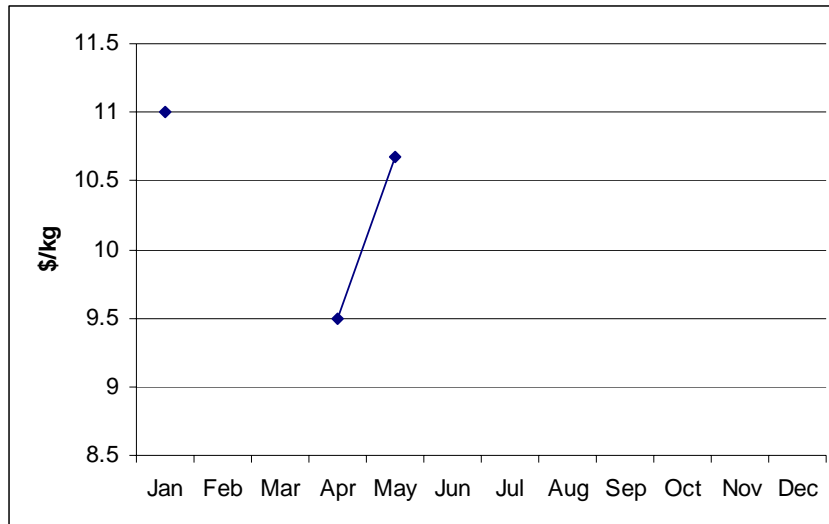
Younger ethnic Asians were less likely to eat durian, and promotion will be needed if current consumption volumes are to continue. (Trade interviews 2004)

Product

Durian's strong smell, large fruit size and difficulty to handle would limit mass market demand. (Market survey 2003) Fresh durian was considered better quality than frozen, and could be differentiated if supply warranted. Fresh product was not supplied in any significant commercial volumes to the major wholesale markets.

Pricing

Figure 4: Durian prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service



Guava (*Psidium guajava*)

Production

In 1995 Australia produced 200-400 tonnes of guava – 189 tonnes in NSW (mainly northern areas), 33 tonnes in Queensland (mostly southern areas) and 6 tonnes in the Northern Territory (around Darwin). In 2002, the Northern Territory industry produced 37 tonnes (Howell 2004).

Guava was particularly prone to insect damage, particularly from fruit fly, as well as bird damage and several diseases. (Coombs 1995)

Markets

The main market was ethnic Asian consumers who used white-fleshed guava for fresh eating. (Coombs 1995)

There was minor use of guava by chefs, e.g. hotel tropical breakfast platters, with potential to develop this segment.

A small market segment of sophisticated foodlovers used guava mainly for fresh eating, also for juice and fruit salads, and preferred pink-fleshed types.

Guava was considered a versatile fruit with good potential for developing the mass market.

Fresh eating was expected to remain the main use for guava, although the processing industry also used it in fruit drinks, juices and blends. There was interest in dual-purpose varieties.

Guava’s competitive advantages included excellent fragrance and flavour suited to fresh eating, and decorative segments. Consumers did not appear concerned at its high seed content.

Slow retail chain sales were attributed to lack of consumer knowledge on how to eat or prepare guava.

(Market survey 2003; Trade interviews 2004; Simpson et al 1995)

Supply

The market was undersupplied, with demand having exceeded production for some time, particularly for quality fruit.

A number of growers, including Northern Territory producers, and often Asian, supplied good quality white guava. Virtually all Northern Territory product was sold interstate in 2000–2.

A longer supply season for pink fleshed guava would enable market development through supermarkets.

(Trade interviews 2004)

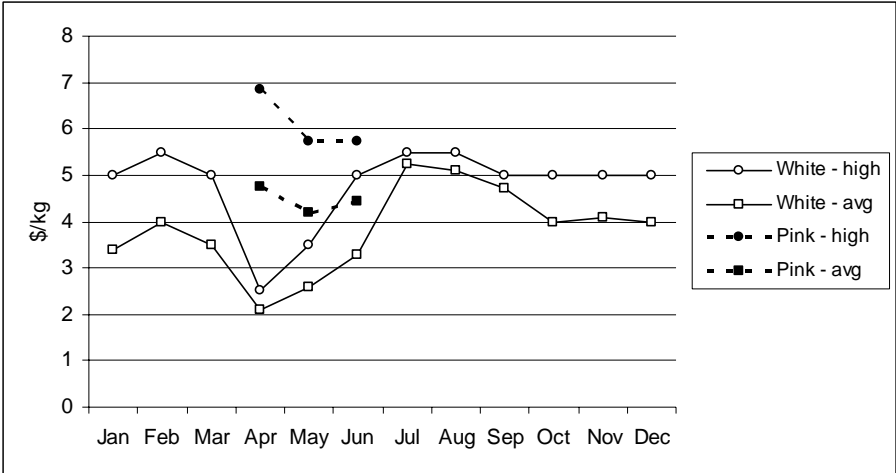
Product

The numerous guava cultivars ranged from bright yellow to cream to green in skin colour, with flesh colour varying from whitish-yellow to pink or red. The Australian industry was based on the red fleshed high acid types from Hawaii, which were used in processing, white dessert low acid types from Asia used mainly for fresh eating, and some newer dual-purpose types.

Quality ranged from high to low. Guava was a fragile fruit that bruised easily, so it needs to be packed and stored in reinforced small cartons or trays. Some producers were devaluing high quality fruit by bulk-packing. (Trade interviews 2004)

Pricing

Figure 5: Guava prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Produce, Cut Flowers & Foliage, 2003, Sydney Market Reporting Service*



Jackfruit (*Artocarpus heterophyllus*)

Production

The commercial industry is mostly in the Northern Territory, which produced 340 tonnes, valued at \$1.3 million, in 2002-3. North Queensland produced 150 tonnes worth \$450,000 the same year. (Diczbalis & McMahon 2004)

The Northern Territory produces the crunchy cultivars which the market preferred for fresh eating. The North Queensland industry was based on mainly soft-fleshed varieties, usually planted as windbreaks.

Around 25% of fruit was picked at the immature stage for use in cooking. Crunchy fleshed cultivars with good quality fruit were considered critical to market development, and the industry needed a better understanding of the correct stages for harvest. (Zappala 2004)

Markets

The market was almost exclusively ethnic Asian consumers in Sydney and Melbourne. They preferred “crunchy” jackfruit, used the flesh either ripe for fresh eating or green in cooked dishes, salads or chips, and bought it at Asian grocery stores which cut and sold the fruit as wedges. The seeds were also eaten boiled or roasted. This market was underdeveloped, with many stores seeking crunchy jackfruit. Jackfruit was considered a good eating fruit, and well accepted. Demand was steady for quality fruit, and expected to grow as production volumes increased and varieties improved. (Trade interviews 2004)

Jackfruit had been a slow to poor seller in retail chain stores, where it was undersold because it was sold as whole fruit which were too large and cumbersome for impromptu eating. New consumers will need to be educated on how to handle jackfruit. There may be potential for processors to break down the large fruit into portion size packs which would be more convenient and appealing than whole fruit, and to produce commercial pulp and dried flesh for chips.

Jackfruit was generally regarded as having some mass market potential, being a versatile fruit with an interesting flavour, and suited to fresh eating, juicing, cooking in curries and other uses.

The food service sector could be developed through promotion and education, with jackfruit having potential as a flavouring for ice-cream, as well as an ingredient for curries, desserts, and cakes. Jackfruit can also be used in tropical drinks and as a display centrepiece. (Market survey 2003)

Supply

Jackfruit was sold year round in large metropolitan markets. However, market development was being restricted by availability of supply, the fresh-eating segment in particular often being poorly supplied with inconsistent quality fruit. (Trade interviews 2004)

Product

Jackfruit size ranged from 5–30kg. The fruit contained an edible portion surrounded by inedible stringy segments high in latex.

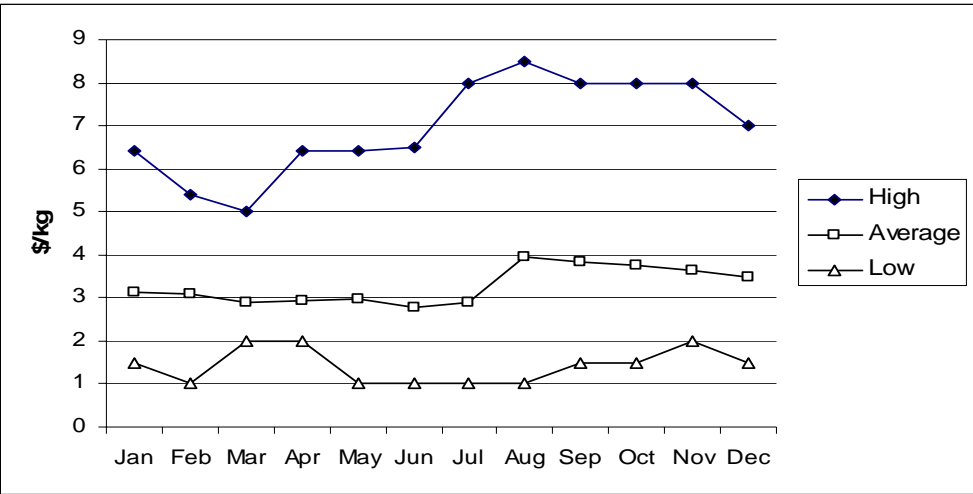
Cultivars were either soft or firm fleshed (“crunchy”), with flesh colour ranging from yellow to orange-pink. Some lines were excellent, and fruit from these growers sold easily. Most markets considered the crunchy cultivars with pink-orange flesh the best quality, with only an

ethnic Indian market segment willing to buy soft-fleshed fruit if the price was very low. Preferably, jackfruit needed to be tree-ripened, with light brownish-yellow skin, widely spaced skin segments and sweet aromatic odour, and giving a dull hollow sound when tapped. It was important that flesh quality and crunchiness be maintained as jackfruit broke down easily. The fruit could be stored up to 20 days in polyethylene bags at 12°C, with chilling injury likely below this temperature. It transported well by road freight, with no transport or logistics issues. (Diczbalis 2004)

Market development was being limited by the supply of quality fruit. Jackfruit was perceived as high risk from a quality perspective and the market prices dropped quickly if larger volumes arrived. (Trade interviews 2004)

Pricing

Figure 6: Jackfruit prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Produce, Cut Flowers & Foliage, 2003*, by Sydney Market Reporting Service

While retailers would pay \$7/kg for the firm type of jackfruit supplied from the Northern Territory, the only market for the soft type was ethnic Indians, with a price ceiling or around \$2/kg. (Trade interviews 2004)



Longan (*Dimocarpus longan*)

Longans were produced along the eastern coast of Queensland, and centred around Mareeba in Far North Queensland. Yields were biennial, with 2004 production between 300 to 500 tonnes, and expected to increase as existing plantings matured.

The fruit was affected by low levels of insect and fungi problems, but attracted flying foxes, and were laborious to pack to market requirements.

The main cultivars were *Kohala*, *Biew Kiew* and *Chompoo*. (Diczbalis and Campbell 2004)

Market

All of current longan production is consumed in the domestic market. This was almost exclusively by ethnic Vietnamese and Chinese, who use longans for fresh eating, in Asian style dishes, and as a prayer and offerings fruit. There are smaller segments of ethnic Indian, Malay, Sri Lankan, Filipino and Indonesian consumers.

Some Asian restaurants offered longans after seafoods and spicy foods, and some large hotels used them to individualise the standard tropical fruit platter. There was potential to develop the food service segment, particularly for fruit platters and buffets.

There was also potential to expand demand amongst a small segment of sophisticated and adventurous consumers and Asian food lovers who buy longans, and noted it had good colour and presentation; a sweet and refreshing taste; convenient size and was easy to eat. Longans were considered unlikely to become a mainstream fruit.

Market growth was being limited by a lack of consumer awareness and knowledge of how to use the fruit, unappealing appearance, variable appeal of flavour, relatively high prices and consumer reluctance to try unfamiliar fruits. Some supermarkets and specialist stores observed consumers would buy longans after being given a tasting. It was suggested longans be introduced to new markets by pairing them with other popular fruits. Many Australian retailers considered longans too risky to handle due to the low demand and high fruit wastage. (Noller 2000a; Market survey 2003)

Exports were no longer viable due to overseas competitors supplying the counter seasonal window that had existed for Australian longans through manipulating the fruiting season of their crops. Emerging disinfection technology may open new phytosanitary markets.

Supply

Volumes have fluctuated because of longan's biennial yield, while the supply season has been extended by crop manipulation with potassium chlorate, and by imports. (Diczbalis 2004)

Agents would prefer a coordinated supply to allow development of new markets and to fill large orders. Retailers have not been able to develop longan as a retail line because of unpredictable supply. (Trade interviews 2004)

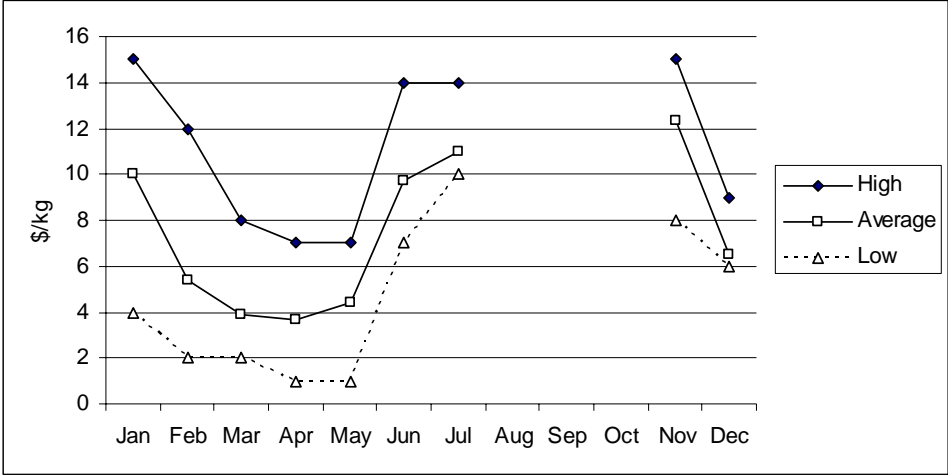
Product

Longans were usually marketed as small panicles, and occasionally as full bunches. Asian consumers preferred large ripe fruit with fresh, clean, light-coloured skin preferably with a green tinge; small seed; texture that was firm, crunchy, juicy, even watery; and good flavour and sweetness. They paid premium prices for *Biew Kiew*, *Chompoo* and *Haew*, while fruit that was small with darkly coloured or blemished skin was very difficult to sell.

Fruit was packed in cartons or open-weave plastic baskets, with post-harvest treatments including sulfur dioxide used to maintain fruit quality and prolong shelf life. (Noller 2000a)

Pricing

Figure 7: Longan prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Produce, Cut Flowers & Foliage, 2003*, by Sydney Market Reporting Service

The market paid higher prices for preferred cultivars, with loose fruit in bulkpacks often sold as low quality.

In 2000, while retail prices in the ethnic Asian market were typically around \$10/kg, prices in the retail chain stores that sold longans were usually around \$20/kg - the higher prices intended to compensate for the high shrinkage that resulted from low mass market consumer demand.

Uncoordinated supply resulted in variable pricing, e.g. the arrival of large volumes in this limited marketplace dropped the wholesale price to around \$3/kg, and “killed the market”. High prices and erratic prices were major constraints to market development, particularly by retail chains that sought to use “everyday low prices” to attract new consumers. (Noller 2000a)

Promotion

Longans were virtually unknown in the mass market, with little point of sale material being used. Retailers had found taste testing and product demonstrations generated sales of longans in ethnic and non-ethnic locations, and recommended point of sale material and media promotions for developing consumer awareness. (Noller 2000a)



Mangosteen (*Garcinia mangostana* L.)

Production

The mangosteen industry was mainly located in North Queensland's Wet Tropics region. While there were some plantings in the Northern Territory, the drier climate was less suitable.

(Downton & Chacko 1998)

Production was 100 tonnes in 2003, valued at approximately \$1 million, and was expected to reach 300 tonnes by 2008 as current plantings matured.

Mangosteen trees were resistant to cyclones, and subject to low levels of pest and disease. However, the fruit had a particularly long juvenile growth phase (around ten years before reaching commercial harvest), required intensive labour to pick every day during harvest, and was prone to predators such as rats and flying foxes, and damage from Gamboge, a condition (probably physiological) that affected the fruit flesh.

Mangosteen plantings lack genetic variation, and the industry was based on one variety. (Zappala 2004)

Markets

The main market was ethnic Asian consumers in Sydney and Melbourne, who knew mangosteen well and used it for fresh-eating, and preferred large fruit (Trade interviews 2004).

Mangosteen also had a small market of mainly sophisticated and adventurous consumers (often well educated with good incomes) and people who liked Asian foods. Mangosteen's appeal was based on a unique and excellent flavour; decorative colour and appearance which creates interest in buyers; its readiness to eat, and its exoticness. This market were most likely to use mangosteen for fresh eating and fruit platters.

Awareness of mangosteens was very low in the mass market and consumers did not understand how to peel and eat it, and often confused "mangosteen" and "mango". There was potential to develop the mass market in the long term using education and promotion, although mangosteen was not expected to become a mainstream fruit.

Mangosteen was considered very good eating with excellent flavour, and appreciated for its unusual appearance.

A small food service segment, mainly hotel chefs and caterers, used mangosteen mainly as a fresh fruit, to decorate displays and buffets. Mangosteen had numerous potential applications in this market due to its presentability and flavour. It was recommended the industry seek a foothold into better restaurants that promoted and used exotic fruits in order to begin to develop the mass market.

(Market survey 2003)

Supply

Market development was being constrained by lack of availability of fruit, with supply inconsistent and inadequate, and affected by biennial fluctuation in fruit volumes. Fruit volumes were insufficient for supermarkets to introduce mangosteen. (Trade interviews 2004)

Thai fruit was sold in Australia in 2004, with variable quality. (Zappala 2004)

Product

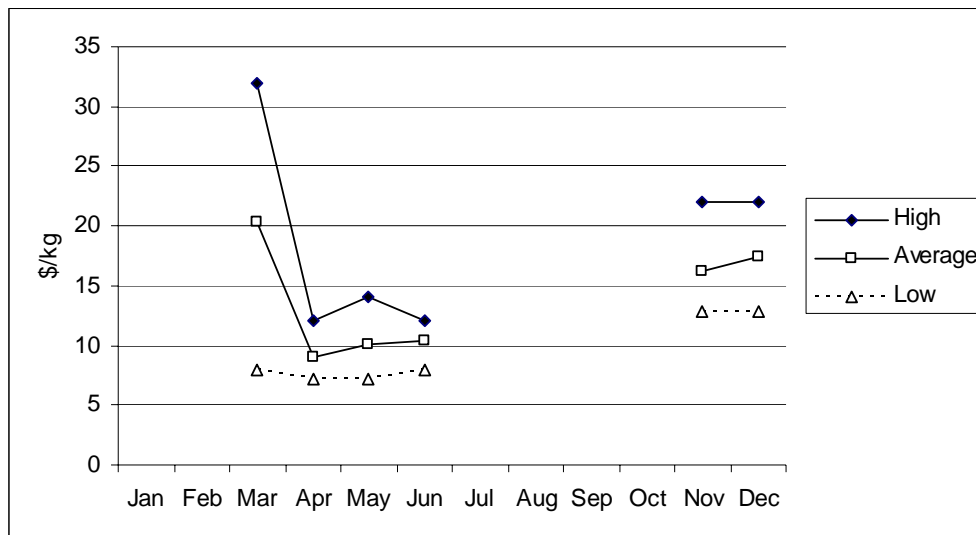
Mangosteen was considered a risky fruit by retailers and wholesalers, but with considerable potential if the industry could “get it right”. Quality in the market ranged from average to very good, with fruit quality being affected by bruising (mangosteen required careful handling), Gamboge, and lack of grading. Quality was higher where fruit had been graded, particularly by grower groups. Nevertheless, demand was such that retailers and retail chains were prepared to tolerate blemish rather than forgo supply. As a result, some growers supplied poor or inconsistent quality product to get a share of higher prices. Consumers and retailers needed to be educated on how to handle and store mangosteen.

Packaging was usually in punnets. Current presentation was considered unlikely to appeal to the mass market and retail chains would require better packaging if they were to promote mangosteens.

(Trade interviews 2004)

Pricing

Figure 8: Mangosteen prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service

High prices had been prohibitive to market development, particularly where quality is variable. As wholesalers are unable to do much to prepare the market for increasing seasonal volumes for minor crops, prices tend to drop to enable the fruit to move. However, prices were expected to stabilise as mangosteen became better known, because of its ready appeal to consumers.

(Trade interviews 2004)

Promotion

Some producers had supplied promotional leaflets. It was considered the industry would need to use market research and promotion to educate the market about the fruit and its availability and affordability. Retailers needed to provide more creative displays, including cutting fruit to show it at its best, as the outer presentation was very different from the interior. (Market survey 2003)



Pitaya or pitayaha (*Hylocerus spp.*)

(also called “Dragonfruit”)

Production

The main production areas for pitaya are the Northern Territory, North and Central Queensland, and northern New South Wales. While production has been dominated by one large grower, a number of regional industries are currently being established.

Production was more than 80 tonnes in 2002-3 and is predicted to expand rapidly as new plantings mature (pitaya produces a commercial crop within three years), with North Queensland’s new industry likely to produce around 500 tonnes by 2006.

Production was mixed between red and white-fleshed types. The white fleshed *Hylocereus Undataus*, with medium sized fruit, rounded shape, and only a few “leaves”, was the traditional variety grown in South-East Asia. The red fleshed type, with large fruit and more “leaves”, was better known in Europe, where it was also called “strawberry pear”. A yellow-skinned white-fleshed type being trialled was expected to give smaller sweeter fruit with stronger flavour.

Pitaya was simple and inexpensive to propagate, with almost no pests or diseases, although bacterial attack, e.g. stem canker could occur, particularly in humid conditions.

(Onley et al 2005)

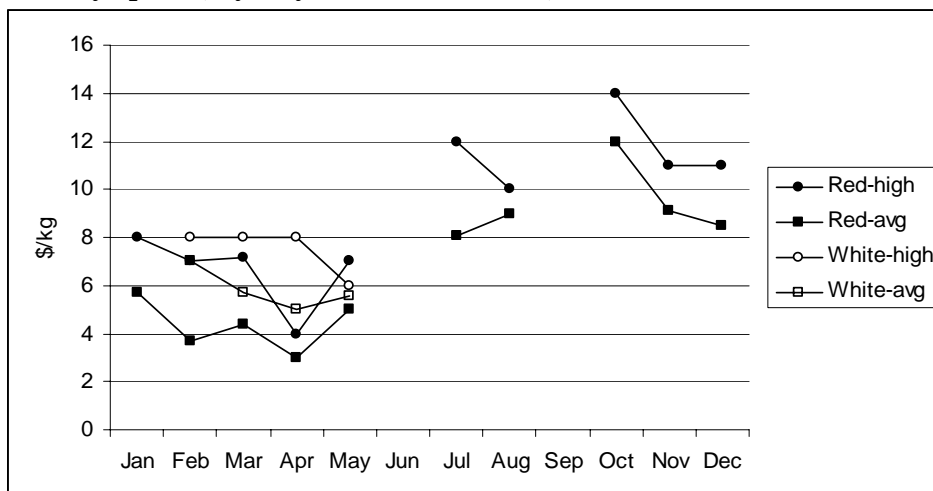
Markets

The main market was a small but growing ethnic Asian segment with strong demand, located in Sydney and Melbourne. These consumers used pitaya for gifts and offerings, traditionally ate white-fleshed pitaya and preferred large fruit. A small ethnic South American market and an emerging wider segment preferred red-fleshed pitaya. Overall market preference was for white-fleshed fruit because of inconsistent market performance of red-fleshed types with regards to shelf life and quality, although supermarkets were also seeking red-fleshed cultivars in smaller sizes. Consumers and chefs considered pitaya an attractive display fruit and good eating. However, overall market potential for pitaya was regarded as limited over the next five years.

(Onley et al 2005; Market survey 2003; Trade interviews 2004)

Pricing

Figure 9: Pitaya prices, Sydney Wholesale Market, 2003



Declining wholesale prices were likely to continue as supply increases from new growers and the rapid expansion of plantings.

Product

While pitaya will ripen slightly if picked at the stage of colour change, some fruit was being picked too green and, while the skin turned red, its flesh remained immature.

Shelf life was up to two weeks with proper post-harvest and storage at 10-12°C. Air-conditioning caused pitaya's thin skin to dehydrate and develop a wrinkled appearance. (Trade interviews 2004)

Promotion

The only promotion was very limited and based on point of sale material. One major retailer had included pitaya in its staff training. (Trade interviews 2004)



Pomelo (*Citrus grandis*)

Production

This tropical citrus industry in Australia is based mainly in Queensland, with minor production in the Northern Territory. Production was 300 tonnes in 2002-3, with a market value of \$900,000, and was increasing.

Pomelo is native to South East Asia. The Australian industry grows both white and red-fleshed cultivars. Fruit size can be up to 6kg. (Diczbalis & McMahon 2004)

Markets

The main market was ethnic Asian consumers, who used pomelo for fresh eating, such as a 'family' eating fruit with a meal, juice, and as a prayer fruit and gift, and preferred sweet varieties. It was a popular fruit due to its size and lower price per kilo, and the market had potential to continue growing. (Market survey 2003)

Pomelo was not considered very exotic (which translates as less difficult to market, handle, etc.) (Trade interviews 2004).

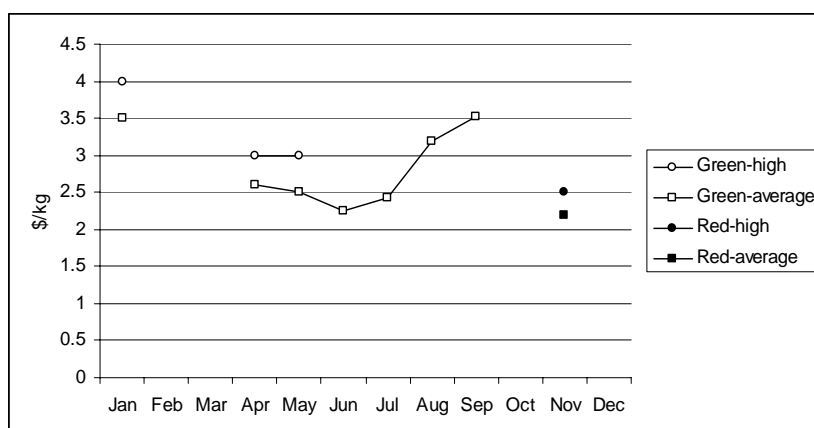
Product

Pomelo quality was considered average to good, but variable across different growers, and some fruit needed to be cleaner. Better skin colour was likely to increase its market appeal. (Trade interviews 2004)

Although pomelo's pith and seeds were considered more manageable than for grapefruit, it was considered a bulky fruit with significant wastage from the thick pith (Market survey 2004).

Pricing

Figure 10: Pomelo prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service



Rambutan (*Nephelium lappaceum*)

The rambutan industry is located in tropical coastal areas of the Northern Territory and Northern Queensland. From 2000-4, Queensland production ranged from 700-1,000 tonnes, with a market value of \$4–6 million, and was predicted to reach 1,700 tonnes by 2007, as a result of continuing new plantings, maturing of current plantings, and demand from expanding exports.

Over the same period the Northern Territory production was 67–91 tonnes. (Horsburgh et al 2002; Howell 2004)

The industry was based on red-skinned cultivars preferred in South-East Asian countries, e.g. *Jitlee*, *R134*, *Bingi*, *R156 Red*, *R162* and *R167* (the “Classic Red” group), with minor volumes of *Rongrien*, *R9* (variegated pink and yellow skin and spinterns), and *156 Yellow*. (Horsburgh et al, 2002).

Markets

The domestic market was around 1,000 tonnes, with rambutans sold in all major cities. A large proportion of product was exported to Japan. (Onley et al 2005)

Rambutan was one of the leading exotic fruits to have taken off in the market, with high market acceptance and likelihood of continuing growth.

Its main markets were ethnic Vietnamese and Chinese, who used rambutan as a fresh snack, palate cleanser, Chinese New Year altar fruit, and gift, with small market segments of ethnic Malay, Sri Lankan, Filipino and Indonesian consumers. Fresh rambutan competed with canned in these markets.

There was a small market outside of these ethnic segments, often introduced to rambutans when travelling, which bought very small quantities, usually to decorate desserts and displays, but this demand was limited by relatively high prices.

There was also a small food service market. Some Asian restaurants offered rambutans, while some large tourist hotels used them to individualise the standard breakfast fruit buffet. One Sydney restaurant used rambutans in desserts and fruit platters and several North Queensland restaurants used them to garnish meals. The food service market was considered a more likely prospect than the mass market.

Retail chain sales of rambutans targeted at the mass market were slow, due to low consumer awareness - most consumers were either unaware of rambutans or did not know how to peel or eat them. (Market survey 2003)

Opinions varied on whether rambutan had mass market potential as an exotic (similar to lychees) or was likely to remain a decorative rather than mainstream eating fruit or ingredient.

Rambutan had a number of competitive advantages in that it was visually appealing with attractive skin colour and decorative appearance; was usually presented well; was good eating with a sweet and refreshing flavour; resisted bruising; was conveniently small in size; was not messy to eat; and the large seed posed little risk to children. But it was harder to peel and de-seed than competing fruits, and its appearance deteriorated rapidly with handling and dehydration.

There was little prospect for processing because of rambutan's delicate flavour and because its outer appearance was its main selling point.
(Noller, 2000b; Onley et al 2004; Market survey 2003)

Supply

Despite rambutan's long supply season, erratic supply has hampered wholesale agents' ability to handle and promote rambutan. Better co-ordination, together with a supply forecast, would reduce price competition and channel saturation and conflict, and enable distributors to provide market feedback to growers. Also, more regular supply, with a continuous availability of reasonable volumes of fruit every week, would enable development of a retail line.

Export supply during peak season has also been constrained by the availability of air freight capacity. (Trade interviews 2004)

Product

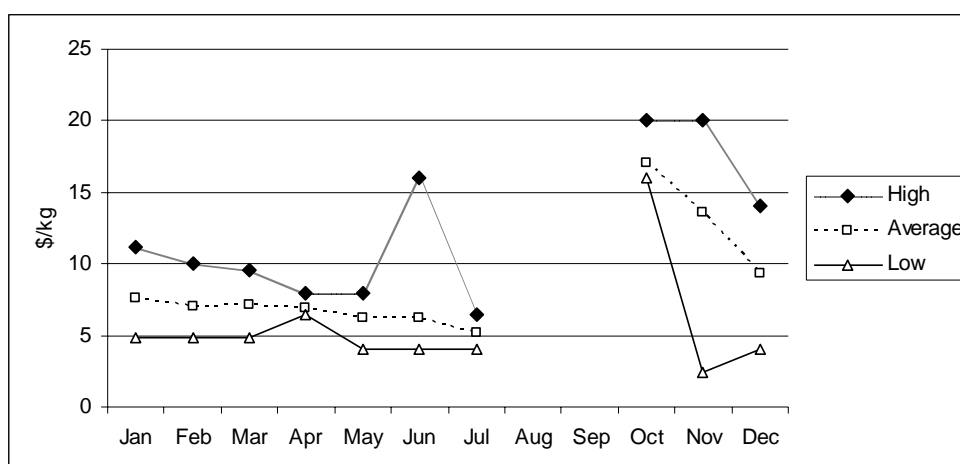
The Asian market sought large fruit with rounded symmetrical shape, fresh bright colour, small seed and good flavour, and preferred fruit with thin red rind and spinterns, as in the Classic Red group, over variegated cultivars. (Noller, 2000b)

Quality from producer groups was usually good to very good, with appropriate grading, and post-harvest standards, although national quality and grading standards were needed. Rambutans with blackened rind and spinterns were major problems for retailers and hotels, and education on cool storage and handling was recommended for retailers, chefs and consumers. (Market survey 2003)

Rambutans were packed in trays, bulk boxes or punnets of 750g and 250g. These smaller containers were used to maintain fruit freshness. Retail chains would require good packaging to develop new markets. (Trade interviews 2004)

Pricing

Figure 11: Rambutan prices, Sydney Wholesale Markets 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service

Promotion

Consumers needed to be educated about rambutans, how to use them, their availability and affordability. Point of sale literature, media promotion, labelling, storage and handling information and samples to consumers and chefs were recommended, timed to coincide with supply. (Market survey 2003)



Soursop (*Annona muricata*)

Market

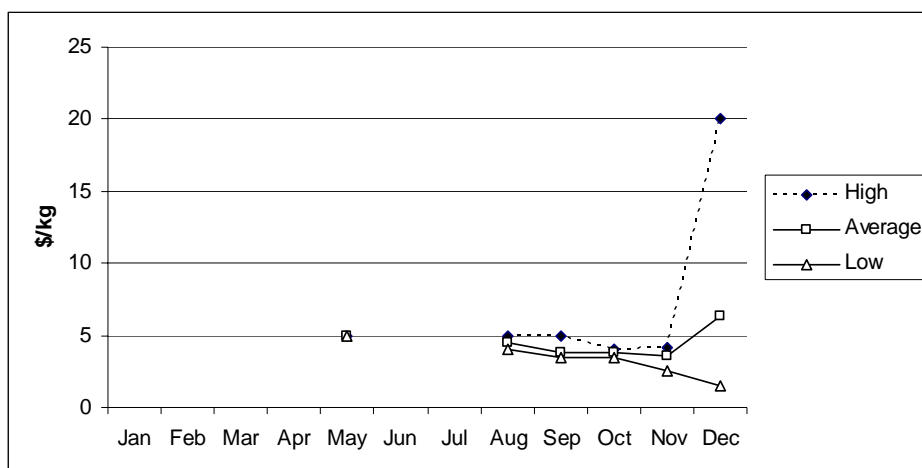
Demand for soursop was strong around Chinese New Year, when soursop was used as an altar fruit, but lower for the rest of the year. The market saw limited uses for soursop, and while there was some potential for market growth, this was unlikely to be significant in the foreseeable future. (Market survey 2003)

Product

Quality of supply has been variable, especially harvest maturity and shelf life. Soursop is fragile when ripe, and browns easily. (Trade interviews 2004)

Pricing

Figure 12: Soursop prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2003*, by Sydney Market Reporting Service



Star apple (*Chrysophyllum cainito*)

Production

The Star apple industry was located in the Northern Territory and along the Queensland coast. Production was 50 tonnes in 2003, and predicted to reach 100 tonnes by 2008. The main production hurdles were trees overbearing and producing small fruit, and attack from fruit fly, flying foxes, birds, rats and various insects. (Zappala 2004)

The main cultivars grown were *Haitian* and *Grimal*. (Goebel 1995)

Market

The main market was ethnic Filipino consumers shopping in supermarkets in Sydney and Brisbane. The fruit was mainly eaten fresh, i.e. cut around the equator, seeds removed and pulp spooned out (to avoid the latex), although the pulp froze well. There was an opportunity to increase consumption through promotion in supermarkets, as the fruit was tasty and attractive. Market development would depend on more consistent supply, good varieties and better fruit size. (Market survey 2003; Trade interviews 2004)

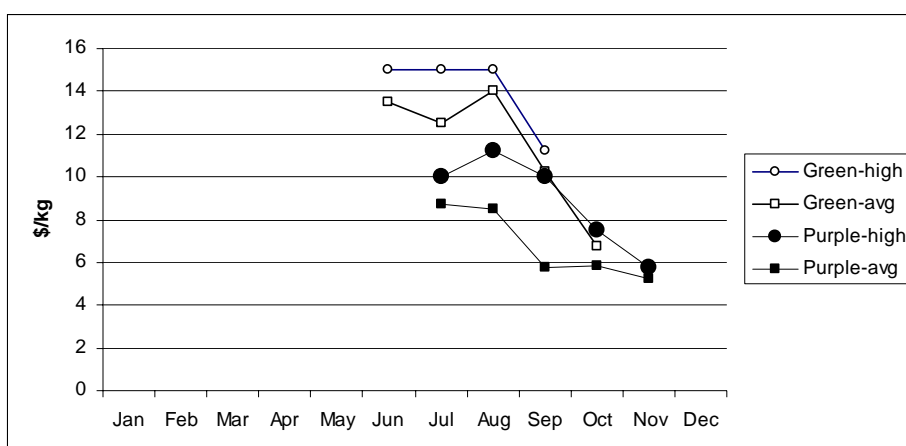
Product

Star apple needed to be picked at full maturity when the latex content of the outer skin was lowest, and with full colour. (Goebel 1995)

Quality was average to good, with appearance affected by scarring, blemishes and small sized fruit. While the market considered the green variety better eating than the purple, green star apple were more difficult to sell in Melbourne, and were often blemished, e.g. from tree rub. Star apples were transported satisfactorily by road freight, and had a one-week shelf life. Recommended packaging was in single layer trays with a soft insert for individual fruits. Waxing improved the fruit appearance and extended shelf life for up to three weeks in cool high-humidity storage conditions. (Trade interviews 2004)

Pricing

Figure 13: Star apple prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2002*, by Sydney Market Reporting Service

Promotion

Star apple was included in a 2003 exotic fruits promotion. (Trade interviews 2004)



Taro (*Colocasia esculenta*)

Production

The taro industry was located mainly in the North Queensland wet tropic coastal regions, with emerging production on the Atherton Tablelands, and in Darwin, central and southern Queensland and northern New South Wales. Production was approximately 1,000 tonnes in 2002, with a market value of approximately \$3.5 million.

The industry has been based on large corm cultivars *Bunlong* (*Colocasia esculenta*) with white flesh and purple flecks that is soft when cooked; *Pink Samoan* types which had white flesh, pink flecks and firmer texture; and *Taro Niue*. The production of small corm Japanese taro (*Colocasia esculenta* var. *Antiquorum*) is also being developed.

Production was expected to expand because of new growers, attractive prices, demand exceeding supply, opportunities for import replacement, and a taro chip factory being developed in North Queensland. Although taro was easy to propagate and tolerated a range of climates, labour-intensive production, lack of mechanisation, and high water requirements could constrain growth. (Daniells et al 2004; Petinaud 2002)

Seasonality

While taro could be harvested year-round in tropical regions, corm growth was slower and volumes smaller during winter. (Petinaud, 2002)

Markets

The main ethnic Asian market preferred *Bunlong*, while ethnic Pacific Islanders sought *Pink Samoan*. While there were other small market segments, taro had not developed a place in the mass market. (Daniells et al 2004)

Supply

The market has been undersupplied, particularly in winter months, and wholesalers were seeking consistent supply and quality. Approximately 3,000 tonnes a year of fresh taro were

imported, and fumigated - mostly Pink Samoan and Taro Nieu from Fiji, as well as frozen peeled taro from countries that included Thailand, Malaysia, Fiji and China. (Daniells et al 2004)

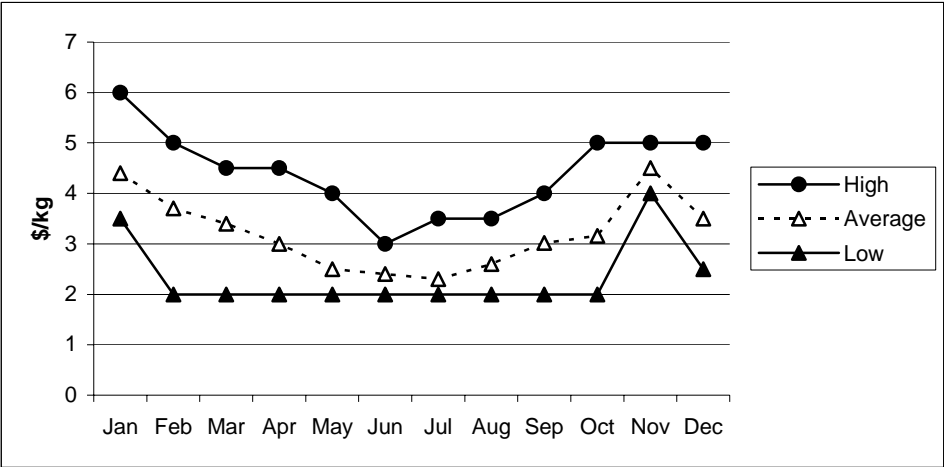
The market has potential to grow further and to date there has been no significant over-supply problems, except in marginal periods where poor quality product was in strong supply.

Product

Taro was a sturdy vegetable with good shelf life and transported well. However, there are no grading standards for taro, and some of the product sent to market is not cleaned properly or has cuts and damage from harvesting. (Wedding and O’Keefe 2002-3)

Pricing

Figure 14: Taro prices, Sydney Wholesale Markets, 2003



Source: *The Sydney Market Yearly Prices for Fresh Fruit & Vegetables, Cut Flowers & Foliage for the year 2002*, by Sydney Market Reporting Service

Glossary

Exotic tropical fruits and vegetables – fruits and vegetables normally grown in tropical latitude zones of the world that are not indigenous to the country of production and are not well known to the general consuming public (Diczbalis, 2005).

Product category - a set of products, which together result in greater value for buyers than if they were to be purchased separately (Europa 2005).

Category management - the process of developing market-based systems to manage product categories and as a result, maximise customer value and business profits (Europa 2005).

Supply chain - a strategic collaboration of organisations for the purpose of meeting specific market objectives over the long term and for the mutual benefit of all links in the chain (Newton 2000).

Supply chain concept - an integrated approach that aims to satisfy the expectations of consumers through continual improvement of processes and relationships that support the efficient development and flow of products and services from producer to consumer. Supply chain alliances can be either horizontal, such as producer associations, or vertical, between parties and collective groups at different levels. The united chain becomes a competitive entity. (Gifford et al 1998, p10)

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