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**Rural Industries Research and  
Development Corporation**

# **Northern Territory Tropical Fruits Industry – *Market Opportunities***

**A report for the Rural Industries Research and Development Corporation**

by Hudson Howells

July 2004

RIRDC Publication No 04/105  
RIRDC Project No HUD-1A

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ISBN 1 74151 014 7  
ISSN 1440-6845

*Northern Territory Tropical Fruits Industry–Market Opportunities*  
*Publication No. 04/105*  
*Project No. HUD-1A*

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Published in July 2004  
Printed by Union Offset Printing

# Foreword

This publication examines the value chain for the Northern Territory Tropical Fruits Industry. The study was limited to rambutan, dragon fruit (pitaya), guava, hog plum, star apple, jackfruit and taro produced in the Darwin, Katherine and Kununurra areas for the Melbourne, Sydney and Brisbane markets.

The value chain is the sequence of activities from the farm gate to the consumer. The objective of the study was to quantify the costs and margins associated with each link and to determine opportunities for reduced costs and improved service quality. The consumers included retail and its associated customers, food service and food manufacturers. The study did not include any primary research with retail customers.

In summary, the study outcomes are:

- The value chain mapped for the designated tropical fruits.
- A documented understanding of the value chain.
- Opportunities for cost reductions and enhanced service quality.
- Recommendations for improvements to the value chain.

This project was funded from RIRDC Core Funds which are provided by the Australian Government. The project also received in-kind support from the Northern Territory Government Department of Business, Industry and Resource Development.

This report is an addition to RIRDC's diverse range of over 1000 research publications and 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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# Acknowledgments

The significant input of the staff of the Northern Territory Government's Department of Business, Industry and Resource Development, especially Ms Gerry McMahon, is acknowledged.

RIRDC's financial support, which made this project possible, is greatly appreciated.

Finally, thanks to the tropical fruit growers, packers, transport companies, unloading agents, wholesalers, retailers and manufacturers who freely gave their time and input.

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## APPENDIX 2 - EAST COAST SURVEY QUESTIONNAIRE

# Executive Summary

This summary contains the main highlights of the report. Readers intending to examine the entire report should proceed directly to Section 1.

## *Introduction and Methodology*

In October 2003, Hudson Howells was engaged by the Rural Industries Research and Development Corporation (RIRDC) and the Northern Territory Department of Business, Industry and Resource Development (DBIRD) to undertake the *Market Opportunities for the Northern Territory Tropical Fruits Industry* study.

It was proposed that research be undertaken into the value chain for the Northern Territory Tropical Fruits Industry. The value chain is the sequence of activities from the farm gate to the consumer. The objective was to quantify the costs and margins associated with each link and to determine opportunities for reduced costs and improved service quality. The consumers included retail and its associated customers, food service and food manufacturers. The study did not include any primary research with retail customers.

The research was limited to rambutan, dragon fruit (pitaya), guava, hog plum, star apple, jackfruit and taro produced in the Darwin, Katherine and Kununurra areas for the Melbourne, Sydney and Brisbane markets.

While this study was limited to the varieties nominated above, commonalities between the mapped value chain have been identified for translation to other varieties of tropical fruit. Indeed, a focus of this study was to identify principles that could be transferred to other varieties. It was also envisaged that the research undertaken in the Sydney, Melbourne and Brisbane markets would be used to identify opportunities for new varieties of tropical fruit.

In summary, the study outcomes are:

- The value chain mapped for the designated tropical fruits.
- A documented understanding of the value chain.
- Opportunities for cost reductions and enhanced service quality.
- Recommendations for improvements to the value chain.

At the commencement of the project, the consultants undertook a review of existing research and reports. The research/consultation stage then commenced. Research/consultation targets included:

- Growers (Darwin, Katherine, Kununurra).
- Packers (Darwin).
- Freight Handlers - Logistics (Darwin).
- Wholesalers/Retailers/Food Service/Food Manufacturers (Melbourne, Sydney Brisbane).

Research was undertaken by a combination of face-to-face and e-mail/telephone surveys. Face-to-face interviews were undertaken in Melbourne, Sydney and Brisbane.

The research findings were then analysed and interpreted and the findings are documented in this report.

### ***Summary of the Study Findings - Growers***

14% of growers claimed to fully understand the concept of supply chains, with 58% claiming to have a reasonable understanding and 28% with either a little understanding or no idea. This finding suggests scope for the development of a much greater understanding of the supply chain by industry participants.

In terms of actual supply chain behaviour, most growers stated that they have developed strong relationships with one or two businesses in the supply chain, typically the packhouse and the transport company but not the wholesaler/agent. This was reinforced during the consultation with the wholesalers/agents who frequently stated that they would like to develop better and stronger relationships with the growers.

Just over half (57%) of the growers surveyed claimed to be either fully advanced (7%) or reasonably advanced (50%) in terms of their major supply chain. The remaining 43% claimed to be either not very advanced (36%) or not advanced at all (7%). This finding is consistent with the feedback received during the wholesaler consultation process as outlined later in this report.

Growers rate themselves most highly in the areas of seeking feedback from customers, looking at new or improved ways of doing business and quickly responding to customer demands. They rate themselves as poor performers in the areas of the utilisation of e-commerce and the supply chain reporting system.

Currently, the majority of fruit (75%) is sold to interstate markets while 16% is sold locally and 9% is sold to export markets. Over the next five years, it is projected that 61% of fruit will be sold to interstate markets while 12% will be sold locally and exports will increase from 9% to 27%.

### ***Summary of the Study Findings - Wholesalers/Retailers***

All wholesalers and retailers consulted in the three markets considered that they had at least a 'reasonable understanding' of the supply chain concept with the majority (67%) believing that they 'fully understand' the concept.

Consultation with the wholesalers/agents and retailers highlighted that few strong relationships have been developed and that they would like to develop better and stronger relationships with the growers.

All wholesalers and retailers were confident that their businesses had well advanced supply chains with the majority (75%) believing that they had fully advanced supply chains.

Key issues from the wholesalers' and retailers' perspectives are:

- Relationships are not well structured and are lacking in formal agreements.
- The use of e-commerce along the supply chain is very low.
- The supply chain does not necessarily reflect feedback from customers.
- There is scope for improvement in supply chain reporting and training.

Few companies consulted could accurately provide volume data (current and forecast) and those that did amounted to small volumes.

The most important product attributes that wholesalers and retailers are looking for from suppliers, and how they rated a selection of attributes, is summarised in the following table:

<b>Most Highly Sought After Tropical Fruit Attributes (What the Wholesalers &amp; Retailers are Seeking)</b>	<b>Most Lowly Rated Tropical Fruit Attributes (What the Wholesalers &amp; Retailers Perceive they are Getting)</b>
<ul style="list-style-type: none"> <li>• Taste</li> <li>• Flesh texture</li> <li>• On time delivery</li> <li>• Consistency of supply</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing support (however, this was not rated highly as a required attribute)</li> <li>• Origin (however, origin was the lowest rated desirable attribute)</li> <li>• On time delivery</li> <li>• Consistency of supply</li> </ul>

Therefore, in terms of strategic importance to meet wholesaler and retailer expectations, ‘consistency of supply’ and ‘on time delivery’ are the priority issues for grower attention (as marketing support and origin were not rated by wholesalers and retailers as highly important attributes).

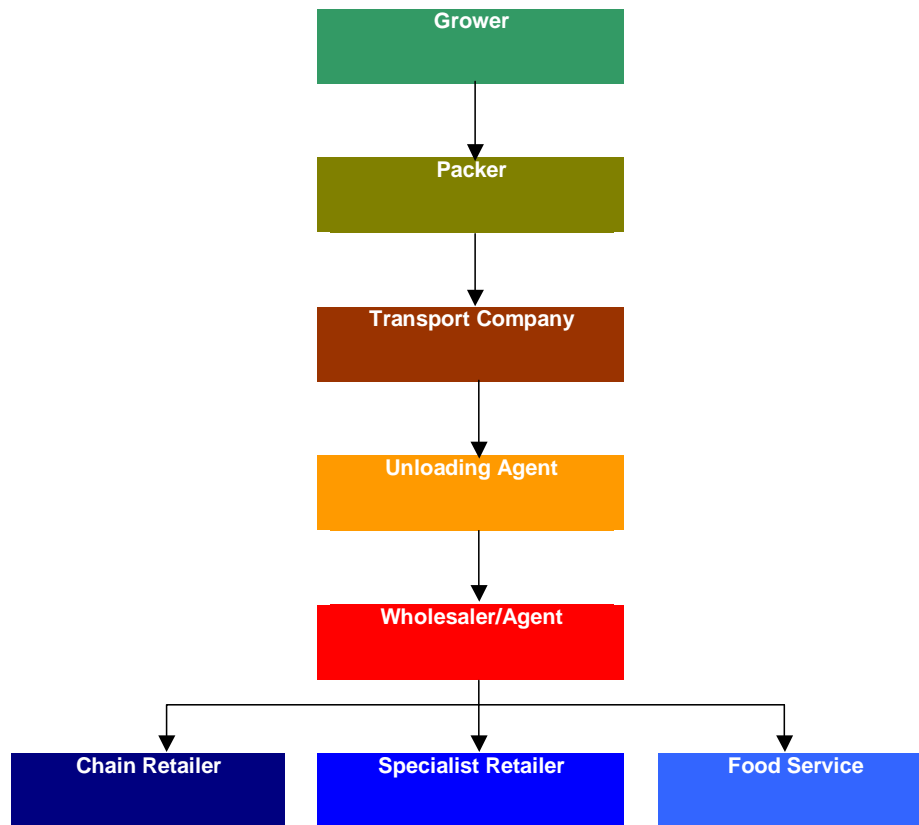
The question of unmet demand for tropical fruit other than that currently available was also raised. This seemed to be of little interest with far greater interest being expressed in the consistent availability of quality produce that is currently available.

***Understanding of the Value Chain***

The tropical fruits (and taro) that are the subject of this study are being produced in very small volumes. The majority of growers are ‘part-timers’ and therefore it is not surprising that the growers’ understanding of the value chain could be described as relatively limited. The research findings suggest that the growers have some understanding at the local (grower/packer) level but that this understanding diminishes the further along the value chain the product gets.

In comparison, the majority of wholesalers/agents claimed to have either a very good or at least a reasonable understanding of the supply chain. They are also keen to be more involved with the growers. It is not clear why the wholesalers/agents don’t take the initiative in this but it would appear to be in the best interests of the growers to develop better relationships. With this will come a better understanding of both buyer and end-user expectations.





***The Value Chain Map***

The above diagram illustrates a typical tropical fruits supply chain. Chain retailers include companies such as Coles and Woolworths. Specialist retailers include fruit and vegetables stores. Food service includes restaurants and cafes. Wholesalers will also sell to secondary wholesalers, who in turn sell to smaller retail buyers and providores who in turn supply the food service industry.

***The Grower – Wholesaler/Agent Relationship***

The information sourced during the buyer interviews held in Melbourne, Sydney and Brisbane suggests that the average wholesaler/agent mark-ups are around 15% in Melbourne and Sydney and slightly lower in Brisbane. The large chains such as Coles and Woolworths have a preference to deal with growers who produce larger volumes or alternatively with packers that consolidate produce from a number of growers. The wholesale markets tend to either set or influence prices.

The wholesalers/agents also argue that growers are better off dealing with them than dealing with the large retail chains. While this could simply be viewed as self-interest, there does appear to be a sound rationale. When dealing with a large retailer, all of the ‘eggs are in one basket’ and the retailer can set/manipulate the price. The retailers argue, of course, that it is in their best interests to set fair prices so that they get continuity of supply. The wholesalers/agents argue that, because they deal with a range of buyers, which includes large and small retailers and the food service industry, that they can seek out the best price for the produce.

The wholesalers/agents claim that all produce can be sold ‘at a price’ The factors affecting the price are seasonal availability, the availability of substitute products and of course consumer spending. In general terms, premium produce will bring a premium price but, unfortunately for the grower, there’s no guarantee that this will be the case. During periods of low availability, even average grade fruit can command high prices. Equally a glut of high quality fruit can mean that prices are depressed.

It would appear to be in the best interests of both the grower and the wholesaler/agent for a sound business relationship to be developed. This is particularly so because of the nature of the produce markets where there is a lack of transparency and the grower must have faith that the wholesaler/agent is acting in the grower's best interests.

### ***Opportunities for Cost Reduction***

During the study, opportunities for cost reduction were sought.

A number of wholesalers/agents suggested that growers should collaborate. This would appear to offer the following benefits:

- Consolidation of supply via networking should provide opportunities for cost reductions. For example, larger and better priced contracts could be negotiated with trucking companies.
- Networking could also provide opportunities for unit cost reductions through the consolidation of warehousing and packaging operations, joint marketing and joint purchasing (higher volumes may enable the negotiation of better supply prices).

The other opportunity is to investigate technologies that will extend the growing season. Fixed costs spread over a longer growing season will reduce the unit cost.

### ***Opportunities for Enhanced Service Quality***

During the study, opportunities for enhanced service quality were also sought. The following suggestions were made:

- Branding, grading and consistency of supply are sought in all markets. This can be achieved through networking and the bulking of supply.
- Pre-cooling of produce is essential to improve quality (reduce spoilage). Data-loggers should also be used during transport to monitor temperature and determine where the supply chain is breaking down.
- Better relationships and communication of produce requirements to transport companies should improve the supply chain.
- Produce leaflets and in-store distribution would improve customer knowledge and potentially boost sales.

There also appears to be a significant opportunity for the growers to 'add value' to the product and to receive higher prices for better graded produce that is packaged and labelled accordingly. An industry marketing network could take responsibility for developing and implementing such a strategy which might need a consolidated warehousing/packaging operation to ensure consistency of product, packaging and labelling.

Product information could also be supplied via the Internet with directions being included on packaging.

### ***Recommendations for Improvements to the Value Chain***

This study has quite clearly demonstrated that the tropical fruit growers in the Northern Territory are in the very early stages of the industry life-cycle and are suffering from the common problems associated with such industries including:

- Lack of critical mass and product volumes.
- Poor quality packaging and labelling.
- Poorly developed supply chain relationships and low levels of understanding of the supply chain beyond seeing the product to transport.
- Lack of supply chain documentation and instructions.
- Low levels of supply chain monitoring and reporting.
- Less efficient transport practices.
- Low use of e-commerce and associated efficiency benefits.
- Low levels of customer education and product support materials.

These issues, identified and confirmed via extensive consultation during this study, are not uncommon in other national horticultural sectors, especially those with similar structural characteristics. Unless corrective action is taken, such industries continue to suffer such problems and, in the face of increasing global competition, suffer declining profitability.

Typically, such industries maintain low levels of industry development unless there is intervention to bring about critical mass. This can occur, for example, via a large corporation with already established supply chain relationships entering the growing stage at the expense of existing growers or one or two growers having the ambition and resources to assume a dominant role in the industry. An alternative, and the major study recommendation, is for existing industry participants (a few or many, depending on levels of commitment) to partner for future growth and development. This could take the form of a simple Industry Network with committed growers, or the development of one or more formal partnerships capable of establishing consolidated operations (eg: packing and distribution). There could even be a transitional phase from Network to Partnership.

The benefits to the grower participants in such partnering will be to overcome the major supply chain and cost problems identified in this study including:

- Achievement of volume and critical mass for market purposes.
- Achievement of consistency of supply, especially to wholesalers/agents.
- Improvement in 'on-time-delivery'.

The subsequent improved market prices from such a strategy will increase the profit potential of participating businesses.

The critical issues to be address by the partners in such an initiative include:

- Branding – one consistently applied brand adhering to the key attributes of consistency of supply and on-time-delivery (this is what the market wants). It is outside of the scope of this study to determine a solution for branding but an option for consideration should include the development of a Northern Territory tropical fruits brand (umbrella brand) under which could sit category sub-brands (rambutan, jackfruit etc) and then the packhouse/grower sub-brands, for example, Northern Territory Tropical Fruits – Jackfruit – Tropitroy Fruits. The development and implementation of the brand strategy would require a high level of industry cooperation and commitment as well as funding.

- Packaging and labelling improvements including transport instructions, specifically addressing the packaging issues identified in this report. Packaging and labelling needs to reflect the market segment (eg food service, chain retailer, specialist retailer etc) that the product is aimed at. This also means that the quality of the product should be reflected by the quality and type of packaging, for example premium product in high quality punnets with appropriate labelling. Apart from reinforcing the product values, packaging/labelling can be used to inform and educate current and potential purchasers. This is particularly relevant with exotic produce which is not well understood by most of the population. Packaging can be used to provide preparation suggestions, details on how to get consumer information and so on. Growers and packers will need to develop strong relationships along the supply chain in order to ensure that packaging/labelling is matched to the requirements of the end user. It is further recommended that growers/packhouses work closely with DBIRD to undertake a series of visits to the Melbourne, Sydney and Brisbane markets in order to see first hand the issues that have been documented in this report and to further improve communications along the supply chain.
- Transport improvements including negotiation of back-door refrigerated transportation and simplified payment conditions to avoid existing difficulties with unloading agents. The findings of this study have reinforced the importance of developing strong relationships along the supply chain. It is recommended that growers/packhouses invest in the development of much better relationships with the companies that transport the produce. It is important to understand all facets of freight transport including, cool chain management, duration of journey, route, transshipment, mode, etc. The clear message is that shifting freight is much more than getting what might appear to be the best price. It is further recommended that growers/packhouses work closely with DBIRD to undertake a freight tracking study (using dataloggers) to determine exactly where breaks in the cool chain are occurring. The use of technologies to extend shelf life should also be explored.
- Relationship development, firstly via regular market visits as outlined above and client contact. During later stages, consideration could be given to more formal relationships such as supply chain vertical integration.
- Supply chain monitoring and reporting. This is a weakness throughout the supply chain. Again, it is suggested that this be addressed through the development of stronger grower/wholesaler relationships. A further option for consideration should be the establishment of a tropical fruits network portal. Reputable wholesalers could then be given access to the website to check on a range of attributes including quality of produce, expected dates for harvest etc.
- Produce pre-cooling. This is a major issue and it is recommended that growers/packhouses work closely with DBIRD to address pre-cooling as a matter of urgency. This is a subset of the cool chain management study noted above.
- Introduction of e-commerce. This would incorporate the network portal outlined above but would be extended to include ordering and payment of inputs as well as offering on-line ordering and payment to wholesalers/agents.
- Consumer education and product support materials. There would be significant cost advantages in the development and production of product support materials on a collaborative basis. This could include product information leaflets, recipe sheets, website, consumer information line etc.

It is therefore recommended that, driven by industry participants, an initial Tropical Fruits Network be established to consider and commence implementation of the findings of this study.

# 1. Introduction

## 1.1 Background

In October 2003, Hudson Howells was engaged by the Rural Industries Research and Development Corporation (RIRDC) and the Northern Territory Department of Business, Industry and Resource Development (DBIRD) to undertake the *Market Opportunities for the Northern Territory Tropical Fruits Industry* study.

## 1.2 Study Objectives

It was proposed that research be undertaken into the value chain for the Northern Territory Tropical Fruits Industry. The value chain is the sequence of activities from the farm gate to the consumer. The objective was to quantify the costs and margins associated with each link and to determine opportunities for reduced costs and improved service quality. The consumers included retail and its associated customers, food service and food manufacturers. The study did not include any primary research with retail customers.

The research was limited to rambutan, dragon fruit (pitaya), guava, hog plum, star apple, jackfruit and taro produced in the Darwin, Katherine and Kununurra areas for the Melbourne, Sydney and Brisbane markets.

Katherine was included because it has a different (less tropical and semi-arid) climate to Darwin. It also presents opportunities to extend the growing season for potential new fruits or vegetables. It was felt that both Katherine and Kununurra would provide contrasting perspectives to Darwin. The Darwin based industry is principally composed of smaller scale operations, supported by significant off farm incomes. By contrast Katherine and Kununurra regions are composed of professional, large scale commercial horticulture operations. It was also felt that Brisbane, which is largely serviced by Queensland growers, would provide a different perspective and contrast to the Melbourne and Sydney markets, as these are the key outlets for Northern Territory growers. The Queensland industry has a significantly larger base and is more commercially focused.

While this study was limited to the varieties nominated above, commonalities between the mapped value chain have been identified for translation to other varieties of tropical fruit. Indeed, a focus of this study was to identify principles that could be transferred to other varieties. It was also envisaged that the research undertaken in the Sydney, Melbourne and Brisbane markets would be used to identify opportunities for new varieties of tropical fruit.

In summary, the study outcomes are:

- The value chain mapped for the designated tropical fruits.
- A documented understanding of the value chain.
- Opportunities for cost reductions and enhanced service quality.
- Recommendations for improvements to the value chain.

## 2. Methodology

At the commencement of the project, the consultants undertook a review of existing research and reports. The research/consultation stage then commenced. Research/consultation targets included:

- Growers (Darwin, Katherine, Kununurra).
- Packers (Darwin).
- Freight Handlers – Logistics (Darwin).
- Wholesalers/Retailers/Food Service/Food Manufacturers (Melbourne, Sydney Brisbane).

The following table summarises the consultation undertaken during the study.

Category	Location	Number of Organisations Consulted
Growers	Darwin	12
	Katherine	1
	Kununurra	1
Wholesalers/Agents	Melbourne	6
	Sydney	6
	Brisbane	3
Retailers	Melbourne	1
	Sydney	1
	Brisbane	1
Transport Companies	Darwin	2
Unloading Agents	Melbourne	1
	Sydney	1
	Brisbane	1
Manufacturers	Melbourne	2

Research was undertaken by a combination of face-to-face and e-mail/telephone surveys. Face-to face interviews were undertaken in Melbourne, Sydney and Brisbane and were generally of a one to two hour duration. In terms of wholesaler/agent interviews, every effort was made in each market to identify and consult with those organisations dealing in tropical fruit.

The research findings were then analysed and interpreted and the findings are documented in this report.

### 3. Tropical Fruits Industry Background

This section of the report provides background information on the climate and growing conditions of the three regions included in this study:

- Darwin.
- Katherine.
- Kununurra.

#### *Darwin*

Darwin is situated in the north of the Northern Territory of Australia (Latitude 12°30' S, Longitude 130°50' E). The climate is described as the wet – dry Tropics. Temperatures in the wet season, October to April, range from 37°– 24° C. During the dry season, May to September, the temperature ranges from 32° – 15° C. Annual rainfall is 1658 mm.

#### *Average Monthly Temperatures, Rainfall, Relative Humidity and Evaporation in Darwin*

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Tot
Mean Max ° C	31.8	31.4	31.8	32.6	31.9	30.5	30.4	31.2	32.4	33.1	33.1	32.6	
Mean Min ° C	24.8	24.6	24.4	23.9	22.1	19.9	19.3	20.6	23.1	25.0	25.3	25.2	
Rainfall (mm)	414	345	309	101	20	1	1	6	17	72	143	229	1658
Humidity (9.00 am)	82	84	83	75	67	63	63	67	71	71	73	77	
Evaporation (mm)	200	170	185	215	225	210	225	235	245	260	245	230	2645

*Source: Horticulture Division, Department of Business, Industry & Resource Development, Darwin.*

Darwin soils are generally poor sandy loams with a shallow iron laterite pan in many areas. Water in the Darwin region is mainly from bores tapped into large underground water reserves. In most areas the water has a high iron content and variable calcium / magnesium levels, which can cause problems with irrigation systems and nutrition.

#### *Katherine*

The town of Katherine is found 300 km south of Darwin (Latitude 14°31' S, Longitude 132°27' E). The climate of the region is described as semi-arid tropical. It is characterised by an intense wet season occurring from December to March. The rest of the year is distinctively dry. The temperature varies between the wet season high of 40°C and temperatures as low as 4°C during the dry. Temperatures are considerably warmer with high humidity during the build up in October and November. The average rainfall is 1076 mm.

#### *Average Monthly Temperatures, Rainfall, Relative Humidity and Evaporation in Katherine*

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Tot
Mean Max ° C	34.9	34.1	34.4	34.3	32.2	30.4	30.6	32.5	35.9	37.7	37.4	36.1	
Mean Min ° C	24.3	24.0	23.0	20.9	16.8	14.0	12.9	14.7	20.2	24.0	24.7	24.6	
Rainfall (mm)	270	251	183	37	6	0	1	1	8	39	89	191	1076
Humidity (9.00 am)	80	83	79	70	64	60	58	54	56	58	66	74	
Evaporation (mm)	170	154	183	195	173	135	164	195	210	198	204	192	2173

*Source: Horticulture Division, Department of Business, Industry & Resource Development, Darwin.*

Katherine soils are generally clay loams, with some loamy sands and some alluvial red earths along the river banks. Water resources in the district are extensive and capable of supporting irrigated horticulture. Some properties pump water from rivers, while the remainder use bores. Ground water is contained within limestone basins, with high calcium bicarbonate levels that cause alkaline soil conditions to develop when used for irrigation.

## Kununurra

Kununurra is situated in the far north-eastern corner of Western Australia on the Ord River Irrigation scheme. (Latitude 15°42'S, Longitude 128°36'E). Kununurra is part of the seasonally wet - dry northern Australian semi arid tropics with an average annual rainfall of 787 mm.

### Average Monthly Temperatures, Rainfall, Relative Humidity and Evaporation on the Ord River Irrigation Area

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Tot
Mean Max ° C	36	35	35.5	35.1	32.7	30.5	30.5	32.9	35.8	38.5	38.9	37.8	
Mean Min ° C	24.4	24.2	23.4	20.7	17.9	15.3	14.1	15.5	19.0	22.8	24.5	24.8	
Rainfall (mm)	190.5	201.9	114.8	44.1	12.0	3.2	6.5	0.6	3.6	23.3	63.1	123.8	787
Humidity (9.00 am)	65	68.5	60.6	44.3	36.2	35.7	31.9	32.5	34.2	39.0	47.7	55.8	
Evaporation (mm)	230	176	195	217	211	203	209	241	294	330	287	275	2869

Source: Department of Agriculture Western Australia, Kununurra.

The wet season extends from early December to the end of March. The distinct long dry season extends from April until November. Temperatures rise sharply in October (beyond 40° C) while often the humidity is extremely low thus creating a very high vapour pressure deficit. Some rainfall occurs in October and November and these months are considered the build up to the wet season.

The soils include a deep sandy red earth known as Cockatoo sands. This soil type is characterised by a very low water holding capacity and very low nutrient status with a pH around 7.0 to 7.5. Levee sandy loam soils and alluvial soils are adjacent to the river system and these soils have good water holding capacity and an average pH between 6.5 to 7.5. The majority of the soils over the irrigation scheme are the black Kununurra clays and these have a pH ranging from 7.5 to 8.5.

Water resources in Kununurra are abundant and of excellent quality supplied from the Ord River Irrigation Scheme. Irrigation water pH is approximately 7.5.

The following tables show the fruit availability in Darwin and Kununurra. None of the fruit included in this study is currently available from Katherine. There are no commercial growers in Katherine, but one grower is planting pitaya. There are three growers in Kununurra who grow star apple, jackfruit and pitaya.

### Fruit Availability Darwin

Fruit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rambutan												
Pitaya												
Guava												
Hog plum												
Star apple												
Jackfruit												
Taro												

Source: Horticulture Division, Department of Business, Industry & Resource Development, Darwin.

### Fruit Availability Kununurra

Fruit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rambutan												
Pitaya												
Guava												
Hog plum												
Star apple												
Jackfruit												
Taro												

Source: Department of Agriculture Western Australia, Kununurra.



The following table shows total production available from the Darwin region over the period 1990 – 2002.

*Total Production (Tonnes) from the Darwin Region*

	1990 tonnes	1994 tonnes	1997 tonnes	2000 tonnes	2001 tonnes	2002 tonnes
<b>Rambutan</b>	26.5	75.573	85.0	91.1	67.0	81.18
<b>Pitaya</b>	*	*	*	2.03	39.63	40.30
<b>Guava</b>	*	13.0	68.2	37.65	31.39	37.68
<b>Hog plum</b>	*	0.5	7.16	38.81	67.20	52.32
<b>Star apple</b>	*	1.0	8.81	9.81	11.02	32.69
<b>Jackfruit</b>	44.6	47.4	57.87	140.25	314.99	337.83
<b>Taro</b>	*	2.0	N/A	88.71	86.96	47.60

Source: Economics Research Branch, Department of Business, Industry & Resource Development, Darwin.

Note: N/A = production figures were added to another commodity

\* = production figures were not recorded

The following table shows a breakdown of the amount of fruit marketed interstate, overseas and locally.

*Destination of Production from the Darwin Region (figures shown are % of total)*

Year	2000 %			2001 %			2002 %		
	Local	Interstate	O/S	Local	Interstate	O/S	Local	Interstate	O/S
Rambutan	27.5	50.2	22.3	52.2	29.9	17.9	14.0	70.2	15.8
Pitaya									
Guava		100			100			100	
Hog Plum	25.1	74.9		14.5	85.5		18.6	81.4	
Star Apple	15.3	84.7		13.6	86.4		4.6	95.4	
Jackfruit	25.7	74.3		5.7	94.3		5.4	94.6	
Taro		100			100			100	

Source: Economics Research Branch, Department of Business, Industry & Resource Development, Darwin.

Note: Rambutan is the only fruit exported overseas.

Production figures for pitaya do not distinguish between destinations.

The following table highlights the number of known growers and average planting areas in Darwin.

*Number of Known Growers and Average Planting Areas in Darwin*

Crop	Number of Known Growers	Average Planting Area (ha)
Rambutan	25	0.5 - 4
Pitaya	25	0.5 – 2.5
Guava	10	0.5
Hog Plum	6	0.5 – 1
Star Apple	2	0.5
Jackfruit	25	0.5 – 2
Taro	2	1

Source: Horticulture Division, Department of Business, Industry & Resource Development, Darwin.

Note: Some growers grow more than one commodity.

Most blocks of land range between 5 ha and 40 ha, but only a small percentage of each block is under production. The Northern Territory has regulations in place that allow only 50% clearing for production. Most tropical fruit growers have other crops such as mango, or supplement their income with other jobs.

# 4. Research and Consultation Findings

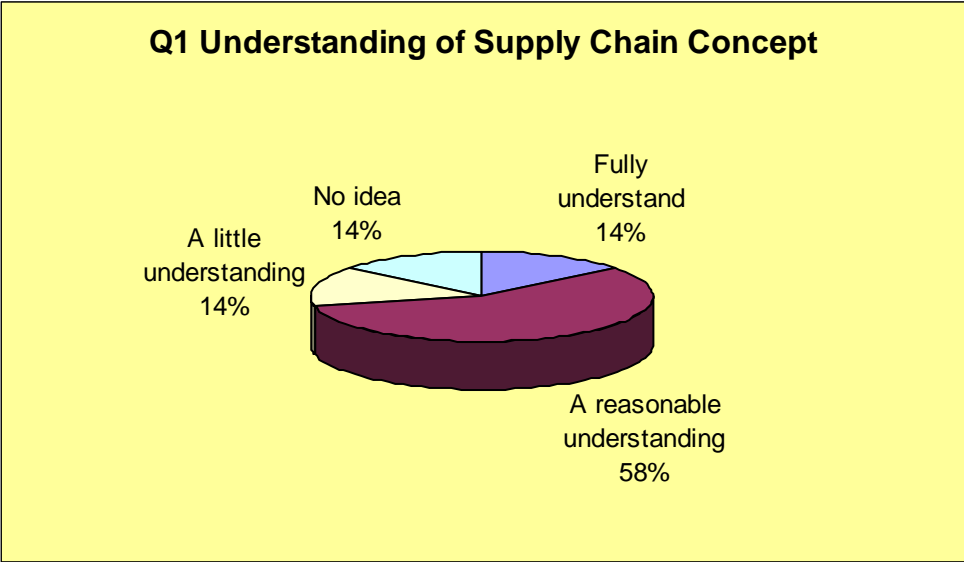
## 4.1 Introduction

This section of the report summarises the findings of the primary research undertaken for the study. This included interviews with growers, packers, transport companies, wholesalers/agents, providores, retailers and food manufacturers.

## 4.2 Research Findings – Growers

This section of the report details the findings of the research undertaken with the tropical fruit growers. The research findings follow the format of the questionnaire (Appendix 1) developed and approved for the study. Aggregated data are included in Appendix 1 where appropriate.

*Q1 How well do you think you understand the concept of supply chains?*



The above chart highlights that 14% of growers claimed to fully understand the concept of supply chains, with 58% claiming to have a reasonable understanding and 28% with either a little understanding or no idea. This finding suggests scope for the development of a much greater understanding of the supply chain by industry participants.

***Q2 How many links are there in your major supply chain (if you have more than one supply chain, please comment on the supply chain that would have the greatest value of product through it annually)?***

The number of links estimated by growers ranged from three to seven. Only one grower claimed to have no idea of the number of links.

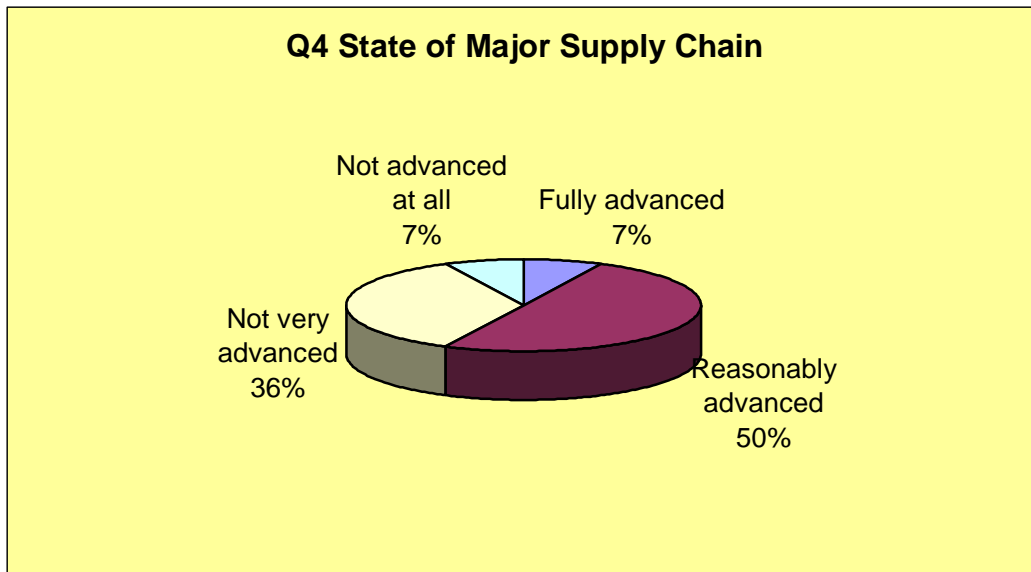
A typical supply chain for the tropical fruit growers has the following linkages:

- Grower
- Packer
- Transporter
- Unloading agent
- Wholesaler/agent
  - Secondary wholesaler
  - Provedore
  - Chain retailer
  - Specialist retailer
  - Food service

***Q3 How many of the businesses involved in your major supply chain would you have developed a strong business relationship with?***

Most growers stated that they have developed strong relationships with only one or two businesses in the supply chain. This was reinforced during the consultation with the wholesalers/agents who frequently stated that they would like to develop better and stronger relationships with the growers.

*Q4 Overall then, how advanced do you consider your business is in terms of its major supply chain?*



Just over half (57%) of the growers surveyed claimed to be either fully advanced (7%) or reasonably advanced (50%) in terms of their major supply chain. The remaining 43% claimed to be either not very advanced (36%) or not advanced at all (7%). This finding is consistent with the feedback received during the wholesaler consultation process as outlined later in this report.

**Q5 The following table contains a list of statements related to supply chains. Please select the level of agreement or disagreement with each statement that most closely matches your opinion.**

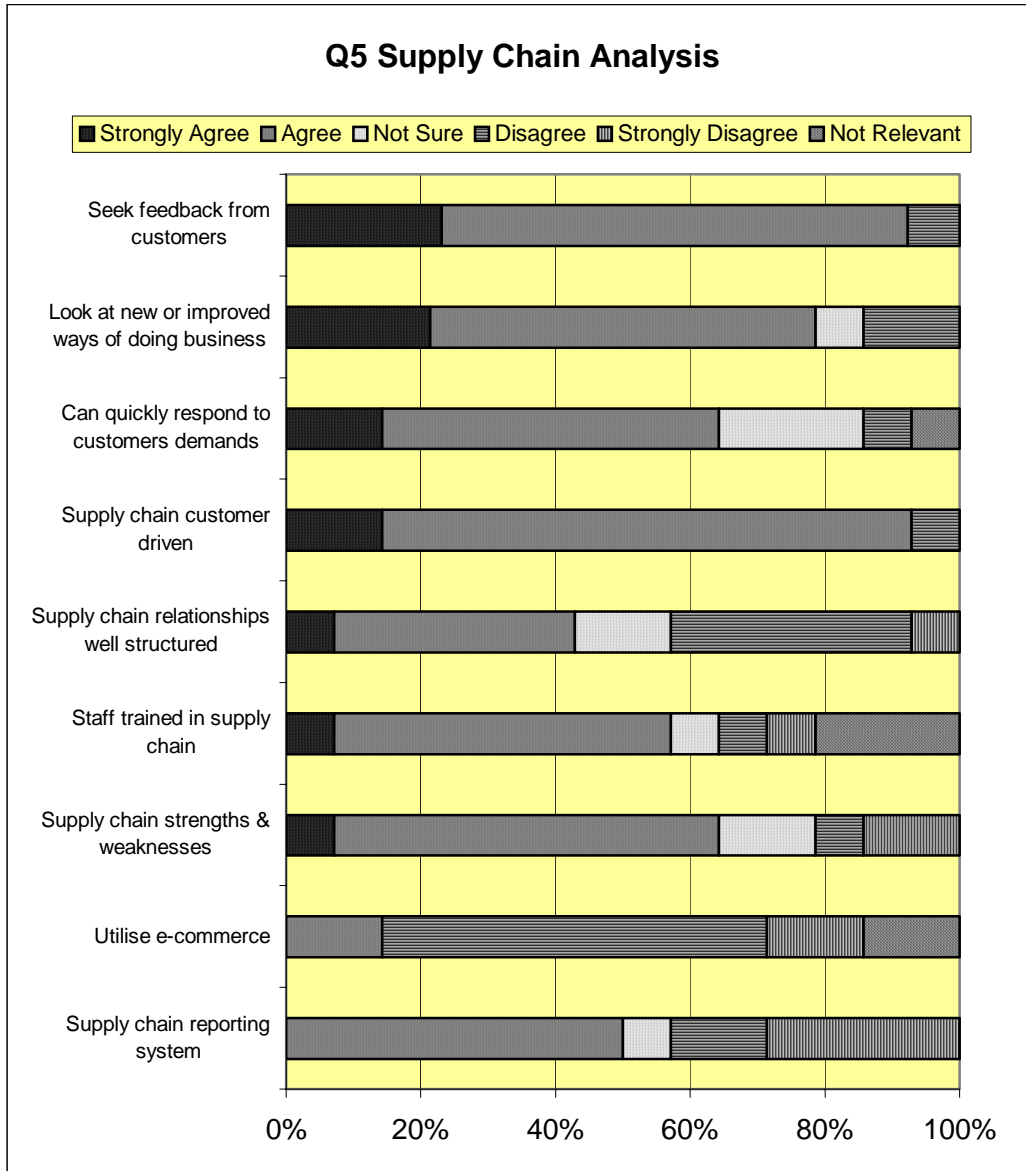
The table contained the following statements which growers were asked to respond to:

**Statement**

- We seek feedback from customers/consumers and others in the supply chain so we can assess and improve our supply chain performance.
- We are continually looking at new or improved ways of doing business that will improve our distribution planning, freight movements, costs, product management and customer service.
- Our business has systems in place that enable us to quickly respond to our customers and consumers demands.
- Our supply chain is driven by what our customers want rather than by our production processes.
- The relationships we have with the people we deal with in our supply chain are well structured and include formal agreements.
- All relevant staff in our business have been thoroughly trained in all they need to know about how our supply chain/s operate.
- We clearly understand the strengths and weaknesses of our current supply chain.
- We utilise e-commerce for selling, buying and business-to-business paperless transacting.
- Our supply chain reporting system (computer or paper based) provides high quality, relevant and timely feedback that helps us make informed decisions for our business.

The responses (level of agreement) to these statements are summarised in the table below and the data are also represented in the chart following the table.

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Not Sure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Not Relev'nt</b>
Seek feedback from customers	23%	69%	0%	8%	0%	0%
Look at new or improved ways of doing business	21%	57%	7%	14%	0%	0%
Supply chain customer driven	14%	79%	0%	7%	0%	0%
Can quickly respond to customers demands	14%	50%	21%	7%	0%	7%
Supply chain strengths & weaknesses	7%	57%	14%	7%	14%	0%
Staff trained in supply chain	7%	50%	7%	7%	7%	21%
Supply chain relationships well structured	7%	36%	14%	36%	7%	0%
Supply chain reporting system	0%	50%	7%	14%	29%	0%
Utilise e-commerce	0%	14%	0%	57%	14%	14%



The above chart highlights that growers rate themselves most highly in the areas of seeking feedback from customers, looking at new or improved ways of doing business and quickly responding to customer demands. They rate themselves as poor performers in the areas of the utilisation of e-commerce and the supply chain reporting system.

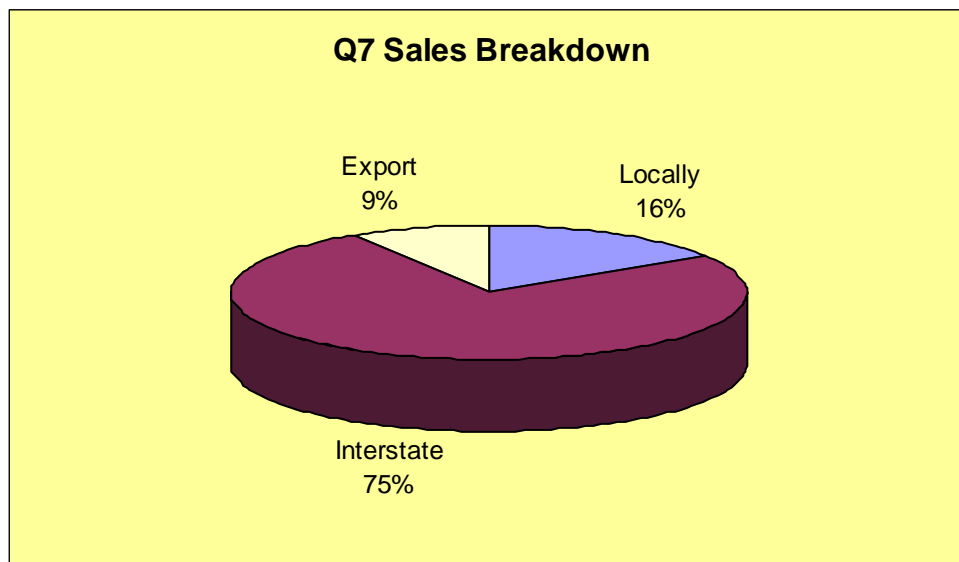
*We would now like to ask you a few questions about your company.*

**Q6 What is the total number of employees you have in the Northern Territory or Western Australia (Kununurra only) - full time equivalent?**

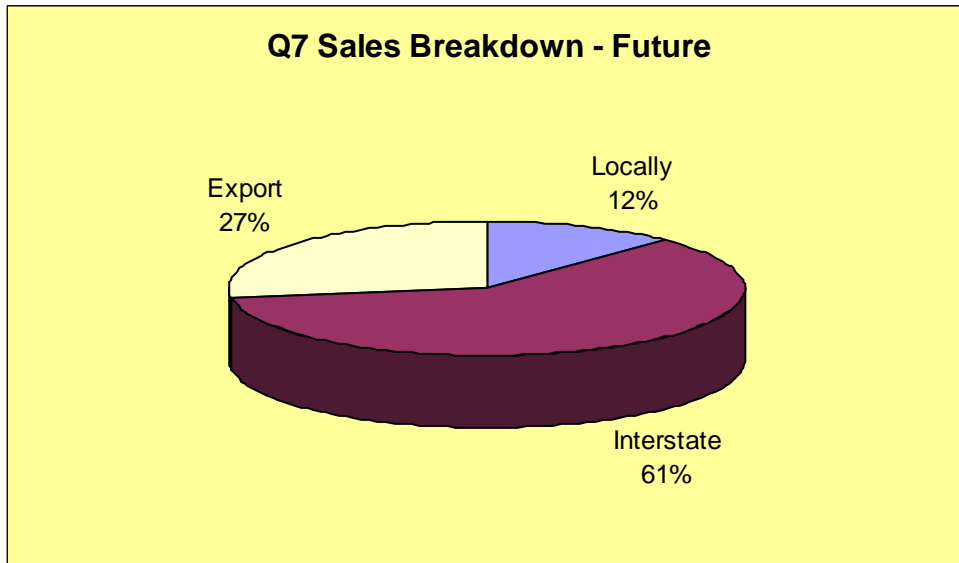
Employees	Average Numbers
Full time	0.5
Family members	3.7
Casual (harvest etc.)	3.6
Owner /Manager	1.5

The above table shows the average number of people employed by the growers. This highlights the relatively small size of the businesses involved in the industry.

**Q7 How much of your overall production was sold either locally, interstate or export, and how do you expect this to look in five years' time?**



The above chart indicates that currently the majority of fruit (75%) is sold to interstate markets, while 16% is sold locally and 9% is sold to export markets.



The above chart indicates that over the next five years, the majority of fruit (61%) will still be sold to interstate markets, while 12% will be sold locally and exports will increase from 9% to 27%.

***Q8 Please show in the following table the types of tropical fruits your business is involved in and the major steps in the supply chain in getting the product to the customer or consumer.***

The following steps summarise a typical supply chain for produce destined for interstate markets as depicted by the growers.

- Grower
- Packhouse
- Transport Company
- Wholesaler/Agent (via unloading agent)
- Retailer

***Q9 Do you have any other comments you would like to make in relation to supply chains?***

- Transport and freight are a big issue (road and air freight) - they don't take responsibility for the fruit.
- We have had rambutans left on the tarmac in Brisbane and arrived at market blackened, unable to sell, and the agent didn't want to know about it or follow up with Qantas.
- Rambutan road freight travels in too low a temperature, delivered blackened and sold at a pittance of value which didn't cover the cost.
- Going to find out (more) about them.
- Hard to predict what the market is going to be like.
- Seek feedback but don't always get any.
- The price is not stable - send one box, the agent says \$14, then send 18 boxes and only get \$10 - happens with all agents.
- No problems with tropical fruits but there are problems with Taro.
- Airlines place a low priority on perishables. Availability of airfreight space is diminishing.
- Packaging companies are reluctant to stock cartons for small industries.
- Problems with Qantas - not enough wide bodied planes - not enough qualified staff.



### 4.3 Research Findings – Wholesalers/Retailers

This section of the report details the findings of the research undertaken with the wholesalers/agents, providores and retailers in Melbourne, Sydney and Brisbane. The research findings follow the format of the questionnaire (Appendix 2) developed and approved for the study. Aggregated data are included in Appendix 2 where appropriate.

#### *General Comments*

The following non-specific comments were made by wholesalers and retailers in Melbourne, Sydney and Brisbane during consultation.

#### *Melbourne*

- Dragonfruit is currently too expensive.
- Safeways wants smaller packages of Rambutans. It is hard to convince the growers to move to smaller production or convince Safeways to move to larger products and packaging.
- Produce is not packed to a standard. There are too many suppliers and no consistency. Produce should be individually packed but there should be only one marketing arm.
- Fresh produce is packed too close to frozen produce when being trucked from Darwin.
- Long lines are needed from one packing shed.
- Supermarkets want consistency in volume and product.
- No one knows what tropical fruit is good for – product knowledge and consumer education is very important.
- Point of sales materials are needed.
- In-store promotions are needed.
- Produce goes missing when transhipped via Adelaide.
- Boxes need improving to stop them collapsing.
- Produce is either too hot or too cold – should be kept at 5 degrees for transport (mangoes 10 – 15 degrees).
- A lot more produce could be sold but it is very price sensitive.
- The best rambutans go to export (Japan) which means that Melbourne gets the seconds.
- One retailer has centralised its buying structure but the states are still dealing independently.
- One retailer would like to do a “fair bit of work with dragon fruit (pitaya)”. There is initial demand but there’s a need for repeat sales. It’s only in 30% of stores (Vic) currently and there’s not enough volume for the whole state.
- There’s not enough volume (supply) – could sell a lot more fruit.
- All the best fruit (rambutan) goes to Japan – we only get the second quality.

#### *Sydney*

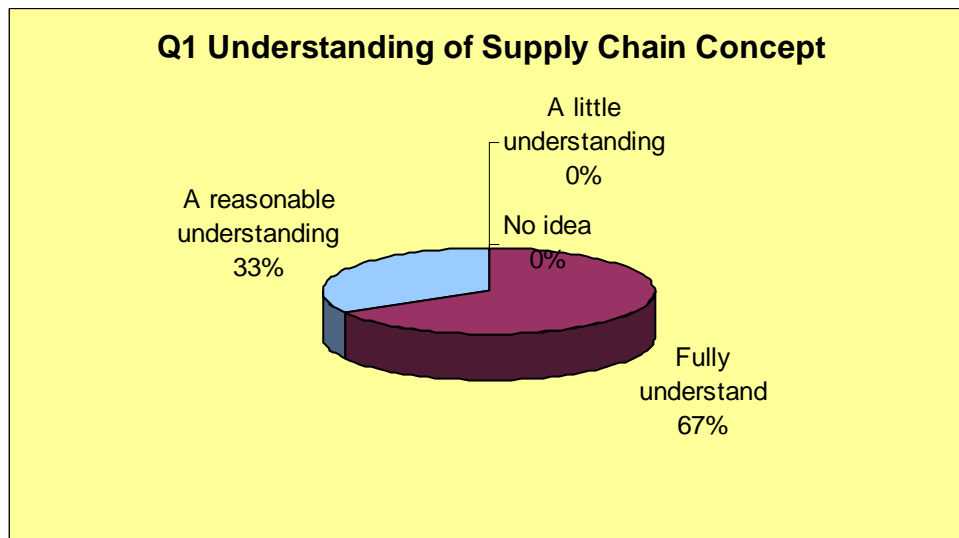
- Sydney manufacturers (value adders, providores, etc.) source fruit from both the markets (Flemington) and growers directly. Growers have the advantage of being more directly in touch with the market and better communications, while needs tend to get diluted along the supply chain when dealing with markets.
- Volume (critical mass) is lacking in tropical fruit from the NT.
- There is some inconsistency of demand.
- There is a big wastage of rambutan as it goes ‘off’ during transport.
- Queensland rambutans are a better product – they are classic red, not orange like the NT produce. The produce loses colour in the freighter, especially if coming by air.
- The rambutan is often ‘cooked’ when it arrives. It comes with mangoes and the temperature is too high.
- Supermarkets need a better understanding of the produce.

- Guava is inconsistent in supply and too expensive.

*Brisbane*

- Retailers have a major lack of knowledge on tropical fruit.
- More consumer education is required. Leaflets explaining what you can do with tropical fruits are needed in stores.
- Waste is high and a major concern for retailers.
- 'Cowboy' transport companies are the major problem.
- Rambutan is the kiwi fruit of the future.
- Field buying and buying direct (eg Coles and Woolworths) works for large volume lines eg bananas, but doesn't work for niche lines.
- Look at packaging options eg punnets.
- One wholesaler is currently sourcing very little from NT/WA due to transportation and contacts but is interested in the potential.

***Q1 How well do you think you understand the concept of supply chains?***



All wholesalers and retailers consulted in the three markets considered that they had at least a 'reasonable understanding' of the supply chain concept with the majority (67%) believing that they 'fully understand' the concept.

***Q2 How many links are there in your major supply chain (if you have more than one supply chain, please comment on the supply chain that would have the greatest value of product through it annually)?***

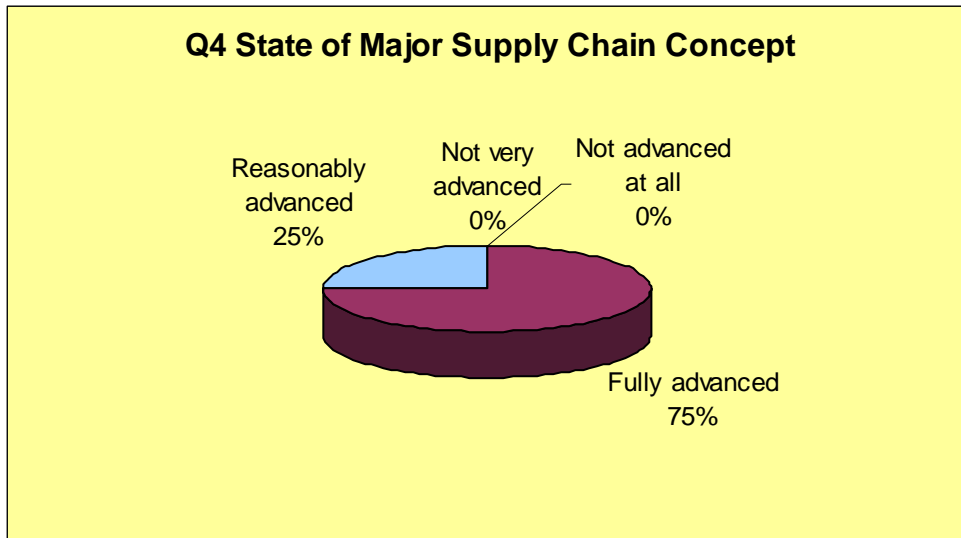
Wholesalers and retailers confirmed the following major steps in the supply chain as described above:

- Grower
- Packer
- Transporter
- Unloading agent
- Wholesaler/agent
  - Secondary wholesaler
  - Provedore
  - Chain retailer
  - Specialist retailer
  - Food service

***Q3 How many of the businesses involved in your major supply chain would you have developed a strong business relationship with?***

Consultation with the wholesalers/agents and retailers highlighted that few strong relationships have been developed and that they would like to develop better and stronger relationships with the growers.

*Q4 Overall then, how advanced do you consider your business is in terms of its major supply chain?*



All wholesalers and retailers were confident that their businesses had well advanced supply chains with the majority (75%) believing that they had fully advanced supply chains.

**Q5 The following table contains a list of statements related to supply chains. Please select the level of agreement or disagreement with each statement that most closely matches your opinion.**

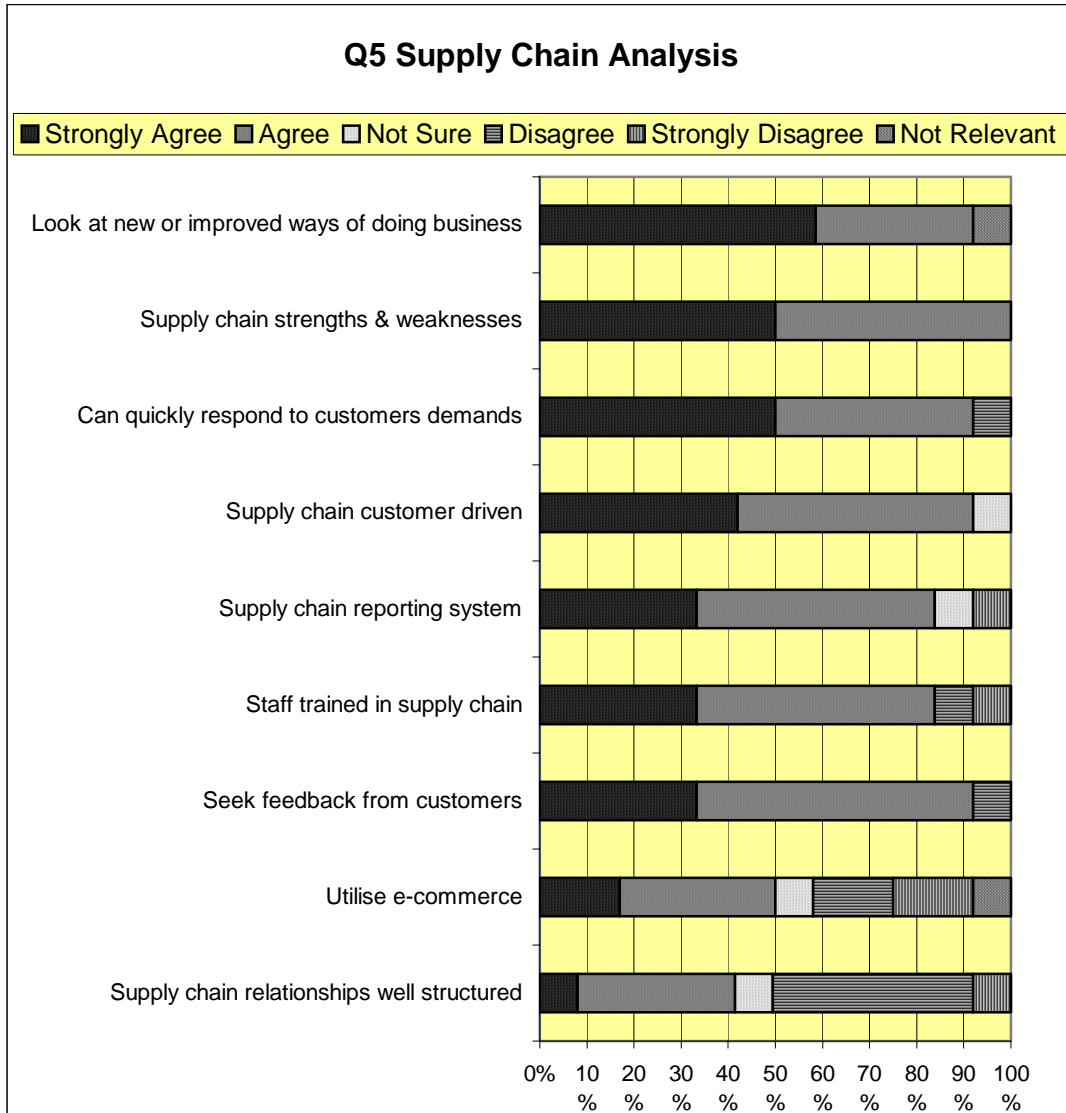
The table contained the following statements which wholesalers and retailers were asked to respond to:

**Statements**

- We clearly understand the strengths and weaknesses of our current supply chain.
- Our supply chain reporting system (computer or paper based) provides high quality, relevant and timely feedback that helps us make informed decisions for our business.
- All relevant staff in our business have been thoroughly trained in all they need to know about how our supply chain/s operate.
- Our supply chain is driven by what our customers want rather than by our production processes.
- The relationships we have with the people we deal with in our supply chain are well structured and include formal agreements.
- We are continually looking at new or improved ways of doing business that will improve our distribution planning, freight movements, costs, product management and customer service.
- We utilise e-commerce for selling, buying and business-to-business paperless transacting.
- Our business has systems in place that enable us to quickly respond to our customers and consumers demands.
- We seek feedback from customers/consumers and others in the supply chain so we can assess and improve our supply chain performance.

The responses (level of agreement) to these statements are summarised in the table below and the data are also represented in the chart following the table.

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Not Sure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Not Relev'nt</b>
Supply chain relationships well structured	8%	33%	8%	42%	8%	0%
Utilise e-commerce	17%	33%	8%	17%	17%	8%
Seek feedback from customers	33%	58%	0%	8%	0%	0%
Staff trained in supply chain	33%	50%	0%	8%	8%	0%
Supply chain reporting system	33%	50%	8%	0%	8%	0%
Supply chain customer driven	42%	50%	8%	0%	0%	0%
Can quickly respond to customers demands	50%	42%	0%	8%	0%	0%
Supply chain strengths & weaknesses	50%	50%	0%	0%	0%	0%
Look at new or improved ways of doing business	58%	33%	0%	0%	0%	8%



The response to this question highlights the following key issues from the wholesalers' and retailers' perspectives:

- Relationships are not well structured and are lacking in formal agreements.
- The use of e-commerce along the supply chain is very low.
- The supply chain does not necessarily reflect feedback from customers.
- There is scope for improvement in supply chain reporting and training.

***Q6 What volume of tropical fruit do you source from the following areas/regions and how do you expect this to look in five years' time?***

Few companies consulted could accurately provide volume data (current and forecast) and those that did amounted to small volumes. The following specific comments were made during consultation in Melbourne:

- No differentiation between the NT and North Queensland.
- Could sell ten times more jackfruit.
- Rambutan growth will depend on price.
- Hog plum – not much growth potential.
- Star apple could grow by 50% and there is not a lot of competition when it arrives (ie mangoes out of season).
- More taro could also be sold.
- Good growth potential for guava.
- Supermarkets want consistent weekly supply – regular supply would increase demand.

***Q7 Please show in the following table how your demand for tropical fruit changes throughout the year.***

While the demand patterns for tropical fruit broadly mirrored the supply of fruit as detailed in earlier sections of this report, wholesalers and retailers were possibly reflecting their knowledge of the availability of fruit. In fact, wholesalers and retailers consistently indicated that they expected demand to increase during the next five years and that tropical fruits could be placed in the market to meet existing demand should it be possible to extend the growing season.

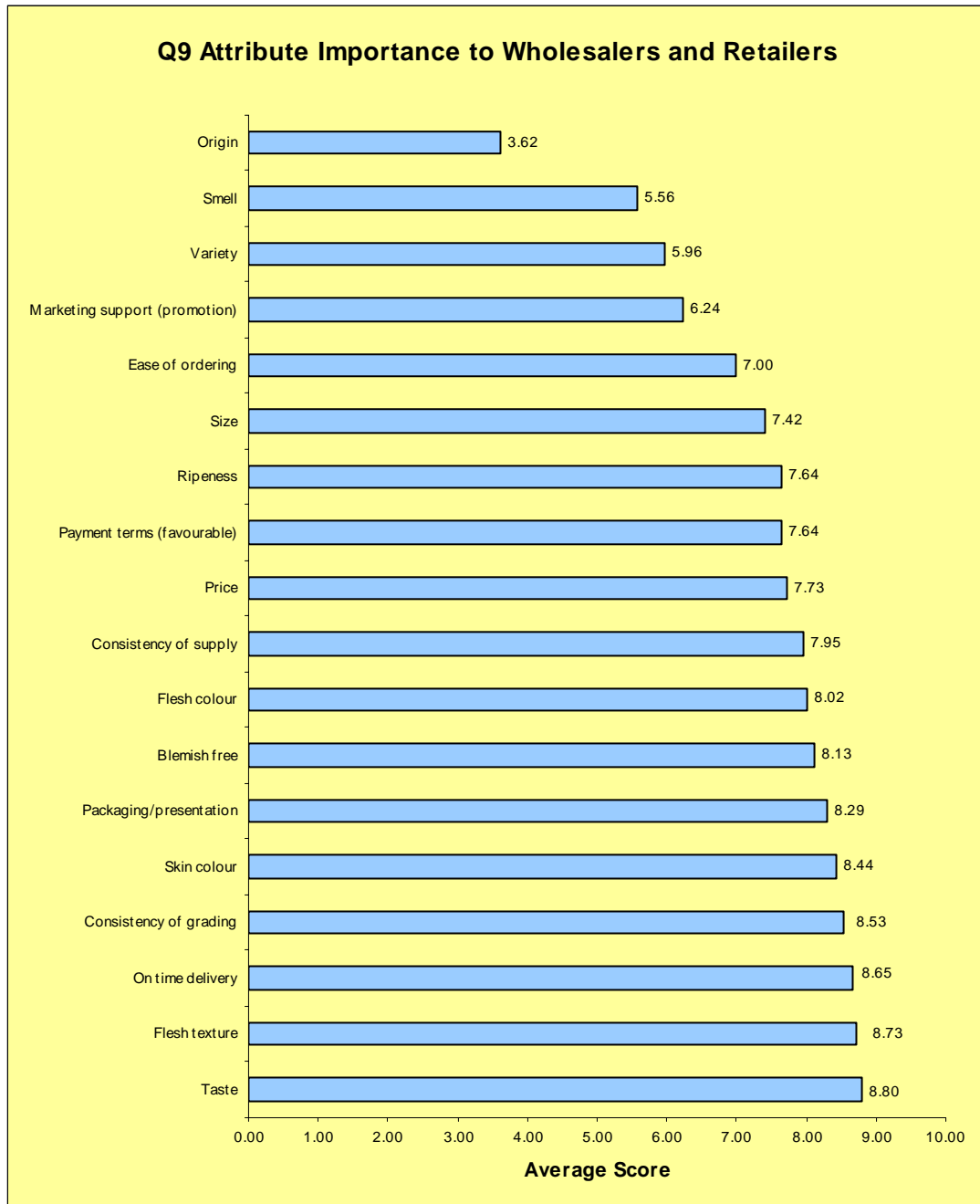
***Q8 Please show in the following table the types of tropical fruits your business is involved in and the major steps in the supply chain in getting the product to the customer or consumer as per the following example.***

Consultation feedback on this question reflected the supply chain structure described elsewhere in this report.

***Q9 Please give the following attributes a score ranging from 1 (not important) to 9 (very important)?***

The following chart contains the consolidated response to this question from all three markets and across all tropical fruit types. The score against each attribute is the average score rated out of 10 for all respondents to this question.

It is important to note that there were no discernable differences between the ratings given to attributes by wholesalers and retailers. Generally, wholesalers reflected the product preferences of retailers as it is clearly in their interests to meet their client needs.





The most important product attributes sought by wholesalers and retailers are:

- Taste.
- Flesh texture.
- On time delivery.
- Consistency of grading.

With the exception of origin, smell, variety and marketing support, the remainder of attributes all scored an average of 7 out of 10 or above.

Specific comments made by wholesalers and retailers in each market are detailed below.

#### *Melbourne*

- For some, origin is important in terms of preferring Australian produce but others don't care.
- Marketing support is needed to grow the market size.
- Rambutan flesh sticking to the stone is a major problem.
- Packaging and presentation is most important.
- Consumers don't know enough about the product (except Asians).

#### *Sydney*

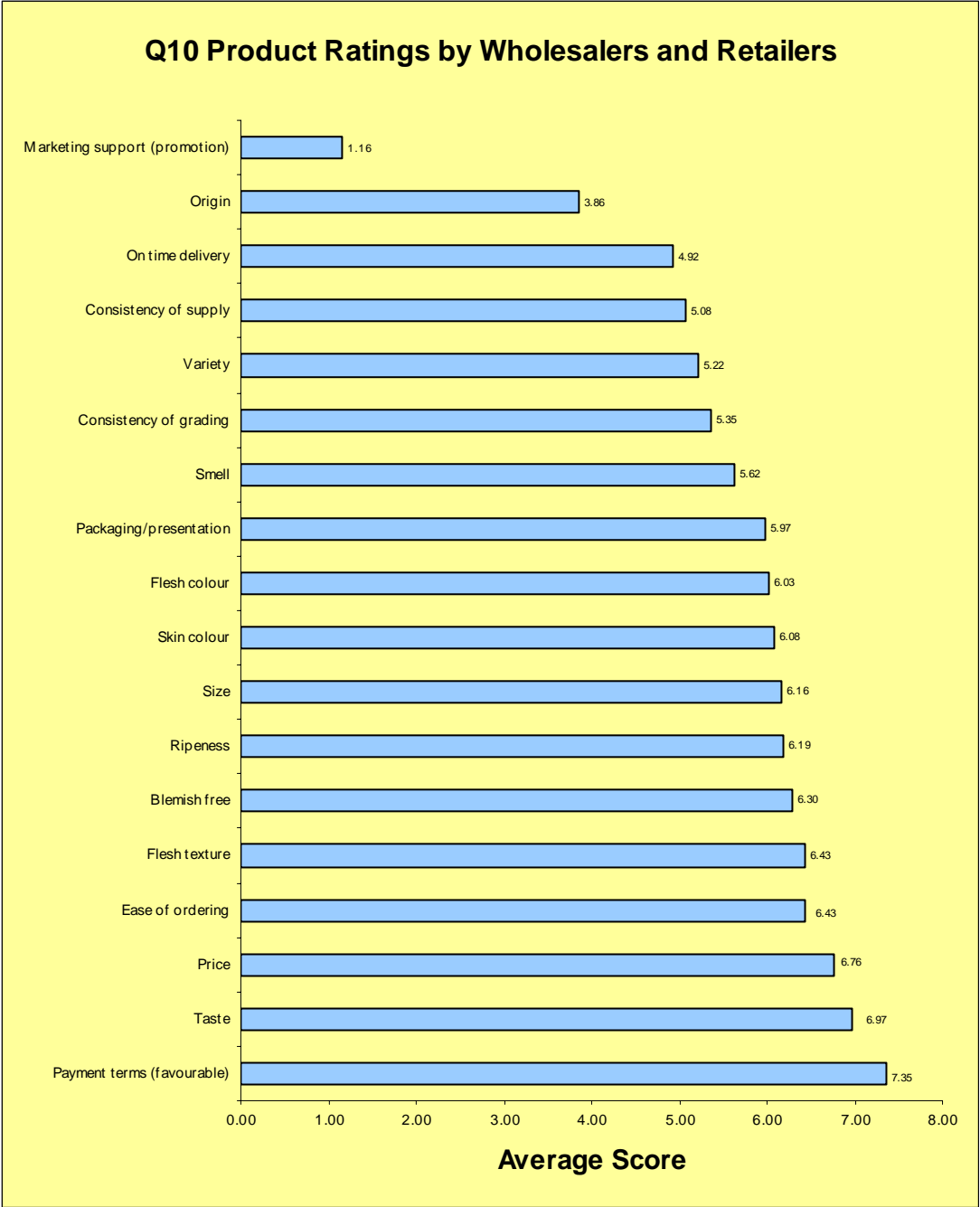
- If the growers seek to boost volumes, pricing will become an issue.

#### *Brisbane*

- Field heat is a major problem.

**Q10 Please rate following attributes for produce sourced from the Top End of the Northern Territory with a score ranging from 1 (very unsatisfied) to 9 (very satisfied)?**

The following chart again contains the consolidated response to this question from all three markets and across all tropical fruit types. The score against each attribute is the average score out of 10 for all respondents to this question,



Attributes rated particularly low by wholesalers and retailers (what the wholesalers and retailers perceive they are getting) included:

- Marketing support (however, this was not rated highly as a required attribute).
- Origin (however, origin was the lowest rated desirable attribute).
- On time delivery.
- Consistency of supply.

In terms of strategic importance, 'consistency of supply' and 'on time delivery' are the priority issues for attention.

Other specific comments made by wholesalers and retailers during consultation are detailed below.

#### *Melbourne*

- A lot of the produce this season was over-ripe due to transport.
- It's difficult to get to the growers when I go to the NT – I need a database of growers. I drive 500 kilometres to one site then drive another 500 kilometres. The size of the area is difficult.
- Some growers try to get direct deals with the supermarkets and this really does annoy the wholesalers. Middlemen in Darwin buy up the market and direct market. Price is lower and consistently driven down – growers need to be aware of this.
- Continuity of supply is a major problem.

#### *Sydney*

- The quality of the rambutans is shocking – they are arriving black.

***Q11 Please rate following attributes for produce sourced from Kununurra with a score ranging from 1 (very unsatisfied) to 9 (very satisfied)?***

Wholesalers and retailers in nearly all instances were unable to differentiate and rate Kununurra produce from produce originating in the Top End. This reflects the small number of growers in Kununurra.

***Q12 What improvements, including cost reductions, would you like made to the tropical fruits supply chain?***

Specific comments made in relation to this question in all three markets are detailed below.

*Melbourne*

- Regular supply which will increase volumes of jackfruit, rambutans and dragon fruit (pitaya).
- Improved marketing.
- Consistent supply.
- Higher volumes.
- In-store demonstrations.
- Advertorials.
- Media coverage – eg: Burke’s Backyard.
- Transport needs to be improved to cut down delivery times.
- Temperature control needs improvement.
- Packaging and presentation.
- Better packaging to reduce box crush.
- There’s a problem with freezer damage to the product – data loggers could be used to monitor temperature.

*Sydney*

- Product (rambutan) needs to be pre-cooled. The field heat needs to be extracted from the fruit before it is shipped.
- Consistent quality is needed and the produce needs to be better graded.
- Transport is a major problem. Although there are several unloading agents they are inefficient and often deliver to the wrong place.
- Transport companies need to be better paid to get a better service.
- Boxes need to be better quality.
- Airfreight needs to be cheaper.
- Focus should be on quality and transport.
- Branding is needed – especially for quality produce. The produce also needs to be graded better.
- Pre-cooling is paramount. The growers need facilities in place to do this. Transport companies should not accept non-pre-cooled produce. Other States do not have this problem.
- There’s a lot of merit in cooperatives – buyers want reliability in supply and distinct grades.
- Have to improve packaging especially the strength of the cartons.
- Branding of premium produce – buyers would ask for grower’s produce.

*Brisbane*

- Growers should pack to the grade of the produce.
- The produce needs to get to a wider market – not just Asians.
- Growers are too focussed on the export market to the detriment of the domestic market.

***Q13 What opportunities do you see for the Darwin, Katherine and Kununurra tropical fruit growers to increase their market share and/or their profitability?***

Specific comments made in relation to this question in all three markets are detailed below.

*Melbourne*

- There is a branding opportunity for NT rambutans.
- Develop premium boxes – packaging is important.
- Do not put seconds into premium boxes.
- Consistency of produce will lead to return business.
- Expand the range of products to, for example, lychees, longans, etc.
- Consistency of packaging and presentation.
- Reduce steps in the supply chain.
- In-store promotions.
- There's a big market for jackfruit but the product needs to be "very edible".
- If you want to grow the industry, you need commercially marketable levels and follow-up promotions.
- There's a need for a database of growers and a better understanding of "what's going on".
- Increased volumes of good quality jackfruit, rambutans and dragon fruit (pitaya).

*Sydney*

- Quality and price are important – origin of the fruit is not that important.
- Reliability of supply is very important – there is not one large grower of Rambutans which is needed. Growers should therefore network and form one brand name.
- The brand is only good if it's consistent and reliable.
- A lot of work needs to be done on the transport system – rail might help.
- Look at cheaper packaging options.

*Brisbane*

- Good quality, consistency and value are important.

The question of unmet demand for tropical fruit other than that currently available was also raised. This seemed to be of little interest (other than the one comment above) with far greater interest being expressed in the consistent availability of quality produce that is currently available.

***Q14 Do you have any other comments you would like to make in relation to supply chains?***

The additional comments made in all three markets are detailed below.

*Melbourne*

- Growers need pre-cooling facilities. Transport to the freight forwarder is very hot.
- Product spends too much time in trucks (4-5 days).
- Growers need educating about demand side.
- Growers need to see their produce at the market.

*Sydney*

- Work is needed on the transport system – there is not enough care taken of the product.
- The distribution system needs to be improved.
- Staff inexperience in fruit and vegetable stores is a problem – they can't provide consumers with advice.
- Transport is a major problem for the Territory growers – anything coming out of Queensland will sell better because the transport system is more efficient.
- Air transport is fine but the rates are “absurd”.
- Transport has been a major headache.
- The first problem is farm management.
- The Territory growers are too far away from the market to understand what the end consumers want.
- Growers are not loyal enough – they need to build loyalty through the supply chain.
- Pre-cooling is absolutely paramount.
- Listen to what the agents say – agents know what the people selling the product (retailers) want.

*Brisbane*

- If you want a sustainable future, you have to cater for a wider market.
- Transshipment through Adelaide or Melbourne is a problem. Growers need to stick to reputable freight companies.
- Pre-cooling is important as field heat and external heat ‘cooks’ the fruit.

## 4.4 Food Manufacturers' Feedback

Henry Jones Foods and SPC Ardmona (Goulburn Valley, etc.) were approached to get a food manufacturers' perspectives on the demand for tropical fruit.

Henry Jones uses relatively small quantities of tropical fruits (eg 2 tonnes of mango per year and 2 tonnes of guava per year) and has no interest in other tropical fruits at this stage.

SPC Ardmona advised that it does not use any tropical fruits at the moment and that it is looking at more 'mainstream' product due to retailer policy (Woolworths and Coles) of deleting lines if they are not turning over minimum quantities. The company also advised that it could be interested in tropical fruits for cocktail lines in 12 months time but existing machinery would need to be able to process the fruit. The company said it would be interested in receiving samples and information on tonnages that would be available for purchase.

## 4.5 Transport Operators' Feedback

Transport operators stressed the need for produce to be aqua-cooled to remove field heat prior to packing. This issue was frequently raised by agents. It was also stated that growers are trying to economise by buying cheaper cartons which then collapse under the weight of the product. This was also noted as a problem by agents.

In summary, good transport planning will pay dividends.

## 4.6 Unloading Agents' Feedback

Unloading agents were consulted in Melbourne, Sydney and Brisbane in order to identify what they perceived to be the major tropical fruit supply chain issues. The key issues identified included:

### *Brisbane*

- There is often confusion and anger over unloading payment conditions. Carriers often arrive in Brisbane and do not want to pay for the unloading service. This often leads to delays in product unloading and quality problems.
- The quality of transport for tropical fruits needs to be improved. Side loading refrigerated vans are often used by transport companies but these are not locked tightly enough leading to the damage of fruit. The fruit requires fully sealed back-door loading refrigerated vans.

### *Sydney*

- Some growers could improve the quality of their cartons.
- Transport packing needs to be improved. Produce is often put on the bottom of pallets and the product is crushed. This could be overcome with the bottom of each box containing a recommended stacking pattern and height restrictions.
- Top rows should always have lids as the fruit often bounces and gets damaged in transit (jackfruit especially).

### *Melbourne*

- Produce often arrives 'hot' and damaged as the fruit has not been pre-cooled.

# 5. Value Chain Analysis

## 5.1 Understanding of the Value Chain

As highlighted in Section 3 – Tropical Fruits Industry Background, the tropical fruits (and taro) that are the subject of this study are being produced in very small volumes. The majority of growers are ‘part-timers’ and therefore it is not surprising that the growers’ understanding of the value chain could be described as relatively limited. The research findings suggest that the growers have some understanding at the local (grower/packer) level but that this understanding diminishes the further along the value chain the product gets.

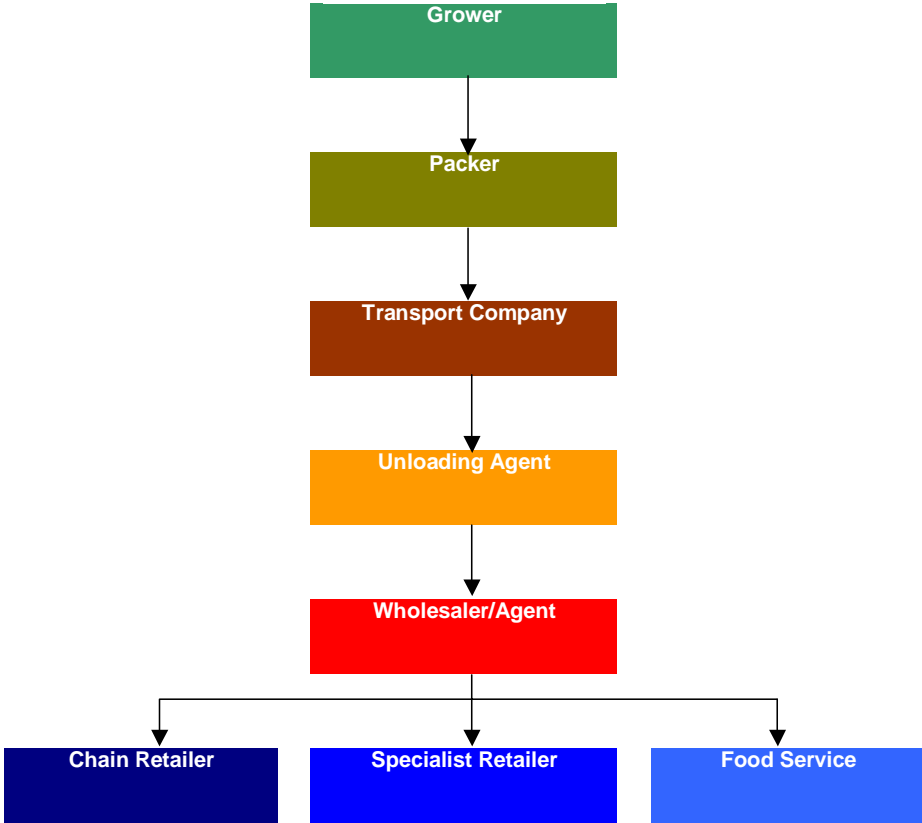
In comparison, the majority of wholesalers/agents claimed to have either a very good or at least a reasonable understanding of the supply chain. They are also keen to be more involved with the growers. It is not clear why the wholesalers/agents don’t take the initiative in this but it would appear to be in the best interests of the growers to develop better relationships. With this will come a better understanding of both buyer and end-user expectations.

Grower, wholesaler and retailer research attempted to collect and analyse costs and margins (or value added) at each supply chain step. Wholesaler/agent margins of 10% - 15% are consistently applied in all markets. By comparison, retailer margin estimates ranged from 0% to 300% depending on who provided the data, seasonality, fruit availability, competition, etc. which all impact on the final retail price. The grower cost data were also very difficult to analyse due to the vastly different measures used and poor quality of responses. However, the following table provides indicative cost/margin ranges based on limited information supplied for rambutans (little data were available for other commodities):

Supply Chain Step	Cost/Mark-up Ranges or Averages
Harvesting Costs	\$12 per hour
Pre-packaging and Packaging Costs	\$12 per hour
Overheads	\$230 - \$1,250 per year
Variable Costs	\$554 - \$1,400 per year
Financing Costs	\$0 - \$2,200 per year
Sales & Marketing Costs	15%
Road Freight Costs	\$0.75 - \$1.00 per kilogram (\$2 air)
Insurance Costs	\$218 - \$685 per year
Farm Gate Price	\$9 - \$10 per kilogram
Wholesaler/Agent Mark-up	10% - 15%
Retailer Mark-up	0% - 300%



## 5.2 The Value Chain Map



The above diagram illustrates a typical tropical fruits supply chain. Chain retailers include companies such as Coles and Woolworths. Specialist retailers include fruit and vegetables stores. Food service includes restaurants and cafes. Wholesalers will also sell to secondary wholesalers, who in turn sell to smaller retail buyers and providores who in turn supply the food service industry.

This is best illustrated by an example. A grower carefully harvests rambutans in the early hours of the morning. The produce is then transported to the climate controlled packing shed where the field heat is removed and the product is graded and packed ready for delivery to the freight forwarder. The freight forwarding company has been selected because of its track record in delivering product on time with no damage. In the early hours of the morning, the trucking company arrives at the Melbourne fresh produce markets where the rambutans are unloaded by the unloading agent and delivered to the wholesaler.

The wholesaler, who has been expecting delivery of the product, has a provedore awaiting supply of the produce for its food service clientele and the remainder of the shipment has been pre-sold to a specialist retailer who services the local Asian community.

### 5.3 The Grower – Wholesaler/Agent Relationship

The following information was sourced during the buyer interviews held in Melbourne, Sydney and Brisbane. It suggests that the average wholesaler/agent mark-ups are around 15% in Melbourne and Sydney and slightly lower in Brisbane. The large chains such as Coles and Woolworths have a preference to deal with growers who produce larger volumes or alternatively with packers that consolidate produce from a number of growers. The wholesale markets tend to either set or influence prices.

The wholesalers/agents also argue that growers are better off dealing with them than dealing with the large retail chains. While this could simply be viewed as self-interest, there does appear to be a sound rationale. When dealing with a large retailer, all of the 'eggs are in one basket' and the retailer can set/manipulate the price. The retailers argue, of course, that it is in their best interests to set fair prices so that they get continuity of supply. The wholesalers/agents argue that, because they deal with a range of buyers, which includes large and small retailers and the food service industry, that they can seek out the best price for the produce.

The wholesalers/agents claim that all produce can be sold 'at a price' The factors affecting the price are seasonal availability, the availability of substitute products and of course consumer spending. In general terms, premium produce will bring a premium price but, unfortunately for the grower, there is no guarantee that this will be the case. During periods of low availability, even average grade fruit can command high prices. Equally a glut of high quality fruit can mean that prices are depressed.

It would appear to be in the best interests of both the grower and the wholesaler/agent for a sound business relationship to be developed. This is particularly so because of the nature of the produce markets where there is a lack of transparency and the grower must have faith that the wholesaler/agent is acting in the grower's best interests.

The table on the following page has been sourced from a report entitled *Price Determination in the Australian Food Industry*, prepared for the Australian Government Department of Agriculture, Fisheries and Forestry by Whitehall Associates in March 2004.

The example is based on the observed practices on the Sydney fresh food market floor. The prevailing market price for top quality on the day is \$16 per 12kg carton of fruit. It is a good illustration of the different market options that exist for the same product.

Type of Supplier	Supplier's Position	Wholesaler's Action	Retailer's Position
<b>A</b> <b>Top quality</b> Reliable high quality with brand, consistent volumes, loyal with good personal relationship.	Strong relationship with wholesaler, in touch with market mood and daily prices, trusts wholesaler will achieve best price	Highly values supplier's custom. Has lined up buyer at \$16 ahead of product arriving on the floor. Offers \$16 less 10-15%. Fruit moves quickly off floor.	<hr/> <b>Major Chain</b> Has source 50-70% direct from suppliers. Will seek to top up with supply from A or B, depending on price and volume. <hr/>
<b>B</b> <b>Good quality supplier</b> Usually reliable quality, seasonal volumes, loyal supplier.	Reasonable relationship with wholesaler, knows market prices, trusts wholesaler will achieve best price.	Will make a judgement call based on the state of the market but likely to make a safe call at \$12 to achieve a reasonable margin based on the overall level of activity and volume out of A suppliers.	<hr/> <b>Independent</b> Where a close relationship exists, sale will have been pre-agreed on availability of A produce at \$16. Will buy lower depending on quality stance. <hr/>
<b>C</b> <b>Average quality supplier</b> Usually reliable quality, seasonal volumes, loyal supplier.	Has a supply relationship with wholesaler, is broadly aware of market prices, relies on wholesaler to achieve best price.	Cautious as to proceeds based on quality and buyer capacity. Avoids commitment to price and suggest 'wait and see'.	Where weak or no relationship, will buy B to D based on price, quality stance and general price position. <hr/>
<b>D</b> <b>Poor quality supplier</b> Usually unreliable quality, seasonal volumes, not a loyal supplier.	Selects wholesaler based on previous custom. Fruit arrives with limited notice. Takes assurance 'will do the best I can'.	Cautious as to proceeds based on quality and buyer capacity. Avoids commitment to price and suggest 'wait and see'.	<b>Outcome may be \$4 - \$8 to grower</b>

The above table reinforces the importance of quality (graded) produce and developing strong relationships along the supply chain.

## 5.4 Opportunities for Cost Reduction

During the study, opportunities for cost reduction were sought.

A number of wholesalers/agents suggested that growers should collaborate. This would appear to offer the following benefits:

- Consolidation of supply via networking should provide opportunities for cost reductions. For example, larger and better priced contracts could be negotiated with trucking companies.
- Networking could also provide opportunities for unit cost reductions through the consolidation of warehousing and packaging operations, joint marketing and joint purchasing (higher volumes may enable the negotiation of better supply prices).

The other opportunity is to investigate technologies that will extend the growing season. Fixed costs spread over a longer growing season will reduce the unit cost.

## 5.5 Opportunities for Enhanced Service Quality

During the study, opportunities for enhanced service quality were sought. The following suggestions were made:

- Branding, grading and consistency of supply are sought in all markets. This can be achieved through networking and the bulking of supply.
- Pre-cooling of produce is essential to improve quality (reduce spoilage). Data-loggers should also be used during transport to monitor temperature and determine where the supply chain is breaking down.
- Better relationships and communication of produce requirements to transport companies should improve the supply chain.
- Produce leaflets and in-store distribution would improve customer knowledge and potentially boost sales.

### *General*

There appears to be a significant opportunity for the growers to 'add value' to the product and to receive higher prices for better graded produce that is packaged and labelled accordingly. An industry marketing network could take responsibility for developing and implementing such a strategy which might need a consolidated warehousing/packaging operation to ensure consistency of product, packaging and labelling.

Product information could also be supplied via the Internet with directions being included on packaging.

# 6. Summary and Recommendations

## 6.1 Introduction

This section of the report contains the interpretation of the research findings in summary form and provides recommendations for improvements in the value chain based on the interpretation. As stated in Section 1.2 – Study Objectives the objectives of the study were to:

- Map the value chain for the designated tropical fruits.
- Document the understanding of the value chain.
- Identify opportunities for cost reductions and enhanced service quality.
- Make recommendations for improvements to the value chain.

## 6.2 Summary of Consultation and Research Findings

### *Growers*

This section of the report provides a summary of the findings of the research undertaken with the tropical fruit growers.

14% of growers claimed to fully understand the concept of supply chains, with 58% claiming to have a reasonable understanding and 28% with either a little understanding or no idea. This finding suggests scope for the development of a much greater understanding of the supply chain by industry participants.

In terms of actual supply chain behaviour, most growers stated that they have developed strong relationships with one or two businesses in the supply chain, typically the packhouse and the transport company but not the wholesaler/agent. This was reinforced during the consultation with the wholesalers/agents who frequently stated that they would like to develop better and stronger relationships with the growers.

Just over half (57%) of the growers surveyed claimed to be either fully advanced (7%) or reasonably advanced (50%) in terms of their major supply chain. The remaining 43% claimed to be either not very advanced (36%) or not advanced at all (7%). This finding is consistent with the feedback received during the wholesaler consultation process as outlined later in this report.

Growers rate themselves most highly in the areas of seeking feedback from customers, looking at new or improved ways of doing business and quickly responding to customer demands. They rate themselves as poor performers in the areas of the utilisation of e-commerce and the supply chain reporting system.

Currently, the majority of fruit (75%) is sold to interstate markets while 16% is sold locally and 9% is sold to export markets. Over the next five years, it is projected that 61% of fruit will be sold to interstate markets while 12% will be sold locally and exports will increase from 9% to 27%.

### *Wholesalers/Retailers*

All wholesalers and retailers consulted in the three markets considered that they had at least a 'reasonable understanding' of the supply chain concept with the majority (67%) believing that they 'fully understand' the concept.

Consultation with the wholesalers/agents and retailers highlighted that few strong relationships have been developed and that they would like to develop better and stronger relationships with the growers.

All wholesalers and retailers were confident that their businesses had well advanced supply chains with the majority (75%) believing that they had fully advanced supply chains.

Key issues from the wholesalers' and retailers' perspectives are:

- Relationships are not well structured and are lacking in formal agreements.
- The use of e-commerce along the supply chain is very low.
- The supply chain does not necessarily reflect feedback from customers.
- There is scope for improvement in supply chain reporting and training.

Few companies consulted could accurately provide volume data (current and forecast) and those that did amounted to small volumes.

The most important product attributes that wholesalers and retailers are looking for include:

- Taste.
- Flesh texture.
- On time delivery.
- Consistency of grading.

In terms of the actual produce supplied by NT growers, the attributes rated particularly low by wholesalers and retailers included:

- Marketing support (however, this was not rated highly as a required attribute).
- Origin (however, origin was the lowest rated desirable attribute).
- On time delivery.
- Consistency of supply.

Therefore, in terms of strategic importance to meet wholesaler and retailer expectations, 'consistency of supply' and 'on time delivery' are the priority issues for grower attention (as marketing support and origin were not rated by wholesalers and retailers as highly important attributes).

The question of unmet demand for tropical fruit other than that currently available was also raised. This seemed to be of little interest with far greater interest being expressed in the consistent availability of quality produce that is currently available.

### **6.3 Recommendations for Improvements to the Value Chain**

This study has quite clearly demonstrated that the tropical fruit growers in the Northern Territory are in the very early stages of the industry life-cycle and are suffering from the common problems associated with such industries including:

- Lack of critical mass and product volumes.
- Poor quality packaging and labelling.
- Poorly developed supply chain relationships and low levels of understanding of the supply chain beyond seeing the product to transport.
- Lack of supply chain documentation and instructions.
- Low levels of supply chain monitoring and reporting.
- Less efficient transport practices.
- Low use of e-commerce and associated efficiency benefits.
- Low levels of customer education and product support materials.

These issues, identified and confirmed via extensive consultation during this study, are not uncommon in other national horticultural sectors, especially those with similar structural characteristics. Unless corrective action is taken, such industries continue to suffer such problems and, in the face of increasing global competition, suffer declining profitability.

Typically, such industries maintain low levels of industry development unless there is intervention to bring about critical mass. This can occur, for example, via a large corporation with already established supply chain relationships entering the growing stage at the expense of existing growers or one or two growers having the ambition and resources to assume a dominant role in the industry. An alternative, and the major study recommendation, is for existing industry participants (a few or many, depending on levels of commitment) to partner for future growth and development. This could take the form of a simple Industry Network with committed growers, or the development of one or more formal partnerships capable of establishing consolidated operations (eg: packing and distribution). There could even be a transitional phase from Network to Partnership.

The benefits to the grower participants in such partnering will be to overcome the major supply chain and cost problems identified in this study including:

- Achievement of volume and critical mass for market purposes.
- Achievement of consistency of supply, especially to wholesalers/agents.
- Improvement in 'on-time-delivery'.

The subsequent improved market prices from such a strategy will increase the profit potential of participating businesses.

The critical issues to be addressed by the partners in such an initiative include:

- Branding – one consistently applied brand adhering to the key attributes of consistency of supply and on-time-delivery (this is what the market wants). It is outside of the scope of this study to determine a solution for branding but an option for consideration should include the development of a Northern Territory tropical fruits brand (umbrella brand) under which could sit category sub-brands (rambutan, jackfruit etc) and then the packhouse/grower sub-brands, for example, Northern Territory Tropical Fruits – Jackfruit – Tropitroy Fruits. The development and implementation of the brand strategy would require a high level of industry cooperation and commitment as well as funding.
- Packaging and labelling improvements including transport instructions, specifically addressing the packaging issues identified in this report. Packaging and labelling needs to reflect the market segment (eg food service, chain retailer, specialist retailer etc) that the product is aimed at. This also means that the quality of the product should be reflected by the quality and type of packaging, for example premium product in high quality punnets with appropriate labelling. Apart from reinforcing the product values, packaging/labelling can be used to inform and educate current and potential purchasers. This is particularly relevant with exotic produce which is not well understood by most of the population. Packaging can be used to provide preparation suggestions, details on how to get consumer information and so on. Growers and packers will need to develop strong relationships along the supply chain in order to ensure that packaging/labelling is matched to the requirements of the end user. It is further recommended that growers/packhouses work closely with DBIRD to undertake a series of visits to the Melbourne, Sydney and Brisbane markets in order to see first hand the issues that have been documented in this report and to further improve communications along the supply chain.

- Transport improvements including negotiation of back-door refrigerated transportation and simplified payment conditions to avoid existing difficulties with unloading agents. The findings of this study have reinforced the importance of developing strong relationships along the supply chain. It is recommended that growers/packhouses invest in the development of much better relationships with the companies that transport the produce. It is important to understand all facets of freight transport including, cool chain management, duration of journey, route, transshipment, mode, etc. The clear message is that shifting freight is much more than getting what might appear to be the best price. It is further recommended that growers/packhouses work closely with DBIRD to undertake a freight tracking study (using dataloggers) to determine exactly where breaks in the cool chain are occurring. The use of technologies to extend shelf life should also be explored.
- Relationship development, firstly via regular market visits as outlined above and client contact. During later stages, consideration could be given to more formal relationships such as supply chain vertical integration.
- Supply chain monitoring and reporting. This is a weakness throughout the supply chain. Again, it is suggested that this be addressed through the development of stronger grower/wholesaler relationships. A further option for consideration should be the establishment of a tropical fruits network portal. Reputable wholesalers could then be given access to the website to check on a range of attributes including quality of produce, expected dates for harvest etc.
- Produce pre-cooling. This is a major issue and it is recommended that growers/packhouses work closely with DBIRD to address pre-cooling as a matter of urgency. This is a subset of the cool chain management study noted above.
- Introduction of e-commerce. This would incorporate the network portal outlined above but would be extended to include ordering and payment of inputs as well as offering on-line ordering and payment to wholesalers/agents.
- Consumer education and product support materials. There would be significant cost advantages in the development and production of product support materials on a collaborative basis. This could include product information leaflets, recipe sheets, website, consumer information line etc.

It is therefore recommended that, driven by industry participants, an initial Tropical Fruits Network be established to consider and commence implementation of the findings of this study.



**Tropical Fruits Supply Chain Project  
Growers' Questionnaire**

You and your company will not be identified in the final report as we are looking at industry aggregates not individuals. We appreciate your help in completing the following questionnaire. If you have any questions in relation to this questionnaire, please contact Ms Gerry McMahon on 08 8999-2309.

Business Name .....  
Contact Name .....  
Phone Number .....  
E-mail .....

## **Background**

This survey sets out to gain a better understanding of the tropical fruits supply chain for rambutan, dragon fruit (pitaya), guava, hok plum, star fruit, jackfruit and taro. All commercial businesses, including your business, are involved in supply chains. The supply chain is made up of all the activities that are required to deliver products to the customer from developing products, receiving orders, procuring materials, marketing, farming, logistics, customer service, receiving payment and so on. Anyone, anything, anywhere that has influence over a product's time-to-market, price, quality, information exchange, delivery, among other activities is part of the supply chain.

The old way of producing product and then trying to sell that product with limited regard to demand is changing. Consumers and retailers are becoming more specific in their demands and suppliers that want to prosper are going to have to try to anticipate and/or match their demands. Therefore, the need to understand your supply chain and develop partnerships along the chain is becoming more critical for success.

Retailers are directly sourcing products worldwide. Their demands are driving food producers to collaborate and work as 'partners' along the supply chain to meet specific customer specifications. In an effort to define the tropical fruits supply chain and to encourage collaboration/partnerships along the chain with the aim of improving product quality, market access, and efficiency of supply, we would appreciate your assistance in completing the following questionnaire. This questionnaire will provide the background information needed for a more in-depth study of the tropical fruits supply chain. The aim of this study is to increase the industry's efficiency in delivering from farmgate to plate by identifying opportunities for collaboration along the chain and, where possible, address barriers/limitations in the supply chain.

This survey is part of a tropical fruits supply chains study that is looking at tropical fruit growers in Darwin, Katherine and Kununurra. The study is being funded by the Rural Industries Research and Development Corporation and the Northern Territory's Department of Business, Industry and Resource Development.

*We would now like to ask you some questions about the supply chain/s your business is involved in.*

***Q1 How well do you think you understand the concept of supply chains?***

Please highlight or circle the number next to the statement that most closely matches your response

1	Fully understand	2
2	A reasonable understanding	8
3	A little understanding	2
4	No idea	2

***Q2 How many links are there in your major supply chain ( if you have more than one supply chain, please comment on the supply chain that would have the greatest value of product through it annually)?***

1	Enter number of links here -
2	Don't know the exact number

***Q3 How many of the businesses involved in your major supply chain would you have developed a strong business relationship with?***

1	Enter number of links here -
2	Don't know the exact number

***Q4 Overall then, how advanced do you consider your business is in terms of its major supply chain?***

1	Fully advanced	1
2	Reasonably advanced	7
3	Not very advanced	5
4	Not advanced at all	1

**Q5** The following table contains a list of statements related to supply chains. Please select the level of agreement or disagreement with each statement that most closely matches your opinion.

For instance, if you *strongly agree* with the statement “**We clearly understand the strengths and weaknesses of our current supply chain**” you would circle/highlight the number 1 in the first column. If you *strongly disagree* you would circle/highlight the number 5 and so on.

<b>Statement</b>	<b><i>Strongly Agree</i></b>	<b><i>Agree</i></b>	<b><i>Not Sure</i></b>	<b><i>Disagree</i></b>	<b><i>Strongly Disagree</i></b>	<b><i>Not Relevant</i></b>
We clearly understand the strengths and weaknesses of our current supply chain.	1 (0)	2 (7)	3 (1)	4 (2)	5 (4)	6 (0)
Our supply chain reporting system (computer or paper based) provides high quality, relevant and timely feedback that helps us make informed decisions for our business.	1 (0)	2 (2)	3 (0)	4 (8)	5 (2)	6 (2)
All relevant staff in our business have been thoroughly trained in all they need to know about how our supply chain/s operate.	1 (1)	2 (8)	3 (2)	4 (1)	5 (2)	6 (0)
Our supply chain is driven by what our customers want rather than by our production processes.	1 (1)	2 (7)	3 (1)	4 (1)	5 (1)	6 (3)
The relationships we have with the people we deal with in our supply chain are well structured and include formal agreements.	1 (1)	2 (5)	3 (2)	4 (5)	5 (1)	6 (0)
We are continually looking at new or improved ways of doing business that will improve our distribution planning, freight movements, costs, product management and customer service.	1 (2)	2 (11)	3 (0)	4 (1)	5 (0)	6 (0)
We utilise e-commerce for selling, buying and business-to-business paperless transacting.	1 (2)	2 (7)	3 (3)	4 (1)	5 (0)	6 (1)
Our business has systems in place that enable us to quickly respond to our customers and consumers demands.	1 (3)	2 (8)	3 (1)	4 (2)	5 (0)	6 (0)
We seek feedback from customers/consumers and others in the supply chain so we can assess and improve our supply chain performance.	1 (3)	2 (9)	3 (0)	4 (1)	5 (0)	6 (0)

*We would now like to ask you a few questions about your company.*

***Q6 What is the total number of employees you have in the Northern Territory or Western Australia (Kununurra only) - full time equivalent?***

*Please fill in the table below regarding the number of employees that work for you.*

<b>Employees</b>	<b>Numbers</b>	<b>Time employed (eg. Weeks / months)</b>
Full time	0.5	
Family members	26	
Casual (harvest etc.)	25	
Owner /Manager	16	

***Q7 How much of your overall production was sold either locally, interstate or export, and how do you expect this to look in five years' time?***

*Please record percentages against each region.*

	<b><i>Region</i></b>	<b><i>Percentage – last year</i></b>	<b><i>Percentage – expected in 5 years time</i></b>
1	Locally		
2	Interstate		
3	Export		

***Q8 Please show in the following table the types of tropical fruits your business is involved in and the major steps in the supply chain in getting the product to the customer or consumer as per the following example.***

Tropical Fruit	Step 1	Step 2	Step 3	Step 4
Rambutan	Barry's Packhouse	KG Fruit Distributors Melbourne	Woolworths	

***Q9 Do you have any other comments you would like to make in relation to supply chains?***

*Thank you for taking the time to participate in this survey.*

***Please fax your completed questionnaire to Ms Gerry McMahon on 08 89992049 by no later than 24<sup>th</sup> Oct 2003.***

*If you have any questions please call Gerry on 08 89992309.*

**Tropical Fruits Supply Chain Project**

*Wholesalers/Retailers Questionnaire*

This survey is part of a tropical fruits supply chains study that is looking at tropical fruit growers in Darwin, Katherine and Kununurra. The study is being funded by the Rural Industries Research and Development Corporation and the Northern Territory’s Department of Business, Industry and Resource Development. This survey sets out to gain a better understanding of the topical fruits supply chain for rambutan, dragon fruit (pitaya), guava, hog plum, star apple, jackfruit and taro.

In an effort to define the tropical fruits supply chain and to encourage collaboration/partnerships along the chain with the aim of improving product quality, market access, and efficiency of supply, we would appreciate your assistance in completing the following questionnaire. The aim of this study is to increase the industry’s efficiency in delivering from farmgate to plate by identifying opportunities for collaboration along the chain and, where possible, address barriers/limitations in the supply chain.

You and your company will not be identified in the final report as we are looking at industry aggregates not individuals. We appreciate your help in completing the following questionnaire. If you have any questions in relation to this questionnaire, please contact Neil Howells on 08 8211-7168.

Business Name .....  
Contact Name .....  
Phone Number .....  
E-mail .....

**Firstly I would now like to ask you some questions about the supply chain/s your business is involved in.**

**Q1 How well do you think you understand the concept of supply chains?**

Please highlight or circle the number next to the statement that most closely matches your response

1	Fully understand	8
2	A reasonable understanding	4
3	A little understanding	0
4	No idea	0

**Q2 How many links are there in your major supply chain ( if you have more than one supply chain, please comment on the supply chain that would have the greatest value of product through it annually)?**

1	Enter number of links here -
2	Don't know the exact number

**Q3 How many of the businesses involved in your major supply chain would you have developed a strong business relationship with?**

1	Enter number of links here -
2	Don't know the exact number

**Q4 Overall then, how advanced do you consider your business is in terms of its major supply chain?**

1	Fully advanced	9
2	Reasonably advanced	3
3	Not very advanced	0
4	Not advanced at all	0



**Q5** The following table contains a list of statements related to supply chains. Please select the level of agreement or disagreement with each statement that most closely matches your opinion.

For instance, if you *strongly agree* with the statement “**We clearly understand the strengths and weaknesses of our current supply chain**” you would circle/highlight the number 1 in the first column. If you *strongly disagree* you would circle/highlight the number 5 and so on.

<b>Statement</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Not Sure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Not Relevant</b>
We clearly understand the strengths and weaknesses of our current supply chain.	1 (6)	2 (6)	3 (0)	4 (0)	5 (0)	6 (0)
Our supply chain reporting system (computer or paper based) provides high quality, relevant and timely feedback that helps us make informed decisions for our business.	1 (4)	2 (6)	3 (1)	4 (0)	5 (1)	6 (0)
All relevant staff in our business have been thoroughly trained in all they need to know about how our supply chain/s operate.	1 (4)	2 (6)	3 (0)	4 (1)	5 (1)	6 (0)
Our supply chain is driven by what our customers want rather than by our production processes.	1 (5)	2 (6)	3 (1)	4 (0)	5 (0)	6 (0)
The relationships we have with the people we deal with in our supply chain are well structured and include formal agreements.	1 (1)	2 (4)	3 (1)	4 (5)	5 (1)	6 (0)
We are continually looking at new or improved ways of doing business that will improve our distribution planning, freight movements, costs, product management and customer service.	1 (7)	2 (4)	3 (0)	4 (0)	5 (0)	6 (1)
We utilise e-commerce for selling, buying and business-to-business paperless transacting.	1 (2)	2 (4)	3 (1)	4 (2)	5 (2)	6 (1)
Our business has systems in place that enable us to quickly respond to our customers and consumers demands.	1 (6)	2 (5)	3 (0)	4 (1)	5 (0)	6 (0)
We seek feedback from customers/consumers and others in the supply chain so we can assess and improve our supply chain performance.	1 (4)	2 (7)	3 (0)	4 (1)	5 (0)	6 (0)

**Q6 What volume of tropical fruit do you source from the following areas/regions and how do you expect this to look in five years' time?**

(Rambutan, Dragonfruit (pitaya), Guava, Hog plum, Star apple, Jackfruit and Taro)

**Please record percentages against each region.**

	Region	Volume (tonnes) last year							Volume (tonnes) expected in 5 years time						
		R	D	G	H	S	J	T	R	D	G	H	S	J	T
1	Top End - NT														
2	Other - NT														
3	Kununurra - WA														
4	Other - WA														
5	Queensland														
6	NSW														
7	International - Asia														
8	International - Other														

**Q7 Please show in the following table how your demand for tropical fruit changes throughout the year.**

Tropical Fruit	% Demand by Month
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November
12	December

**Q8 Please show in the following table the types of tropical fruits your business is involved in and the major steps in the supply chain in getting the product to the customer or consumer as per the following example.**

Tropical Fruit	Step 1	Step 2	Step 3	Step 4
Rambutan	Barry's Packhouse	KG Fruit Distributors Melbourne	Woolworths	

**Q9 Please give the following attributes a score ranging from 1 (not important) to 9 (very important)?**

(Rambutan, Dragonfruit (pitaya), Guava, Hog plum, Star apple, Jackfruit and Taro)

	<i>Attribute</i>	<i>Tropical Fruit</i>						
		<b>R</b>	<b>D</b>	<b>G</b>	<b>H</b>	<b>S</b>	<b>J</b>	<b>T</b>
1	Blemish free							
2	Consistency of grading							
3	Consistency of supply							
4	Ease of ordering							
5	Flesh colour							
6	Flesh texture							
7	Marketing support (promotion)							
8	On time delivery							
9	Origin							
10	Packaging/presentation							
11	Payment terms (favourable)							
12	Price							
13	Ripeness							
14	Size							
15	Skin colour							
16	Smell							
17	Taste							
18	Variety							
19	Other – please specify							

***Q10 Please rate following attributes for produce sourced from the Top End of the Northern Territory with a score ranging from 1 (very unsatisfied) to 9 (very satisfied)?***

(Rambutan, Dragonfruit (pitaya), Guava, Hog plum, Star apple, Jackfruit and Taro)

	<i>Attribute</i>	<i>Tropical Fruit</i>						
		<b>R</b>	<b>D</b>	<b>G</b>	<b>H</b>	<b>S</b>	<b>J</b>	<b>T</b>
1	Blemish free							
2	Consistency of grading							
3	Consistency of supply							
4	Ease of ordering							
5	Flesh colour							
6	Flesh texture							
7	Marketing support (promotion)							
8	On time delivery							
9	Origin							
10	Packaging/presentation							
11	Payment terms (favourable)							
12	Price							
13	Ripeness							
14	Size							
15	Skin colour							
16	Smell							
17	Taste							
18	Variety							
19	Other – please specify							

***Q11 Please rate following attributes for produce sourced from Kununurra with a score ranging from 1 (very unsatisfied) to 9 (very satisfied)?***

(Rambutan, Dragonfruit (pitaya), Guava, Hog plum, Star apple, Jackfruit and Taro)

	<i>Attribute</i>	<i>Tropical Fruit</i>						
		<b>R</b>	<b>D</b>	<b>G</b>	<b>H</b>	<b>S</b>	<b>J</b>	<b>T</b>
1	Blemish free							
2	Consistency of grading							
3	Consistency of supply							
4	Ease of ordering							
5	Flesh colour							
6	Flesh texture							
7	Marketing support (promotion)							
8	On time delivery							
9	Origin							
10	Packaging/presentation							
11	Payment terms (favourable)							
12	Price							
13	Ripeness							
14	Size							
15	Skin colour							
16	Smell							
17	Taste							
18	Variety							
19	Other – please specify							

***Q12 What improvements, including cost reductions, would you like made to the tropical fruits supply chain?***

***Q13 What opportunities do you see for the Darwin, Katherine and Kununurra tropical fruit growers to increase their market share and/or their profitability?***

***Q14 Do you have any other comments you would like to make in relation to supply chains?***

*Thank you for taking the time to participate in this survey.*