



Agribusiness Research and
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New Zealand Agribusiness: Structure, Conduct and Performance

KIWIFRUIT

*The key elements of success
and failure in the NZ
kiwifruit industry*

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Executive Summary

This study is one of four studies of New Zealand agribusiness success.

The Agribusiness Research and Education Network has in 2006 and 2007 researched the success of the New Zealand dairy, kiwifruit, sheep meat and venison industries. These studies are all business history studies focusing on issues of industry strategy, structure, conduct and performance as perceived by industry participants.

New Zealand is a major player in world kiwifruit markets.

Globally there are ten major producers of kiwifruit – Italy, China, New Zealand, Chile, France, Greece, Japan, the United States of America, Iran, and South Korea. Italy, Chile and New Zealand were the dominant producers in the early 1990s. Their individual shares of global production have been stable but China has emerged as a major player and is now the second largest producer.

The business context for kiwifruit industry participants has been characterised by significant change over the last three decades.

Contextual changes have involved significant challenges to the legislation governing kiwifruit exporting, substantial changes in domestic economic conditions within New Zealand, the development and adaptation of substantial human and social capital, and business and technological innovation facilitated by significant research and development activity.

Industry structure has evolved considerably over the last three decades.

Structural change has occurred throughout the kiwifruit industry. Historically orchards were largely run as family enterprise. Today family enterprises are still significant but it is complemented by professional managers, numerous contractors, and specialised roles and responsibilities. The post harvest sector has adopted new technology and developed economies of scale. Exporting is now dominated by Zespri International, the sole exporter to all countries except Australia. The sector has developed governance arrangements involving Zespri International, Kiwifruit Growers Incorporated and the individual orchard owners.

Industry conduct and performance have evolved in response to legislative change, business opportunities and business capabilities.

Key developments within the industry have included: enhanced orchard productivity, reduced chemical use, enhanced post harvest productivity, development of the Zespri brand, and development of international marketing strategies. Key decisions have been made by the New Zealand Government, Zespri International and its predecessor, Kiwifruit Growers Incorporated, post harvest operators, and orchardists.

Interviews with industry participants identified seven key success factors.

The seven critical success factors identified were: industry champions and management conduct; innovation; industry structure; economies of scale and market power; branding, differentiation and strategy; value chain developments; and market research, responsiveness and information dissemination.

The kiwifruit industry continues to evolve and faces numerous challenges.

Key challenges identified by industry participants are development of future leadership capabilities, continually updating marketing strategies, sustaining government support, and ensuring effective business and scientific research and development activity.

1 *Introduction*

THE EXAMINATION OF THE PAST IS ESSENTIAL for drawing lessons from previous experience so that informed future decisions can be made. The Agribusiness Research and Education Network (AREN) have undertaken this study of the New Zealand kiwifruit sector as part of a wider analysis of structure, conduct and performance across major agribusiness sectors over the past two decades. The wider project includes three other sectors - venison, meat, and the dairy sector.

By examining the different stages of development in the kiwifruit industry and identifying the key success factors this research aims to develop a platform for a more solid research basis. A more robust research basis will assist policy formation in expanding New Zealand's kiwifruit sector. This will be achieved through comprehensive research and analysis that will provide lessons to enable strategic planning for efficient, productivity driven growth.

Overview of the Research Project

This project uses the sequential framework proposed by Yin (2002) for steps in a multiple-case research project, which are define and design; prepare, collect and analyse within case; compare findings from cases (cross-case analysis); and conclude. The first stage of define and design involved a review of studies on business structure, management practises and performance indicators related to agri-food systems in New Zealand and overseas. Following on from this review a brief historical overview for each of the sectors was completed. The review of literature and the historical overviews guided the development of the theoretical framework that underpin the research project, the data to be collected and the specific data collection methods. The theoretical framework was used to develop semi-structured interviews which were conducted with personnel from a wide range of businesses and organisations involved in each sector, either at present or in the past. The interviews were based mainly on open-ended questions following the usual three stages of interviewing: Opening (rapport building), developing and closing (Keats, 2000). Through the interview process key factors influencing management decisions were identified and described. The researchers were seeking to develop descriptions of the firms with respect to structure, strategy and conduct; and to build a clear understanding of their relationship with performance level over the past 20 years.

The Research question

Since the 1980's the New Zealand kiwifruit industry has been through substantial change as a result of internal firm and sector developments, external pressures from customers, governments, competitors and ongoing business evolution. These changes are examined to provide a better understanding of the development path of the kiwifruit industry. This historical review will provide an understanding of how business structure and conduct influence the performance of the kiwifruit industry.

The objective of this study is to explore the key elements underlying the success of the New Zealand kiwifruit industry. Therefore in examining the structural changes, conduct and performance of the kiwifruit sector, the research question that we are addressing is:

What have been the key elements of success and failure in the New Zealand kiwifruit industry?

In answering this question, the following questions will also be addressed:

- *How has New Zealand's kiwifruit sector evolved?*
- *Why did New Zealand's kiwifruit industry evolve the way that it has?*

In responding to these questions this study will identify the range of factors that have driven success in the kiwifruit industry and will also evaluate the importance of these factors at different stages in the industry's development.

Motivation behind the research

This research is motivated by the need for a robust foundational knowledge base on the kiwifruit sector in New Zealand. Future performance can be enhanced as a result of rigorous analysis of the past. This knowledge of the past can directly impact on current policy analysis and new and ongoing research and marketing programmes.

From a planning point of view we have to understand the structure of the kiwifruit industry, its operations, and the practical relationships which already exist between industry participants. Changes that have occurred in the environment in which the industry operates also need to be examined so that future industry challenges can be informed by these past conditions and responses.

Research coverage

The study explores the nature and performance of the New Zealand kiwifruit industry from 1980 to 2006. As almost 94 per cent of kiwifruit produced in New Zealand is exported the focus of this study is on the export sector of the kiwifruit industry.

Value chain theory is used to define the kiwifruit industry in New Zealand. The value chain links the key participants and organisations that ultimately bring kiwifruit to consumers. Therefore it incorporates the three main stages from the orchard to market– growing kiwifruit, post harvest operations, and exporting.

The examination of the industry since 1980 can be separated into the following key focus areas:

- changing market characteristics – production trends, target markets, changing consumer preferences and increasing competition.
- operating environment – how different factors have changed to impact on the industry.
- industry structure – changes in firm and industry level in response to changing circumstances and environments.

- conduct and performance – analysis of broad performance measures, extent of sharing of information, knowledge and resources within the industry, and the degree of interdependence along the value chain.

In particular this study explores the kiwifruit industry's current single desk seller structure – Zespri. It examines how it evolved by looking at the structural developments that preceded its existence and the factors that influenced its formation. It also looks at the recent consolidation amongst post-harvest operators and explores the factors that have brought about this change. It reviews how the industry has responded to changing market conditions by producing new products and how the role marketing – branded products – has influenced export turnover.

Research method

The project proceeded as per the methodology documented by the AREN team (AREN 2006a). To ensure a comprehensive set of respected information sources a list of key individuals from within the industry was required. Hence key industry people including past and current industry leaders were identified. The process identified people from all of the key groups within the industry including: Growers; post harvest operations; research groups; and Zespri.

Report Structure

In this introductory section a brief overview of the kiwifruit sector in New Zealand provides background to the following chapters. This overview outlines the sector's path to becoming a major world producer and key horticultural export earner for New Zealand. The kiwifruit value chain is examined to help provide a framework for further analysis of the sector's performance. Further information on the size and location of the sector is also provided.

Chapter two examines the key characteristics of the kiwifruit market- including production, consumption and trade flows since 1980. Chapter three explores the operating environment for the period whilst Chapter four focuses on industry structure. Chapter five explores conduct and performances whilst Chapter six identifies critical success factors. Chapter seven concludes by reporting industry perspectives on future challenges the industry faces.

Overview of Kiwifruit in New Zealand

The path to major export earner

Kiwifruit seeds were originally brought to New Zealand from China in 1904. In 1925 New Zealand horticulturalist Hayward Wright produced the now dominant green fleshed Hayward variety.

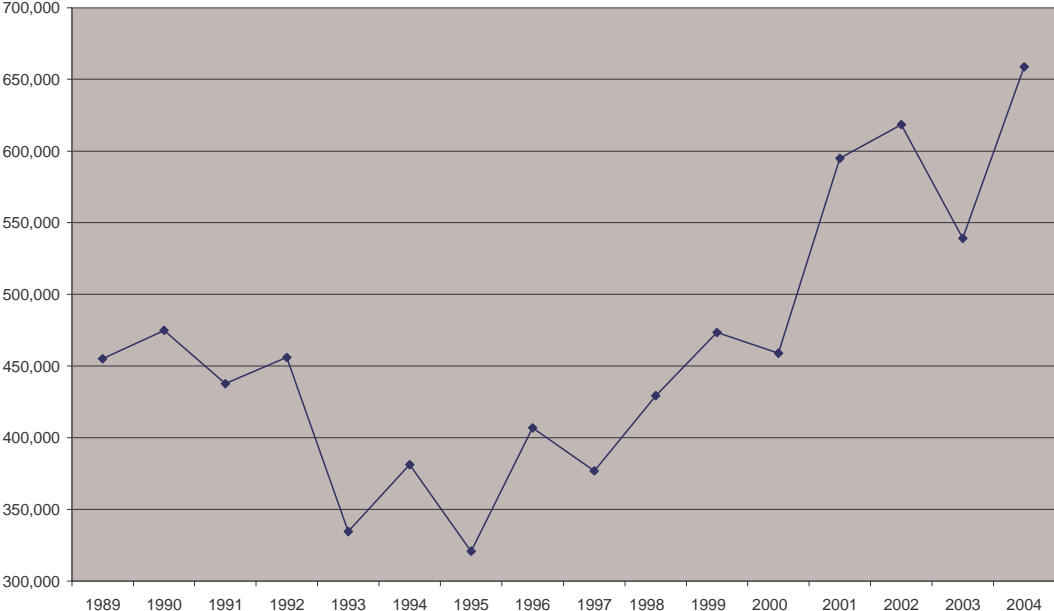
The first commercial orchard was producing fruit for the domestic market in the early 1940s. In 1952 the first export shipment of kiwifruit went to the United Kingdom. The volume of kiwifruit exports rose rapidly over the late 1960's and early 1970's – the number of exporting firms rose from four in 1964 to fourteen in 1974 (Zwart and Moore 1990). By 1976 the exported crop exceeded local consumption for the first time.

Production and export volumes have continued to increase over the past three decades – although production eased in the late 1980s, as the industry experience falling prices for kiwifruit. In 1975 kiwifruit exports earned 2.9 million and three decades later in 2005 they were at 680.9 million (New Zealand Horticulture 2005, p.3). Today kiwifruit makes up around 2.5 per cent New Zealand’s merchandise trade and over 60 per cent of total fruit exports (Statistics New Zealand 2006).

Until recently the Hayward cultivar dominated production and was the standard export fruit. However, in the past few years the Zespri Gold™ cultivar has rapidly gone from limited trials to commercial expansion in many major markets.

Figure 1.1

**Kiwifruit Exports
NZ\$ (000)**



Source: MAF, 2007

Geographic location

The kiwifruit industry began in the Bay of Plenty and today the region produces around 80 per cent of the New Zealand crop (MAF 2006, p.7). During the late 1970’s and early 1980’s there was a geographical expansion of kiwifruit production away from the Bay of Plenty. The other kiwifruit producing regions are in the Nelson, Northland, Auckland, Gisbourne and Hawke’s Bay regions.

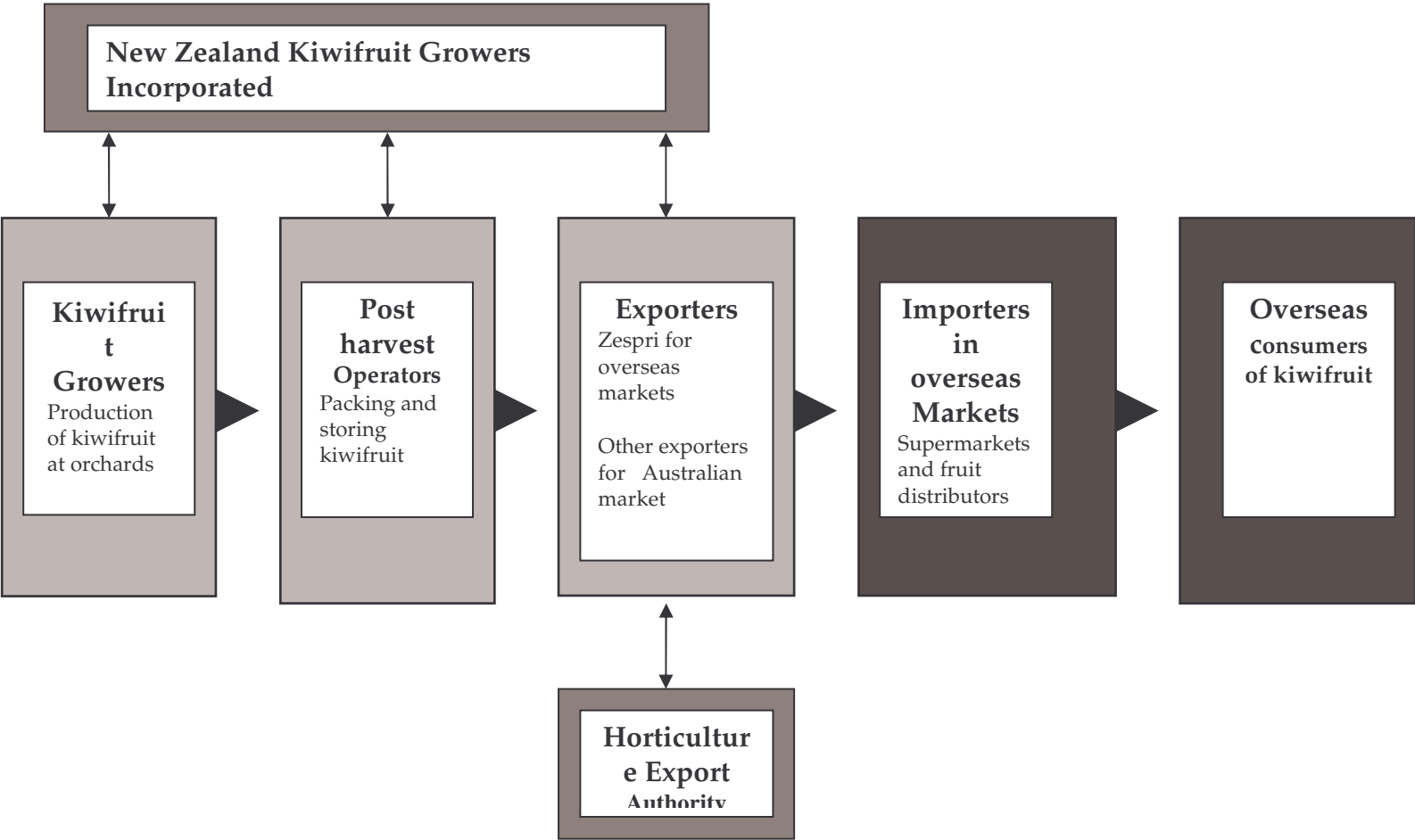
However, the Bay of Plenty region still dominates kiwifruit production – 84 per cent of kiwifruit is produced in the Bay of Plenty region. The latest Agricultural census records a net planted area of 8,600 hectares in the region as at 30 June 2002 representing 72 per cent of New Zealand’s total planted area. The region’s net planted area of kiwifruit has increased by 6 per cent since 1994, compared with a 2 per cent decrease for New Zealand overall (Statistics New Zealand 2002).

The majority of post harvest operators are also located in the Bay of Plenty to take advantage of the proximity to supplying orchards. The industry's key exporter is also based in the Bay of Plenty and has offices in 11 of the major export markets.

The Kiwifruit value chain

It is useful to break up the kiwifruit industry into separate value generating activities – that form the kiwifruit value chain. Identifying these activities provided insight into how value is created within the industry and also highlights important linkages between the various components of the industry. Therefore the kiwifruit value chain provides a vital framework for examining the key elements of success and failure in the New Zealand kiwifruit industry. As previously noted almost 94 per cent of total kiwifruit production is exported therefore for simplicity the value chain used in this study focuses only on the export path. Although the value chain continues outside of New Zealand we are examining the New Zealand kiwifruit industry and are therefore only concerned with the New Zealand based value added activities.

Figure 1.2 The New Zealand export kiwifruit value chain



As illustrated in Figure 1.2 the kiwifruit industry in New Zealand can be separated into three broad value generating activities:

- kiwifruit growing;
- post harvest operations – including grading, packing and storing; and
- exporting - incorporating the marketing and distribution to overseas markets.

The first value generating activity in the kiwifruit industry - the production of kiwifruit at the orchard - includes the maintenance of the kiwifruit vines, pruning, pest and disease management, and the harvesting of fruit.

The second set of next activities along the value chain are the post harvest operations - the grading, packing and storing of kiwifruit before it goes through the export process. Grading refers to the sorting process to produce certain products groups for specific export markets and customers. Packaging is an essential part of the distribution system which gets goods from the grower to the consumer. As a natural product kiwifruit are variable in size and weight, susceptible to damage by rough handling or pressure and perishable to some degree dependent on temperature, humidity and gaseous environment (Cardwell 1982, p. 26). Therefore the tray as a package has to be able to accommodate different numbers and sizes of fruit and provide adequate resistance to the range of conditions that kiwifruit are affected by. Cool stores allow kiwifruit to be effectively stored until it is able to be transported to its destination markets. Technology - such as automatic blemish sorting, Near Infra Red (NIR) sorting and robotic packing – plays an increasingly vital role in these post harvest operations.

The final stage in the New Zealand kiwifruit value chain is the selling and distributing kiwifruit to overseas markets. Zespri Group Ltd is responsible for marketing almost all the export kiwifruit from New Zealand, except for the Australian market.

2 *The Kiwifruit Market*

TO PROVIDE A MORE COMPREHENSIVE understanding of the kiwifruit industry an awareness of the global kiwifruit market – and New Zealand’s place in it – is required. This section gives an overview of the characteristics of the kiwifruit market. The global production profile is examined to provide a background for further analysis on the changing operating environment for the New Zealand industry. A key feature of the global production profile is the influence of overlapping production seasons on trade.

In looking at the demand side the available information on kiwifruit consumption is reported. New Zealand’s key export markets are also identified.

Global Production

Production profile since 1980

Global kiwifruit production grew significantly in the 1980s. However, by 1993-95 it still accounted for only about one quarter of a per cent of world production of major fruits and berries. This share fell in 2003-2005. After price falls in the early 1990s the global kiwifruit industry shrank for several years before beginning a turnaround in the late 1990s. Between 1993-95 and 2002-03, world production of kiwifruit barely exceeded the rate of world population increase. During that decade, production of many other fruits grew at faster rates – including major fruits like apples, pears and bananas (World kiwifruit review 2006, p.17).

Production outlook

The most recent United Nations Food and Agriculture Organisation (UN FAO) reports provide data to 2005 on area harvested, yield and production of kiwifruit in countries reporting commercial production. However, the size of the area harvested to kiwifruit in China is still a matter of much speculation because national statistics are not available. It has been estimated that the area harvested was about 53 000 hectares in 2003 (World Kiwifruit Review 2006).

The data from the UN FAO indicates that when the potential contribution of China is considered total world production is expected to grow significantly in the future. Global production – excluding China came close to around 1 million metric tons in 1992 but did not actually surpass that level until 2000. It then remained at a plateau above 1 million metric tons for the next four or five years as one or other major producing country suffered from severe adverse weather conditions. With more favourable growing and harvesting conditions production outside of China is estimated to have reached about 20 per cent above the 1 million metric ton level (World Kiwifruit Review 2006).

Major kiwifruit producers

World kiwifruit production is concentrated among a few countries. The top ten producing countries contributed over 95 per cent of world production and the top five producing countries 85 per cent. Traditionally the three largest exporters – Italy, New Zealand and Chile have dominated production however in recent years China has emerged to join these three countries as a major producer (World Kiwifruit Review 2006, p. 20).

The volume and rankings of the major producing countries has changed over slowly over the last decade (see Table 2.1). All the countries in the top ten in 2003-2005 – with the exception of France, Japan and the United States - increased the production. Both Portugal and Spain dropped out of the top ten despite modest increases in production between 1993-95 and 2003-05 (World Kiwifruit Review 2006, p. 20).

Table 2.1 Top Ten Kiwifruit Producing countries

1993-95			2003-05		
Rank	Country	Volume (mt)	Rank	Country	Volume (mt)
1	Italy	322 730	1	Italy	401 622
2	New Zealand	224 000	2	China	341 000
3	Chile	125 333	3	New Zealand	303 000
4	France	77 570	4	Chile	151 667
5	Japan	51 267	5	France	76 157
6	Greece	41 681	6	Greece	50 000
7	United States	38 213	7	Japan	38 100
8	China	23 167	8	United States	28 335
9	Portugal	9 9394	9	Iran	20 333
10	South Korea	8 787	10	South Korea	12 000

Source: World Kiwifruit Review 2006

Consumption

Import growth

World imports of Kiwifruit averaged only 16 300 metric tons in 1982-84 and increased by a staggering 33 000 per cent to 530 900 metric tons in 1992-94 and experienced a further increase – almost 55 per cent - to 822 300 metric tons in 2002-04 However, imports of three competing tropical fruits, fresh mangos, fresh papaya and fresh pineapples increased even more dramatically over the past decade (World kiwifruit review 2006, p.17).

Many fruits that were once rare in the Northern Hemisphere are now a regular part of consumers' diets. The unique competitive niche that kiwifruit once enjoyed has become crowded with many other fruits. Major retailers, influential food chefs and the general media help educate consumers about the various ways in which little known fruits can be used and enjoyed. This encourages the continual search for new fruit experiences (World Kiwifruit Review 2006, p.18)

Major markets

In the 1980s kiwifruit imports were concentrated in just a few large affluent markets; EU-15, Japan and the United States. However, as volumes have increase, retailers and consumers in many other countries have acquired a taste for kiwifruit (World kiwifruit review 2006, p.34).

The EU-15 continues to be the most important market for imported kiwifruit. While imports to new markets have increased, particularly in Asia, a heavy reliance on the a few major markets stick remains. The top ten consistently take almost 70 per cent of total world imports (see table 2.2).

Table 2.2: Top Ten Kiwifruit Importing Countries 2004

Country	Volume
Belgium	117 307
Germany	102 849
Spain	98 658
Japan	61 955
Italy	52 127
Netherlands	44 472
France	42 888
Russian Fed.	37 681
United States	37 166
United Kingdom	34 719
Top Ten Importing Countries	629 822
World	915 960
Top Ten per cent of world imports	68.8

Source: World Kiwifruit Review 2006

Per capita availability of kiwifruit

The global per capita availability of kiwifruit remained steady at around 200 grams per person over the decade from 1992 to 2004. Data from the UN FAO indicate that this availability increased significantly in 2005. This along with the increasing supplies from China, indicates an end to the relatively stable equilibrium that has characterised per capita supplies since the dramatic growth of kiwifruit production in the 1980s (World Kiwifruit Review 2006, p. 45).

Unlike other major fruits the kiwifruit did not experience an increase in supply that was much faster than the growth in world populations. However, the World Kiwifruit Review 2006 reports that:

'The kiwifruit industry appears to be entering an era when it will have to cope with similar supply-demand imbalanced. Programs to enhance demand will become much more critical to its future.' (World Kiwifruit Review 2006, p. 45).

New Zealand's place in the kiwifruit market

New Zealand production

New Zealand was the first producing country to rapidly expand production in the early 1980's and to also cut back production as more competitors entered the market in the late 1980's. Production stabilised in the early 1990's as a result of significant price falls. A number of very profitable years began in 1998-99 as the weaker New Zealand dollar and reduced international competition provided New Zealand producers with steadily rising prices and orchard returns.

Although the potential to increase the area planted was limited by availability of suitable land in the Bay of Plenty producing region the industry still provided a robust supply response. It invested heavily in:

- new and upgraded plantings;
- converting area to the new high yielding Hort 16A (gold) cultivar; and
- modernising its packing, storage and marketing systems.

As a result production has been on an upward trend since 1998 (World Kiwifruit Review 2006, p. 22).

Trade flows

Since the early 1980's New Zealand has decreased its export dominance in the world market. In 1990 New Zealand had an overwhelming dominant position – with an estimated share of total world exports at just over three – quarters (OECD 1990, p.12). However, by 2000 this share had fallen to under a third (World Kiwifruit Review 2006, p.26).

Kiwifruit exports earned \$7.85 million dollars in 2006 - making up over 30 per cent of New Zealand's total horticultural export earnings (Statistics New Zealand 2006). This value comes from the production of 84.7 million trays supplied by 2 748 kiwifruit growers (Zespri 2006).

As New Zealand - via Zespri - seeks to sell its products at a substantial price premium over its competitors the major markets for New Zealand kiwifruit are the few high-income markets that can support such premium prices. Its major markets continue to be the EU-15, Japan, and the United States (World Kiwifruit Review 2006).

Within the EU market growth has been the strongest in Spain. In Asia the largest growth has been in sales to South Korea, Taiwan and Hong Kong. In 2004 and 2005 strong growth was also experienced in the Japan – New Zealand's oldest Asian market.

Overlapping seasons

Over 80 per cent of world kiwifruit exports come from just three countries – New Zealand, Italy and Chile. Therefore these countries are the New Zealand kiwifruit industry's competitors. However the degree of competitor is dependant on the extent that each countries production season overlaps

The season worldwide

Generally kiwifruit produced in either the Northern or Southern Hemisphere is sold before off season supplies become available from the other hemisphere. In most years, supplies from the two hemispheres are complementary not competing. However, as global production has increased, the possibility for increased overlap has increased. Overlap is often blamed for sluggish sales or depressed prices at the end of one season or the beginning of the next season (World Kiwifruit Review 2006, p.42).

The impact of New Zealand's trade

In both the 2004 and 2005 calendar years stocks from New Zealand's crop in 2004 were still available as a record Italian crop was being harvested. Prices of Italian kiwifruit began the 2004-05 season at a low level and trended downwards- resulting in lower prices throughout Europe (World Kiwifruit Review 2006, p.43).

Table 2.3 Kiwifruit Production by Three Main Exporters

	1995	2000	2005	Increase over decade
Production ('000 t)				
Chile	114	115.5	150	31.58%
Italy	314.03	345.69	415.05	32.17%
New Zealand	223	261.64	318	42.60%
3 country total	651.03	722.83	883.05	35.64%
Share of 3 country total				
Chile	17.51%	15.98%	16.99%	
Italy	48.24%	47.82%	47.00%	
New Zealand	34.25%	36.20%	36.01%	
3 country total	100.00%	100.00%	100.00%	

Source: FAOSTAT

3 *Operating environment*

THE ENVIRONMENT THAT THE KIWIFRUIT SECTOR operates in is fundamental to its performance. The success of kiwifruit exports depends not only on the choices of kiwifruit growers, post harvest operators, exporters and Zespri but also on the environment in which they operate. It is therefore appropriate to undertake an examination of this operating environment.

The operating environment is made up of a number of dimensions – political, economic, social and technology. How these operating factors have changed over time will provide a basis to explore how the New Zealand kiwifruit industry has evolved. It will also provide an insight into how the various conditions have influenced the industry’s structure and performance along the kiwifruit value chain.

The Political Operating Environment

Key legislation and regulations

The key legislation and regulations that have been identified - by the research both through the literature review and interview process – as impacting on the kiwifruit industry since 1980 are documented below. These legislation and regulations guide the path of the industry’s changing structure. The following chapter provides a more detailed discussion on the industry’s structural changes.

Primary Product Marketing Act 1953 – the NZKA

The New Zealand Kiwifruit Marketing Authority (NZKA) was established in 1977 under the powers of the *Primary Product Marketing Act 1953*. This legislation provided controls to producers to market their products.

The Kiwifruit Authority licensed a limited number of exporters to export kiwifruit and coordinated these exports. The NZKA also set quality standards for the industry, controlled marketing and packaging, and funded research and development (Willis 1994).

The NZKA operated until 1988 when a major restructuring of the industry led to the creation of the New Zealand Kiwifruit Marketing Board (NZKMB). Despite the general trend away from producer boards, kiwifruit growers successfully lobbied the government to re- regulate the industry. A report compiled by Coopers and Lybrand (1998) was influential in this decision. The report argued against a ‘free market’ solution. While the report actually recommended a structure slightly different to that of the NZKMB its findings were used by growers to oppose the ‘free market’ option and establish a general need for change.

Kiwifruit Marketing Regulations 1977

The NZKA's export licensing system was abolished and replaced by the NZKMB in September 1988. The NZKMB was set up under the *Kiwifruit Marketing Regulations 1977*- which in turn stem from the *Primary Products Marketing Act 1953*.

Under the *Primary Product Marketing Act 1953* the NZKMB was granted monopoly powers to purchase, distribute and market kiwifruit in all international markets except Australia. It was also obligated to buy all fruit offered by growers that met export standards.

Kiwifruit Industry Restructuring Act and Kiwifruit Export Regulations 1999

The *Kiwifruit Industry Restructuring Act 1999* was passed in September 1999. This Act established from 1 April 2000, the NZKMB's commercial operations -Zespri - as a company with shares tradable among producers. The *Kiwifruit Export Regulations 1999* made under the Act were set up to recognise Zespri Group Ltd as a single desk exporter. This exclusively authorised Zespri to export and market New Zealand kiwifruit overseas except in Australia. The Regulations:

- retained the near-sole right for Zespri to purchase growers' product for export, although other exporters can apply for export licenses;
- subjected Zespri to extensive regulations, including rules on non-diversification, non-discrimination, and information disclosure. These regulations are designed to protect growers while the export restrictions remain;
- established the Kiwifruit Board that was independent from the commercial activities of Zespri and that was responsible for monitoring and Zespri's compliance with the regulations; and
- gave the new Kiwifruit Board power to decide on collaborative marketing applications and the power to require Zespri to work with approved collaborative marketers.

2004 Amendment to the Kiwifruit Export Regulations 1999

The *Kiwifruit Export Regulations 1999* were amended in 2004 so that every exporter wanting to export to Australia had to apply for a license or exemption to the Horticultural Export Authority (HEA). The Government therefore made an Order-in-Council bringing kiwifruit exports to Australia under the *New Zealand Horticulture Export Authority Act 1987*.

The Horticulture Export Authority (HEA) licenses exporters of particular horticultural products. The HEA approved the export marketing strategy developed by New Zealand Kiwifruit Product Group to Australia Incorporated. The export marketing strategy imposes grade standards, which are intended to improve the market price. In addition, the HEA has been monitoring the compliance of licensed exporters, and is able to take disciplinary action if the approved marketing strategy has been breached.

International relationships

CER and GATT requirements

Closer economic relations with Australia and adherence to the GATT subsidies code meant that export incentives for horticulture have been removed. It is not clear how significant these incentives were but this issue will be explored in future research.

Another more immediate issue is perceived pressure for the WTO for New Zealand to remove the single desk. The industry is aware of this risk and a common argument is that the industry should operate in such a way that participants would choose to remain with the single desk even if there were no compulsion.

Italian market access

When Italy increased its kiwifruit production competition in all EU markets increased. However, it was in the Italian market that the strengthened competition put pressure on trade relations. This began in 1990 when Italian trade officials expressed concern about the chemical residues on New Zealand kiwifruit. The Italian government then introduced local standards that were more stringent than the European wide regulations governing maximum residue levels (MRL's) to prosecute some sellers of New Zealand kiwifruit. When this occurred again in the following season New Zealand responded by establishing the Kiwigreen programme.

Economic conditions

The economic liberalisation that occurred after 1984 had a range of impacts on the New Zealand economy. As kiwifruit is exported the changes in monetary and exchange rate policies had a direct impact on the industry. Taxation reforms changed incentives for industry participants and the deregulation of the agricultural and horticultural services changed the way growers and exporters accessed these services.

The increasing competition from other supplier markets also changed the economic environment for the kiwifruit industry.

Monetary and exchange rate policies

In 1982 a fixed exchange rate was reintroduced and a freeze on wages and prices and controls on interest rates were put into place. This gave the industry temporary protection against exchange rate instability and price increases in domestic input prices – including wages. However, this ended when the price and wage freezes were lifted in 1984. In July that same year, following a major capital outflow, the newly elected government undertook a currency devaluation of 20 per cent against a basket of currencies of major trading partners. In the following year the New Zealand dollar was floated and the Reserve Bank role changed to control of monetary policy.

The value of the New Zealand dollar rose dramatically after 1987 and this impacted negatively on the kiwifruit industry – as it made the price of kiwifruit in overseas markets relatively more expensive and therefore decreased demand for them. The Reserve Bank's inflation reducing policies caused interest rates to rise to extreme levels by 1988. At the same

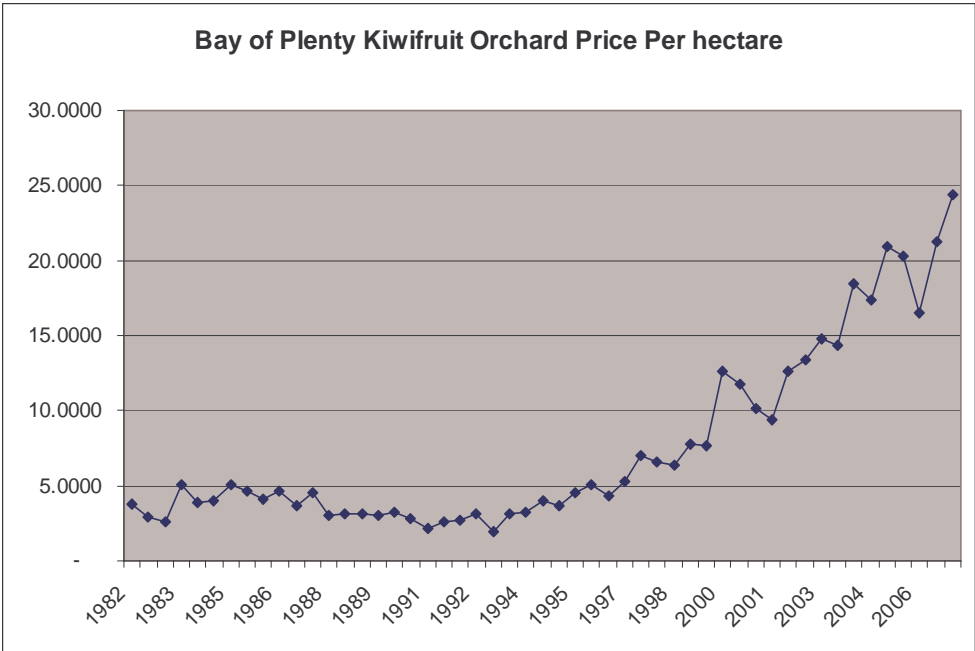
time orchard land values fell leading to an equity crisis for many growers (Lees 1993). Johnston and Sandrey (1990) reported that a 1987 survey showed 35% of kiwifruit growers had less than 50% equity while 8% had negative equity. Douglas and Burgess (1992) also state that:

'Government policies aimed at reducing New Zealand's excessive inflation pushed grower interest payments up- which had only been 8.7 per cent of gross revenue in 1982 up to 23 per cent by 1988.
 '(Douglas and Burgess 1992, p.4).

Tax Reforms

In 1986 taxation reform progressively removed major concessions which had been perceived to divert investment into kiwifruit. Analysis of kiwifruit orchard prices in the Bay of plenty showed that prices were relatively flat in the 1980s but tax was only one relevant factor.

Figure 3.1



Source: Quotable Value New Zealand.

Deregulation of Primary Industries

As part of New Zealand’s economic liberalisation that occurred after 1984 the agricultural and horticultural sectors were deregulated. These reforms included:

- the removal of input subsidies on a range of inputs – including fertiliser and water supply;
- cost recovery of advisory, research, animal health and quarantine services; and
- full cost recovery of inspection services by MAF Quality Management

The deregulation led to increased competition as new entrants in servicing and exporting sought to establish market footholds (Campbell et al 1997).

International market changes

Up until the mid 1980s New Zealand was the unchallenged leader in world kiwifruit production. However this dominance was overturned with the dramatic increase in kiwifruit planting in other markets – especially in Europe so that by 1989 total European production had surpassed the New Zealand crop (Lees 1993).

The increased production in the EU was a result of incentive grants provided to European kiwifruit growers and the high prices being paid for New Zealand - especially in West Germany – in the early 1980s, along with an over supply of traditional crops such as grapes. It was the excess supply of grapes that motivated government subsidisation of kiwifruit production. The move from grapes to kiwifruit in Italy resulted in Italy overtaking New Zealand to become the world's largest producer of kiwifruit in 1989. The majority of Italy's crop is exported to other EU countries.

Social

Social capital in the Kiwifruit industry

Social capital refers to the value created by a person's or firm's relationships with other people, firms and organisations. Social capital does not have a formal definition as such. However, according to Putnam social capital refers to the collective value of all social networks (Putnam 2000). In essence it is the collective resources built up through social interaction. It includes trust, co-operative behaviour, helpful networks, and willingness to participate in issues of common concern.

Although the concept of social capital cannot be formally measured some broad assumptions can be made on the extent of social capital within the kiwifruit industry and therefore how it has enhanced conduct and performance.

The vast majority of kiwifruit growers and post harvest operators are concentrated in the Bay of Plenty. This close proximity means that individual growers and cool store operators have had the opportunity to develop important relationships and networks with each other. It is these network structures that have given rise to a high degree of information sharing and mutual cooperation among growers and post harvest operations. We can assume that in other sectors where the primary producers, processing operations and exporters are more widely dispersed the extent of social capital not likely to be as extensive.

Kiwifruit forms the central identity for Te Puke – the central town to the Bay of Plenty's kiwifruit growing area. There is a high profile annual focus Te Puke kiwifruit festival held each year.

Consumer demand for kiwifruit

Another part of the social operating environment is the social factors that influence demand for kiwifruit. Consumers like to try new types of fruit and to try variants of existing fruit. Retailers can also benefit from new cultivars as they are able to put larger mark ups on new products. The growing interest in food and cooking – influenced by the availability of a wider variety of food and the emergence of celebrity chefs – has bought about a far greater desire for new and higher quality food products.

During the 1980's kiwifruit was a relatively new fruit for consumers in the major importing markets. Therefore it had wide consumer appeal. However, the success of the early kiwifruit exporters triggered a powerful supply response both in kiwifruit production and other products that would compete for the same emerging niche that kiwifruit had occupied. This increase in supply led to kiwifruit losing its niche market position.

'The Hayward cultivar continues to be seen as adequate, but can no longer provide the sort of excitement that other exotic fruits can generate.' (World Kiwifruit Review 2006, p.8).

However the New Zealand kiwifruit industry has responded to these changing conditions by creating the new Gold kiwifruit.

Research and Development

Research and development as a dimension of the operating environment for the kiwifruit industry can be separated into two related areas:

- Enabling technologies and innovation; and
- New products.

Referring back to the value chain framework, the two activities that have the greatest scope for the application of research and development opportunities are growing and post harvest operations. The World Kiwifruit Review (2006) states:

'Another hard truth about the value of production in the marketing system is that the potential value is determined initially by the producer in the orchard during the life of the kiwifruit plant and each year during the growing season. That effort is either confirmed or weakened by the care with which the product is harvested. Whatever quality exists when the fruit leaves the orchard can at best be maintained by each subsequent packer, storage or handling operation. It can rarely be improved much.' (World Kiwifruit Review 2006, p.93).

Therefore to add value to New Zealand's existing Kiwifruit crop enabling technologies and innovation are required at the orchard and post harvest facilities. And this is where the major changes have occurred since 1980. To further expand the value and overall performance – profitability – of the industry the development of new crops have the potential to play a significant role.

Enabling technologies and innovation

Enabling technology and innovation has and continues to play an essential role in the performance of the New Zealand kiwifruit industry. Enabling technology is the adoption of new technology that increases efficiency along the value chain and innovation is the practical application of new knowledge. This section reviews some of the major enabling technologies and innovations that have changed the operating environment of the kiwifruit industry since 1980.

Integrated Pest Management (IPM)

Integrated Pest Management (IPM) aims to provide a sustainable approach to managing pests by combining biological, cultural, physical and chemical tests in a way that minimizes

economic, health and environmental risk. During the 1980's Integrated Pest Management (IPM) research for kiwifruit focused on two strategies:

- developing sprays that were safer and less harmful to the environment than conventional insecticides; and
- reducing the number of sprays applied by growers in each season.

In developing new sprays products based on Bt (*Bacillus thuringiensis*) were registered for control of leafrollers in the early 1980's. Attempts to reduce the numbers of sprays had shown by the mid 1980's that most leafroller damage occurred immediately after flowering. However, this finding could not be exploited as the spray schedule in total use was to control both leafrollers and scales. Research trials to better time sprays against scale pests gave inconsistent result so monitoring systems were developed against scale pests. With the implementation of monitoring, sprays could be applied only when necessary to prevent economic losses.

The KiwiGreen program

In 1992 Zespri introduced the KiwiGreen program, - an integrated pest management approach developed by HortResearch. This program built on the earlier research and development on applying the IPM approach to controlling pests on kiwifruit.

The aim of the KiwiGreen program was to produce fruit with minimal or no chemical residues so as to provide an environmentally and ethically responsible production system that ensures safe fruit for consumers. The key motivation for this was maintaining access to the Italian market – where new standards had been imposed. Other major institutional buyers were also enquiring about the possibilities of supplying 'greener' kiwifruit. For example, two major UK supermarket chains – Sainsburys and Tesco – visited New Zealand to examine the food safety of kiwifruit.

The program involved increased monitoring of orchard pests, a decrease in the use of organophosphated and synthetic pyrethroids, and the use of soft pesticides for pest control – such as Bt-based products and mineral oils. Any pesticide application is only permitted when there is a demonstrable need for it. Although a limited number of applications of some conventional chemicals are permitted, usage of these is restricted to ensure that residue levels will be less than 5 per cent of the allowable minimum residual level under the International Codex standard. All kiwifruit growers must comply with the KiwiGreen program.

The kiwiGreen program successfully resulted in maintaining access to the Italian market within two years. In its initial season 262 000 trays were produced and the following year this rose to 4.7 million. The 1994 harvest included 6.8 million trays of fruit produced under the program. In 1996-97 – after five years of the program – the total export crop was produced using the techniques from the program. The only exception was the small portion of kiwifruit grown organically and even these crops used monitoring techniques and infrastructure developed for KiwiGreen.

Pest monitoring involves both sampling in the orchard for leafrollers and the use of stereo-microscopes to determine if live scale insects are present on kiwifruit leaves. Monitoring runs from January until close to harvest. During this period packhouses are relatively under-utilised and already had people whose employment during the short packing season had

given them skills relevant to pest monitoring: namely, quality control and grading table operators. From this base, Pest Monitoring Centres have been established at packhouses.

Post harvest operation technology changes

Post harvest technologies have been very significant. These include automatic blemish sorting, near infra red NIR sorting, robotic packing and advances in cool storage technologies. Further research is needed to more fully understand their impact on process, the product, and the economics of post harvest handling.

New Products

Zespri™ Gold

The creation of Zespri™ Gold began in the late 1970s when seeds for the research project of developing a new variety were collected in the Beijing Botanical Gardens in China. These were subsequently planted in the research orchard in Te Puke, New Zealand. A couple of years later further seeds were collected in China. These seeds and the second generation of the earlier collected seeds were crossed because of their attractive characteristics. They created fruits with yellow flesh, sweet flavour, and large succulent fruits. One generation later in 1992 one single plant was selected from this new family (Anon year?).

After this initial stage the development of the characteristics of the new fruit followed. Commercial considerations like taste, colour, size, storage and shelf-life had to be taken into account. In 1997 almost 400 hectares was covered by the new variety and the first 4000 trays were exported the following year. In 2000, the kiwifruit was launched, under the name Zespri™ Gold and Plant Variety Rights were taken out in order to protect it internationally. The purpose of developing Gold has never been to substitute the Green variety, but rather to act as a complimentary product to extend the options for customers and consumers (Celebrating 100 Years). Zespri™ Gold currently accounts for almost 18 per cent of total kiwifruit exports from New Zealand (World Kiwifruit Review, 2006).

Hort Research is currently the major provider of research pertaining to the growth of kiwifruit. There are a range of projects being undertaken including research on new red-centred cultivars and rootstocks identified with potential to increased dry matter and /or reduce vine management costs.

4 *Industry Structure*

THIS SECTION BEGINS THE EXPLORATION of the structure, conduct and performance links in the kiwifruit industry by reviewing the key structural features of the sector. It examines the industry's response to changes in the operating environment by looking at how organisations within the industry have evolved. In particular the evolution of the exporting structure is reviewed.

Once again the value chain framework is used to guide the analysis of the industry structure. Changes within each of the three valuing generating activities are reviewed. The key organisations within each activity are identified and the relationships between them explored. In The size and number of enterprises along the value chain and how these have changed over time is examined. The extent to which firms are diversified across the various value adding activities is also noted.

It is important to note the high degree of vertical integration within the industry and the opportunities and challenges associated with this.

The Orchard

The earlier structure of the industry was characterised by family run operations which simultaneously managed an orchard and packhouse. With the expansion and consolidation of post harvest operations kiwi growers now specialise in producing kiwifruit at the orchard.

Further analysis of data is required but the number of orchards peaked in around 1990 with approximately 4000 orchards. During the 1990s there was a period of consolidation with the number of orchards decreasing and the size increasing.

The number of orchards has increased marginally since 1999 when there were 2843 registered orchards. Today there are just over 3000 registered kiwifruit orchards with an average size of 3.43 hectares (World Kiwifruit Review 2006, p.75). Almost half the orchards are between 2 and 5 hectares and another 30 per cent have less than 2 hectares. Fewer than 5 per cent of orchards contain over 10 hectares (Zespri 2006). While there is some multiple ownership of orchards, and some large orchards exceed 80 hectares, the number of individual producers is still large.

Most of the large post harvest operators also now manage significant numbers of orchards to ensure supply of fruit for their operations. They provide the management expertise and organise the work across all leased orchards, generally using labour contractors, in order to gain efficiencies.

In recent years there has been an increase in the number of growers joining cooperative post harvest operations. Post harvest operators compete for grower business on the basis of service, pricing and orchard gate return (Zespri 2006).

Post harvest arrangements

Consolidation in the industry

During the early stages of kiwifruit industry many of the larger growers owned their own packhouses – and also packed fruit for a few other growers. However as the industry developed a very clear trend emerged towards concentration of packhouse numbers and increased operating capacity of post harvest facilities.

When the KMB was formed in 1988 there were 620 packhouses operating (Willis 1994). This number has fallen steadily - today there are 83 packhouses and 85 coolstore facilities (Zespri 2006). This trend represents a major upsizing of packhouses and has partly reflected the move away from combined orchard and packhouse operations to joint packhouse and coolstore operations. Most packhouses now also operate a coolstore – and it was the lack of coolstore facilities that contributed to the demise of many smaller packhouses. Today 45 per cent of packhouses pack less than 500 000 trays compared to 65 per cent in 1999. In 1999 20 per cent of pack houses were packing over a million trays and last season this rose to 33 per cent.

The role of packhouses as Pest Monitoring Centres that emerged under the KiwiGreen program extended the activity of post harvest operations into production. This has strengthened the links between grower and packhouse operators. It has also accelerated the trend towards the increasing involvement of packhouses in orchard operations, especially in terms of leasing. Both effects increase the certainty of throughput for post harvest operators.

Factors behind the consolidation

The major influence of the consolidation trend within the post harvest sector of the kiwifruit industry has been the achievement of economies of scale. Economies of scale refers to the reduction in average costs that occur as the scale of a firm's output increases. A number of factors over the past decades created further impetus for creating larger scale operations that could realise the potential of economies of scale. One such factor has been the change in the relationship between packhouses and the exporting organisations.

When the NZKMA was the marketing body for the industry and controlled the exporting sector it was largely responsible for recording and administration for packing and storing. This changed when the NZKMA was replaced by the NZKMB in the early 1990's. The NZKMB devolved an increasing amount of administrative activity back to the packhouse level. For example, costs of fruit labelling were borne by packhouses but the requirements were set by the NZKMB. As market differentiation increased and labelling specification became more detailed, labelling costs increased. These rising costs meant made it more efficient for larger operations.

Another example of how the exporting organisation influenced packhouse costs was when the grade weight tolerances were decreased by the NZKMB. This required more up to date electronic grading equipment which larger packhouses could more easily afford. This forced smaller operators with older equipment out of the industry.

The ability of the NZKMB to impose these kinds of quality control measures on post harvest facilities was partly attributable to the long term development of traceability systems within the kiwifruit industry – that remains today. Pallets of kiwifruit are bar-coded which allows

individual pallets to be traced within an electronic inventory from the coolstore to the market. Coolstores are responsible for electronically submitting the inventory of barcodes to the NZKMB at the time that pallets enter the cool store. This system allows rejected fruit in the market to be accurately traced back to the post harvest facility that processed them and then ultimately back to the grower.

Therefore, it was the bigger post harvest operators which were more readily able to adapt to meet these changes. The changing requirements for market accountability, coolstore facilities, and capital equipment required a greater volume of output for the post harvest operations to be economically viable.

As post harvest operations have expanded they have differentiated so that some handle mainly organic fruit for example, or have added the facility to pack jumbo (large size) fruit, as well as normal count sizes. Further, expansion in coolstore facilities has enabled fruit to be stored in bulk for later packing so the packing season has been extended.

Profile of some major post harvest operators

The post harvest sector has consolidated in recent years. Three of the major post harvest operators – that together account for almost 70 per cent of post harvest activity - are profiled below.

Seeka

Seeka is New Zealand's largest kiwifruit post harvest supply company. Seeka and its associated OPAC are forecast to handle more than 27 per cent of New Zealand's total kiwifruit production in 2007.

Seeka is made up of two divisions – post harvest operations and orchard operations. During 2005 Seeka leased orchards that totaled 579 hectares, managed orchards totaling 299 hectares and 105 hectares of long term leased orchards. In total these orchards produced 7.3 m trays in the 2006 season, making it New Zealand's largest grower. This orchard capability provides secure trays to the post harvest division.

Seeka operates a range of post harvest facilities, including specialist Gold, Green and Organic packhouses, and manages post harvest services and product inventory. Its 16 major post harvest facilities – 13 pack houses and 19 coolstores - service the Te Puke, Tauranga and Katikati regions and employ more than 2 500 seasonal staff (Seeka 2006). These facilities contain 52 packing lanes and use controlled and standard atmosphere bulk storage. Seeka's specialist Gold packing facilities feature an 8-lane optical pre-grader and a robotic packing arm. This technology is fundamental efficiently segregating product to maximize its value.

Since 2000 Seeka's market share has risen from 9.5 per cent to 27.1 in 2006 due to major acquisitions over the period - providing further evidence of the significant consolidation that has taken place within the sector. Seeka notes that:

'Systems development provides the Company and its growers with an unparalleled level of sophisticated information that was not economically justifiable in the previous smaller- Company structure' (Seeka 2006, p.4).

Seeka believes that further supplier consolidation is necessary for the industry and that the current kiwifruit supply structure remains unnecessarily fragmented (Seeka 2006).

Satara

Satara is a kiwifruit and avocado co-operative that packs and stores 13 per cent of New Zealand's annual kiwifruit production. Its history can be traced back to the amalgamation of Bay of Plenty Co-operative Growers Ltd and Bay of Plenty Fruitpackers in 1974. In 1997 Bay of Plenty Fruitpackers Ltd Manukau Horticulture Ltd to become Baypak and then in 2001 Katipak and Baypak merged to create BK Mergeco Ltd. The following year BK Mergeco Ltd became Satara Co-operative Group Ltd. Satara listed its investor shares on the NZAX and in 2006.

Today Satara has 7 packhouse facilities located in Whangarei and the Bay of Plenty. Most of the sites also operate substantial cool storage rooms and controlled atmosphere facilities. Operating a total of 74 packing lanes Satara packs over 11.2 million trays of kiwifruit annually. The largest of Satara's packhouses and coolstores are located Te Puke where 4 million trays of kiwifruit are produced annually. A modern Research and Development Laboratory is also on site along with Satara's administrative, logistical and technical teams. During 2007 Satara will continue its centralisation and redevelopment of facilities to progress the planned reduction in the number of operating sites in the Bay of Plenty from 6 to 4 (Satara 2006). Satara also has an orchard division that produced 2.2 million trays in the 2006 season.

Satara and Seeka have recently invested in Kiwi Produce Limited – New Zealand's leading pre packing and local market fruit supply business. Kiwi Produce specialises in pre-packing fruit in punnets, netlon bags and distributing kiwifruit, avocado, citrus, onions, pip fruit and summer fruit to both the export and domestic markets (Satara 2006, p. 7).

G6 Kiwi

G6 Kiwi Ltd was formed in late 1997 by a group of post harvest operators. Today it has 13 members, and is one of the larger kiwifruit suppliers representing 26% of the industry for the 2006 season. The G6 Kiwi supply entities along with their contributing growers supply kiwifruit of all varieties and growing methods to Zespri International via G6 Kiwi through the Ports of Tauranga, Whangarei and Auckland.

The key role of G6 Kiwi is the contract and management of the supply of kiwifruit to the marketer on behalf of the supply entities and their growers. This includes the provision of contract negotiation, packaging allocation, delivery allocation, inventory management, and logistic (port and transport) services.

Export and Marketing Structures

It is the export and marketing part of the kiwifruit value chain that has undergone the most changes since 1980. Many of these changes have been vigorously debated by those in the industry. Often the changes have been a result of crises in the industry – represented by depressed or negative grower returns.

The long and often turbulent evolution path of the industry's current export and marketing body - Zespri - can be traced back to a series of grower exporter meetings that resulted in the

formation of the Kiwifruit Export Promotion Committee (KEPC) in 1970. The KEPC appointed public relations offices overseas. However, the lack of coordination in timing and destination among export consignments led many growers to suggest a controlling body for the industry (Lees 1993). The exporting companies vigorously opposed any such form of industry control (Yerex and Haines 1983). This conflict continued through the 1970s and abated only in 1977 with the creation of the New Zealand Kiwifruit Authority (NZKA). The NZKA represented a compromise between the two parties – as it involved a majority of grower representatives in the Authority but also guaranteed representation for exporters (Yerex and Haines 1983).

The export licensing system – New Zealand Kiwifruit Authority

The NZKA was established in 1977 under the powers of the *Primary Products Marketing Act 1953*. The legislative functions of the NZKA included:

- licensing exporters;
- promoting the export of kiwifruit and encouraging marketing outside New Zealand;
- establishing co-ordinated export marketing of kiwifruit;
- assisting the development of the kiwifruit industry; and
- promoting greater efficiency in the kiwifruit industry (Allison 1982, p.6).

The authority licensed a limited number of exporters to export kiwifruit and coordinated market entry of the fruit. It was funded by compulsory levies on growers and exporters. The emergence of the NZKA effectively reduced the number of exporters from 14 to 7 – via the authority licensing powers. This reduction was in response to fears that competition amongst exporters may drive down prices in overseas markets.

In addition to licensing exporters the authority – and in accordance with its legislative functions the NZKA:

- developed standardised requirements for quality packaging and labelling;
- set prices;
- required exporters to send the same minimum percentage of their exports to each of the major markets; and
- undertook overseas product marketing (Douglas and Burgess 1992, p.4).

Due to these regulatory controls exporters had limited capacity to compete with each other in adding value to the crop through innovative product differentiation.

‘Exporters ended up as little more than licensed commission sellers getting a percentage as the crop passed through their hands without being exposed to normal commercial trading risk or responsibility’ (Douglas and Burgess 1992, p.4).

In 1982 the KEPC was replaced by the kiwifruit Marketing Planning Committee KMPC. The KMPC is responsible to the NZKA and is made up of members of all the licensed exporters and three grower members of the NZKA (Nicol 1982).

New Zealand Kiwifruit Marketing Board

The NZKA operated until 1988 when a major restructuring of the industry led to the creation of the New Zealand Kiwifruit Marketing Board (NZKMB). The restructuring occurred in response to the crisis in the kiwifruit industry. The twin effects of monetary instability and increased world supplies of kiwifruit placed the industry in a series of crises in the mid 1980s (Lees 1993).

Kiwifruit growers wanted a grower-owned organisation- answerable directly to the industry through a grower elected board. They were seeking this organisation to be the sole purchaser and exporter of all kiwifruit with one aim and one aim only – to maximise returns to the grower – and power to take over any or all marketing to the retail customer (Douglas and Burgess 1992p, 2).

The NZKMB was established as a monopoly single desk seller with a self funding mechanism - expenses deducted from revenues. However, the NZKMB differed from the other statutory marketing boards by being subject to audit and review. It also had the lowest ratio of growers to other Board members - 4 growers; 4 non growers - in comparison to the NZDB (8:5), APMB (6:2), Meat Board (7:4) and Wool Board (6:4). The other Board members included: a government appointee and three other members appointed by the Board to represent the industry's commercial participants (Moran et al.1996).

The NZKMB operated in a form that was slightly different to the other horticultural board - the APMB. The two key differences were:

- The NZKMB originally had only one major fruit pool - the export standard or 'class one' Hayward pool. This has since been joined by the organic Hayward pool, a class two Hayward pool, and the pool for Early Gold variety. The APMB administered a number of variety pools reflecting the wide range of apple varieties grown in New Zealand.
- The NZKMB did not have any capital investment in post-harvest facilities whereas the APMB had significant investment in processing and cool storage facilities.

The absence of capital investment in the industry by the NZKMB resulted in a distinctly different industry structure to the pip fruit industry. This was demonstrated by the grower payment and fruit ownership structures that the NZKMB operated. The NZKMB inherited a system of grower payments that was the clear legacy of competition between the licensed exporting companies that preceded the NZKMB. Prior to 1988, exporting companies competed for grower custom by making generous forward payments in order to secure supply to their company. This prepayment locked growers into one exporting company and allowed that company to use this fruit as security for the funds advanced to growers. The legal ownership of fruit was transferred to the exporter when the fruit entered the coolstore. The NZKMB did try to modify this practice and attempted to wean growers from the high levels of crop advances.

Developments from the Industry Review

Lead up to the Industry Review

As the 1992 selling season began, the NZKMB recognised that prices were softening in Europe and estimated a decline in returns of about 10 per cent on the \$6.08 per tray received in 1991. Consequently, a prepayment on submission of fruit of \$3.50 was made with most orchards beginning to harvest in April and May. The standard monthly progress payment of 20c a tray was paid in July, but dropped to 15c in August and then in September all payments suddenly ceased as it became apparent that the price for kiwifruit had crashed in the European market. The final payment to growers in New Zealand remained at the average pre-payment of \$3.85 per tray - only 58 per cent of the previous year's payment.

This resulted in a significant overpayment to growers, so that the NZKMB would require heavy borrowing against future grower returns to continue operating or it would require a repayment of some of the \$3.85 advance.

Two things occurred as a result of the price crash:

- debt financing and government intervention to protect the NZKMB; and
- a vociferous debate as to the future of the NZKMB

The crisis of 1992 ended with a Government review of the NZKMB and the industry in general. This plan involved three elements:

- grower representation/industry structure;
- marketing; and
- strategic direction

Grower representation

The first stage of the industry review was targeted at grower representation in, and control of, the industry. Many people felt that the formal channels of grower representation to the NZKMB were inadequate and that a new structure was required.

The previous form of grower representation had been through the dual mechanisms of grower representatives on the NZKMB itself, and through the Fruitgrowers Federation. The Fruitgrowers Federation comprised of eight regional directors each with individual sectoral responsibilities and the responsibility for chairing a sector committee one of which was responsible for representing Bay of Plenty interests and, as a result, the interests of kiwifruit growers.

Growers were represented on the NZKMB itself by directors who were elected using a voting system whereby three votes were accorded to growers producing over 30,000 trays, two votes to growers with between 20,000-30,000 trays, and one vote to growers producing less than this. Grower representatives filled 4 out of 8 Board positions.

The new structure of grower representation centred on the formation of New Zealand Kiwifruit Growers Incorporated (NZKGI). The industry working party decided that the

NZKGI voting system should be structured on the basis of 'one tray equals one vote', and that the new body should have considerably more room for grower representation than what had previously been the case with the Fruitgrowers Federation.

This process culminated with the election of 38 NZKGI members in June 1994 (with an executive of 8). The NZKGI then took over the industry review from the Kiwifruit Industry Working Party and undertook to:

- review the onshore activities of the industry
- receive the findings of the marketing review of the industry (stage two of the industry review) and lead industry discussion on their implementation
- develop Stage 3 - an industry strategic plan
- pursue the implementation of the strategic plan through revision of the NZKMB Act (NZ Kiwifruit, June/July 1994: 4).

Effectively, the formation of the NZKGI placed growers firmly in control of the future structure of the overall industry.

Marketing Structures

The review of marketing of kiwifruit came up with clear indications as to what the future strategic direction of the industry should be. The key recommendations were:

- the industry should concentrate on retail marketing strategies and avoid moving the industry towards bulk commodity trading;
- that the global scale of the industry should be increased through sourcing of non-New Zealand grown kiwifruit and establishing linkages to other fruit markets;
- that two further developmental steps should take place which would: 1) embrace more collaborative marketing, and 2) split the NZKMB into two different organisations - one dealing with the statutory functions of the NZKMB and the other concentrating on marketing.

These recommendations were generally accepted by NZKGI (New Zealand Kiwifruit Journal, December 1994/January 1995: 25), and this marketing review established the next stage of the industry restructuring plan.

Stage Three of the Industry Review

Stage three of the Kiwifruit Industry Review was conducted in November 1995. It was accepted by the KMB and recommended the following reforms:

- separation of the commercial exporting and political representation functions;
- corporatisation of the commercial exporting and (Zespri International) and establishment of a new consumer brand, Zespri;
- introduction of collaborative marketing licensing arrangements; and
- increasing flexibility of the Board's operational structure.

The splitting of the NZKMB resulted in the retention of statutory powers by Kiwifruit New Zealand (KNZ). Growers are able to vote for both grower representatives on the Board of KNZ and for growers as forum representatives in NZKGI. KNZ retains the statutory functions of the NZKMB and will continue to be the monopoly purchaser of Class One export kiwifruit for all markets except Australia. Alongside KNZ, the marketing functions of the old NZKMB were corporatised into Zespri International Ltd. which concentrates on the global marketing of fruit from KNZ including the development of new markets.

Zespri

The New Zealand Kiwifruit Board (Kiwifruit New Zealand) monitors and enforces Zespri's compliance with the regulatory measures set in the Kiwifruit Export Regulations 1999. The board also decides whether to approve other exporters who wish to export kiwifruit in collaboration with Zespri.

The industry was corporatised and fully commercialised in 2000 and the KMB was converted into the public company Zespri Group Ltd. Existing growers were issued shares based on their recent years' production. Today Zespri is owned by more than 2500 New Zealand growers. It's headquarters is based on Mount Maunganui and has a network of global market offices- and employs almost 200 people. While Zespri is not formally a co-operative, being a grower-controlled company, it operates functionally as a co-operative.

Aragorn

Aragorn is the processing subsidiary of Zespri, formed in 2002 (Ministry of Agriculture and Forestry, 2004), which focuses on transforming particularly Gold kiwifruit. Aragorn is not part of the fresh whole fruit programmes of Zespri. The company processes kiwifruit into food ingredients and preparations. Aragorn will remain a unit under development over the next couple of years, concentrating on growing the markets in Europe and Asia. In these markets ingredients developed by Aragorn have been mainly used in dairy, beverage and dessert products (Zespri 2005).

In 2005-06 Aragorn bought 1.2 million trays of non-Zespri standard gold fruit – up 9.3 per cent on last year. The fruit was used as ingredients for a wide range of products from individually quick frozen fruit to purees and concentrates (Zespri 2006).

Several new products incorporating Gold Kiwifruit ingredients were launched in Japan over the past year, including fruit jellies, beverages and ice cream and in the South Korea two new beverage products were launched.

Australian Exporters

Since 1994 - when kiwifruit exports to Australia came under the *New Zealand Horticulture Export Authority Act 1987* – all exporters wanting to export kiwifruit to Australia need to be licensed by the New Zealand Horticulture Export Authority. In 1996 there were 63 license holders – including the NZKMB - and today this has decreased to 16 – including Zespri. Total kiwifruit exports to Australian were worth 35.2 million FOB in 2006.

Research and Development Arrangements

Industry research arrangements have changed considerably during the past two decades. Initially the industry relied heavily of external suppliers of research but the Universities, MAF and DSIR. Subsequently Respire internalised the majority of the research as part of its efforts to increase effectiveness. More recently Zespri has returned to a model where the majority of research is outsourced and HortResearch is the major provider of research services to the industry. Recently it was estimated that kiwifruit off farm investment is about 20 per cent of on farm investment (New Zealand horticulture 2005, p. 25). Future research should explore the reason for and effectiveness of alternative arrangements with respect o research.

Kiwifruit Supply Research Limited

HortResearch and four kiwifruit supply companies have formed this joint venture company to make models developed by HortResearch available to the kiwifruit industry via the internet. Seventeen weather stations installed in commercial orchards provide the meteorological data needed for the models.

Growers use winter chill models to predict when vines will break bud, and how well they will flower. This information is then used to optimize the timing of HiCane™ applications, so that vines will carry heavy crops. Other models allow growers to estimate how large fruit will be at harvest from measurements made as early as February (HortReseach 2007).

Zespri Innovation Company

The Zespri Innovation Company is Zespri's research and development unit. It helped to develop the KiwiGreen orchard management program and has designed a quality assurance system that can trace a Zespri kiwifruit from the orchard where it is grown to the shop shelf (Zespri 2007).

The Zespri Innovation Company is currently working on:

- new cultivars;
- improved environmental technologies; and
- Improved logistics technologies for delivering fruit in perfect condition at lower cost.

5 Conduct and Performance

DRAWING ON THE PREVIOUS EXAMINATION OF the kiwifruit industry this section considers the conduct of the industry – the extent of information sharing, conflict resolution and its response to changing market conditions. From the analysis of the operating environment, industry structure and the discussion on conduct a broad review of the industry’s performance between 1980 and 2006 is provided.

Conduct

Conduct is defined broadly in this research. The key issue at stake is how economic agents behave in response to the opportunities and constraints they face. Clearly these are partly a result of their choices (eg their chosen strategy) and partly in response to their evolving commercial context.

Value chain issues

Sharing of information, knowledge and resources

As discussed in Chapter 3 there were significant changes in the economic operating environment for the kiwifruit industry during New Zealand’s economic liberalization in the mid 1980s. One such change is the trend for post harvest operations to become focal points for growers during the production period. Another has been the demise of MAF advisory services. Although many MAF employees moved laterally to become private consultants, the low returns of the early 1990s trimmed consultancy activity in kiwifruit. In addition the introduction of the KiwiGreen program meant that there was new information to be disseminated to growers.

During the conversion process to KiwiGreen the NZKMB provided information at area-wide meetings and some technical support through a Field Manager contracted to implement the KiwiGreen programme. Packhouses also responded to these opportunities for information provision by establishing discussion groups and by improving the information returned to each grower concerning his or her performance (production and storage data for that crop compared to packhouse averages). Some private consultants have forged links with particular packhouses, thus enabling the packhouse to extend the service available to its suppliers.

Duplication along the chain

Some industry participants believe there is duplication of activity between Zespri and supply operators. Eradication of this duplication could result in significant cost savings. ‘One example of duplication was how Zespri put a lot of resources into calculating payments to individual growers and then paid all the money to the growers’ supply structures such as Seeka. The supply businesses then consolidated the money and paid it to growers according to their own rules” (Ward 2006)

Zespri is also involved in areas such as determining what payments should be made for different fruit attributes and industry research. Some such as Ward, 2006 argue 'There is extensive duplication of that activity taking place amongst supply companies' but it is appropriate for further analysis before concluding this is the case.

Pricing distortions

Single desk exporters such as ZESPRI make pricing decisions which influence resource allocation. Inappropriate pricing associated with multiple investments and activities have the potential to distort production and marketing decisions. This research has not identified any distortions of this sort but it has highlighted the need for research in this area. Grower angst about payment mechanisms is symptomatic of concern that prices have the potential to provide misleading signals if Zespri gets them wrong. There is significant value in future researchers gaining information on how the grower payments have been calculated by the various marketing/exporting bodies since 1980.

Returns flows along the value chain

Research so far highlights the challenge of tracking the movement of value along the chain. The lack of clarity is linked to the adequacy of information systems, commercial sensitivities and legislative impacts.

When the regulations were established that brought the NZKMB into existence there was no clear provision made as to who was responsible for debt incurred through overpayment. In fact, the NZKMB existed in a form of legal/ financial limbo somewhere in between a State Owned Enterprise and a limited liability company (The Orchardist, June 1993). The governing regulations defined the powers and existence of the NZKMB, and these regulations were often amended by government at the request of growers or the Board of Directors itself. Up until the price crash of 1992 six amendments to the regulations had been requested and granted, but none had the implications of the revisions required to cope with the 1992 crisis (The Orchardist, June 1993). Basically, the NZKMB required the government to quickly establish the right of the NZKMB to recover overpayment from growers, and to also be able to take into account outstanding debts when setting grower payouts in subsequent seasons.

The Minister for Agriculture, John Falloon, made a statement on March 1st, 1993, which headed off a major escalation of the crisis, as his policy decision enabled the NZKMB to come to a suitable debt arrangement with a consortium of 17 banks (The Orchardist, March 1993). This enabled the NZKMB to both cover its 1992 trading deficit, and to offer an initial payment for the imminent 1993 harvest. The consequence of this was that the following two seasons saw growers receive a reduced payment per tray as money was directed towards repaying the outstanding debt.

A beneficial outcome for the NZKMB from this crisis was that they were able, not only to establish the right to account for overall NZKMB debt in their payments to growers, but to restructure the pre-payment system as well. Previously, the NZKMB had been committed to maintaining the system of pre-payments established prior to 1988, with the initial 1992 payment being \$3.50 per tray. After the crisis this system was reviewed and the NZKMB established a new pre-payment rate of only \$1 per tray with further payments being more closely aligned to market returns.

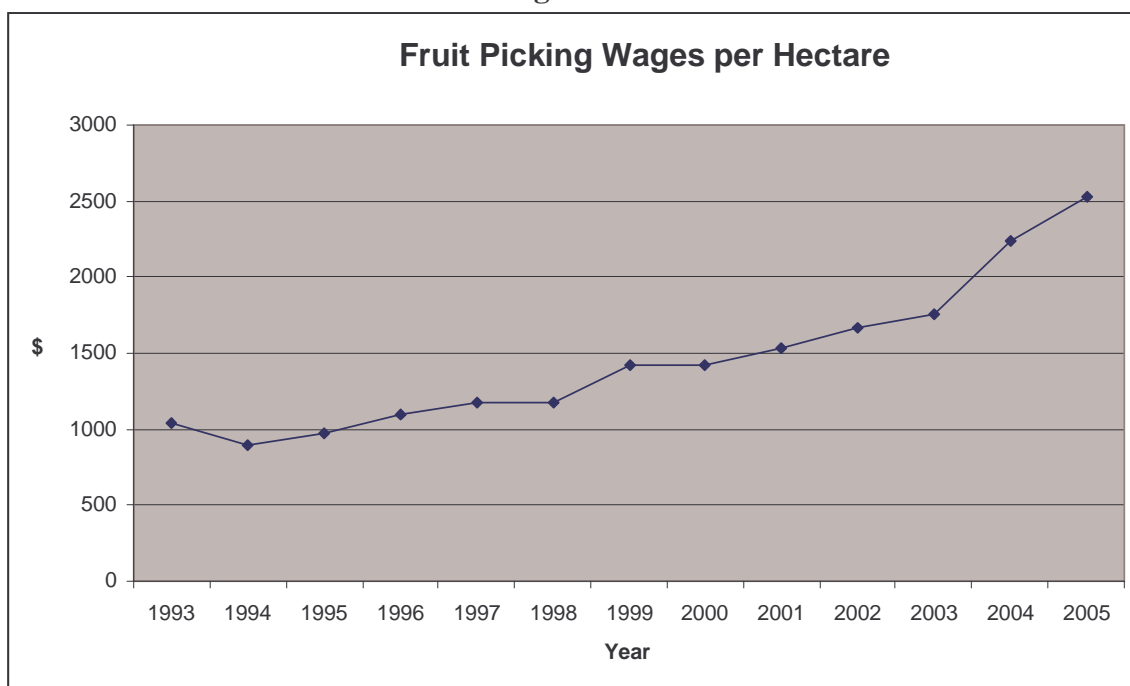
Under the new grower payment system, the NZKMB ceased to be the major finance supplier for many of the seasonal costs of running an orchard. Under the old system, the high level of payments early in the selling season and staggered system of progress payments meant that growers could manage with minimal outside funding of operational activities. The subsequent effect of this restructuring is that many growers now have to negotiate with banks for seasonal finance packages to cover temporary operating deficits.

Labour issues

Labour shortages are becoming an issue through all aspects of the value chain. This is evident by recent effort to facilitate migrant workers.

Orchard Wages for Fruit Pickers

Figure 5.1



Source NZKW Annual Reports 1993-2005

This chart illustrated the fruit picking wages per hectare for the years 1993 to 2005. Wages increased constantly each year. In the years of 2003 and 2005, picking wages went up due to the New Zealand economic boom and the minimum wage increase at that time. Orchard picking wages followed the economic trend and increased significantly.

Response to market demands

Providing a brand

The development of a credible branded product is critical for effective and profitable overseas marketing. The term Zespri is now the corporate marketing brand of Zespri International Ltd. New Zealand kiwifruit are now marketed as Zespri New Zealand kiwifruit (with the changeover to the new brand occurring in early 1997). This change was principally undertaken to enable the promotion of New Zealand kiwifruit as distinct from the increasing number of kiwifruit being produced in other countries. Prior to the adoption

of the Zespri label, promotional activities by the NZKMB were seen as being too restricted by the generic term kiwifruit, thus enabling other producers to 'free ride' on the promotional activities of the NZKMB.

Twelve month supply

The provision of product to the market 12 months a year facilitates market access by ensuring shelf space. To develop a twelve month supply system Zespri has set up plantings of Green and Gold kiwifruit grown under the Zespri brand in eight different countries. Zespri has identified 12 month supply as key to being able to maximise New Zealand Grower returns long term.

Last season Zespri sold 1.9 million trays of offshore-grown Green kiwifruit – up 39 per cent on the previous season- and 1.9 million trays of Gold Kiwifruit, more than double the previous year’s volume (Zespri 2006, p. 11).

Currently Zespri have approximately 1 157 ha of licensed Gold plantings outside New Zealand. See table 5.1 1 There are also trail orchards in China and Australia.

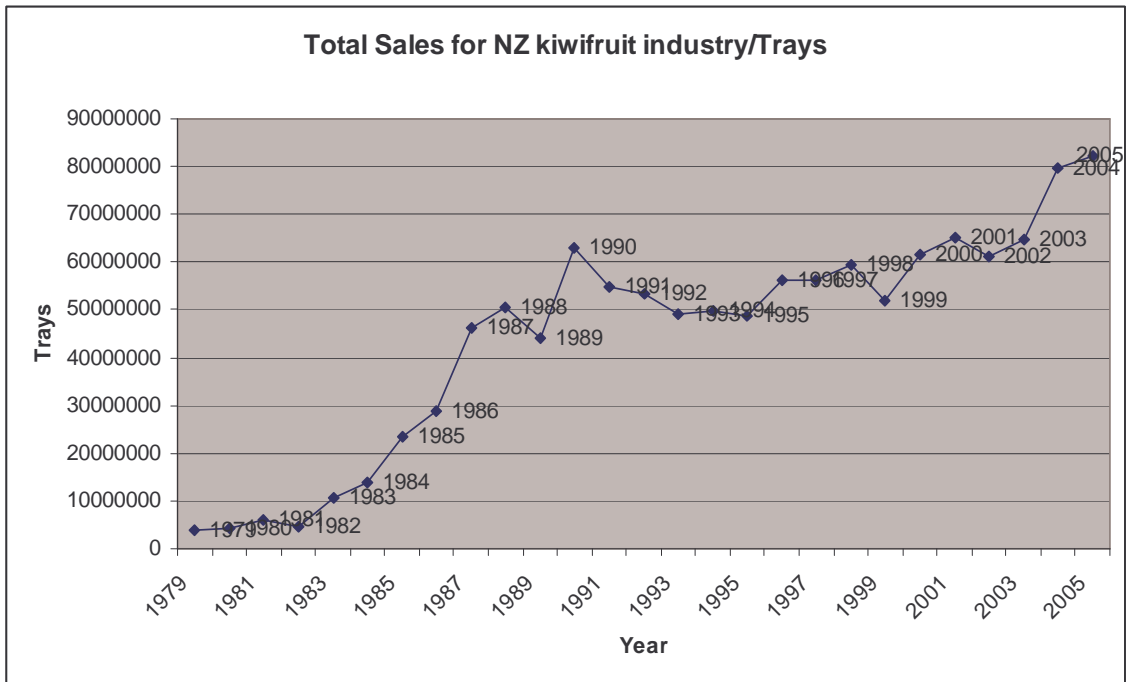
Table 5.1 Licensed Gold Plantings outside New Zealand

Country	Size of licensed Gold Plantings (hectares)
Italy	568
United States	210
Japan	120
Chile	115
South Korea	100
France	44

Performance

In reviewing the performance of the kiwifruit industry we report four key performance measures – grower returns, sales volume, production costs, and productivity.

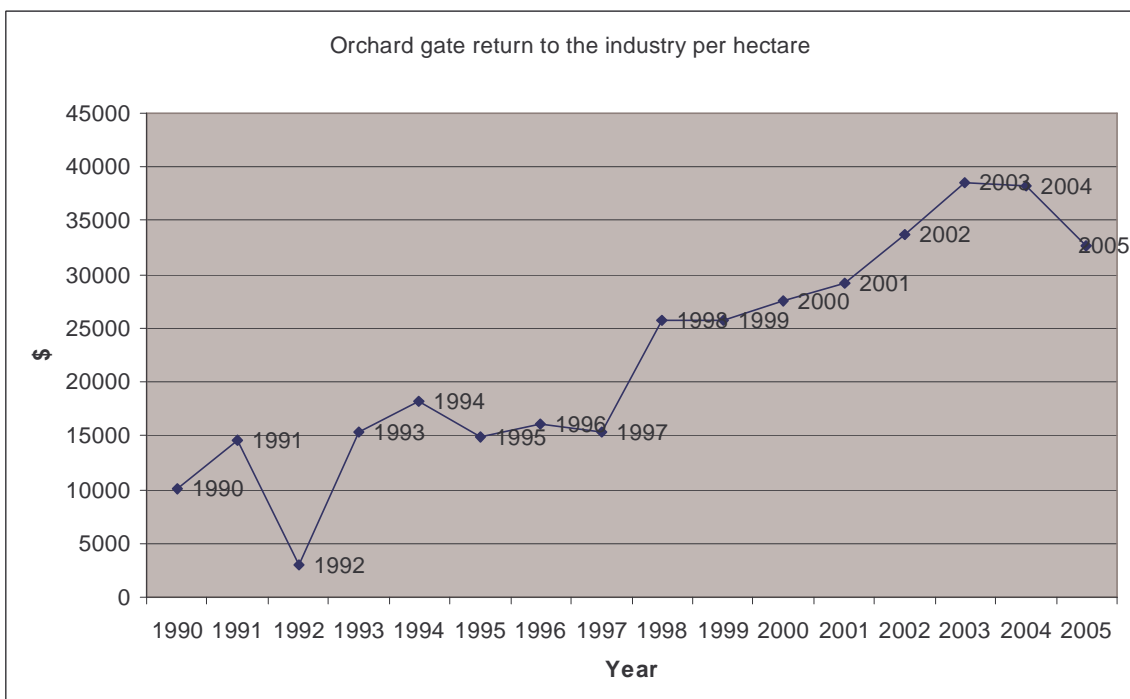
Figure 5.2 New Zealand Kiwifruit Export Sales



Source NZWK Annual reports 1979-2005

Sales volumes in 2005 were over 2000% greater than the volume in 1979. There were two volume surges; in the 1980s, and during recent years. After the sales boom in 1990, the New Zealand kiwifruit industry went into a period of recession with the kiwifruit industry shrinking for several years. In 1999, the industry started to recover and another boom occurred during the 2005-2006 period.

Figure 5.3 Orchard Gate Returns 1990-2005



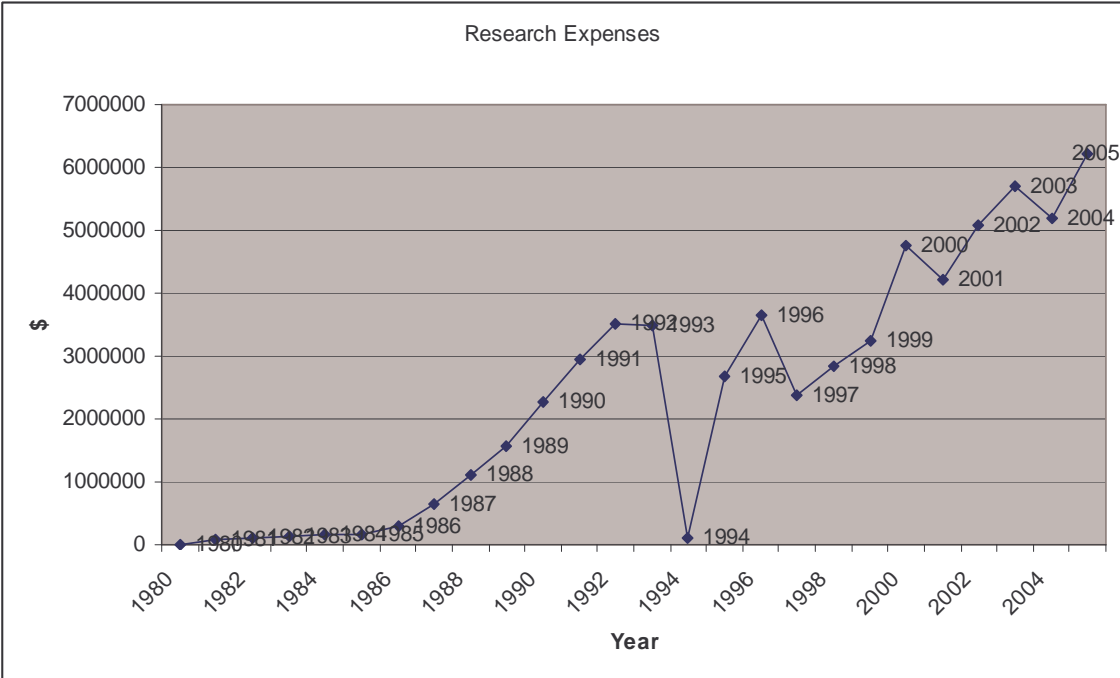
Source from the NZKW Annual Report

Orchard Gate Returns are the key measure of profitability for the grower. This chart illustrated the Orchard gate returns to the industry per hectare. The value of the return follows a growth trend except for the year 1992 and the period 2003-2005. In 1992 there was a price crash in the kiwifruit industry and sales dropped significantly with a resultant effect on orchard returns. In recent years 2003-2005, returns have dropped again.

As an exporter, NZKI's bottom line is threatened by both foreign exchange and freight costs. This presented a big challenge in 1996 and partly explains the reason why sales volumes increased by 16%, but the orchard gate returns still decreased slightly in that year. The establishment of the NZKI's own logistic company stabilized shipping costs.

Returns decreased again in 2003-2005, with Orchard gate returns per hectare decreasing by 20 per cent for Green, 10 per cent for Green Organic and 14 per cent for Gold in 2005. (NZKW, 2005) In 2005-06 growers had a difficult year and felt the brunt of the strengthening New Zealand dollar. (NZKW, 2005)

Figure 5.4 Kiwifruit Industry Research Expenses



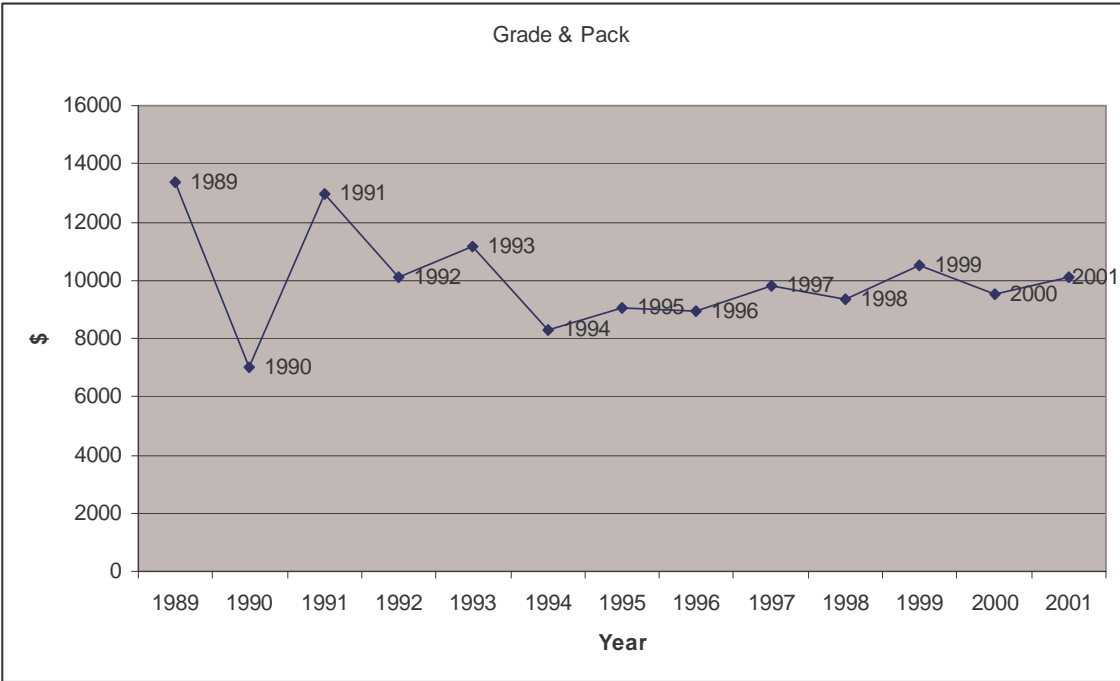
Source from the NZKW Annual Report

The high quality of kiwifruit and innovations in the industry provide the basis for the competitive advantage of NZKI in the world kiwifruit market. Since the industry was conceived in New Zealand it has had to be highly innovative from its inception, thus innovation is part of the culture of the industry and research has been central to the industry's success.

The fall in research expenses in 1994 was due to the crisis faced by the industry that lead the NZKI to reduce research expenses by 97%, and use the money to pay back debt. In 1997, Kiwifruit New Zealand Research Ltd was established as a commercially accountable subsidiary (NZKW, 1998) and research expenses decreased. In 2004, a new Innovation Advisory Board, with representatives from all sectors of the industry, science, and ZESPRI, was established as a consultative body (NZKW, 2004) and again research expenses declined. During the years 1996 to 2006, the average kiwifruit yields per hectare increased by 40%. In

2006, New Zealand’s average kiwifruit yields per hectare were 64.7% higher than the average competitor’s figure of Italy, Chile and France. (Creston, 2006)

Figure 5.5 Grading and Packaging Expenses 1989-2001



Source NZKW Annual Reports 1989-2001

This chart shows the average grade and pack cost per hectare. The grade and pack cost in 1990 decreased significantly from \$13344 to \$7000. In 1991, the grade and pack cost increased again to \$10125. However, the grade and pack cost went down in the years 1992 and 1994. Between 1994 and 2001 grade and pack costs have fluctuated in a small range.

New Zealand Grower's profitability: 1980- 2006

The profitability of kiwifruit growing has varied dramatically during the last 25 years. At the beginning of the kiwifruit industry both production and returns grew rapidly. Grower returns continued to increase during the 1970’s and early 1980’s. The return per tray was \$2.25 in 1970 and ten years later in 1980 it was \$8.00 (Yerex & Haines 1983 unchecked reference from lit review). The price peaked in 1983 at \$10.13 a tray (Lees 1993). These returns were reflected in land prices which increased over 800 per cent in the Bay of Plenty – the main growing region -between 1972 and 1982 (Johnston and Sandrey 1990)

As world production expanded nominal returns to New Zealand growers declined from \$10.13 a tray in 1982 to \$4.62 in 1990. In inflation adjusted terms, this reflected a fall from a high of \$24.04 a tray in 1980 to \$4.84 by 1990 (Douglas and Burgess 1992, p.1). The consequences for kiwifruit growers were severe. By 1991 average orchard sale prices in the Bay of Plenty had fallen to 42 per cent of their 1982 value according to MAF Douglas and Burgess 1992, p.1). However it should be noted that Quotable Value data does not reveal a fall. In stead it shays prices stability in nominal terms.

In the fifteen years from 1990 to 2004, the average unit values of exports from New Zealand were higher than those from Italy and Chile in eleven years. In the other four years Italy was the price leader. The low New Zealand dollar benefited growers between 1997 and 2001.

Orchard Gate returns for growers declined in the 2004-05 season and this decline continued in the 2005-2006 season. A number of reasons contributed to this decline - these included:

- increased world supplies of kiwifruit
- an increasing overlap of the Northern and Southern Hemisphere supply periods;
- depressed prices that both caused and were exacerbated by various quality issues;
- the high value of the New Zealand dollar relative to the currencies of its major trading partners.

A powerful negative factor was the emergence of competitors in Italy, France, Japan and the USA (Lees 1993). This increased production led to a dramatic decline in the world prices for kiwifruit between 1982 and 1988 (Zwart & Moore 1990). By 1988, an even more potent threat was emerging with the development of a Chilean kiwifruit industry which directly competed with New Zealand's selling season from April to December (Willis 1994).

As Zwart and Moore (1990) state exchange rate variations and a decline in the world price for kiwifruit accounted for 67% of the decline in farm gate returns between 1984 and 1989. Lees (1993) documents that this decline was most noticeably apparent in the orchard revenue of growers. Orchard revenue ranged from a high of \$50,000 per hectare to a low of \$31,000 per hectare between the years of 1982 and 1987 (Lees 1993). This then dropped to \$22,000 per hectare in 1989 (Lees 1993).

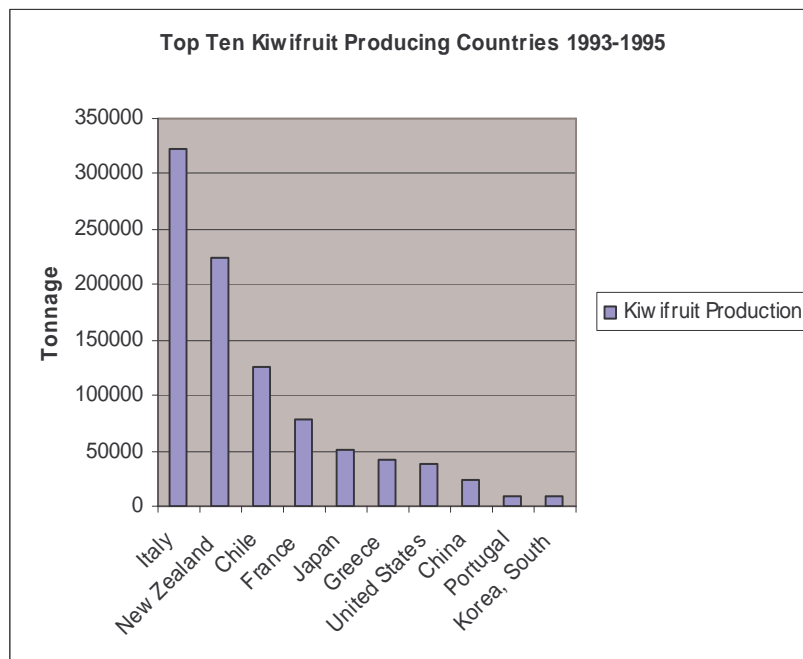
The cause of the 1992 price crash was a fruit glut in Europe (Willis 1994). Kiwifruit formed only a small part of the total collapse in prices for fruit in Europe (which then severely depressed other global markets for fruit). Apples and bananas were the worst hit, with the flow-on effect to kiwifruit causing major producers like Italy to initiate government aid packages for domestic producers and even arrangements to leave large parts of the crop unpicked (New Zealand Herald, 25/1/93). The final payment to growers in New Zealand remained at the average pre-payment of \$3.85 per tray - only 58 per cent of the previous year's payment.

Production costs over time

Production costs over time have increased with inflation but have been offset by technological advances. MAF's orchard production model provides some indication of changing orchard costs.

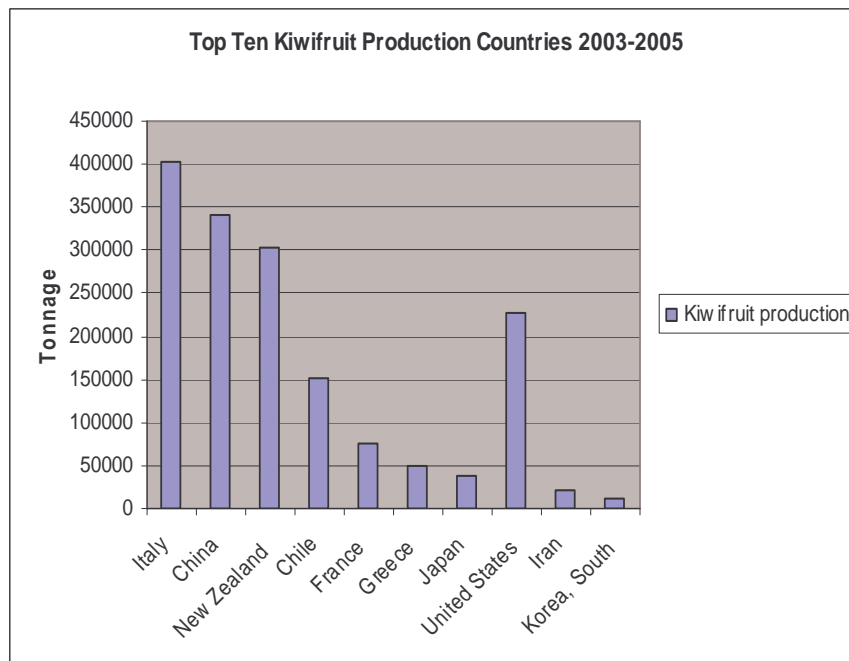
Production by Competitors

Figure 5.6



Source: World Kiwifruit Review, 2006

Figure 5.7

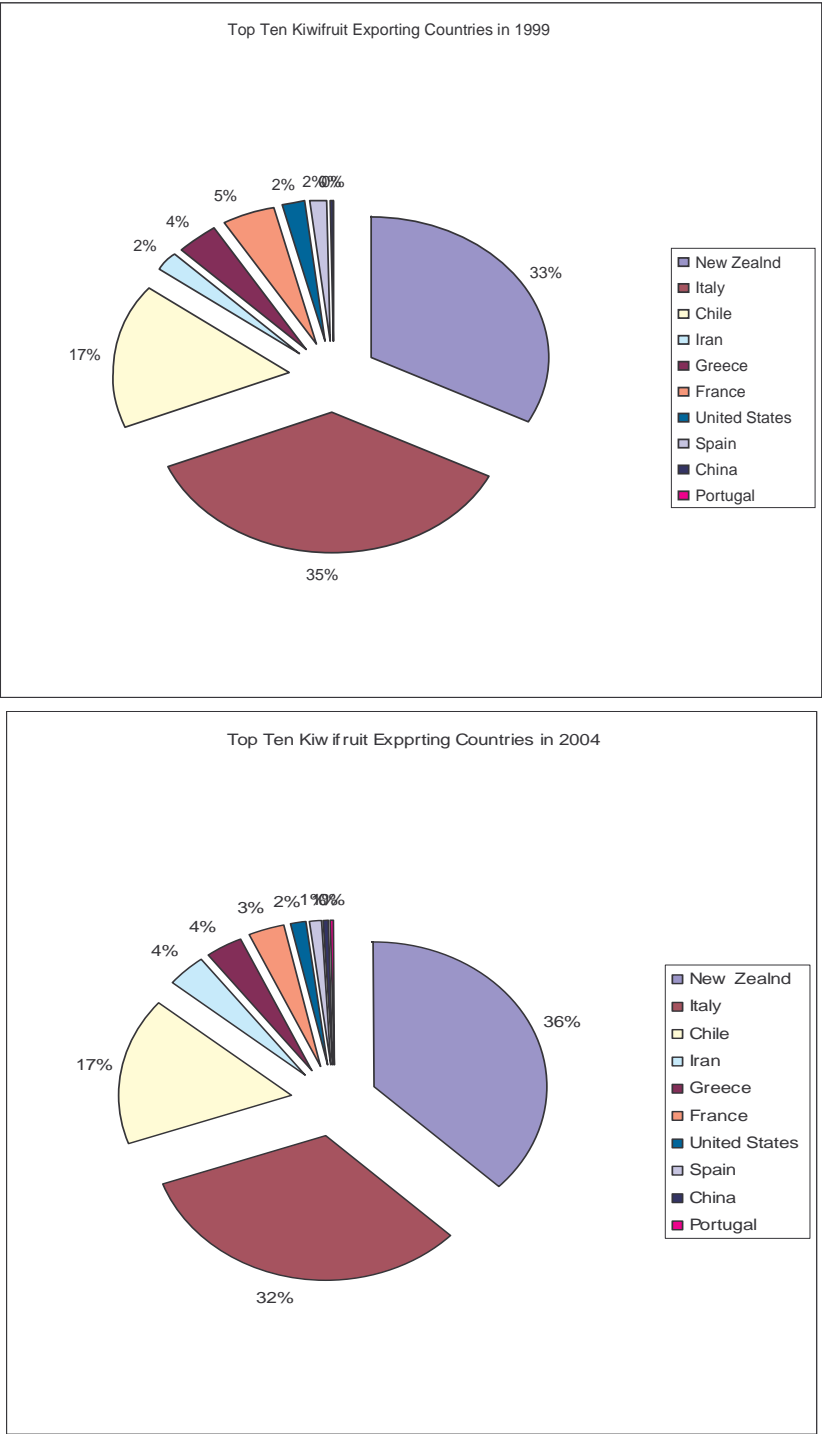


Source: World Kiwifruit Review

The relative share of New Zealand Kiwifruit shrank during the period between 1993-1995 and 2003-2005. The leading production country, Italy, increased their volume by 24%. China's kiwifruit production has rocketed from a position of number eight to the number two position in the world, almost 15 times the volume of ten years ago. However, the crop from China has not met the quality standards demanded in most markets, and has not yet

been authorized to exports to most major European markets (Creston, 2005). If China can increase the quality of their products, they can become another major world supplier. Although New Zealand’s volume increased by 35%, competition obviously increased. It is important to note that the US also increased their production from 38213 tonnages to 228335 tonnages during the period. The US is a big market for kiwifruit, and the increase of native production for kiwifruit meant a decrease of the volume in imports. However for New Zealand being an off season supplier to the US market this may provide sales opportunities if consumer consumption of kiwifruit increases in this market and they demand year round supply.

Figure 5.8 Kiwifruit Export Countries.



Source from the World Kiwifruit Review 2006

The two charts above demonstrated the percentage of sales in exports for the top ten countries. New Zealand represents a big stake in the world kiwifruit exporting market. New Zealand became the largest world kiwifruit exporting country in 2004.

Although the United States has significantly increased their production volume during the last decade, they only represent a small amount of export volume. This is because the US is a big market, with a large domestic demand.

Table 5.2

New Zealand: Kiwifruit Exports, by Market, 1999-2005(percentage)							
Market	1999	2000	2001	2002	2003	2004	2005
United State	6.65%	7.11%	7.03%	5.75%	4.38%	4.71%	4.30%
Canada	0.00%	0.04%	0.00%	0.00%	0.00%	0.14%	0.05%
EU-15	59.51%	59.60%	60.31%	56.39%	59.69%	55.93%	56.37%
Spain	10.64%	12.71%	4.63%	9.65%	12.66%	12.72%	13.26%
Japan	18.31%	15.88%	14.18%	19.37%	18.46%	19.54%	17.60%
Taiwan	3.53%	3.78%	3.98%	4.53%	4.49%	3.79%	4.82%
Korea, South	1.76%	1.94%	2.58%	3.52%	4.06%	6.28%	5.95%
Hong Kong	0.71%	0.71%	1.06%	1.20%	1.15%	1.44%	1.60%
Saudi Arabia	0.60%	0.40%	0.55%	0.43%	0.32%	0.23%	0.19%
Australia	4.07%	6.57%	7.15%	5.85%	4.72%	4.71%	5.25%
All Others	4.85%	4.01%	3.17%	3.01%	2.72%	3.22%	3.87%
TOTAL	100%	100%	100%	100%	100%	100%	100%

Source from the World Kiwifruit Review

This table shows the New Zealand Kiwifruit exports by market. The percentage exported to the US has declined significantly since 2002, while other markets have kept a constant or increasing level. The reason for the US market shrinkage can be attributed to increased competition from Chile which had the biggest market share in the US in 2005 of 36%. Since Chile is closer to the US than other kiwifruit exporting countries, Chile has a transport cost advantage. Recently, Chile has changed their focus from the US market to the EU-15 countries. The EU-15 still takes a large per cent of New Zealand kiwifruit exports.

The EU has been the primary destination for fresh kiwifruit exports with the 15 countries prior to expansion showing good volume increases through their well developed modern supermarket food systems (Creston, 2005). The strategic change of Chilean kiwifruit industry had a negative effect on NZKI market power in the EU market. In 2004, NZKI exported 100097 tons to Belgium, the redistribution centre for Europe, and took 85% of the Belgium market share. However, both Italy and Chile are major competitors for NZKI, and they took more than 50% of the market share in the EU in 2004. (Creston, 2005). The EU-15 continues to be the most important kiwifruit market with over 56% of world kiwifruit sales. Japan is the biggest customer for New Zealand and NZKI had a 91% of the market share in 2004 (Creston, 2005). The export volumes to Japan have remained relatively constant. NZ kiwifruit also dominated the Australia market.

6 *Critical Success Factors*

INTERVIEWS WITH INDUSTRY PARTICIPANTS identified seven key success factors. This section explores these key factors by drawing together the information from the previous analysis.

Summary of the Interviews with Industry Participants

From a review of the literature on the New Zealand kiwifruit industry, as well as interviews with a diverse range of industry leaders, key factors and issues were highlighted as central to the success of the industry. These key success factors were consistent across the diverse range of people interviewed.

Key Success Factors

Key Success factors were categorized into the areas of:

- Ø Industry Champions & Management Conduct
- Ø Innovation
- Ø Industry Structure
- Ø Economies of Scale and Market Power
- Ø Branding, Differentiation, and Strategy
- Ø Value Chain Developments
- Ø Market Research, Responsiveness, and Information Dissemination

Industry Champions & Management Conduct

The leadership style has been pro-active, visionary leadership, based upon the long term interests of the industry. It has been led by people with integrity that have always known the importance of marketing. It has not been a matter of one leader, but leaders in different areas and changes to that leadership as the nature of the industry has changed and needed different expertise. This has all led to a strong action orientated, cooperative culture. Moreover, decisions that affect the industry must go through committees that contain members that are representative of the New Zealand industry

Issues

Continued need for new ideas and new vision as the environmental conditions change. The co-operative style must be matched with strong individuals with self conviction that will drive through changes as they become necessary. This will be increasingly difficult as the industry continues to grow and diversify; as what may be good for one area may not be good for another. Additionally, new markets and research initiatives will have costs that

must be borne by all industry members but that have long term rewards that may be perceived to be disproportionately allocated.

Innovation

While cultivators are the obvious and visible innovations, improved systems around the production and post harvest systems are the key to success. An example is the KiwiGreen Programme. A wide range of innovations have been crucial to the development of the industry. Since the industry was conceived in New Zealand it has had to be highly innovative from its inception, and hence innovation is part of the culture of the industry. Initial innovation was undertaken by the small number of pioneer growers, but as the industry developed government also stepped in to provide funding for research and development. This was essential to a newly developing industry with high development and marketing costs that individual growers would not have funded individually. This is a key lesson that needs to be applied to other emerging export industries.

Innovations have been well co-ordinated due to sound information dissemination processes and the three group structure of the New Zealand industry; Growers, Suppliers and Zespri. Innovation has driven, or has been driven, by the need for the New Zealand industry to follow a differentiated marketing strategy in global markets given our location and access disadvantages. The New Zealand industry is the most productive in global terms, and produces the highest quality kiwifruit. The government has supported industry innovation, but the industry itself has taken the initiative in regards to pushing market driven initiatives such as Taste Zespri and KiwiGreen.

Issues

There are some innovation issues in regards to Crown Research Institutes and other government research bodies relating to: staff changes, distance from growers, and different incentive structures; with growers focused on more immediate returns and maintenance of intellectual knowledge, while scientists and academics are rewarded based upon publication records. However the biggest issue is the trade-off between long and short term research aims.

Producers will often have a short-term problem solving focus for research and development while longer term higher risk innovations are also required in order to maintain the competitiveness of the industry as a whole. For example it is estimated that a new fruit variety can take 15 years to develop. Hence there is a need for long term strategic thinking to support research as well as short term application based research. The difficulty is getting the correct balance between the two types of research.

A final problem with research is the trade off between the need to invest in a knowledge base within the research community New Zealand and to keep costs down. An issue for the research providers is specialist skills and expertise take time to develop and are the basis for long term research ideas. At the same time short term research may not always be available to keep the scientists employed. Therefore, there is a need to both recognize long term strategic objectives, which may be government funded, as well as short term industry objectives which will be industry funded.

Industry Structure

Initially the New Zealand industry had a multiple seller market which was a good structure during the development years because it enabled market development and good returns. When returns collapsed, as supply finally exceeded demand, buyers were able to play off one exporter against the other, purely on price. The over supply was caused by a focus on commodity production orientations, rather than trade and payment incentives focused on quality. The formation of the single desk seller allowed for the coordinated marketing focus that was required when major markets became saturated.

One key difference between New Zealand and major global competitors is the single point of entry (SPE) system. This structure has provided economies of scale (EOS), specialist skills, market power, the ability to undertake industry-wide initiatives, and most importantly the co-ordination of promotion and distribution at a time when the global industry was in crisis as growth in major import markets had stalled and low quality volume produce was threatening future growth and consumer confidence.

Many industries in New Zealand do well at the production end, but underestimate the importance of promotion and distribution. When demand exceeds supply this emphasis is appropriate, but as growth slows in a market and competitors enter in force, the importance of promotion and distribution dramatically increase. The kiwifruit industry has recognized this and this recognition can be attributable to past and present leaders who visited foreign markets and understood the consumer conditions; coupled with knowledgeable growers that have kept abreast of changing conditions. The ability of growers to keep abreast of changing market conditions and retain an element of marketing control has been fundamental to the success of the industry.

Key industry initiatives such as Taste Zespri and KiwiGreen have been driven from market demands. However, key to the success of the industry has been the ability of the industry to work as an integrated cohesive unit to make the changes itself to deal with those demands. Industry players have worked together to deal with change, how this process is managed as the industry diversifies and high competition puts pressure on growers will be a key issue. The SPE structure has allowed industry-wide initiatives to be introduced, as well as market information to be dispersed to the industry.

The marketing body must be seen to be providing a higher return to growers than its costs, so marketing and cost factors must be emphasized. The size of Zespri means it has the resources to undertake critical large (industry wide) initiatives like Taste Zespri and re-branding. This has allowed for the ability to control actual production and product variety; an inability to do this was the downfall of other New Zealand primary producer boards.

The structure of the industry has changed over time in response to changes in market size. While the industry is not vertically integrated it is based upon very close relationships and alliances. This provides:

- Vigour
- Checks and balances
- A focus on performance at all points along the chain
- Transparency and pressure to perform

- Specialisation
- Decentralised power

The concentration of the industry in the one location provides two key benefits.

- Significant advantages due to the clustering effect – easier to gain scale efficiencies in transport, support services, skills and labour development.
- Enhances the social capital within the industry.

Issues

The strategic knowledge of growers needs to be continually updated. Much of this relates to information dissemination as well as the maintenance of good relationships throughout the industry. It is important that growers realize that it is not just a good product that is the key to success of an industry in the maturity stage of its life cycle, but also service aspects and promotion. Service aspects are all about distribution, ensuring the product is in the right place at the right time, in the right quantity and the right condition. A production focus will not succeed. For example new competition from China may squeeze margins, despite the off season nature of its competition, and the distance between growers and the market may mean a tendency to focus on short term objectives that do not adequately consider the long term strategic implications.

Zespri has followed a differentiated strategy and the issue will be how to manipulate the elements of the marketing mix that are harder for competitors to replicate and hence ensure long term success. Key elements are distribution and promotion, with promotion focusing on a pull strategy to ensure brand awareness and loyalty. While growers own the market and most are motivated to produce quality, it is critical that they are continually kept informed of consumer changes in demand. This is made more difficult through the fact that New Zealand sells to multiple markets with very different demands.

Quality control systems based upon market factors are crucial to the industry. Socio-metric measures, and research that emphasizes environmental and health aspects of the fruit, have considerable potential. However, it is important that strategic decisions are based upon a sound understanding of consumer perceptions that may be very different in different markets. One example is food miles, the emissions and energy associated with transportation of fruit to the market. Overseas consumers may perceive New Zealand kiwifruit as less desirable than kiwifruit from countries closer to them due to the food miles issue, when in fact New Zealand is far superior in terms of production efficiencies. New Zealand's superior production efficiency may be a key factor to emphasise when reducing the negative perceptual issues of food miles i.e. low energy efficiencies. However, this argument needs to be made carefully as an emphasis on food mile issues by Zespri could make people nationalistic in certain countries.

A key issue will be how the potential for increased divisions within the industry is handled as new product varieties result in different grower groups within the industry that are treated differently by markets. As the industry grows and diversifies keeping co-ordination and harmony between competing interests in the New Zealand industry is going to be an increasingly significant issue. Deregulation due to WTO pressures could compound this problem.

Economies of Scale and Market Power

The government tax incentives applied in the late 70's and early 80's encouraged the development of the kiwifruit industry. The kiwifruit industry needed 'economies of scale' to have sufficient volume offering to establish a market. The initial tax incentives put in place by the government enabled the industry to establish.

The industry later united under a single structure to enable many things to happen:

- a. Production volumes and therefore market plans could be put in place and offered to customers
- b. Sufficient quantities of fruit could be assured to warrant big customers carrying the product
- c. Buyers could only negotiate with one marketer out of New Zealand
- d. High quality could be assured by Standards set and enforced within New Zealand
- e. EOS in shipping to the other side of the World meant affordability

SPE has provided the New Zealand industry with the market power to counter the strength of the dominant retailers, the supermarkets. The co-ordinated size of the New Zealand industry provides economies of scale not just in production and distribution, but also in promotion, and allows for effective integrated marketing communication planning which is central to the New Zealand strategy of differentiation. Where Zespri has dominant market share in a market product category advertising to increase per capita consumption levels is a strong option.

Interviews with industry participants reveal that the single desk system has provided a number of advantages including the coordination supply and promotion that retailers appreciate. Supply customers have invested heavily in the single desk and therefore will not support a break up at that level

Issues

Supermarkets are continuing to consolidate leading to greater size and market power. Consumers are increasingly time poor and demanding convenience which is leading to increased large retailer strength. A possible counter trend is awareness of monopoly structures and support for small local traders (whether this emerges is debatable). In addition, due to the need for manufacturers to maintain an independent brand in the minds of the consumer to counter distributor strength, promotional margins must be maintained and therefore if retail margins shrink then there is a disproportional effect on growers in terms of reduced returns. This leads to the need to maintain brand awareness, alliances with other producer industries, and the correct selection of distributors to minimize risks and reduce their power. Appropriate government promotional support is an ongoing challenge.

Branding, Differentiation & Strategy

As New Zealand has not positioned itself as the lowest cost producer, given market access and location issues, the New Zealand industry has followed a differentiation strategy

particularly in our most profitable markets. This has been based on taste, health benefits and low pesticide usage and has led to a successful price premium to support the promotional and branding efforts. The New Zealand industry has been successful as it has been able to claim the best kiwifruit in the world, but competitors are beginning to erode that position and continuous innovation is needed. The Zespri brand has been one of the most critical initiatives that Zespri has made.

There has been effective recognition of market issues within the industry which has led to individuals driving initiatives. For example in relation to the Gold cultivar it was identified that Japan and other Asian palates prefer sweeter flavoured fruit and retailers and wholesalers saw the opportunity for the new product with a different flavour and appearance. Gold has led to advantages but it is important to ensure that by the time the patent runs out the competitive advantage based upon product differentiation has been replaced by a distribution and promotional advantage – dominant brand position.

Gold was introduced in a relatively short period of time in order to take advantage of intellectual property rights. There have been a number of teething issues along the entire value chain from picking of the fruit all the way to the market. However, the green and gold kiwifruit varieties have been largely complementary not cannibalizing.

How innovations and technology is initially introduced in an industry will have impacts long after that technology changes. It is important to consider these long term implications and how industry members will manipulate those factors. Likewise new products and new markets need plenty of support and a long term strategic plan is required

Issues

A differentiated branding strategy has worked well. The current strategy of working with strong retailers and providing consumer advertising support for the brand, combined with increasing international year round production options is sound. However, there will be implications for growers in relation to innovation transfer, seasonal overlaps, and the funding of research, development, and promotion.

There is a need for a strategic long term focus. The conflict between short and long term objectives must be at the heart of strategic discussions in the industry.

Distribution will be a key area which requires a strong need to maintain high levels of effective consumer pull promotional strategy to reduce the bargaining power of buyers/supermarkets and maintain the independent brand strength. Alternative distribution options could be looked at.

Zespri has a positive country of origin effect but new issues, such as food miles, will continually influence brand perceptions. What makes the process difficult is different consumer values and beliefs in different markets meaning attitudes will vary across those markets. Information collection and dissemination systems are required but the balance between information provision and information overload is a difficult one to make.

There is the need to recognize that promotion is an investment, particularly in new markets. High promotional costs with limited short term returns further grower awareness needed and agreed new market targeting.

Value Chain Developments

The New Zealand industry is characterised by good co-ordination of the value chain facilitated by relatively open communication systems, an understanding of market issues and the general co-operation. Despite this, continued improvements to increase efficiencies and remove duplication of activities as well as improvements in quality audits, and market driven incentive systems are needed.

Issues

Total supply chain management is crucial. One of the advantages that New Zealand has, particularly relative to competitors, is in the total supply management system. The concentration of production, processing, distribution, and information sharing systems means that New Zealand has a total supply chain management system that will be difficult for foreign competitors to replicate. The ability to continue to streamline and improve the efficiencies and effectiveness of this system is the basis for a sustainable competitive advantage.

For success to continue to accrue to New Zealand the ownership and control of the industry must stay in New Zealand hands. Ownership issues need to also be communicated to the growers strongly so they can understand the objectives of different groups; and who is behind those objectives.

Labour problems in the domestic market in relation to both skills and availability also need to be further addressed. Seasonal workers are becoming harder to attract with low levels of domestic unemployment. While government initiatives are being introduced to provide for an overseas labour force there are significant issues involved in regards to training and support facilities that need to be addressed.

Market Research/Responsiveness and Information Dissemination

Transparency of information and innovative developments is critical to the kiwifruit industry. Change is difficult and needs to be well managed. Support is needed for technology transfer to ensure essential market drive change occurs. Analysis of lessons learnt from the introduction of the gold variety would assist future change management in the industry.

Innovation must be tied to market demands and those market demands must drive the incentive structure to producers. Market demand factors must be communicated constantly throughout the entire value chain. Different markets have different priorities due to some markets providing higher returns. Growers respond to price incentives, but financial indicators are lagging indicators i.e. cut promotion and profits increase in the short term but lead to long term brand depreciation and the erosion of competitive advantage.

Issues

Distance from market means a potential lack of understanding of market driven production initiatives meaning that incentive systems are critical but they must not just incorporate current issues but also market development and growth issues. There is a balancing act of information dissemination. How to communicate information to growers without over-

whelming them with too much information. Committees and research bodies are therefore important. This is a need for growers to understand the different strategic requirements.

New Zealand Kiwifruit Industry Success

Summary of the Key Success Factors

Success has come as a result of sound understanding of changing market conditions communicated throughout the industry and leading to informed long-term strategy of a co-ordinated value chain. The competitive advantage of the New Zealand industry is based upon a number of elements:

- Informed decision making
- A balanced industry structure
- An integrated value chain
- Market driven, industry initiated research and development initiatives
- A strong differentiated marketing strategy

7 *Future Challenges*

Industry views

In addition to the revision of the industry success factors, industry participants also identified the following ongoing challenges:

- The complexity of the industry is made more difficult due to external events that are difficult or impossible to predict (i.e. weather patterns, typhoons in Japan, US anti-dumping legislation, exchange rate fluctuations).
- It is not an easy industry to make money in. There are high levels of competition from both other kiwifruit producing nations and substitute products such as tropical fruit. Additionally, global legislation determines the environment for competition and the actions of national bodies and interest groups in different countries is continually changing that environment.
- The speed of change in the New Zealand industry is too slow. This may be attributed to two factors: first, the collaborative nature of the industry structure slows the decision making process. Second, the distance from market and increasing number of lifestyle orchard owners means market driven changes take time to be actioned.
- It is important that the mistakes of others are learnt from. Two such examples are: not taking the industry seriously, and poor investment decisions.
- There is a significant risk of staying on the wrong track. The industry needs to ensure it continues to have the ability to identify and make changes as the environment changes.
- Low returns have occurred during the last two seasons. This was due to exchange rate losses in the previous season and large fruit losses in the current season. Quality control systems need to be put in place to address the second of these problems. Losses will not be evenly spread and this may cause feelings of inequity within the industry.
- There is a strong need to develop a structure that will allow the SPE system to be retained without regulations as SPE systems are under attack at the World Trade Organization (W.T.O.).

Leadership

- Future leadership is a major issue of concern. The first generation of industry leaders had skills from a diverse range of other backgrounds. Various crises encouraged active grower involvement in the political and decision making structures of the industry. Currently, there is a lack of new young leadership coming through due to the fact that ownership structures are changing namely:
 - w Current leaders in the New Zealand industry have been through periods of crisis and have learnt the importance of being aware of: changing competitive and market conditions, and the need to be active in leading the required change in the

industry. It is important that new leaders heed this lesson so as to ensure that forward planning and change occurs that avert future crises.

- w Much of the orchard work can be outsourced meaning that owners can keep their orchard longer. This has made it harder for new/young people to get into ownership of orchards.
- w The highly capitalized nature of current orchards has led to high productivity levels but also high values meaning it is difficult for young people to enter the industry. An increasing percentage of orchards are run by professional managers who may not have the long term perspective, or political drive, that independent grower/managers possess.
- w A lack of future leadership coming from growers would lead to increased decision influence by corporate decision makers from Zespri and Packhouses
- The leadership questions are therefore:
 - w Where are leaders for growers coming from in the next 10-15 years?
 - w How will grower control and co-operatives change over the next decade?
 - w How will this change in ownership structure and the increased importance of corporate leadership influence the strategic decision making of the industry?
 - w How can new leaders be made aware of the lessons of the past, such as the need for long term strategic planning, industry collaboration, and the importance of the correct ownership structure, in order to avoid repeating mistakes?

Marketing

- There is a need to maintain brand relevance as consumer demands change in different markets.
- The U.S. market has significant potential for growth and there is a need for cooperation in marketing with local suppliers in order to expand total consumption. This would take advantage of the alternative season supply as well as maintaining relationships with US groups.
- The current major competitor countries, Chile and Italy, (*refer appendix B*) are continuing to expand their production area and they are making significant strides in terms of Free Trade Agreements which provide them with access advantages.
- The rapid expansion of the Chinese market is an emerging threat. Despite their alternative growing season, the potential international increases in supply will still impose price pressures.

Government

- The New Zealand government has an important role to play, and current issues of particular importance are:
 - w Labour
 - w Trade access – to ensure a level playing field
 - w Biosecurity
 - w SPE – regulatory changes may be required.

- There is a role for Hortresearch and other research organizations to provide engineering technologies, for example the chisel on end of gold fruit for processing is a key challenge.
- Policy and program initiatives are required to make horticultural education a desirable option for students.

Current R & D Issues

- Gold – Research is needed focusing on a maturity equivalent programme, as per Taste Green
 - w Currently research is yield focused
 - w There are complexities in terms of maturity.
- Fruit maturity for both Gold and Green is an ongoing issues that needs further research.
- Ongoing research is needed regarding pest levels on fruit being exported and chemical use.
- Continued research into plant nutrition, fertilisers, and soil biology is required.
- Need for more research to assist in the processes of suppliers/packhouses i.e. new generation grading machines.

Future Issues

- Understanding consumer markets. As the number of markets increase and become increasingly diverse, this will become increasingly difficult.
- The need to grow the US market, while maintaining positive relationships with key stakeholders in that market.
- The preservation of an integrated marketing structure in New Zealand in the face of changing ownership structures and potential regulatory pressures from the W.T.O.
- Strategies are needed to optimise the benefits of the different varieties.
- Comparative orchard performance analysis and best practise transfer.
- The need to improve practises in relation to environmental sustainability.
- The need to increase orchardists understanding of key issues, such as ripeness, through appropriate information dissemination systems.
- The need to enhance farmer knowledge at a time when many new investors subcontract out orchard management and have the expectation that no knowledge is required. Subsequently the do not understand the business and the implications of long term issues such as R & D, promotion, and quality processes
 - w Additionally, these investors also do not require this high level of knowledge of their managers.
- The industry is grower centred and therefore high returns are required for happy growers. However, long term strategic decisions based upon an understanding of changing market conditions that may have short term costs, may be required for long term success.

- An over emphasis on domestic political issues without sufficient attention being given to the international regulatory environment could restrict competitiveness
w An under investment in market development.
- The need to maintain the correct balance in an industry that currently has a large number of committees which facilitates information flows and involvement but can slow decision making processes.
- Labour is a critical issue that need addressing both in relation to farm and packhouse labourers, as well as the encouragement of managerial expertise into the industry to assist in its future development.
- Bio-security is an issue that is central to growers and needs review to ensure the industry is properly protected.

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