The Australian Bamboo Shoot Industry
A supply chain approach

A report for the Rural Industries Research and Development Corporation

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Foreword

Horticulture is one of Australia’s most important primary industries. The economic contribution of this sector comes largely from traditional industries such as wheat and sugar. However, new horticultural industries also have the potential to make an important economic contribution to the prosperity of the sector. Due to Australia’s proximity to Asia and its ability to supply counter seasonal produce to much of this region, traditional Asian foods have become of particular interest to many Australian producers. Investing in the development of new rural industries based on these Asian foods and other new crops is seen as important in managing the overall competitiveness of Australian horticulture.

The underlying principles of supply chain management appear to be useful tools in improving a firm’s competitive position and are commonly linked to success in agribusiness. Linking the need to develop new horticultural industries with the potential of supply chain management to aid in this process, this publication examines how supply chain management principles can be used to aid the development of the Australian fresh bamboo shoot industry.

This project was funded from RIRDC Core Funds provided by the Australian Government. Funding was also provided by the University of Queensland and the Australian Commercial Bamboo Corporation.

This report, an addition to RIRDC’s diverse range of over 1,200 research publications, forms part of our Asian Foods R&D program, which aims to support industry in its drive to develop new products and markets and to gain competitive advantage through improving productivity in, and achieving price premiums for, Australian production.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- purchases at www.rirdc.gov.au/eshop

Tony Byrne
Acting Managing Director
Rural Industries Research and Development Corporation
Acknowledgments

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Finally we acknowledge the support necessary to undertake this research given by the School of Natural and Rural Systems Management of the University of Queensland.

Abbreviations

ABARE Australian Bureau of Agricultural and Resource Economics
ABIA Australian Bamboo Industry Association
ABN Australian Bamboo Network
ABS Australian Bureau of Statistics
ACBC Australian Commercial Bamboo Corporation
ANU Australian National University
ANZFA Australia New Zealand Food Authority
APEC Australian Persimmon Export Company
CFT Centre for Food Technology
CQU Central Queensland University
CSIRO Commonwealth Scientific and Industrial Research Organisation
DPI Department of Primary Industries
DSD Department of State Development
EPA Environmental Protection Agency
FCDD Fibre Composites Design and Development
HACCP Hazard Analysis of Critical Control Points
IMS International Market Selection
JETRO Japan External Trade Organisation
MAFF Ministry of Agriculture Forestry and Fisheries
NTDPI Northern Territory Department of Primary Industries
QA Quality Assurance
QDPI Queensland Department of Primary Industries
QFVG Queensland Fright and Vegetable Growers
RIRDC Rural Industries Research and Development Corporation
ROC Republic of China
SCM Supply Chian Management
WTO World Trade Organisation
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Executive Summary

In the early 1990s entrepreneurial horticulturists realised the potential to develop a commercial bamboo industry in Australia. Initial market investigations showed possible domestic and international markets for Australian bamboo products and in 1998 industry pioneers formed the Australian Commercial Bamboo Corporation (ACBC), a representative industry body. The ACBC was a group of just over 40 bamboo growers who had a common interest in developing the commercial potential of the bamboo industry.

The goal of the ACBC members to develop their industry was the catalyst for the research reported in this report. The group was enthusiastic but lacked the knowledge, experience and networks to create a commercial vehicle capable of marketing the anticipated significant volumes of bamboo shoots available in the future. This report presents research into the development of the bamboo shoot industry in Australia by detailing a strategic intervention into the development of the Australian Commercial Bamboo Corporation between May 1999 and June 2002. The objective of this intervention was to work with a core group of participants, using supply chain management principles, to address constraints to the group’s commercial development.

The application of supply chain management principles to the ACBC influenced the group’s structure and culture and led to the empowerment of the group to take responsibility for managing its own activities. The motivation behind this approach was not only to aid the ACBC to address the limitations to its own development, but also to provide a role model for the wider bamboo industry, and perhaps other new horticultural industries.

The success of this core group (the ACBC) over the three years of the intervention demonstrates that supply chain management principles can provide an integrative framework for new industry development. The ACBC is now Australia’s largest bamboo grower group comprising more than 90 members who between them command more than three quarters of the industry’s plantings. For the three years of this intervention the ACBC was engaged in developing both domestic and export markets for bamboo shoots. Through its domestic brand, ‘Cockatoo Bamboo’, it is now responsible for the majority of domestic trade in high quality fresh bamboo shoots. The ACBC now has an established, grower regulated HACCP (Hazard Analysis of Critical Control Points) based quality system and is in a position to supply its export brand, ‘Kangaroo Bamboo’, to international markets. The ACBC has investigated the potential of five major export markets and is continuing to search for other markets.

The intervention process was grounded in a supply chain management framework adapted to the development of new industries. The framework was based on the need to concurrently manage three areas of new industry development:

- The development of a consumer orientation
- The development of cooperative relationships
- The development of effective information and communication systems.

This framework delivered six guiding principles of supply chain management to these three areas of new industry development. Such a framework has never before been reported as guiding the development of new and emerging agricultural industries.

Results demonstrate that the implementation of supply chain management principles allowed the ACBC to address three major risks to new industry development:

- Lack of accurate information
- Lack of a strategic orientation that incorporates the needs of the marketplace
- Lack of strategic action and collective vision.

Action learning was the basis of the intervention process and was used to empower the ACBC as a group of individuals with a common purpose. When taken as a conceptual package, the supply chain
management framework, applied using action learning and strategic intervention techniques, represents an important advance in better understanding both strategic and operational approaches to new industry development in horticulture. Through participatory observation and action learning the primary data sources used in this study were the fellow participants in the process.

The case of the ACBC as presented in this report cannot be used alone to develop generalisable theory, but it does contain valuable lessons for other industries by providing both practical and theoretical insights into new industry development. It also provides guidance for future researchers interested in studying or influencing the development of new crop industries which in turn may also help to identify more general theoretical propositions relating to the application of supply chain principles in new agricultural industries.
1. Introduction

This report presents research undertaken with the Australian bamboo shoot industry during its formative years. It demonstrates that supply chain management principles can provide an integrative framework for new industry development.

Over the period reported in this document, major progress has been made in the Australian bamboo industry. By the conclusion of this research the Australian Commercial Bamboo Corporation (ACBC), the core group of industry members, had:

- successfully developed the industry’s most recognised domestic brand name
- explored the viability of five different export markets
- developed their export capability, including a grower regulated quality management system.

This core group:
- controlled among its members more than 75% of the commercial bamboo plantings in Australia
- established two registered, quality managed bamboo shoot brands, ‘Cockatoo Bamboo’ and ‘Kangaroo Bamboo’
- has steadily built their domestic market sales to more than an estimated $100 000 in 2003.

The progress of the ACBC over the period of this research has resulted in it becoming the bamboo industry’s leading industry body. The ACBC is now in a position where it is capable of taking control of its own future and as the industry leader it is now in a position to promote excellence and demonstrate a way forward for other industry members.

1.1 Background to the research

Horticulture is Australia’s second most important primary industry

Among Australia’s agricultural industries, horticulture has the second largest gross value of production after beef (DPI 2003). In 2000 the gross value of production was close to A$6 billion (CSIRO 2000), the vegetable sector contributing about A$1.8 billion or close to 30 percent of this total (Cirillo 2000).

The export value of horticultural produce is also significant, having increased by 112 percent in the decade up to 1997-98 (ABARE 2000) to a value of A$1.2 billion. The value of exports of fresh vegetables reached A$192 million or 26 percent of the total value of horticultural exports in 1999-2000. Asian and Pacific markets were the major destinations for fresh Australian horticultural exports (Cirillo 2000). Australia has a counter seasonal advantage in the supply of fresh fruits and vegetables to the Northern Hemisphere. Its Southern Hemisphere competitors include New Zealand, South Africa, Argentina and Chile. These countries, together with the United States, are Australia’s main competitors in the Asian market.

Bamboo shoots could become an important contributor to Australia’s minor vegetable production and an important export commodity

The last decade has seen strongly increasing interest in the growing of bamboo in Australia. Several industry pioneers have researched and obtained bamboos from around the world (Cusack 1997a, 1999a; Dart 1999) and an industry group, the ACBC (Australian Commercial Bamboo Corporation), has been founded through the work of these pioneers.

Industry pioneers have identified Australia’s potential to grow high quality bamboo for both edible shoots and timber (Cusack 1997a; 1999a). Many factors that could impede the development of an Australian bamboo industry have been resolved or are in the process of being resolved. While there is a still considerable amount of work to be done in fields such as postharvest, other areas such as species
selection and propagation are reasonably well understood (Collins 1999, Cusack 1997a, 1999a, Dart 1999).

At first glance, both the domestic market and export markets in Asia appear to have potential for fresh bamboo shoots. The relatively small Australian domestic market is currently dominated by imported canned product, with a reported increasing demand for fresh shoots to replace canned shoots (Cusack 1999b, Midmore 1998a). Asian markets consume large quantities of bamboo shoots and appear to present opportunities for out-of-season Southern Hemisphere producers (Collins 1999).

The successful development of the Australian bamboo shoot industry could result in:
1. the generation of export earnings from the sale of fresh shoots in Asian markets
2. the replacement of some of the annual import of canned and preserved shoots into Australia
3. an opportunity for primary producers in both subtropical and tropical climates to diversify into an enterprise that is environmentally friendly and profitable (Collins 1999).

New industries, Australian horticulture and supply chain management

New horticultural industries are important to the continued development of the horticultural sector because they have the potential for levels of growth that established horticultural industries no longer experience (ABS 2002). The Australian wine industry is a good example of a horticultural industry that was once considered new but is now a major contributor to the Australian economy. In 1993-94, the gross value of production of grapes was A$450 million, increasing to A$1.1 billion in 1998-99 (ABS 2001), and in 2001-02 wine exports had reached a value of A$2.1 billion (ABS 2002). This may be an exceptional case, but it does show the potential contribution that can be made by a successful new horticultural industry.

To achieve the level of success of the wine industry Australian horticulture needs to improve its international competitiveness. Horticulture in Australia has been criticised for lacking international competitiveness, being fragmented and having a poor focus on customers (Fitzpatrick, Gregory and Minnis 1991; Horticultural Policy Council 1992, 1994; Pullar et al. 1993; CSIRO 2000). Growers have been criticised for being supply driven and domestically orientated in their attitudes to both production and quality (Horticultural Policy Council 1994). This production orientation, or perhaps more correctly the lack of market orientation found in Australian horticultural enterprises, has been cited as a major impediment to the industry’s future competitiveness.

CSIRO (2000) identified effective supply chain management as an important factor in ensuring that consumer demand is met and that Australian horticulture develops its international competitiveness. Although supply chain management has been implemented in a wide range of agricultural industries around the world (Hughes and Merton 1996; Fearne and Hughes 1999), Mowat and Collins (2000) are the only authors to have considered the role of supply chain management in new and emerging horticultural industries.

Gifford et al. (1998 p. 8) identified supply chain management as “an integrated approach that aims to satisfy the expectations of consumers, through continual improvement of processes and relationships that support that efficient development and flow of products and services from producers to consumers”. The use of supply chain management in new horticultural industries could provide the same benefits as in established industries.

1.2 Objectives of the research

Given the lack of understanding of how supply chain management could contribute to improving Australian horticulture’s international competitiveness and the apparent potential of the Australian bamboo industry, the objective of the research was to determine How supply chain management principles can contribute to the development of a successful fresh bamboo shoot industry in Australia?
1.3 Justification of the research

The development of new industries is one way in which the horticultural sector can continue to develop. Supply chain management has been identified as a means of imparting competitive advantage (Dunne 2001), and one of the key principles of supply chain management is the development of a market orientation (Collins and Dunne 2002). The development of a market orientation has been identified as a key requirement in improving the marketing performance of Australia’s horticultural sector (Horticulture Policy Council 1992; CSIRO 2000).

The application of supply chain management to the development of new horticultural industries is an area of research that has been largely ignored. This research is therefore a step towards redressing the lack of attention given to the application of supply chain management principles in this area. The research also adopts a methodology based on action learning and strategic intervention that may provide lessons for the development of improved research methodologies for other new and emerging industries.

1.4 Methodology

An overarching case study methodology

The overarching approach used in this inquiry was a case study, informed by analysis of particular research issues. Within the case study, strategic intervention lead to the implementation of supply chain management principles through action learning. This composite strategy was designed to develop insights into the emerging industry that could be used to improve practice.

A case study allows a phenomenon to be studied in its real-life context and allows for the application of multiple research methods (Yin 1994). The case study strategy is also better able to adapt to a constantly changing research focus than other strategies of inquiry. Most importantly in this case, the approach was able to accommodate the multiple sources of information that had to be gathered during the research. This ability to deal with a variety of data sources is one of the unique strengths of the case study approach (Yin 1994).

However, the findings of a single case study can rarely be accepted without question. It is not uncommon for equivocal evidence or biased views to influence the direction of such research (Yin 1994), thus there is a lack of generalisability of the outcomes of case study research (Berg 2001). Despite this, a case study does have the potential to provide important theoretical insights into the phenomenon being studied – in this case, new horticultural industry development. Chapter four of this report presents a case study of the intervention into the development of the Australian Commercial Bamboo Corporation (ACBC).

Mixed methods

Within the case study methodology, a combination of strategic intervention and action learning methods was used. The action learning approach employed methods such as participant research, interviews and surveys, and to provide additional objective evidence in specific circumstances, quantitative methods such as scientific experiments were also applied.

Participatory research through action learning immersed the researcher in the case. The objective was to study first hand the day to day experiences and behaviours of the subjects in particular situations. This required participation, but not as a group member, making it possible to use initial observations to formulate hypotheses which could subsequently be discarded or refined to take into account further observations (Waddington 1994). The inductive nature of this approach makes it ideally suited to research that emphasises the importance of human meanings and interpretations. It provides an opportunity to explore issues in depth within their context, gain a unique understanding of the case, and develop insights into theory that may be applicable on a wider basis (Hartley 1994).
Strategic intervention needed to involve members in such a way as to promote a feeling of ownership of the outcomes of the research process. This meant developing a sense of collaborative inquiry where participants became co-researchers and co-subjects (Heron and Reason 1997).

Action learning was used to give the group the opportunity, skills and motivation to reflect on and evaluate results of the research as it progressed. The aim was to draw lessons from the experience of the group and the researcher and learn from them, in order to improve subsequent performance, following Kolb’s (1984) cycle of experiential learning (Figure 1.1).

![Figure 1.1 Elements of an Action Learning Cycle (Kolb 1984)](image-url)

In the context of this report the form of inquiry used has two aims. The first is to aid the bamboo industry in producing information that is directly useful to its members. The second aim is to empower the members of the ACBC to take responsibility for their own future by applying and evaluating the information gathered in research.

**Validity**

The validity of the results of this research may be assessed using four of Merriam’s (1998) strategies for examining validity: member checks, long term observation, peer examination, and participatory and collaborative modes of research. The research was conducted over a three year period incorporating three seasonal cycles making this a long term observation. The process of action learning ensured that the people who were the subject of the research reviewed and commented on the results obtained during seasonal cycles, a process referred to as member checks. At all stages a previous study of the Australian persimmon industry was used to benchmark the development of the bamboo industry, and the researcher involved in the persimmon study (Collins 1997) supervised the research in this study, amounting to peer examination. As explained above, the research was participatory and collaborative.
2. Bamboo – An Australian perspective

Bamboo is extensively cultivated and utilised throughout Asia (Cusack 1997a), and to a lesser degree in South America, however in most countries outside of these regions it is a relatively unknown crop. A number of countries, including the USA, Canada and Australia, have in recent years started to show increasing interest in bamboo as a commercial crop. Despite this interest, there is a definite lack of knowledge and a large amount of misinformation about bamboo in the wider community (Collins 1999).

Bamboos are a member of the Poaceae (or Gramineae) family, which is divided into between six and ten subfamily groups. The subfamily Bambusoideae comprises both woody and herbaceous bamboos. It is divided into six tribes, one of woody bamboos (Bambuseae) and five of herbaceous bamboos. Bambuseae can be divided into ten subtribes, 101 genera and in excess of 1500 species (Ohnberger 1999). The exact number of species is unknown, as identification is largely dependent on how different species are characterised by different authors.

The flowering characteristics of bamboos are one reason for taxonomic difficulties. The occurrence of flowering and fruiting varies among bamboo species (McClure 1993). The majority of bamboos flower gregariously, that is, a clone of a species flowers at the same time across regions and even countries. Depending on the species, intervals between flowering may vary from a few decades to over a hundred years. Other species flower sporadically or annually, flowering only in a specific area rather than worldwide, as with gregariously flowering bamboos (Cusack 1998a).

Bamboo species are commonly divided into two groups. These groups are differentiated by the growth habit of the underground rhizome section of the plant. There are two basic forms of rhizome system, sympodial and monopodial. The form of rhizome system determines the form of the visible part of the plant. Sympodial rhizomes produce compact clumps, with tightly packed culms or poles and these are commonly termed clumping bamboos (Figure 2.1). Monopodial rhizomes produce less compact clumps, with culms spread over larger areas, and these are commonly called running bamboos (Figure 2.1).

Figure 2.1 The Growth Habits of Sympodial and Monopodial Bamboos
The successful production of bamboo relies on matching the needs of the bamboo plants with the environment in which they are grown. The plants need to be suited not only to the climate of a particular region but also to the specific conditions of the site on which they are grown (Maoyi and Jianghua 1996). Different species of bamboo vary in growth and development patterns and have different environmental requirements. With over 1500 species, the diversity of bamboo means that there are species suited to most locations.

Temperature, precipitation and humidity are usually considered the most important climatic factors when selecting the best bamboo species for a particular site (Bindon 1995; Cusack 1998a). The temperature tolerance of different species is commonly the determining factor in the choice of which species can be grown at a particular site. Clumping species tend to be found in tropical and sub tropical areas and are not as cold tolerant as the running varieties, which can be found in cooler climates. The limiting factor in the distribution of bamboos is the availability of water. Most species require more than 1400 millimetres of precipitation annually, while a few species found naturally in arid areas can survive on substantially lower precipitation (Ma Naixun 1996). In areas where there is not enough rainfall, irrigation would be needed to grow bamboos commercially.

Water availability and minimum average temperatures combine to define suitable bamboo growing regions in Australia. Sympodial species require higher average temperatures and higher rainfall and are best suited to tropical areas in the north and east of Australia. Monopodial species, which are considered harder than sympodial species, can withstand more diverse conditions. They can grow in subtropical and temperate areas and can thrive with less water than their more tropical relatives. However, they are best suited to areas in the south and south east of Australia, as shown in figure 2.2.

![Figure 2.2 Map of Australian showing areas most suitable for growing bamboo](image)

Clumping species mature swiftly with the first harvest of shoots usually between 3 and 5 years after planting and the clump reaching full maturity after 5 to 8 years. The shooting season for clumping species runs from late spring to early autumn. Running varieties take longer to establish with the first harvest up to 8 years after planting. They also have an earlier and shorter shoot season in early spring.

Bamboos are in general considered hardy plants and are capable of growing in most types of soils (Bindon 1995). Clumping (sympodial) bamboos will grow in most loam soils but running (monopodial) bamboos, which have a more complex underground structure, tend to prefer more friable sandy loams. Both types appear to grow best in deep, loose and fertile loam soils. Very dry, rocky or
sticky soils are not suitable for commercial production. Bamboos prefer a soil pH close to 7.0. In Australia a gentle slope facing northeast is favorable.

Australia remains relatively free of the large number of bamboo specific pests and diseases, although bamboo mosaic virus (BoMV) is present. This virus attacks leaves, shoots and young culms and causes shoot to harden, resulting in poor eating quality. The virus affects the Bambusa and Dendrocalamus genera and is spread by mechanical means. Its distribution in Australia is presently very limited. A number of leaf-biting and sucking insects, including aphids, can cause minor damage, especially to young plants. Scale insects are common but cause no obvious damage and are controllable using white oil.

### 2.1 Distribution of world-wide bamboo resources

The bamboo plant produces a number of remarkably versatile products with a wide range of potential uses. Bamboo is a readily available natural resource and because of its distribution, availability, rapid growth and desirable properties it has been widely used as a sustainable resource in the everyday lives of the people in a number of countries (Dransfild and Widjaja 1995). Its most significant use is as a building material. Other significant uses are as a fibre for making paper, baskets and goods and as a food source.

Bamboo grows naturally on all continents except Antarctica and Europe and is found naturally between N46° and S47° (Maoyi and Jinaghua 1996; Cusack 1997a). The majority of species are native to Asia, however Africa, Australia, North America, South America and Central America all have endemic species (Crawford 1997).

Information on the area of bamboo resources in the world is sketchy. Data on native forests and plantations are unavailable for many Asian countries, and the data that exists is often conflicting. Maoyi and Jinaghua (1996) estimated that in excess of 14 million hectares of bamboo could be found distributed in the tropical, subtropical and temperate zones of Asia, Africa and Latin America. Table 2.1 shows Maoyi and Jinaghua’s (1996) estimates of the distribution of the world’s bamboo resources.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>AREA (HA)</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>4 000 000</td>
<td>500</td>
</tr>
<tr>
<td>India</td>
<td>2 980 000</td>
<td>136</td>
</tr>
<tr>
<td>Burma</td>
<td>2 170 000</td>
<td>90</td>
</tr>
<tr>
<td>Thailand</td>
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<td>50</td>
</tr>
<tr>
<td>Bangladesh</td>
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<td>30</td>
</tr>
<tr>
<td>Laos and Cambodia</td>
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<tr>
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</tr>
<tr>
<td>Philippines</td>
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<td>55</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>2 000</td>
<td>30</td>
</tr>
<tr>
<td>Islands in Oceanic and Pacific</td>
<td>200 000</td>
<td>10</td>
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<tr>
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<td>1 500 000</td>
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</tr>
<tr>
<td>Africa</td>
<td>1 500 000</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>14 008 000</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Maoyi and Jianghua (1996)

The majority of commercial production of bamboo takes place in India, Japan, China, Thailand, Vietnam, Burma, Indonesia and the Philippines. Other countries in South America and the western portion of the Middle East are also known to produce bamboo, though primarily for its timber. It is
only in recent times that bamboos have been cultivated for food outside of Asia (Cusack 1997b). Although most species produce edible shoots, of the more than 1500 species, less than 100 are commonly grown specifically for their shoots. Phyllostachys heterocycla var. pubescens is by far the most common, and stands can be found growing wild around many villages in China and Japan.

2.2 Bamboo shoots

Bamboo shoots are the actively growing immature culms emanating from buds on the underground rhizome section of the plant. The worldwide consumption of bamboo shoots is estimated to be in excess of two million tonnes per year with China consuming in excess of 1.2 million tonnes (Cusack 1999b).

The characteristics of bamboo shoots differ between species and also depend on maturity at harvest. Shoots tend to be conical in shape, bulging slightly above the base before tapering towards the tip. The shoot is encased by tightly packed leaves that vary in colour from creamy white/yellow through to dark brown and green. The flesh, exposed at the base where the shoot is cut from the plant, is creamy white to golden in colour. Its main constituents are water, protein and fibre (Francis 2000).

Plantation bamboos tend to have a high water requirement, especially during the shoot season. This requirement is dependent on species. In Australia the equivalent of 2000 to 2500 mm per year of rainfall is the current recommendation for total annual water requirements. Based on the transpiration rate of bamboo clumps it has been determined that the maximum requirement for clumps could be as high as 3300 millimetres per year (Kleinhenz et al. 2000).

Bamboo shoot quality attributes

The single most important quality factor in bamboo shoots is freshness (Vinning 1995). Ideally, shoots should be harvested in the morning and sold the same day. Shoots are favoured for their delicate flavours and crispy yet non-fibrous texture.

Bitterness of shoots is also an important quality consideration. The shoots of some species are more bitter than others. Bitterness in bamboo shoots is linked to the presence of cyanide compounds, present in the form of a cyanogenic glycoside. These glycosides, also commonly found in nuts and the seeds of stonefruit, are considered to be of minimal risk to public health if bamboo shoots are prepared properly.

In most areas where bamboo shoots are consumed, longstanding local traditions relating to their preparation as a food reduce the cyanide concentration (Montgomery 1969). However, in some societies it is a common practice to consume bamboo shoots raw, commonly through their incorporation into dishes such as pickles and chutney. It is for this reason and because of the link between cyanide and bitterness in shoots that the concentration of cyanide in bamboo shoots is of concern to producers.

Colour is an attribute commonly used by consumers as an indicator of both freshness and bitterness. Shoot flesh should be cream or white, brown or yellow colours indicating that the shoot is not fresh. The colour of the culm leaf is used by consumers as a measure of bitterness. Dark coloured shoots are considered to be of lower quality and more bitter than light coloured shoots.

World production and trade in bamboo shoots

Figures on production and trade in bamboo shoots tend to be inaccurate and incomplete. The producers and consumers of the Asian region dominate the world trade in bamboo shoots. A large proportion of the production is consumed domestically; however, a healthy trade in processed products does exist. There are currently no large-scale producers in non-Asian countries and no exporters of
shoots in the Southern Hemisphere. However, plantings are on the increase in North America, South America, Europe and Australia.

Trade liberalisation and increased affluence in Asian markets has resulted in an increased interest in Asian vegetable production in countries that can supply traditional produce outside of the local season. Consumption of bamboo shoots outside of Asia is minor with shoots selling mainly to consumers with Asian backgrounds. However, the market is thought to be increasing in countries including Australia, the United States and Canada (Cusack 1999b).

**China**

China is the world’s largest bamboo shoot producer, with most of its production consumed domestically. In 1999 China was estimated to be consuming in excess of 1.2 million tonnes of shoots domestically from in excess of 4 million hectares of native and commercially planted bamboo stands. A small quantity (< 1000 tonnes) of early season shoots produced from December through to March is exported fresh to markets including Taiwan, Singapore and Japan (Akamine 2000; JETRO 2000). The volume of exports of fresh and processed shoots from China is expanding (Vinning 1995).

**Taiwan**

In 1997 Taiwan produced 349 950 tonnes of bamboo shoots, making it by volume the largest single vegetable crop produced. A substantial proportion of this crop is processed to make pickles and other value added products, which are sold both domestically and internationally (ROC 1997). In 1997, approximately 10 800 tonnes of bamboo shoot products were exported and 1752 tonnes of bamboo products were imported, indicating that approximately 340 000 tonnes of bamboo shoot products were consumed domestically (ROC 1997).

**Japan**

The production of bamboo is on the decline in Japan, almost halving between 1993 when it was at 90 164 tonnes and 1997 when it had reduced to 48 593 tonnes (MAFF 1997). Average household consumption is on the decline with only 1.7 kilograms of shoots consumed per household in 1999 compared to 3.2 kilograms per household in 1977. The bamboo shoot is the single most commonly consumed canned vegetable in Japan, accounting for in excess of 6 million cans of shoots per year, the majority of which are imported from China. Fresh shoot consumption is based almost entirely on a single species of running bamboo (*Phyllostachys heterocycla var. pubescens*) whose season runs from March through to May.

**Thailand**

Statistics for the production of bamboo shoots in Thailand are not readily available. This is in part because a portion of the shoots consumed are not commercially cultivated, but are harvested from wild stands. The species *Dendrocalamus asper* is counted as Thailand’s single most important commercial species, its shoots used primarily for canning. According to the National Statistics Office of Thailand, 34 741 tonnes of bamboo shoots were exported in 1999. It is not known in what form these shoots were exported.

**Singapore and Hong Kong**

These two countries have a large demand for fresh bamboo shoots, currently met by imports from China, Taiwan, Thailand and Japan. Domestic production is extremely limited.
**South East Asia**

South-East Asia includes the countries of Indonesia, Malaysia, the Philippines, Vietnam, Cambodia, Laos and Burma. In general these countries do not commercially cultivate bamboo shoots although they do harvest from native stands for domestic consumption.

**India**

India produces large quantities of shoots, the majority of which are consumed domestically. A small quantity is exported in the form of pickles and other processed products. The production of shoots is far less than the area covered by bamboo in India would indicate, as bamboo is currently underexploited, being used primarily as a source of timber and fibre and not for its vegetable shoots (Farrelly 1984).

**Latin America**

Most of the current interest is aimed at the economic benefits from the timber but other secondary uses for bamboo such as shoot production are also of interest. Currently bamboo only plays a conspicuous role in the local economies of Colombia, Ecuador and Brazil. In Colombia the bamboo industry is based around the native species *Guadua angustifolia*, which is farmed for its timber. A number of other bamboos are utilised but only at the village or community level. The area of *Guadua* in Colombia is estimated at 51,500 hectares, of which 5,260 hectares are commercially cultivated, the remainder being forest. Ecuador also cultivates *Guadua* for timber. Brazil grows both native and introduced species and utilises them for building materials, paper pulp, food and ornamentation amongst other varied uses (Londono 2001). Production information on the shoot crop is not available.

**North America and the European Community**

The bamboo industry in these areas is in its infancy. Relatively few commercial plantations exist and those that do are generally not yet at full production. These areas import the majority of their bamboo shoot requirements in processed form from Thailand, Taiwan, Japan and China. The small size of the markets for bamboo shoots in these countries means that the total imports into these areas cannot be determined as bamboo is not listed in trade statistics.

**Australia**

In 2002 the Australian Commercial Bamboo Corporation, Australia's largest single bamboo producer organisation, estimated that some 60,000 bamboo plants were distributed among its 69 members. Most of these were not at full production and were distributed between three primary growing areas, northern New South Wales (10%), south east Queensland (11%) and north Queensland (43%). The majority of bamboo planted by ACBC members is of three species, *Dendrocalamus asper* (74%), *Dendrocalamus latiflorus* (6%) and *Bambusa oldhamii* (12%). At an estimated yield of ten tonnes of shoots per hectare, this represents a total annual production of in excess of 2700 tonnes by about 2005.

**2.3 Bamboo in Australia**

While bamboo and bamboo products have a long history of use and cultivation in Asia, relatively little is known about bamboo as a crop in Australia. A number of common misconceptions, including the idea that all bamboos are pests, have led to a number of local government councils in Australia actually banning the cultivation of bamboos (Cusack 1999a). Many people do not realise that there are invasive running and non-invasive clumping species of bamboo. To many, bamboo is recognised as a weed because of the reputation of the monopodial running species of bamboos. Many consumers also do not recognise bamboo shoots as a common ingredient in traditional Asian cuisine.
The relatively small Australian domestic market for bamboo shoots is dominated by imports of 4,000 to 10,000 tonnes annually of canned shoots (Cusack, 1999; Midmore et al., 1998). However, there appears to be a market for bamboo shoots produced in Australia, both domestically and in the international marketplace. Australia has the dual advantages of counter seasonal production and proximity to major Asian markets.

Most Australians who are familiar with shoots consume them in canned or other processed forms, as very little fresh shoot has been available on the Australian market. In 1996 shoots from *Bambusa arnhemica*, a species native to Australia, were gathered from the wild around the Adelaide River region and sold for between A$3.50 and A$5.00 per kilogram on the domestic market (Midmore et al. 1998). In 1999 fresh shoots received between A$2.00 and A$8.00 per kilogram retail while canned shoots received on average between A$2.00 and A$6.00 per kilogram depending on the size of the can and the brand of shoots. Boiled and other forms of preserved shoots received about A$2.00 per kilogram for unsliced whole bamboo shoots imported in brine and A$16.40 per kilogram for vacuum packed dried shoots.

While these price indications appear promising, the difficulty of gauging the size of the Australian market for fresh bamboo shoots means that it is not possible to determine if these prices will be maintained as more product reaches the market. The current demand cannot be determined exactly because there are no figures recorded for bamboo shoots. The Australian Bureau of Statistics does not gather information specific to bamboo shoots.

It is supposed that people of Asian ethnic backgrounds currently consume most of the bamboo shoot products in Australia. Working from the number of Asian born immigrants in Australia it is possible to estimate the amount of bamboo this group may consume. In the 1996 Census there were 856,144 Asian born persons in Australia. In 1999-2000 a total of 31,100 people of Asian ethnic backgrounds settled in Australia. Assuming that this is the average net migration of Asians to Australia since 1996 and taking into account mortality rates of 6.8 percent per 1000 people, this would mean that there would be in excess of 900,000 people of Asian birth living in Australia in 2000. Add to this the number of Australian residents who are second generation Australians of Asian ethnicity and overall, approximately 1.5 million or 8 percent of the population has an Asian ethnic background. This is a substantial market and at this point the evidence appears to be strong that people of Asian descent who commonly consume bamboo shoot products prefer fresh shoots, and if available at a reasonable price will buy them in preference to processed shoots (Dooley 1992).

Hibberd et al. (1989) estimated that the total value of bamboo shoot imports in Australia was A$4,000,000. More recent estimates by Cusack (1999b) and Midmore et al. (1998b) estimate the volume of imports at between 4,000 and 10,000 tonnes of canned and processed bamboo shoots per year. While it is unclear where these figures come from, they appear to be realistic considering the growth in the size of the Asian ethnic community in Australia since the early 1990s. Assuming that these numbers are realistic, there is potential for fresh shoots produced domestically to replace a proportion of the market for processed shoots. For example, if domestic production could substitute for approximately one third of annual imports, then between 1500 and 3500 tonnes of fresh shoots could be sold on the domestic market.

While the development of the domestic market for bamboo shoots will be important to the future of the bamboo industry in Australia, the size of the market means that it could potentially be supplied by as little as 150 to 350 hectares of plantation bamboo. The area of commercial plantation in Australia is small but is increasing, with just over 200 hectares planted in 1999 increasing to over 350 hectares in 2002. Further plantings in excess of 200 hectares have also been planned (Cusack 1999b). This level of industry commitment would indicate production potential for bamboo shoots in Australia to already exceed the apparent size of the domestic market for shoots.

So while the development of export markets is where the future may lie for the Australian bamboo shoot industry, the lack of information on the size of these markets makes it difficult to estimate their potential. The main consumers of bamboo shoots are Japan, China, Korea, Taiwan and Thailand but they are also the largest producers. Other markets where non-traditional consumers are eating bamboo
shoots could prove feasible for Australian exports. These include Middle Eastern countries, the USA, Canada and the EU. While the demand in these countries is not large it appears to be increasing, most noticeably in countries where there is an increasing population of Asian ethnic backgrounds.

**Species selection**

There has been much debate on the best species of bamboo for shoot production under Australian conditions. Factors including the adaptability of species, their yield and product qualities are the primary factors determining choice of species. These factors have generally been approached from a production perspective rather than a marketing perspective. Sympodial species have been favoured over monopodial species for a number of reasons, including the invasive nature, shorter peak production period, and longer period before first harvest of monopodial species. Other management factors also affect species choice. Monopodial bamboos preclude the use of vehicles or tractors, as these can damage the rhizomes and developing shoots, so all maintenance needs to be done by manual labour, which is more expensive in developed countries such as Australia. Sympodial plantations allow the use of tractors and other vehicles. The harvesting of shoots is also an issue, with monopodial bamboos traditionally dug from below ground, while shoots of sympodial species are cut off above or at ground level. Many monopodial species such as *Phyllostachys praecox* produce high quality, small shoots, but they are deemed too labour intensive to be considered for growing in Australia, where labour costs are high (Dart 1999).

A large number of bamboo species have been introduced into Australia; however, only a small number have exhibited characteristics that have led to them being considered as suitable for large scale commercialisation. The main species grown in Australia for shoots are *Dendrocalamus asper*, *Dendrocalamus latiflorus*, *Phyllostachys heterocycla pubescens* “Moso” and *Bambusa oldhamii* (Table 2.2).

**Table 2.2.** Data relating to bamboo species for shoot production.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>ORIGIN</th>
<th>MIN TEMP (°C)</th>
<th>SHOOT SIZE (Kg)</th>
<th>YIELD (Tonnes/Ha)</th>
<th>PLANTS PER HA</th>
<th>SHOOT SEASON</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dendrocalamus asper</em></td>
<td>Thailand</td>
<td>-3</td>
<td>0.5-4</td>
<td>8-10</td>
<td>15</td>
<td>100-400</td>
</tr>
<tr>
<td><em>Dendrocalamus latiflorus</em></td>
<td>Taiwan, S. China</td>
<td>-4</td>
<td>1-5</td>
<td>10</td>
<td>20</td>
<td>200-400</td>
</tr>
<tr>
<td><em>Bambusa oldhamii</em></td>
<td>Taiwan, S. China</td>
<td>-9</td>
<td>0.5-1</td>
<td>6-10</td>
<td>12</td>
<td>400-800</td>
</tr>
<tr>
<td><em>Phyllostachys heterocycla pubescens</em></td>
<td>Chain, Japan, Taiwan</td>
<td>-15</td>
<td>0.3-1.5</td>
<td>10</td>
<td>16</td>
<td>100-400</td>
</tr>
</tbody>
</table>

*Dendrocalamus asper* is a sympodial bamboo best suited to tropical climates. The characteristics of its shoots differ between cultivars, the most commonly found cultivar in Australian plantations being a Thai variety known as Phai Tong Keo. The shoots of *D. asper* are primarily used in canning but are also commonly consumed fresh.

*Dendrocalamus latiflorus* is also a sympodial bamboo best suited to tropical and subtropical environments and is a species commonly used in the preparation of preserved shoots and traditional Japanese pickles. It is only consumed fresh in large quantities in Taiwan.

*Bambusa oldhamii* is not commonly found outside of plantations. It is the favoured shoot species in Taiwan and is cultivated in large volumes to supply shoots for fresh consumption and for processing. It is a sympodial bamboo best suited to subtropical environments, favouring warm and humid conditions. Its major advantage over other sympodial species is that it is more tolerant of lower temperatures. It is a smaller plant and shoot yields per hectare are lower than for other species.
*Phyllostachys heterocycla pubescens* is commonly called “Moso”. Of the four common commercial varieties in Australia, Moso is the only monopodial species and is better suited to colder and temperate areas than sympodial species. It is highly invasive by nature, which means that it requires intensive management to ensure it does not get out of hand. Moso yields two crops of shoots. Winter shoots which are available from May through to August in Australia are small, weighing an average of 300 grams. These shoots are considered to be the highest quality shoots possible. Spring shoots are available from September through to November and are generally larger, from 1 to 1.5kg. They must be dug from under the ground.

Other species currently being harvested for shoots in Australia include *Dendrocalamus giganteus*, *Gigantochloa atter*, *Phyllostachys nigra*, *Bambusa vulgaris var. vittata*, *Bambusa balcooa* and *Bambusa arnhemica*. 
3. Supply chain management principles in new horticultural industries: towards a framework for implementation

3.1 New industries

The development of plant and animal products into new industries has a long and successful history in Australia. The introduction and development of sheep and wheat production into huge industries are commonly acknowledged, but a range of other products including cotton, citrus and sugar cane have also experienced major successes (Hyde 1998). Industries such as wine, rice and cotton are considered to be major contributors to Australia’s economic growth but these industries were once considered new, and the way in which they emerged and became established is a subject of great interest to other new Australian industries. The success or failure of these industries offers lessons for other new and emerging industries (Hyde 1998).

Historically new industry development in horticulture is heavily production orientated, concentrating on assessing the adaptability of new species to new environments and production systems. Little attention has been paid to how new species become new industries. Most new horticultural industry development models are heavily oriented towards production and the factors considered critical to the development of a new industry are frequently based on the qualities of the product. Little attention is paid to external forces such as the market (Douglas 1993; Wood et al. 1994; Collins 1997). Despite this there is evidence that increasingly, the importance of a large number of factors including a market orientation are been recognised as success factors in the development of new crop based industries.

Although different authors express success factors in different ways, there is a degree of correlation among the factors they identify. However different the expression, there are four groups of major factors: people and management related factors (information and communication), market orientation factors, functional and production competency related factors (logistical and infrastructure issues) and financial factors. Table 3.1 presents a synthesis of success factors as they contribute to successful new industries.

Table 3.1 Synthesis of Success Factors in New Industries

<table>
<thead>
<tr>
<th>PEOPLE AND MANAGEMENT</th>
<th>MARKET ORIENTATION</th>
<th>FUNCTIONAL AND PRODUCTION</th>
<th>FINANCIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood et al 1998</td>
<td>Social and organizational factors</td>
<td>Supply and demand, emphasis on quality, market development and promotion</td>
<td>R&amp;D, technology and compatibility of existing systems</td>
</tr>
<tr>
<td>Gifford et al 1997</td>
<td>Leadership, communication, skills and commitment, operational expertise</td>
<td>Reliable market intelligence, meeting cost of entry conditions for a market</td>
<td>Critical mass, operational efficiencies, technological innovation</td>
</tr>
<tr>
<td>Key 1998</td>
<td>Committed and skilled management with the right knowledge and training</td>
<td>Market knowledge and awareness of alternatives, change, access and competition, quality product</td>
<td>Integrated systems, effective transport and processing infrastructure, R&amp;D, efficient production and supply</td>
</tr>
</tbody>
</table>
The factors presented in this table are those that literature shows can lead to a successful industry. However, not all successful industries will exhibit these traits and not all industries that exhibit these traits will succeed. These factors do little to demonstrate the process by which new industries emerge. Rather, they indicate the importance of production, marketing, relational and financial factors in the successful development of new industries. Scott and Lewis (1984) claim that a failure to identify reliable measures by which new industry development can be quantified remains a major barrier to understanding the success or failure of new industries.

### Indicators of success in new and emerging industries

Wood et al. (1994) show that the most common means by which success or failure can be demonstrated is through the use of indicators, an approach that is also adopted in this report. Wood et al. suggest indicators such as:

- The growth rate and current size of the industry
- The value of the crop in relation to the opportunity of the resources displaced by the crop
- The market share of the domestic industry
- The extent of value added to the industry
- The extent of employment generated by the industry
- The industries contribution to regional stability and profitability
- The impact on the nations foreign exchange position, either through its impact on import substitution or on export earnings
- The stability of the industry
- The rate of return for the R&D expenditure on the industry
- The impacts, either positive or negative, that the industry has on the environment

Success as a concept in new industry development also relates to a specific point in time. In other words, a new industry may be considered unsuccessful at one point in time but more successful at some other point in time. In this report, success is considered in terms of the period over which the intervention in the development of the Australian bamboo shoot industry took place and the above indicators (Wood et al. 1994) are used to demonstrate its success.

### A model for new horticultural industry development

A single generalised theory of emergence of new industries does not exist. Furthermore, the complexity implicit in the development of industries based on new crops means that it may be unlikely that a single model will fit all situations. The ability of any model of industry development to identify and address as many of the success factors identified above as possible, is a good indicator of the usefulness of the model.
Collins (1997) developed a model of new industry emergence in horticulture, based on the findings of reviews of relevant literature and personal experience in horticultural industries. The model draws on theory from social science, new industry and new crops literature and combines them with empirical evidence from horticultural industries themselves. It addresses many of the shortcomings of other models by placing a greater emphasis on the role of the market in the development of a new industry based on a new crop, recognising that industries emerge through a process of discontinuous change, and acknowledging that industry champions or entrepreneurs play an important role in this process. The role of cooperation between members is also highlighted.

Collins (1997) presented the model diagrammatically to highlight its multiple pathways and potential complexity. However, the underlying structure of the model is relatively simple and is based around four phases and seven stages.

**Figure 3.1** Collins’ (1997) Model for New Horticultural Industry Emergence

This model presents a linear progression for the emergence of new crop industries while still taking into account the effect of punctuations or dramatic changes. The underlying principle is that each of the four major phases is associated with a period of relative stability or incremental change. These phases are linked together by dramatic changes or punctuations.

The first phase of the model revolves around the efforts of individuals with interests in identifying and collecting new crops. *Hunters* search out potential new crop species while *collectors* acquire them. Hunters and collectors play an important role because they become enthusiastic information sources. However, the information that is generated by hunters and collectors is often inaccurate and
incomplete as it is generally obtained from external sources and is rarely scientifically validated. This is often the only information available and often proves to be the most attractive to those seeking it.

This phase is characterised by high levels of cooperation rather than competition. This is not because it represents a punctuation in the growth process but because this phase does not take place within an economic framework and cooperation is in the common interest. The end result of phase one is that those with commercial interests gain information about potential new crop species. Punctuation occurs as the result of a champion or entrepreneur taking the information generated by hunters and collectors and promoting it as a possible candidate for commercialisation. A punctuation of the hunters and collectors phase causes a progression to phase two of the model, quasi-commercialisation.

Quasi-commercialisation also has two stages, rising enthusiasm and first commercial responses. Proponents of the commercial potential of new crops emerge, commonly accompanied by a certain amount of hype regarding the new crop’s potential. The hype and the efforts of the crop champion or entrepreneur result in increased publicity and an increasing level of enthusiasm. The result of this rising enthusiasm is an increase in the plantings of the new crop or the first commercial response. These plantings are often very small and intensively managed and they generate information about the product which, while factual, is unfortunately often misleading. The activities during the quasi-commercialisation phase tend to favour a production orientation as participants work to establish a production base. Minimal competition in the marketplace and a generalised hunger for information tend to result in this stage remaining cooperative in nature. This phase, like all of the others, is stable until the information generated by the first commercial response triggers another punctuation. This punctuation can be positive or negative. A positive punctuation would usually be the result of good production capacity and/or a positive market response to the first small quantities of product, encouraging an increased investment. A negative punctuation would result from a negative response from the market or poor production characteristics. In this case the industry may regress back to the hunter and collector phase.

Phase three, the dawning of reality, has two stages, commercial marketing results and responses to reality. Commercial marketing results reflect the point at which the new crop reaches a commercial yield. At this stage it is common for the larger size of plantations to result in a drop in the quality of product and thus a more realistic picture of the market and its requirements begins to emerge. At the same time prices fall and the market often fails to expand as predicted. The response is formation of strong industry lobby groups and calls for government assistance in research and development and the establishment of export programs. The dawning of reality is the phase of industry emergence where members are forced to reconsider their expectations and determine appropriate responses to the emerging situation. It is during this phase that a market orientation starts to emerge as participants attempt to modify production to improve their marketing results. This is also the phase when individuals tend to start to compete against each other in order to gain market share as conditions change. Participants with a long term perspective find themselves cooperating in order to create greater competitive advantage through activities such as lobby groups and marketing cooperatives.

Punctuations of this phase can lead to failure during commercialisation if the effect of the punctuation is sufficiently negative. Alternatively, it can lead to a new round of increased enthusiasm. In the absence of punctuations the industry evolves towards phase four, sink or swim.

Phase four has only one stage, the results of rationalisation. The imbalance between expectations and the reality of the market is addressed and those for whom the difference between expectation and results is unmanageable will leave the industry. This action has two possible effects. By reducing the production base, supply will be sufficiently reduced to ease pressure on the market and result in more favourable market conditions. The second effect is that the remaining growers will often be those who are most determined and able to resolve any problems inhibiting the further development of the industry. Phase four of the model is typified by the collective efforts of individuals who have successfully gone beyond emergence. This phase represents what is likely to be the longest period of relative stability in a new horticultural industry.
Collins analyses the model to identify three risks to the development of a new horticultural industry. The first is the risk of acting on unreliable or unsubstantiated information. The second is the risk of not adopting a strategic orientation that incorporates the needs of the marketplace, and the third risk is acting tactically instead of strategically, and independently rather than collectively.

Having identified these risks to new industry development Collins (1997) worked with members of the Australian persimmon industry over seven years to create an empowered group of growers who could shape their industry’s future. He had not started out with a deliberate framework for addressing the risks highlighted in his model, rather he had developed his methods over time by using approaches that best suited each issue as it arose. Many of the principles adopted in this approach are today the basis of supply chain management.

3.2 Supply chain management

The trends towards globalisation of markets and trade liberalisation have undeniably changed the face of both international and domestic markets. More international markets are now open for trade, and domestic markets are increasingly exposed to more intense competition (Sainsbury 1999; Dunne 2001). These changes in the environment in which businesses compete have led to increasing interest in supply chain management. Starting in the 1980s, many companies recognised the need to rethink their approach to the manner in which their goods or services reached their final consumers (Ellram 1991; Harland 1996). Consumers were demanding more in terms of value for money, variety, quality, food safety, freshness and convenience than in the past. The focus was moving away from a traditional production orientation to one of servicing the diverse needs and desires of customers. This increasingly resulted in the adoption of a market orientation at all levels of the supply chain (Schill 1992).

A market orientation required businesses to understand and meet the changing demands of the consumer, necessitating the development of relationships with suppliers and customers to obtain the relevant market information. This led to companies achieving competitive advantage through cooperating within their supply chains (Gifford et al. 1998), shifting the basis of competition from a company versus company situation to one of supply chain versus supply chain.

In the 1990s an increasing number of retailers (noticeably those in the food industry) reduced the number of suppliers with whom they dealt and sought to form longer term relationships with key suppliers. A smaller number of suppliers enabled these retailers to improve coordination between members in their supply chain, resulting in an improved competitive position. This trend was of particular note in Europe and the UK (Hughes and Merton 1996).

The change of focus from individual competition to supply chain based competition and the increasing number of companies developing a consumer orientation are among some of the changes in modern business that led to the current interest in supply chain management. Not only does supply chain management represent a means of responding to the changes in consumer demand but it also enables businesses to capture efficiencies and control costs in their market systems while reducing risks (Gifford et al. 1998).

Supply chain management means different things to different people. From a logistics perspective, supply chain management means optimising transport, handling and storage of physical goods through the various stages of production and distribution to the consumer. However when the term supply chain management is used in the context of competitive strategy, it combines the pursuit of logistical efficiency with the need to create value and achieve competitive advantage (Dunne 2001). Disciplines such as economics and marketing also use the term supply chain management. The economist’s view is concerned with the market and the creation of value within the supply chain, while the marketing perspective concentrates on relationships within a chain and the effect these have on its operation. Issues such as cooperation and trust are important in the marketing perspective on supply chain management (Morgan and Hunt 1994).
Gifford et al (1998) defined the supply chain management concept in terms that go beyond the application of logistical efficiency to view supply chain management as a mechanism for creating value and a means of obtaining competitive advantage. They defined supply chain management (p. 8) as:

*An integrated approach that aims to satisfy the expectations of consumers, through continual improvements of processes and relationships that support the efficient development and flow of products and services from producer to consumer.*

In other words, supply chain management incorporates a number of different disciplinary perceptions focusing not only on the movement of goods but also on the flows of information and the effects of relationships in the supply chain. In addition, supply chain management seeks to increase the value to the customer and lower costs for stakeholders. This is achieved through greater logistical efficiency, cooperation among stakeholders in the supply chain and the building and maintenance of relationships between businesses. By spanning multiple enterprises the goals of the entire supply chain become the common objective of each of the chain’s members. Cost and service improvements that are not normally possible for individual firms are attainable through companies acting in concert (Lancioni 2000).

The definition of Gifford et al. (1998) is adopted in this research because it clearly identifies some of the major issues that govern the practice of supply chain management. These issues - relationship management, logistics management, information management and a focus on the consumer, are also identified as important success factors in new industry development.

Research into supply chain management has been extensive but its implementation, particularly in areas such as agriculture, has been much slower (Parker 2002). While supply chain management appears to be an effective means for improving competitiveness, its underlying principles are difficult to practise in an environment where continuous changes in political, economic, social and industrial culture influence the structure of industries and chain relationships (Parker 2002).

While supply chain management principles have been applied in established agricultural industries (Hobbs et al. 1998), the dynamic environment of new industries would make the practice of supply change management principles a more difficult prospect. Mowat and Collins (2000) published one of the only records dealing with supply chain management principles in the context of new and emerging industries. Their work showed that the development of a supply chain orientation in the emerging persimmon industries in New Zealand and Australia should make it possible to deliver economic benefits by addressing a lack of information linking product quality to consumer behaviour.

Anecdotal evidence suggests that supply chain management may be an ideal tool for dealing with the issues highlighted as critical to the success of new and emerging industries. The findings of Mowat and Collins (2000) appear to support this contention.

**Principles of supply chain management**

Supply chain management involves switching from a model where firms are inwardly focused, to one where they are thinking in terms of organised interdependence through cooperating with their chain partners in order to better compete (Porter, 1985; Dyer and Singh 1998; Dunne 2001). Changing from proprietary information systems to open, progressive systems of optimised information sharing (Dunne 2001), and a system that pursues competitive advantage and value creation (Porter 1985) to the benefit of all chain participants are integral dimensions of supply chain management (Hauguel and Jackson 2001).

The result is a supply chain that is reliable, reactive and cost effective. The dynamic nature of marketplaces and the need to be responsive to consumer demands dictates that supply chains must also remain flexible and responsive in order to compete effectively. Flexibility is a feature of the market orientation of the chain, cooperative relationships between chain members and information availability, reliability and dissemination (Lancioni 2000). A flexible chain with the above attributes
will provide consumers with added value and impart competitive advantage to all members of the chain (Hauguel and Jackson 2001).

Literature on supply chain management examines its concepts, origins and goals but it does little to address how supply chain management is implemented. Collins and Dunne (2002) summarise the implementation of supply chain management in terms of six guiding principles that enable the whole chain to work together to build cooperative relationships, operate as a single competitive unit, develop value for customers and consumers and improve overall competitiveness. These six guiding principles are:

- focusing on customers and consumers
- getting the product right
- ensuring effective logistics and distribution
- having an effective information and communication strategy
- building effective relationships
- creating and sharing value.

Newton (2000) and Fearne and Hughes (1999) highlight the importance of addressing all six of the underlying principles of supply chain management in order to succeed. Newton (2000) indicated the importance of having a focus on customers and consumers, and established the importance of trust between chain partners as a crucial precondition for success. Trust is not possible without relationships; relationships are not effective without communication; and communication is not possible without information. Furthermore, trust cannot develop in a relationship based on ineffective communication of inaccurate information. By highlighting the importance of trust Newton (2000) also indicates the importance of building relationships and of effective information and communication systems.

Fearne and Hughes (1999) identified a number of factors that are crucial to supply chain success in the retail sector. These included:

- Strategic orientation: It is important that the management has the vision and leadership to take the business forward
- Organisational structure and business culture: The organisation needs to have the core capabilities to perform in the market. Factors such as people, leadership and market orientation will all affect success
- An ability to exploit market information and add value: The supply chain needs to be able to communicate information in both directions along the chain. The chain must also add value
- An ability to measure and control the costs of servicing customer requirements: This requires a consumer orientation and that each individual chain member adds value.

The creation and sharing of value is closely linked to the other five principles of Collins and Dunne (2002). O’Keeffe (1998) stresses that under supply chain management the value created by individual firms and the value created by sharing this along the supply chain must be aligned to creating and enhancing value for the consumer. Managing relationships, information and logistics support value creation activities in the chain.

### 3.3 Linking supply chain management and new industry development

Supply chain management literature highlighted six underlying principles and their importance in developing a successful supply chain. New industries literature highlights three major risks associated with new industry development. A degree of correlation between these three risks and the six underlying principles is evident. Each of the three risks could conceivably be addressed through one or more of the guiding principles of supply chain management. Table 3.2 shows the specific relationships between the guiding principles of supply chain management and the risks to new industry development.
<table>
<thead>
<tr>
<th>RISK TO INDUSTRY DEVELOPMENT</th>
<th>SUPPLY CHAIN MANAGEMENT PRINCIPLES THAT ADDRESS RISK</th>
</tr>
</thead>
</table>
| 1) Acting on unreliable information | Principle 4. Having an effective information and communication strategy  
                                  Principle 6. Creating and sharing value |
| 2) Not adopting a strategic orientation that incorporates the needs of the marketplace | Principle 1. Focusing on customers and consumers  
                                  Principle 2. Getting the product right  
                                  Principle 3. Ensuring effective logistics and distribution  
                                  Principle 6. Creating and sharing value |
| 3) Acting tactically instead of strategically and independently instead of collectively | Principle 5. Building effective relationships  
                                  Principle 6. Creating and sharing value |

### 3.4 A framework for the development of new horticultural industries using supply chain management principles

The following framework was developed from the amalgamation of concepts from reviews of literature, the researcher’s three-year involvement with the Australian bamboo industry and the foundations prescribed by the work of Collins (1997). With the exception of work by Mowat and Collins (2000) there have been no published attempts to link the process of successful new industry development to the successful implementation of supply chain management principles.

The framework addresses the three risks to new horticultural industry development by implementing the six principles of supply chain management in three focal areas of new industry management. The framework’s three areas of focus are:
- development of a consumer orientation
- development of strategic relationships, and
- development of information and communication strategies.

Figure 3.2 illustrates how each area of focus is linked to the six guiding principles of supply chain management.

*Figure 3.2 Links Between Supply Chain Management Principles and Areas of Focus in New Industry Management*
The development of a consumer orientation is an approach to building chains so as to meet the increasingly complex demands of consumers. Development of a consumer orientation requires a radical change in the way in which suppliers perceive their business orientation, to move away from their traditional product driven supply chains and embrace market or customer driven supply chains. This puts the focus on customers and consumers, and the feedback from this orientation helps to get the product right and enhances logistical efficiency through knowledge of what is required in terms of packaging, price, and product specifications by the final consumer. By developing a consumer orientation the new industry would be adopting an orientation that incorporates the needs of the marketplace, thus addressing risk two to the development of new industries.

Developing strategic supply chain relationships requires a change from discrete short term exchange relationships to long term cooperative relationships based on trust, commitment, sharing of goals and in particular the sharing of knowledge and experience. The formation of strategic relationships along the supply chain in order to enhance the value of a firm depends on the selection of the correct partners and management of the relationship to maximise trust, commitment and innovation. By acting in a strategic manner and developing cooperative relationships both along the supply chain and between stakeholders at the same level of the supply chain, new horticultural industries can address risk three to new industry development.

By sharing accurate and relevant supply chain information participants in supply chain relationships can improve logistical functions and can share product development functions. Supply chain relationships are highly dependent on communication for their continued success. Information flows allow supply chain members to adopt behaviours and technologies that aid in strengthening the linkages between firms. This improves supply chain efficiency and ultimately allows the chain to better meet the needs of its customers by increasing value and reducing costs while remaining agile and responsive to fluctuations in demand. The development of systems for the generation and dissemination of accurate and relevant information reduces the risk of acting on unreliable information and addresses the first risk to new industry development.

By implementing the six principles of supply chain management across these three areas, a strategic foundation based on supply chain management could be built for a new industry. The result is the creation of value and the development of competitive advantage for the supply chain and its members. A successful new industry is also one that creates and shares value and has achieved sustainable competitive advantage. Thus supply chain management strategies may guide the development of new industries as well as the firms within them.

The framework presented

In the framework below the three risks to new industry development are represented graphically as blue, green and red rectangles. The three areas of new industry management are represented graphically as yellow circles labelled ‘consumer orientation’, ‘relationships’ and ‘information’. Each of these circles is found in the rectangle representing the risk that the area of management addresses. A small white rectangle detailing the supply chain principles that the management areas utilise is found above each of the three circles. The two-way interaction between these areas of management is indicated by arrows. The area bounded by the three circles contains a triangle, representing the fact that all three management areas incorporate the sixth supply chain management principle “creation and sharing of value”. It also represents the proposed result of the interactions between these three management elements. Below the triangle created by the three areas of management is an area labelled ‘sustainable competitive advantage’. In addition to addressing the risks to new industry development each of three management areas is a source of advantage, as is the result of their interactions – the creation of value.
The framework described

The management of a new or emerging industry so as to address risks to development by implementing supply chain principles is a complex process. Making the problem more complex is the fact that the goal of sustainable competitive advantage is achieved through the simultaneous implementation of all of the supply chain principles.
**Consumer orientation**

Modern consumers are more self-assured and are making new demands on products and services and thus on supply chains. Customers are increasingly demanding more flexibility and personalised design, not only for their products but also for the total supply chain package including promotion and customer service. Their expectations are changing and they demand more than just quality, consistency, safety and convenience. They require supply chains to provide products to increasingly specialised individual markets by demanding a wider range of products with constantly changing frequency.

In agricultural industries the diversification of the product base to provide more choice and longer seasons is commonly used in an attempt to address some of these demands. However, meeting these increasingly complex consumer demands requires more than just production oriented solutions. Instead it requires a greater degree of coordination through the supply chain than achieved in traditional discrete exchange relationships. It requires a radical change in the way in which suppliers perceive their business orientation. In this report the terms ‘consumer orientation’ and ‘market orientation’ are used interchangeably to describe this changed orientation.

Implicit in the concept of market or consumer orientation are five features:

- An understanding of consumers is fundamental and requires an appreciation of their needs and wants
- The gathering and dissemination of information is essential
- It is an inherently managerial concept with close attention paid to business processes and activities
- Its focus on business process and activities means that it is cross-functional in character
- It must create value for the consumer.

Taking these features into account, Uncles (2000 p. 1) broadly defined market orientation as being concerned with “the process and activities associated with creating and satisfying customers by continually assessing their needs and wants, and doing so in a way that there is a demonstrable, measurable impact on business performance”.

By fostering market orientated activity through necessary training and resources, employee motivation and support, a market focus and communication of this focus, management can influence the development of market orientation in a firm. Likewise, rewards for customer satisfaction also help promote a market orientation, and while these are important, connectiveness between supply chain partners through effective formal and informal communication systems is also important. Within the firm, the exchange of information between functions and departments is essential to achieving a market orientation (Pulendran et al. 2000). A market orientation is more than a set of processes or activities. Rather, it is part of an organisation’s culture. In creating a market orientated culture the main task for management is to have individuals accept the critical importance of being committed to delivering superior value for customers.

Increasingly, the development of a market orientation is being seen as pivotal to the development and maintenance of market leadership (Pulendran et al. 2000). In order to maintain competitive advantage over the long term, a company must continue to increase the value to the customer through development of skills, resources and processes (Day 1994). The process of generating, disseminating and responding to market information allows market oriented firms to learn what buyers want and develop the resources and processes necessary to deliver the value customers desire much more effectively then less market oriented firms (Kohli and Jaworski 1990; Jaworski and Kohli 1993). This provides a market orientated firm with an important basis for building sustainable competitive advantage. Being market orientated creates an environment for listening, understanding and responding to the market and to competition. Despite the debate over some aspects of market orientation the ability of such an orientation to improve business performance is widely agreed on (Sharp 1991).
Collins (1997) developed a marketing orientation matrix for operationalising the marketing orientation concept in emerging horticultural industries, which he maintains required special treatment not reported in the marketing literature. Collins based his market orientation matrix on Sharp’s (1991 p. 21) definition of the marketing concept, which was “the matching of company objectives and capabilities with consumer needs and wants”. This definition was used because of the clarity and simplicity with which it conveyed the relationships between consumers and businesses.

This definition addresses the need to balance what the market needs and wants with what firms wish to achieve by taking into account the capabilities and objectives of the company. Simply put, the needs of the business may be paramount, but it must be recognised that these needs are best met through the process of satisfying consumer demand. A firm with a market orientation still has the ability to choose its own market and manage its own production capabilities in order to achieve its goals (Sharp 1991).

Collins’ marketing orientation matrix identified two sets of factors that need to be matched to achieve a marketing orientation. By juxtaposing horticultural consumers’ needs against the horticultural organisation’s capabilities, a marketing orientation matrix was developed. The horticultural organisation’s objectives and capabilities were identified as embodied in production functions, postharvest functions and marketing functions. These functions described the process of producing a horticultural product and getting it to the market. The market’s needs and wants were identified as the quality attributes of a product, quantity of a product demanded, time at which a product is demanded and the price at which a product is demanded. The 12-cell matrix developed by Collins is presented in Figure 3.4.

![Marketing Orientation Matrix for a Horticultural Organisation](source: Collins (1997))

**Figure 3.4 The Marketing Orientation Matrix for a Horticultural Organisation**

Each of the 12 interactions in the matrix represents certain decisions to be made or information to be gathered in order to achieve a marketing orientation. Collins (1997) notes that the performance of a firm across all 12 of these interactions indicates its relative strengths and weaknesses in achieving an all round marketing orientation. This matrix is used in this report to demonstrate how successful the implementation of supply chain management principles was at developing a consumer orientation.

By researching product attributes in target markets and, as a result, getting the product right, a strategy can be developed that addresses the requirements raised by the quality interactions in the market orientation matrix. Market research is used to determine the desirable product characteristics and work back through postharvest operations and production decisions to achieve a product that best caters to the needs of the market and identifies the production and postharvest processes that will result in product with the desired characteristics. The development and adoption of end user designed quality systems, development of defined product standards and systems through consultation with agents/wholesalers, and cooperation with supply chain partners to develop customer defined product
standards and systems for a branded product, are commonly associated with the development of a market or consumer orientation.

A product is of little use unless it is available where and when the consumer wants it, so it essential to have an efficient distribution and logistics system. By researching the distribution channel and finding potential partners and potential markets it is possible to develop an effective distribution and logistics system. This system can also address the issues raised by the quantity and timing interactions in the market orientation matrix. Market research to determine the distribution channels and product characteristics highlights the challenges that need to be addressed by the distribution and logistics system. The use of a process to identify markets followed by the development of contacts along the distribution channel and the development of packaging systems that help maintain the desired product characteristics are some of the operational means of achieving this and developing a consumer orientation.

The results of developing a consumer orientation include greater accuracy, speed and flexibility in responding to the market, improved response to consumer and environmental demands, the development of new technology and products and more cooperation to maximise value at the chain level (Gifford et al. 1998; Newton 2000). A consumer orientation enables the chain to meet total customer needs in terms of both product and service attributes. Thus the emphasis in the chain is moved from the margin created by the exchange to the total value of the supply chain package provided by suppliers. The value created by the supply chain is expressed by the price that consumers are willing to pay for a product.

A consumer orientation impacts upon relationship development and its results can be recognised through improved coordination between chain members in terms of strategy and activities. Thus it is intimately associated with the development of information systems and relationships within supply chains. The development of a consumer orientation therefore reflects a number of the underlying principles of supply chain management. A consumer orientation puts the focus on customers and consumers in order to get the product right and improve logistics and distribution, which in turn creates and shares value along the supply chain. A consumer orientation develops effective logistics and distribution systems through the development of an understanding of what is required in terms of packaging, price, timing and product specifications by the final consumer. The development of a consumer orientation should effectively address the risk not adopting a strategic orientation that incorporates the needs of the marketplace.

**Relationships**

Changes in the global marketplace for food products and the changing requirements for competitive success have resulted in a trend towards greater cooperation among supply chain members (Dunne 2001). Cooperative relationships can result in greater efficiency and improved competitive advantage (Buzzell and Ortmeyer 1995), an approach to marketing that typically involves taking a long term view. Growers need to acknowledge the importance of basing decisions on reliable information and on establishing a balance between the needs of the consumer and the needs of suppliers. Acting with a short term view and not adopting a consumer orientation lead to tactical rather than strategic responses. The development of cooperative relationships among supply chain participants results in the creation of value not only for the individuals, but for the whole supply chain, strengthening its competitive position (O’Keefe 1994).

Two types of relationship are important to new and emerging industries, vertical relationships (between firms at different levels in the supply chain) and horizontal relationships (between firms at the same level of the supply chain).
**Vertical relationships**

Long term relationships are based on trust, commitment, sharing of goals and in particular the sharing of knowledge and experience. This type of relationship requires the ability to continually adapt and change the boundaries of the relationships in response to changes in consumer demand. For long term relational exchange to be successful each member of the supply chain must have a whole of chain focus, based on knowledge of their business and their partners’ businesses (Gifford et al. 1998). A whole of supply chain focus enables an organisation to identify desirable change, either within the supply chain or in its own organisation. Changes introduced with a whole of chain focus improve efficiency in the chain and returns to participants (Gifford et al. 1998).

The formation of strategic relationships along the supply chain depends on the selection of the correct partners and management of the relationship to maximise trust, commitment and innovation. The choice of a supply chain partner requires two questions to be answered: what value do they offer, and where does this value originate? Collins and Dunne (2002) state that value comes from a firm’s ability to innovate. In turn, innovation comes from a firm’s culture, structure and strategy, which are an expression of its vision and leadership. Simply put, a firm’s ability to innovate, its leadership and its vision create its potential value. As relationships develop between supply chain participants, trust and commitment are created, making it possible to work towards a shared vision. Recognising and taking advantage of each other’s competencies and sharing accurate and relevant supply chain information allows participants in supply chain relationships to improve efficiency and share product development functions. This creates shared value along the chain, which eventually becomes value for consumers. The creation of superior value for consumers becomes the basis for the supply chain’s competitive advantage. As can be seen above, a number of factors including trust, commitment, communication, power and cooperation, can all exert an influence on supply chain relationships.

The five stages of relationship development proposed in Wilson’s (1995) model describe the process of finding the correct partner and the subsequent management of the relationship to maximise trust, commitment and innovation. These five stages - partner selection, defining purpose, setting relationship boundaries, creating relationship value, and relationship maintenance, are used in this report to show how successful the implementation of supply chain principles was at developing vertical relationships.

Strategic relationship development along the supply chain embraces a number of the underlying principles of supply chain management. Supply chain partners must have a similar vision to work cooperatively in supply chain relationships. They need to be consumer orientated, share information through an effective communication system and create and share value.

**Horizontal relationships**

Cooperation or relationships between chain members depend on historical and cultural aspects as well as the regulatory environment in which the chain operates. Firms will only work together as long as there are clear and tangible benefits for both parties, otherwise opportunistic behaviour will take precedence.

In a traditional market system, in order to deal in a complete range of horticultural produce, retailers needed to deal with a large number of small producers to supply their needs. This can create difficulties for both sides of the buyer seller relationship. The traditional solution has been the introduction of a third party who operates between producers and markets, a position traditionally occupied by wholesalers (Collins 1997).

A less traditional approach that is becoming increasingly common is the formation of producer alliances that take some level of marketing responsibility for themselves. By doing so they take responsibility for their products much further along the supply chain, making it possible for some of the profits from marketing activities to be accrued to the group’s grower members (Collins 1997). Such groups may still engage the services of marketing agents, but they reduce their role by
aggregating supply in order to provide consistent quantities of an appropriate quality product at a time when it is required by the market.

Acting strategically and cooperatively can also improve a grower’s ability to capture market opportunities and create value. Marketing research commonly identifies a market’s needs and wants in four areas, these being the quality attributes demanded of a product, the quantity of a product, the time at which the product is demanded and the price at which a product is demanded (Malhotra 1996). These are the core elements of a marketing opportunity and are the criteria that both producers and marketers attempt to satisfy to capture that opportunity. The development of a market orientation is one mechanism through which these four elements can be addressed. However, in the horticultural industry, an average grower is not capable of supplying the combination of sufficient quantity, consistent quality, at a stable price, over a long enough season, to meet the needs of most markets. This means that while individual growers can have a strong market orientation, they may still not be capable of addressing the market’s needs and wants. Horizontal coordination in the form of grower groups or alliances gives horticultural producers a mechanism through which they can address market needs and wants and create value.

The development of strategic and collaborative relationships along the supply chain and between members at the same level of the supply chain helps to address the risk of individuals acting tactically instead of strategically, and independently instead of cooperatively.

**Information**

The generation and communication of accurate information is essential to the development of a consumer orientation and to the development of strategic and collective relationships. Supply chain members need to understand the social, economic and cultural environment in which their chain operates in order to be competitive in a global market. Without this information, the development of cultural and business skills crucial to successfully operating in targeted export markets is not possible.

To cater to the diverse information needs of developing industries, communication strategies need to embrace both vertical and lateral communication systems. Lateral communication is a means of coordinating efforts between interdependent units at the same level of the supply chain. Lateral communication builds the social support system of a group and is the primary method of information sharing. In this way it facilitates problem solving and allows individuals to learn from one another. Lateral communication can prevent individuals within a group replicating effort and serves to prevent conflict due to misconceptions. Examples of lateral communication include phone conversations, social events, meetings, task forces and groups, written communications such as email and more formal communication through presentations, workshops and newsletters (Gibson and Hodgetts 1986).

Vertical communication is the primary means of sharing information along the supply chain. It is the backbone of the system of business transactions that form supply chain relationships and is one of the primary methods of building trust and coordination. Developing vertical communication channels is closely associated with developing close cooperative relationships between members of the supply chain. This type of communication can supply valuable strategic and operational information and communicate product attributes to the market. It tends to be formal in nature. Examples of vertical communication include phone conversations, meetings, fax, email, interviews, letters, reports and memos. In close supply chain relationships it is not uncommon for supply chain members up and down the chain to also be included in many of the lateral communications that occur within a group at a different level of the supply chain. The development of friendships and social links among supply chain members facilitates this.

Without effective information and communication systems, producers remain unaware of consumer needs and wants, and consumers remain unaware of products and services that are available. It is not possible to develop an effective marketing system without establishing channels of communication. Even the best product does not sell itself. Marketing communications are required to provide
information, stimulate demand, differentiate products or services, underline a product’s value and regulate sales (Palmer and Weaver 1998).

Information on markets, the business environment, competitors and consumers enable a firm to target production and research to areas that allow it to better cater to its consumers and to differentiate its product (Hobbs et al. 1998). This kind of information helps supply chain members to understand how supply chain partners add value and aids in the development of trust and commitment in relationships. Information also helps in implementing effective logistical strategies by providing feedback on existing systems and their effect on issues such as quality, cost and time to market (Gifford et al. 1998).

Successful supply chain management requires a two-way flow of information along the supply chain, with market information moving back along the chain to producers and production information moving forward to agents and retailers. Traditionally, more and better quality production information is passed forward than market information is passed back.

Literature on supply chain management highlights a number of variables that will influence the transfer of knowledge between supply chain participants. Some of these variables include trust, commitment, communication, type of relationship and a firm’s core competencies such as its management style, orientation and ability to learn (Morgan and Hunt 1994; Mohr and Spekman 1994; Gifford et al. 1998).

Trust and commitment are essential factors in a relationship, but they are also central to an information and communication strategy. Trust enables participants in a chain to place themselves in a position of risk knowing that the other participant will not act in their own self-interest (Doney and Cannon 1997). However, trust takes time to develop and the communication of accurate and reliable information is essential to that process. Commitment is a participant’s willingness to devote time, energy and resources to an alliance. Like trust, commitment is one of the cornerstones of an information and communication strategy. In the context of supply chains, Spekman et al. (2002 p. 44) notes that “successful supply chain management is linked to communication frequency and quality”, a finding supported by Mohr and Nevin (1990), who show that greater communication leads to better cooperation between supply chain participants.

A firm’s core competencies, including its structure, culture and strategy, will influence its information and communication strategy. Structural factors such as flexibility and adaptability will influence knowledge transfer. Open organisations that are flexible and adaptive in nature are more likely to engage in highly interactive exchanges. A culture that is open and supportive of trusting behaviour and experimentation would result in a more effective communication strategy than would a culture that avoids alliances because of the potential risks (Collins and Dunne 2002; Spekman et al. 2002).

Dunne (2001) highlighted the importance of information and communication as strategic resources in the supply chain and in particular their importance in the development of relationships and competitive advantage. Collins (1997) and Gifford et al. (1998) both give examples of how information gathering through methods such as strategic intervention, the recruitment of personnel with relevant knowledge, consultants, experience over time and direct involvement with end users can be used to gain competitive advantage in a supply chain. Gifford et al. (1998) also detail methods, including briefings by market agents and chain partners and the use of market information gained from chain partners through their other operations in the market, as means of gathering information.

The development of relationships and a consumer orientation, along with strategies for the generation and communication of information, address the final issue relating to new industry development - the risk of acting on unreliable or unsubstantiated information. The success of the development of information and communication strategies are reflected over time by the communication infrastructure developed and the quality and frequency of information exchanges.
4. Case study: the Australian commercial bamboo corporation

In chapter two the Australian bamboo industry was briefly discussed and in chapter three a framework was proposed that utilised supply chain management principles to address risks to the development of successful new horticultural industries. In chapter one a method for implementing this framework incorporating participatory investigation, strategic intervention and action learning was described. This approach was applied with members of the Australian Commercial Bamboo Corporation (ACBC) to help create a core producer group empowered to continue its own development and to become the focus for ongoing industry development.

A lack of knowledge of production, postharvest and marketing issues was regarded by most ACBC members as the major barrier. In order to address these concerns the strategic intervention needed to integrate research on pre and post harvest as well as marketing and logistics issues. The issues were complex and diverse, and demanded a systems approach where the differing fields of study became the subject of simultaneous and interdependent investigations. At the same time, the framework needed to engage the ACBC in such a way that it could see direct benefit from the research conducted.

Two important aspects of the research were:
- Members needed to be involved in the process in such a way as to feel ownership of the outcomes of the research.
- The ACBC had to be given the opportunity to develop its own capabilities, skills and motivation.

In this chapter the first three chapters of the report are brought together as a case study of the strategic intervention process that describes and analyses the intervention in the Australian bamboo shoot industry between May 1999 and June 2002. The action learning cycle is used as a framework for presenting the three year study of the group’s development. The process is presented as three annual production cycles. Along this time line each annual cycle is overlaid with the authors' interpretations of the impact and efficacy of the implementation of supply chain management principles.

The purpose of this chapter is to demonstrate that using the supply chain framework to address risks to new industry development is not just a theoretical concept, but a practical tool that stands up to real world experience in the case of the ACBC. The content and interpretation of the case study was validated through a process of member checking that incorporated:
1. Checking the authors’ interpretations against those who were present (Whyte et al. 1991)
2. Checking of the written draft by individuals who were closely involved with the development of the ACBC for the full duration of the intervention (Merriam 1998)

The process of consultation and member checking ensured that the case study as presented in this chapter is regarded by participants as a fair and accurate record of events as well as an accurate interpretation of them.

4.1 A brief history of the ACBC

A number of bamboo enthusiasts from around Australia had spent decades finding and collecting a wide variety of bamboo species. These enthusiasts helped to develop suitable propagation methods and became the emerging industry’s sources of information about bamboo, its production and management. These enthusiasts or industry champions started to share their information with the wider community through plant nurseries, books, workshops and field days. A number of entrepreneurs planted bamboo based on the information and propagation material supplied by these industry champions.

In August 1997 Central Queensland University (CQU) surveyed a wide cross-section of approximately 360 persons or entities that had a known interest in bamboo (Midmore et al. 1998a). Of those surveyed
only 55 responded and this was attributed to the survey being designed to capture information on the plantings of bamboo for commercial production of shoots and timber.

The survey revealed that during the 1995-1996 bamboo shoot season the small volume of shoots that was sent to market in that year received an average price of between A$4 and A$7 per kilogram. Prices of up to A$20 per kilogram were achieved for select species. The respondents also identified what they considered to be the major limitations of the Australian bamboo industry and what issues were of concern to them.

The lack of marketing structure was identified as the single most limiting factor and marketing problems and difficulties associated with marketing were identified as the issues of most concern to respondents.

In Australia at this time the supply of bamboo products was very small and growers were focused on the domestic market. The domestic market for bamboo shoots was under supplied and some shoots from a few individual growers obtained prices as high as A$20 per kg for high quality fresh shoots. These types of returns were widely publicised and when accompanied by data showing high yield potential, considerable interest was generated in the industry (Cusack 1997b).

A number of industry members were also promoting the export potential of the bamboo industry (Cusack 1999b; Dart 1999). They claimed that the world was consuming more than two million tonnes of bamboo shoots annually, and that very attractive prices (up to US $ 10/kg) were paid for “off season” shoots in Japan. Australia, being a Southern Hemisphere country, could produce fresh shoots at the opposite time of the year to Asia and when the supply of shoots in the major shoot producing countries is minimal.

Although the emerging bamboo industry could in no way be considered to be export oriented, a number of growers and investors spread throughout Queensland, New South Wales, Western Australia and the Northern Territory were investing in the industry based on their confidence in its export potential. These entrepreneurs formed informal groups, which worked with universities and government bodies to gain information about areas of importance such as production, propagation and plantation management.

One of the industry leaders approached the Rural Industries Research and Development Corporation (RIRDC) about funding for industry development, in particular the development of markets for bamboo products. RIRDC recommended that the formation of a group that was representative of the industry was more likely to gain financial backing than an individual grower or smaller group. RIRDC had already funded some bamboo-related projects; these projects only had a minimal focus on markets and market development. So in mid 1997 the RIRDC and industry members organised for funding that was already allocated for an existing bamboo project to be reallocated to assist in the development of a bamboo growers marketing group.

An industry workshop was held in Brisbane, Queensland on the 24th and 25th of October 1997. This workshop provided the initial catalyst for interaction between a number of then current and prospective industry members. It also served to promote interest from a number of others with a general interest in bamboo (Midmore 1998b). A forum session held during the workshop revealed two distinct groups amongst participants. The first group consisted of those with substantial experience with bamboo built up over a period of time dealing with the product. The second group were those with little or no experience who were searching for information and looking for guidance as to the commercial viability of the product.

Experts from the then Department of Primary Industries (DPI), and Australian universities, as well as private bamboo researchers and industry champions, all addressed the workshop of approximately 100 participants. Issues including the state of the industry, its current and future prospects, export strategies, common marketing strategies, research results in areas such as species selection, plantation costing, production and product development were presented to participants.
At the time of the workshop several small groups of bamboo enthusiasts and interested growers had already formed groups. The two major groups were the Australian Bamboo Network (ABN) and the Australian Bamboo Industry Association (ABIA). The ABN was a group of bamboo enthusiasts interested in learning about bamboo and developing collections. The ABIA was a group more interested in the development of the bamboo industry, comprising growers, investors and other interested parties such as nursery owners.

These groups and other smaller ones were producing newsletters and providing information to their members; however, this information was usually based on individual experience and biased towards the author’s view, often making it unsubstantiated or inaccurate. The different groups encountered difficulties due to the geographical isolation of their members, the lack of availability of accurate information, indecision relating to the best species of bamboo to grow and other factors, including political and personal differences between members of the different groups. Those present at the industry workshop believed that in order to overcome the entrenched problems within these existing groups, the establishment of an incorporated association that was broadly representative of the industry and tasked with setting industry standards, as well as dissemination of information, promotion and marketing of products, was required. This association would reflect the needs of industry members. A committee was nominated from those present to draft a constitution for the association. The draft constitution was to be completed and circulated to interested parties for discussion at a follow up meeting to be held in Brisbane in June 1998.

The meeting in June 1998 discussed the inauguration of the Australian Commercial Bamboo Corporation (ACBC) and the draft constitution was amended to a point where most participants considered the ACBC to have come into existence. In August 1998 a bamboo workshop was conducted in Brisbane and a large portion of this workshop was devoted to the discussion of what had to be done to register the ACBC as a company. Details such as the memorandum and articles of association were discussed and voted on by those present.

The ACBC was registered as a public company limited by guarantee on the 20th of October 1998. Registration meant the ACBC could now source funds from federal government funding agencies such as the RIRDC, a process about which the ACBC was unsure as to how to proceed. After approaching the RIRDC it was recommended that they contact Dr Ray Collins of The University Of Queensland. Dr Collins had been successful in aiding the development of the persimmon industry and it was suggested that he would be able to help develop a project proposal.

In October/November of 1998 the ACBC contacted Dr Collins to initiate the processes involved in obtaining government funding from the RIRDC in order to further the bamboo industry development.

On the 10th of December 1998 Dr Collins met with the board of the ACBC. He held a short half day workshop for the board members. At this workshop Dr Collins was briefed by the ACBC board and membership on the potential of the bamboo industry. The board indicated the need for a project that could help to draw the members of the newly formed ACBC together so that they could better address relevant issues. They also highlighted the need for a multi faceted project that could address areas including production, postharvest, marketing and group development. This workshop concluded with the ACBC board committing the group to a project where it would contribute both financially and in kind to its own industry’s development. Dr Collins agreed to write a project proposal.

The project proposal was developed over the next few months with input from board and industry members. On the 13th of February 1999 the first ACBC workshop was held at the Centre for Food Technology (CFT) in Hamilton and was held in connection with the ACBC’s AGM. Approximately 50 people were present at this workshop, including a number of officials from both government and university groups already working with the ACBC. Dr Collins presented the strategy that had been developed for the research project he had been asked to pursue on behalf of the ACBC.

The strategy presented by Dr Collins revolved around the development of a whole of industry approach based on the ACBC becoming the driver for the rest of the industry. Following this workshop the bamboo industry development program outlined in Dr Collins’ proposal was accepted.
by the RIRDC for funding. On the 30th of March 1999 The University of Queensland and the ACBC became partners with the RIRDC in a new industry development project funded for approximately A$300 000. This set the scene for the intervention that would guide the ACBC towards a more strategically managed future.

4.2 Implementation of the supply chain management framework in the ACBC: seasonal action learning cycles

Season one: 1999-2000

The bamboo industry workshop held in October 1997 was an initial point of activity involving many of the individuals who at the time represented the core of the Australian bamboo industry. In the context of this project this workshop introduced a key group of growers to each other and gave them the opportunity to socialise as a group while engaging in planning for their industry’s future. The survey conducted by Central Queensland University (CQU) prior to the workshop served as a first attempt for the industry to identify the shape and content of its preferred future. The survey highlighted the importance of marketing related issues in this future.

The formation of the ACBC as a result of the industry workshop was effectively the catalyst that led to the attainment of funding to facilitate intervention in the industry’s development.

Pre season activities 1999 -2000

Funding and appointment of scholar

On the 15th of April Dr Collins and two ACBC board members interviewed co-author, Steven Keilar, and subsequently offered him the position of project scholar. He commenced at The University of Queensland on the 10th of May 1999.

Familiarisation with subject

The proceedings of the industry workshop held in October 1997, together with communication with ACBC members highlighted three main areas that needed urgent attention, as detailed in Table 4.1

| Table 4.1 Issues Identified by Members of the Bamboo Industry as Needing Urgent Attention |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| PRE HARVEST ISSUES                           | POST HARVEST ISSUES                           | MARKETING ISSUES                               |
| Amount of water required                     | Shoot bitterness                              | Lack of marketing structure                    |
| Methods of irrigation                        | Shoot quality                                 | Size of market                                 |
| How to cultivate bamboo                      | Methods of cooling shoots                     | Potential for oversupply                       |
| How to manage plantations for shoots.        | Packaging materials and methods               | Lack of information on consumers               |
|                                              | Measuring shoot maturity                      | Level of return on investment                  |
|                                              | Harvest methods                               | Export potential                               |

Of all these issues, market related issues were considered by ACBC members as requiring immediate attention. In consultation with the board of the ACBC an action plan to address the obvious lack of information about markets commenced. By addressing market related issues, many of the other issues would be clarified and the first steps taken to address them.

International market selection

Information on export markets that had been circulating around the industry until this point was highly questionable. Many of the figures detailing market size and access that were being quoted had no
identifiable source. The lack of readily available information about export markets for bamboo shoots meant that despite a high level of enthusiasm from growers a cautious approach needed to be adopted.

As there was no history of export of fresh shoots from Australia, the process of international market selection (IMS) was used to identify potential target markets by eliminating countries unsuitable for market development from the large number of available alternatives. Anderson and Strandskov (1998 p. 67) define international market selection as “The process of establishing criteria for selecting markets, investigating market potentials, classifying them according to agreed criteria and selecting which markets should be addressed first and those suitable for later development”.

There are three stages in the IMS process used to determine export markets for the ACBC. The first stage is market identification where a large set of possible countries is evaluated against general qualifying criteria in order to determine a set of attractive markets. The second stage of market selection eliminates more markets with the use of specific qualifying criteria in order to determine a final set of markets. The final stage is market size estimation. This involves an in depth investigation of the final set of markets to forecast market size and develop strategies to achieve this market size.

The IMS process was commenced in late July 1999 and was implemented to determine export market opportunities and rate the attractiveness of the different potential markets to determine which markets would be the best to approach in the near future.

Stage one of the IMS process considered the largest possible number of countries. These countries were analysed with regard to three qualifying criteria that reduced the number of countries to be considered in the second stage of the IMS process. This analysis began with 211 countries, classified into regional or trade related groupings. Table 4.2 lists the countries remaining in the analysis after stage one of the IMS process.

<table>
<thead>
<tr>
<th>Countries Remaining in IMS Analysis after Stage One</th>
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<tr>
<td><strong>North East Asia</strong></td>
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<td>Hong Kong</td>
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<td>Japan</td>
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<td>South Korea</td>
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<td>Taiwan</td>
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<td><strong>Middle East</strong></td>
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<td>Jordan</td>
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<td><strong>South East Asia</strong></td>
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<td>Thailand</td>
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<td><strong>North America</strong></td>
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<tr>
<td>Canada</td>
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<tr>
<td>United States of America</td>
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<td><strong>Australasia</strong></td>
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<td>New Zealand</td>
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**Taiwan market analysis**

In August 1999 the opportunity arose to travel to Taiwan with a group from the University of Queensland. At this time only the first of three stages of the IMS process had been completed; however, Taiwan was one of a number of countries that had been identified at this early stage of the IMS process as a potential target market.

The IMS process was put aside for a period and in depth desktop research on the Taiwanese market was conducted. During the period from the 14th to the 21st of September 1999, market research was conducted in Taiwan. This research consisted of field observations and interviews with importers, retailers and government bodies. Information on market size, quarantine regulations, trade tariffs, market opportunities, competition and Taiwanese market product preferences was obtained from this research.
This research identified two aspects of the Taiwanese market in relation to bamboo shoots. A 40 percent import tariff on bamboo shoots and the prohibition of the import of shoots from Queensland and New South Wales because of the nematodes *Radopholus similis* and *Ditylenchus dipsaci* meant that at the time of the research it was not possible to export shoots to Taiwan. Despite this, the market investigation was continued because of the possible future prospects of the Taiwanese market. It was possible that Taiwan’s bid for entry into the World Trade Organization (WTO) could result in reduction of import tariffs on bamboo shoots. The quarantine ban on asparagus exported from Queensland and New South Wales to Taiwan, which involves the same nematode species, had also recently been lifted. This indicated the possibility that the quarantine ban on fresh bamboo shoots could also be reconsidered.

While the Taiwanese market for fresh bamboo shoots was in decline, there may be future prospects for Australian grown bamboo shoots to supplement the anticipated decline in Taiwanese domestic production of bamboo shoots caused by high cost, small land holdings and inefficient farming techniques. Taiwan appears to have a market for fresh shoots year round, with prices for fresh shoots being higher in the off season when Australian product is readily available.

As a result of this investigation Taiwan was acknowledged by the ACBC board as a potential future market and the IMS process to determine which markets would be looked at next was recommenced.

**The 1999 -2000 bamboo shoot season**

**DPI cyanide investigations**

At the end of the 1998/99 season a researcher with the DPI’s Centre for Food Technology (CFT) had been employed to investigate a number of postharvest issues the ACBC had identified as of concern. The DPI researcher’s early investigation were designed to highlight areas of particular importance and to indicate where more rigorous investigations would be needed in the future. They covered two main areas:

- the investigation of cyanide compounds in bamboo shoots, and
- investigations into preliminary packaging and postharvest storage methods.

The major contribution of this work by the DPI was related to cyanide levels in bamboo shoots. The presence of cyanide-containing compounds in bamboo shoots was considered to be of particular importance by the ACBC as:

- high concentrations of cyanide had the potential to be a health hazard, and
- many cyanide compounds are bitter, a characteristic not favoured by most bamboo consumers.

These DPI investigations identified that the compounds in bamboo shoots, cyanogenic glycosides, were similar to those found in cassava. The Australian National University (ANU) had developed a simple field test kit for measuring cyanide in cassava and was willing to help adapt the kit for measuring cyanide content in bamboo shoots.

Using this test kit the DPI researcher and the research scholar identified three issues that needed further investigation:

1. Bamboo shoots tested using the test kit appeared to have very high concentrations of cyanide, up to and exceeding 1000 ppm. These levels were substantially higher than those found in other high cyanide foods such as cassava.
2. Different species of bamboo appeared to have significantly different concentrations of cyanide.
3. Excluding shoots from sunlight while they are growing appears to reduce their cyanide content.
Pre and post harvest investigations

The results of the DPI cyanide investigations along with the concerns of group members regarding the possible health risks of high cyanide concentrations were the major triggers for the development of protocols for testing the effect of pre and post harvest treatments on the quality attributes of bamboo shoots.

Planning and design of this project commenced in early November 1999. With the aid of the ACBC board and input from a biometrician, an experimental design that served to address the issues identified as of concern was developed. The design took into account the interactions between time of harvest, exclusion of light by bagging of shoots, postharvest storage and the quality attributes of bamboo shoots for the major commercial species, Dendrocalamus asper.

The results of this research showed that the bagging of bamboo shoots as part of a commercial production system had a number of positive effects on shoot quality:

- Bagging results in a significant reduction in the cyanide content of shoots.
- Bagged shoots are less bitter.
- Bagging results in lighter coloured shoots that are more acceptable to export markets.

The research also indicated that shoot maturity appears to have a significant effect on both cyanide content and colour; however, difficulties experienced in determining shoot maturity meant that these results were not able to be statistically verified. Finally, the results showed that low temperature, high humidity storage conditions helped in the maintenance of the quality attributes of bamboo shoots.

It would appear, based on these findings, that the use of bagging to exclude light has a positive effect on shoot quality and would be a useful method to ensure the production of high quality shoots. The findings also indicate that cyanide content of shoots reduces during storage periods of up to six days if cool and high humidity conditions are maintained.

This research pointed towards the importance of pre-cooling of shoots before storage and developing a packaging system that helps maintain high humidity and low temperatures.

Cyanide testing

During the pre and post harvest investigations a problem was encountered with the cyanide field test kit developed by ANU and the DPI. The accuracy of the test kit was questioned when cyanide testing results from analysis done by the Chemistry Centre (WA) for Northern Territory Department of Primary Industries (NTDPI) showed shoots from the Northern Territory averaging less than 30 ppm of cyanide. The tests using the field kit showed results averaging between 1000 and 2000 ppm.

The accuracy of the test kit was an issue of obvious importance. In order to determine the validity of its results, shoots were harvested in early and mid February 2000, tested using the test kit and also sent to the Chemistry Centre (WA) and to ANU for laboratory analysis. Table 4.3 presents the results from testing of three samples using the test kit and laboratory analysis by the two institutions.

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>ACBC TEST KIT (PPM)</th>
<th>AUSTRALIAN NATIONAL UNIVERSITY (PPM)</th>
<th>CHEMISTRY CENTRE (PPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1130</td>
<td>1010</td>
<td>58</td>
</tr>
<tr>
<td>2</td>
<td>700</td>
<td>623</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>1330</td>
<td>1140</td>
<td>69</td>
</tr>
</tbody>
</table>

The reliability of the results from the cyanide test kit were questionable and therefore the results of much of the work done in the pre and post harvest investigations were of questionable value. Until the issue with the cyanide test kit could be resolved to the satisfaction of all involved any results from those investigations could not be used. For this reason the results of the pre and post harvest research were not passed on to the ACBC membership at this time.
ACBC annual general meeting

The ACBC AGM was held on the 11th of February 2000 in Brisbane at the Mt Coot-tha Botanical Gardens. At this stage the ACBC was still a relatively new group and the majority of members were not well known to each other. Before market development on a collaborative basis could occur there was a need for group development which would result in ACBC members making a commitment to the group. A presentation by Dr Collins’ detailed for the 28 members present how, through empowerment of the ACBC as a core industry group and the use of a supply chain framework, industry development through action learning could occur.

Post 1999 –2000 season activities

Shoot species selection

In February 2000 the issue of which bamboo shoot species would be allowed to be sold through the ACBC arose. A number of different species were being grown for shoot production but only a small number in significant enough volumes to be considered for future commercialisation. Furthermore, the Queensland Department of Primary Industries (DPI) research had found that some species such as Bambusa balcooa and Bambusa vulgaris vittata were naturally high in cyanide containing compounds.

The ACBC board ruled out the sale of shoots from these two high cyanide species through their marketing system due to possible public health considerations. Discussions on the exclusion of other shoot species continued for some time and were preventing the board from addressing other issues. In an attempt to prevent the board from getting stuck on this one issue, it was suggested that growers be allowed to send all other species through the channels developed by the ACBC and that the feedback from the markets would be used to guide the group as to which species could be sold through the ACBC. This process also served as a means of demonstrating how consumers and not production factors would define the eventual shoot market. This was an important first step in steering ACBC members to think in terms of a consumer orientation.

IMS process continued

Prior to the 1999-2000 season an IMS process to identify and rank potential markets had commenced. The first stage of the IMS process was complete and had narrowed the number of potential markets down to 18. The second stage had also commenced and was starting to reveal which markets looked most promising.

The objective of stage two market selection was to reduce the number of countries identified during the market identification stage to a small group of countries from which to select target markets (Johannessen 1998). Stage two resulted in each country being given a score to indicate its attractiveness in terms of a number of factors. The higher the score the more attractive that market is in terms of the particular criterion. Each country also received an overall score out of 1000. This score was used as an indicator of overall attractiveness with countries scoring above 500 being identified as target markets and those above 750 as high priority markets.

From the information reviewed at this stage, the markets for fresh shoots in Japan, Singapore, and Hong Kong were high priority while the markets in South Korea, Taiwan, Malaysia, Canada, the USA and New Zealand all appeared to offer some promise. The first two stages of the IMS process were now completed but the difficulty of obtaining relevant information without visits to the individual markets meant that stage three, the market size estimation stage, was difficult to complete for those countries not visited.

Some board members were becoming anxious about the apparently poor prospects of the Taiwanese market, and they were pushing for some positive news on other potential markets. Earlier in the season a number of growers and some board members started to discuss the returns possible from the Japanese market. Prices of around A$10 per kilogram had been rumoured amongst growers for some
time, and when some anecdotal evidence showing prices as high as A$15 per kilogram wholesale was received it created a great deal of excitement. Together with the view of Japan as the large, premier market to export to, the Japanese market swiftly became the focus of the ACBC’s attention. Information supplied by a marketing consultant on wholesale prices and market size for bamboo shoots in Japan reinforced the apparent potential of the Japanese market. ACBC members were keen to investigate the Japanese market in greater detail and the board requested an investigation into this market as a target for the next season.

The formal IMS process was once again abandoned and desktop market research into the Japanese market commenced. A market investigation trip was planned for mid to late November 2000. This was considered the best time, as this would coincide with the ACBC harvesting season.

ACBC members survey

The AGM in February 2000 requested that trial shipments be available for both the domestic and potential export markets in the 2000-2001 season. This required:

- a better understanding of the production capabilities of ACBC’s membership,
- an indication of what postharvest facilities growers had available, and
- a list of growers ready to participate in the next season’s marketing effort.

In preparation for the season a survey of ACBC membership addressing the above issues was required. Despite the fact that this was the first harvest season for most growers and that any harvest projections by would be mainly guesswork, information on the species planted, the age of the plants and the facilities that growers had access to was still important for the ACBC to have. Asking growers to project their expected harvest would also get them thinking about how to do this for future seasons. Most importantly, this process would motivate growers to think about the coming season and help the ACBC to gauge the commitment of its members.

The ACBC surveyed its members to determine the availability of shoots, the species available and the predicted volumes that would be available, by sending out a questionnaire in May 2000. At the time, the ACBC had a total of 51 grower members and responses were received from 20 individuals. Of the 20 responses eight wanted to send shoots to market in the 2000-2001 season. Two more were uncertain because the species that they had growing in large volumes had been excluded from the list of approved species to be sold through the ACBC. Including the two uncertain growers the ACBC members who responded estimated that they would be sending 11 tonnes of shoots to market over the duration of the coming season. Only five of these ten members had access to cool room facilities and these were spread geographically throughout northern New South Wales and south east Queensland, up to Proserpine in north Queensland.

The survey results were not encouraging, and, while all respondents had indicated a willingness to sell shoots through the ACBC in the future, only a small number felt ready to send shoots in the coming season. This meant that it was unlikely the ACBC would be able to supply a large enough quantity of quality shoots to conduct trial shipments into target export markets in the 2000-2001 season.

Cyanide issue continued

In May 2000 after several months of discussions, the problem of identifying the cause of the very large differences found between cyanide concentrations in bamboo shoots as measured by different methods was resolved.

The Chemistry Centre could not at this time give a definite answer. However ANU carried out further tests and confirmed that there was a definite correlation between the test kit method and the acid hydrolysis laboratory method they were using. They also supplied a number of publications on testing of cyanide levels in cassava and a yet to be published article on cyanide levels in bamboo shoots in order to support their case. Taking into account the information supplied by the Chemistry Centre, ANU and a review of literature detailing cyanide content in vegetables, it was determined that the test
kit gave a fair indication of cyanide content. The results from the Chemistry Centre were dismissed as non-valid because of poor sampling or experimental technique.

Using the information supplied by ANU to support the decision, the pre and post harvest work was finalised and a report written. In August 2000 a short report was given to the ACBC board for dissemination to the remainder of its members.

The results of the pre and post harvest work were used to support recommendations to growers that:

- Shoots be bagged or mulched during growth so as to exclude sunlight from the shoots. This would result in a lighter coloured shoots with a lower cyanide concentration.
- Shoot maturity could be measured as a function of a shoot’s height-to-base diameter ratio. By harvesting shoots using this ratio as a guide growers could ensure that they achieved the best yield of edible flesh per shoot while not allowing the shoots to become fibrous and woody.

Table 4.4 provides a summary of the activities undertaken during season one, showing the time frame of each activity.

**Table 4.4 Season One Timeline**

<table>
<thead>
<tr>
<th>Activity</th>
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<tr>
<td></td>
<td>1999</td>
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<td></td>
<td>May June</td>
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<td>Appoint scholar</td>
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<td>Familiarization with subject</td>
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<td>International Market Selection</td>
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<td>Taiwan market analysis</td>
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<td>Taiwan market visit</td>
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<tr>
<td>DPI cyanide investigations</td>
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<tr>
<td>Pre and postharvest investigation</td>
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<tr>
<td>Cyanide problems</td>
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<td>ACBC AGM</td>
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<td>Shoot species selection</td>
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<td>ACBC member survey</td>
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<td>Japan market analysis</td>
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**Lessons learnt from season one**

Two lessons may be drawn from this first season. The most significant of the lessons was the importance of accurate information. Season one was largely a period of familiarisation that served to give the project its initial focus and direction. Much of this period was devoted to gathering and processing the available information on bamboo, the Australian bamboo industry, and the ACBC. As the season progressed an understanding of the issues affecting the ACBC was developed. These issues were largely related to a lack of reliable and relevant information. Growers were distrustful of much of the information that they had, and lacked information on many areas that they considered vital.

The second lesson became apparent towards the end of the season. This lesson was that the ACBC could not just work to find solutions to issues faced by the group, but needed to keep its members informed and involved in the process. The ACBC needed to be seen by its members to be addressing the issues that were important to them. During the first season the research team had largely relied on the board to inform them of the issues that the group felt needed addressing, but towards the end of the season a number of complaints from ACBC members began to emerge. These complaints are covered in more detail in the pre season analysis of the 2000-2001 season. They largely related to not being kept informed of what was happening with the project.
The continued development of the ACBC may be addressed from the following three points of view:

- relationship development lessons, which can be divided into lessons about supply chain relationships and group development
- development of consumer orientation lessons, and
- information and communication lessons.

From this point on, at the end of each season, a summary of the action learning process that occurred over that period, the milestones achieved and the lessons learnt is provided. The purpose is to provide a record of interpretations of events in each season and to demonstrate the group’s adoption of the supply chain framework through the development of basic supply chain principles. The adoption of these principles is measured against the model of relationship development, stages of group development, marketing orientation matrix and development of communication and information infrastructure as presented in the framework in chapter three. Each season is thus analysed in relation to lessons learnt about each of three areas highlighted by the supply chain framework: relationship development, consumer orientation, and information and communication.

**Relationship development lessons**

At this stage of the project the development of vertical relationships along the supply chain was limited to making contact with potential future partners in Taiwan.

During 1999 and early 2000 the board of the ACBC spent considerable time building up the membership base of the ACBC to more than 60 voting members. Workshops or field days held for industry members were well attended. Bamboo growers were enthusiastic to learn about their industry and its products and appeared to communicate freely. At meetings such as the AGM group members started to get to know other members of the group but few were forthcoming with their own input. The board was looked to for leadership and the activities of members were primarily related to growers seeking to develop their understanding of pre and post harvest activities and marketing issues.

During this season communication arose as an issue to be addressed while group commitment was built through the donation of time and product to the research carried out over the season. The level of commitment was reasonable with the majority of ACBC members who would have shoots in the next season agreeing to supply them through the ACBC’s marketing systems.

Over the season, members of the board started to show greater interest in the running of the group and towards the end of the season were raising a number of questions relating to better communication and also confidentiality of commercial information generated by the ACBC. The president elected at the AGM in February quickly adjusted to a leadership role and kept members interested and informed on the progress of the group. Conflicts arose towards the end of the season and the president and board appeared to have difficulty dealing with them. Group members were made aware of the importance of customer orientation at the AGM and all market research was aimed at finding what the market wanted and communicating it back to the ACBC.

The board took responsibility for the direction of the group’s export market effort by requiring Japan to be the next market to be investigated. The board also clarified a number of political and personal issues that had led to earlier conflict between the group and other industry participants. The development of the ACBC over this season was positive but very slow and if the different members of the ACBC were to share a collective vision and develop relationships, there was a clear need for members to get to know each other much better.

**Consumer orientation lessons**

The lessons relating to the development of consumer orientation can be assessed by reference to the marketing orientation matrix introduced in chapter three. During season one, information was gathered or decisions were made that affected the following cells of the matrix:
• Production/quality interaction
Two issues were addressed during this season in relation to this interaction of the matrix. The first of these was the effect of management practices on selected quality attributes. Preharvest investigations examined the effect of excluding shoots from light. The second issue addressed was the effect of species selection on selected quality attributes and shoot availability.

• Postharvest/quality interaction
Market investigations aimed to determine the quality characteristics to which the market would respond contributed to addressing the postharvest/quality interaction. The freshness, colour, size and price of shoots were all recognised as important in the Taiwanese market.

• Postharvest/time interaction
This season showed the importance placed on freshness which required a review of transportation of shoots to target markets and identified the need to air freight shoots.

• Marketing/quality interaction
The Taiwanese market investigation identified a number of quality parameters by evaluating shoots in the markets and questioning wholesalers, importers and consumers about their product preferences. Freshness, colour, species, bitterness and shape were all identified as important quality parameters. The quality criteria used in the pre and post harvest investigations were derived from these characteristics and investigations were designed to match product as closely as possible to the attributes identified in the market.

• Marketing/quantity interaction
The attractiveness of the Taiwanese market was evaluated in terms of its size and the cost of getting shoots to the market compared to the prices paid for shoots.

• Marketing/time interaction
In this season the IMS process was used to start the process of identifying potential markets and to determine the attractiveness of markets by investigating market size. In addition, market price was examined in Taiwan, one of the potential markets for ACBC product. Towards the end of the season the ACBC’s ability to supply was also investigated and the number of plants and their level of development was recorded to estimate what volume of shoots would be available to market.

• Marketing/price interaction
In the IMS process tariffs and quarantine barriers for all potential markets were also investigated.

A number of interactions were not addressed during this season, but more important than addressing these issues was the importance of making ACBC members aware of the importance of a consumer orientation, and of how they might achieve such an orientation. This season was a start, but would require reinforcement in future seasons.

**Information and communication lessons**

The first step in developing a supply chain communication strategy for the ACBC was to determine the group’s information needs. Direct questioning of the members of the ACBC was a useful starting point to determine the perceived needs of an information system for the group. The familiarisation period of this season identified three areas that the membership of the ACBC considered needed particular attention:

• Preharvest issues
Some of the bamboo growers were not farmers and had little experience with crop management practices. This meant that some growers required information on bamboo production, including information on propagation and plantation management. A substantial amount of the information regarding these issues was circulated by industry leaders, much of it was conflicting and some of it not applicable under Australian conditions. The recommendation by Cusack (1998b) that growers apply 420 kilogram of total nitrogen per hectare is an example of such information. This recommendation is based on practices found in Thailand where differences in rainfall, soil structure and plantation management mean it is a realistic figure. When applied to Australian conditions the application of such a high level of nitrogen is not cost effective and can cause degradation of surrounding environments.
Postharvest issues
Estimates of potential yield circulated freely between members. However, plants were not performing in line with expectations. Growers, particularly those new to horticulture, also needed information about the postharvest treatment of shoots and exactly what constituted a high quality shoot.

Marketing issues
The members of the ACBC did not know what markets existed or anything of real substance about these markets. Literature indicating large yields and high consumption in Asian countries had caught the attention of growers, but little was known about how shoots were consumed or in what form.

In general, information issues were addressed as they arose, taking care to employ approaches that could be replicated in future seasons. The IMS process and the pre and post harvest investigations set out to obtain information that was relevant, accurate, clear, current and as complete as possible. This would help to address the lack of information in these three areas and could be used to answer questions growers would face as their plantations reached commercial maturity.

Towards the end of the first season some members of the ACBC started to feel that they were not getting the results of the research and that communication channels were not functioning effectively within the ACBC. The complaint of lack of information flow appeared hard to substantiate as a review of newsletters circulated to the membership that year showed that they had summaries of almost all the work conducted for the year. However the communication channels that had been operating up until this point were far from ideal.

Until the AGM in February 2000 the communications between the project and the ACBC had been primarily through a single board member who was a member of the group’s research committee. Information was passed on from this individual to the rest of board through meetings and email and to the rest of the membership through newsletters. After the AGM, this individual became president of the ACBC and continued as the project’s main channel of communication. This arrangement was criticised, as the board started to feel that it was no longer receiving all the information and some considered the summaries reported in the newsletters to be biased towards the view of the president. As the author of these newsletters, the president could in a few cases be accused of presenting these reports in as positive a manner as possible; however, the facts were still being presented to the best of his knowledge. While project results were not being presented in full they were still being disseminated to the board and members and they were still accurate summaries. The communication of information between members of the ACBC was one issue that needed to be addressed in the next season.

Very few growers had marketable shoots this season but a few growers had sent product to the domestic market, and, while these individuals were ACBC members, the ACBC had very little to do with their marketing attempts. These growers communicated directly with the agents selling their product and in general they felt that the flow of information from agents was not satisfactory. Information flow was primarily one way, with growers getting very little feedback from agents about their product’s performance. Thus the communication between agents and growers was another issue that needed to be addressed in the next season.

A summary of what the board felt needed to be achieved before the commencement of the next season was presented in a newsletter distributed towards the end of February 2000. It detailed the expectation that the coming season would involve a lot of work from grower members. Harvesting and packaging procedures would need to be addressed as would the training of growers, quality assurance, market development and promotion of product.

Comments from the new president and from some other members portrayed a feeling of excitement amongst growers and there appeared to be a growing commitment on their behalf.
Season two: 2000-2001

Pre season activities 2000 -2001

A desktop investigation into the Japanese market was in progress and a trip was planned for November in the first weeks of the 2000-2001 season. The lead up to the 2000-2001 season required the identification of supply chain stakeholders in the Japanese market and to start workshops with ACBC growers who were expecting to send shoots into domestic and export markets this season.

In August 2000 a member of the ACBC travelled to Thailand on bamboo related business. At the project’s request the grower provided a detailed summary of his trip and its findings, including the fact that the average market price for bamboo shoots in the Thai wholesale markets was less then 40 cents Australian per kilogram. Some information on the harvesting and postharvest treatment of shoots was also supplied. This information was viewed as being of potential use as the species being harvested was *Dendrocalamus asper*, the same species that made up approximately 90 percent of ACBC members’ existing and projected plantings.

Novel foods legislation

While investigating the regulatory framework for foods in Australia it became apparent that because of their cyanide content and the potential health effects associated with the incorrect preparation of shoots, fresh bamboo shoots were a potential novel food under Standard A19 of the Australian Food Standards Code. Discussions with the Australia New Zealand Food Authority (ANZFA) confirmed that because there was insufficient information in the wider community to enable the safe preparation of bamboo shoots, they may be classified as a novel food. ANZFA asked that the ACBC or any other group or individual submit an application for fresh bamboo shoots to be considered as a novel food. This would require a safety assessment of bamboo shoots, including toxicological and nutritional testing.

The requirement to apply for novel food status was complicated for two main reasons. These were:

1. Testing had revealed that cyanide content of shoots could measure up to 2000 ppm. The allowable cyanide content according to the World Health Organisation was 30 ppm. Adding to the complexity of this issue was the fact that species and growing techniques influenced cyanide content. The ACBC had already made a decision to exclude several species of shoots from being sold under their name due to their naturally high cyanide content. Furthermore, the results of the pre and post harvest research carried out in January 2000 had revealed that preharvest practices (for example, bagging) can reduce cyanide content.

2. The costs involved were considerable. Although a fixed quote from ANZFA was not available they did advise the cost of food safety testing could be up to A$30 000. At this stage of its development the ACBC would have had difficulty raising and justifying the expense of even a fraction of that cost.

The board was presented with copies of the relevant standards, applications to have bamboo shoots listed as novel foods and information on the food safety testing requirements and the potential costs involved. After much discussion it considered the issue too complicated to address at this time and it was put aside to be addressed at a later date.

Workshop one

Workshop one was held on the 18th of October in Brisbane at the Mt Coot-tha Botanical Gardens, prior to the start of the 2000-2001 harvest season. This workshop was to be the first in a series of workshops. It was designed to orient the participants to the commercial and group building processes that would follow.

The workshop started with a case study of the Australian Persimmon Export Company (APEC). The APEC group was an example of a successful new industry that developed from similar beginnings to the bamboo industry in Australia. Particular attention was paid to the similarities between APEC and the ACBC and this was used to highlight what was possible. The case study also helped to demonstrate the importance of addressing the issues of lack of marketing orientation, lack of collective vision among industry stakeholders and lack of reliable information.
This was followed by a session dedicated to identifying the ACBC’s goals and the activities that could achieve these goals. An examination of what the participants at the workshop wished to get out of the industry development process that this project was implementing was designed to make public to the group members the values, aspirations and attitudes of other group members insofar as they related to the industry’s development. This examination identified twelve components:

1. harvesting and transportation system
2. exchange of ideas
3. group commitment
4. marketing strategy
5. like minded people
6. timber marketing system
7. professional industry group
8. confidence/security/support
9. learning
10. income from investment
11. quality management system
12. building relationships

These twelve components were presented to the workshop participants as being what the group needed to aim to achieve in order to feel it had achieved success. The identification of these components effectively established the goals and objectives of the group as a whole.

Having identified the group’s needs and desires an examination was made of what was known at this stage of the project. This commenced with a general summary of what was known in terms of production knowledge, postharvest knowledge, marketing knowledge and the organisation and management of the ACBC. Participants were then asked to help identify the gaps in knowledge and the mechanisms through which they might be addressed.

The workshop concluded with a discussion on how the group would proceed in the immediate future in terms of what the group needed to do to enable members to export during the coming season and who was going to do what. A number of issues were discussed; however, technical issues, including development of packaging, transportation and quality assurance systems, were considered critical. Other issues such as the development of relationships along the supply chain, identifying the potential volume of product and the geographical distribution of growers and dealing with business issues of finance and organisation were identified for attention after more critical issues had been resolved.

This workshop served to start the development of a core group of industry members within the ACBC and to allow the workshop participants to make a decision as to whether they were going to join this group at this stage. It was also a time of reflective observation on what had been achieved to this point and served to develop plans for the coming season. It set the scene for the group’s development and highlighted a number of issues that would need to be addressed before the end of the coming season. These issues linked this workshop through to a second workshop to be held at the beginning of the coming season. This second workshop would be designed to help develop the required systems and competencies to see the ACBC through to the attainment of its immediate goals.

**Export brand name**

With only a short time left before the Japanese market visit, the board made a decision on the export brand name. Contact was made with a number of Japanese Australians, the Queensland Department of State Development (DSD) Tokyo office and an Asian market consultant to develop a list of words that were positive descriptors that would be well accepted in Asian markets.

Eventually the export brand name “Kangaroo Bamboo” was adopted as the ACBC export brand name. Several ACBC members, some of whom were board members, had reservations, but the majority felt that the combination of the novelty, the rhyming and the kangaroo would be attractive, not only in the Japanese market, but also in most Asian markets.
Japan market research (Trip 1)

From the 4th to the 12th of November 2000 market investigations were carried out in Japan. In order to familiarise a member of the ACBC with the processes involved in market investigation and development, a representative of the ACBC accompanied the research scholar on the trip. This also served a secondary purpose by introducing that member to prospective supply chain partners in order to start the process of building relationships.

Visits were made to four major cities, Tokyo, Osaka, Kobe and Fukuoka, and meetings were held with six bamboo shoot importers, four wholesalers, two processors and one supermarket chain representative. As marketing aids to use on the trip, a brochure had been developed providing information about Kangaroo Bamboo including the varieties available, the availability and some information on the ACBC.

One issue frequently raised in relation to Kangaroo Bamboo was that it was seen as a new product. The Japanese consumer knows what a bamboo shoot should be like. They are familiar with the domestically produced running bamboo species such as *Phyllostachys pubescens* (Moso). Kangaroo Bamboo was substantially different to any bamboo shoots in the market at that time and it might be viewed negatively by consumers.

Despite this, Kangaroo Bamboo was received very positively with a number of operators along the supply chain requesting sample product, including wholesalers and importers in Tokyo, wholesalers and importers in Osaka and importers in Fukuoka. A high level of enthusiasm was evident from many of the contacts made in Japan. Of the six importers with whom meetings were held, four were keen to see samples of ACBC product, as were two of the four wholesalers.

The results of this market visit looked promising but the nature of the Japanese market would require a great deal of work to develop Kangaroo Bamboo to its full potential. Market development in Japan was definitely a long term project. In order to be competitive and to gain the desired price and sales volume, ACBC would need to differentiate Kangaroo Bamboo with higher quality, longer shelf life, better marketing, more efficient transport and handling and better packaging. Reliability of supply as well as consistency of quality would be paramount to success.

The 2000-2001 bamboo shoot season

Workshop two

The second workshop was held over two days from the 27th of November 2000. The workshop was held at the property of an ACBC member in Wadeville, northern New South Wales. A total of 24 ACBC members from all over New South Wales and Queensland, including growers from north Queensland and the Cairns area, were present. The first workshop had given participants an understanding of what was hoped to be achieved and the information they needed to help them decide if they wanted to stay in the core marketing group or not. The first workshop had only been a discussion of the issues, while the second workshop would attempt to find solutions to them. This process would hopefully identify those growers who were willing to commit to forming a core group.

The workshop was designed to assist members work towards the goals established in the first workshop and to inform participants of progress since the previous workshop. In addition, if the members present were going to share the same collective future they needed to get to know each other better. While overtly this workshop was designed to prepare growers for the coming season, covertly it was an opportunity to introduce ACBC members to each other and provide the opportunity for individuals to meet with and evaluate those they might be working with in the future.

The workshop started by revisiting workshop one and clarifying what the group wanted to achieve and where this would fit into the bigger picture of the industry’s continuing development. A number of issues were discussed including harvesting and bagging techniques as well as recommendations for
plantation management, including the development of some basic watering, thinning and fertilising guidelines. Postharvest discussions revolved around the development of standards for the cleaning, cooling, grading and packing of shoots. A draft set of quality standards was presented for growers’ consideration.

Having discussed a range of issues, the gaps in knowledge were established (reflective observation) on day one of the workshop. Day two was devoted to developing means of addressing these gaps (abstract conceptualisation and active programming). The success of the Japan market visit and the positive response from so many supply chain stakeholders led to the decision to continue to pursue the Japanese market. A second market visit was tentatively scheduled for January of 2001. On this visit product samples would be taken to discuss potential trial shipments with potential supply chain partners. First test marketing in the domestic markets before the end of the 2000-2001 shoot season was also planned.

With these two goals in mind the participants split into groups, each addressing issues under one of the following headings:
- quality assurance
- communication
- logistics
- finance
- domestic marketing.

Participants were asked to determine what needed to be done for the January trip and what needed to be done for the first export test marketing in 2001-2002. They were also asked to determine who was going to do what.

Each of these groups then gave a short presentation to other participants. The key issues identified were:
- the need to develop a quality assurance system to an appropriate standard
- the need to develop an effective communications infrastructure among growers, the ACBC and the supply chain partners
- the need to identify logistics suppliers for packaging materials and transport
- to identify funding sources for ongoing research, and funding for day to day operations of the ACBC as a non profit organisation
- identification of marketing agents in the major domestic markets
- product identification under a unique brand image
- promotion of bamboo products in the domestic market
- the development of guidelines for plantation management
- the refinement of the recommended packaging system.

All of the groups were asked to provide a report for the ACBC detailing their discussions and identifying the key elements. These reports would be summarised and published in an upcoming newsletter. It was anticipated that by having the groups continue to work past the end of the workshop and then having them report back formally to the ACBC, they would continue to provide input in further addressing the key issues.

The workshop ended with a review of what had been achieved and reinforcement of the role that growers would need to play over the coming years. A reassessment of the means by which the industry would progress was also conducted. The workshop participants agreed that they were proceeding on the right track and that the process was appropriate. At the end of this workshop, it appeared that participants were left with a sense of
- what they had to do to achieve the preliminary product specifications, quality and timing targets set by the ACBC
- how they would be able to contribute to the effectiveness of the ACBC, and
- the economic benefits of being involved in the process they were now engaged in.
Addressing the issues identified in workshop two

The remainder of the 2000-2001 season was used to address the issues identified by the action groups formed at the November workshop. This was the first major step for the growers to take responsibility for the development of their own industry. The amount of work that needed to be done before the group could get export samples ready for Japan meant that the Japan trip was rescheduled for mid February of 2001.

The members of the domestic marketing action group recognised that the shoot harvest season had started in November and with input on projected availability of shoots combined with their own experience they realised that a low projected production volume meant that exports of any quantity would not be feasible until at least the 2001-2002 season. Growers raised the concern that the ACBC was attempting export market development too early, as production was not yet at a critical mass. The group had moved swiftly in its development to this point and growers were concerned that they may have moved too fast and felt that it would be better to ignore the export market for a time and concentrate on developing the domestic market. The growers were reminded that it did not matter that the ACBC was starting with a small volume of product and that it was the quality that was important. They were reassured that while larger quantities may make for a larger impact in new markets, any mistakes would be significant and highly visible.

The research scholar worked closely with the action groups addressing the issues that they had identified earlier. The results of this work with group members was incorporated into their reports along with comments on how these issues may continue to be addressed. The reports were then sent out to all those who were present at the workshop as this feedback was designed to motivate them and start them thinking and volunteering to continue the work that was outlined in the reports.

Issue 1: The need to develop a quality assurance system to an appropriate standard

To facilitate the development of a quality system the group identified the need to draft a quality manual detailing postharvest and packaging practices. These practices would need to incorporate product standards in order to meet the quality expectations of potential markets.

The research scholar was asked to draft a packhouse quality manual using the information on quality gathered from market investigations. This was to form the foundations of the quality system. Following the example of the persimmon industry the group recommended that the system should be self regulated at this stage.

The participants at the workshop had recommended that the manual incorporate recommendations for:
- preharvest bagging of shoots for export markets
- a size-based grading system to be included as part of the quality system
- the size and type of packaging to be used domestically

It became apparent that the process of developing a quality manual was going to be a lengthy process requiring a lot of feedback on the proposed standards. It was unlikely that the system would be in place before the end of the 2000-2001 season. The development of a branded product selling through a single marketing agent would therefore not be possible until the system was more advanced. Until then, growers would need to use their own brands and agents.

Growers who were ready to send shoots to market were asked to sell shoots under their own brands using the systems recommended at the November 2000 workshop. The feedback from these experiences would then be incorporated into the manual design.
Issue 2: The need to develop an effective communications infrastructure among growers, the ACBC and the supply chain partners

The action group addressing issues relating to communication identified two distinct communication channels that needed attention. The first of these was communication within the ACBC and the second was communication between the ACBC and its supply chain partners.

The fact that the ACBC membership is spread over a large geographical area meant that communication between members was considered an issue of particular importance. In the short term the group recommended that growers as a minimum obtain access to fax facilities but by preference have email access. Furthermore they recommended that regular communication of market information between growers should occur during the season. Growers were also asked to send this information to the research scholar for collation and analysis for an end of season report.

In the longer term the group recommended that the ACBC:
- develop a comprehensive growers’ manual detailing plantation management in order to communicate basic production information to all growers
- hold field days and seminars with formal and informal components to communicate information on quality standards and market performance
- publish newsletters summarising board discussions and matters of interest to the membership on a quarterly basis
- develop a web site on which market information and production updates could be posted and incorporating a chat page or bulletin board for members
- increase the frequency of board meetings using methods such as teleconferences
- introduce a disputes resolution process to mediate in any member dispute.

Recommendations for developing communication channels between the ACBC and its supply chain partners were limited to:
- developing relationships with potential supply chain partners
- having members visiting various parts of the marketing chain
- advertising and promotion through the use of media such as radio and TV for spoken promotions and magazine and newspapers for written articles.

In order to facilitate the implementation of some of these longer term recommendations and to get the group ready to send bamboo shoot samples to Japan, a field day was held at the property of one of the ACBC’s northern New South Wales growers. The field day was held on the 22nd of January 2001 and was designed to demonstrate the proposed postharvest handling and packaging systems as they had been developed to this point. Discussions held during the day also helped to highlight issues that needed to be addressed in the quality manual being developed.

In December 2000 the board made contact with an Australian exporter in Brisbane. After being briefed on the results of the November market investigations in Japan and the desire to send samples to the market in February the exporter agreed to assist us. The exporter met with a representative of the ACBC board and was shown around the properties of a number of ACBC growers. The exporter generously agreed to topload our Kangaroo Bamboo samples with some of his product going to Japan. He offered to do this at no cost to the ACBC, thus saving considerable expense. He also offered to provide us with some packaging materials to compare to our established packing system, an offer the ACBC was happy to take advantage of.

The ACBC board also requested a more effective communication system between wholesalers and growers. Again using the Persimmon industry for guidance, it was suggested that the ACBC channel its communications through a single individual who would coordinate their marketing effort. The board asked for the development of a duty statement for the appointment of such an individual and in the meantime the research scholar was asked to take on this role.

Issue 3: The need to identify logistics suppliers for packaging materials and transport

The action group looking at the issues relating to logistics identified packaging suppliers and transport companies and this information was distributed to the remainder of the group.
Issue 4: *To identify funding sources for ongoing research and funding for day to day operations of the ACBC as a non profit organisation*

For the immediate future, operating funds were required to implement the recommendations of the other action groups. In order to generate the funds required, the group made the following recommendations:

- The annual membership fee should be raised to reflect the increased role that the ACBC was playing. The recommendation was later ratified at the group’s AGM.
- A joining fee of A$100 should be set on the understanding that it would rise substantially each year thereafter. This joining fee would reflect the benefit gained by being a member of the ACBC. Growers who were members from the beginning of the group felt that new members should have to pay a fee to compensate the group for the work that they had already done which the new member received the benefit of. This recommendation was also ratified by the board at the AGM.
- The ACBC should approach the Rural Industries Research and Development Corporation and other funding bodies with a view to obtaining funding to make up any shortfall.

The group recommended that the issue of longer term finance could be addressed by the introduction of a growers’ levy or fee on a per carton or percentage of net return basis to be collected by the agent/merchant appointed and paid direct to the ACBC. The committee and the board discussed this and a decision was made to place a levy on product sold through the ACBC in future.

**Issue 5: Identification of marketing agents in the major domestic markets**

The ACBC needed to decide which agent they would be using in each market. To these ends on Monday 11th December the researcher visited the Sydney Flemington Markets with one of the ACBC members in order to identify which agents were moving large quantities of Asian produce and, in particular, bamboo shoots. A shortlist of agents was compiled and informal discussions with agents were held with the aim of obtaining information regarding their capacity to handle larger volumes of shoots, their relationship with traditional bamboo shoot consumers and their attitude regarding the growth of the industry and its promotion.

From this visit a shortlist of five agents was compiled and the ACBC asked growers to send shoots to all five of the agents shortlisted in the Sydney market and to supply feedback on prices returned and performance of the agents.

In late December 2000 the grower who had visited the Sydney markets travelled to Melbourne with another ACBC member. The visit to the Melbourne markets was conducted in a similar manner to the visit to Sydney, based on a list of agents in Melbourne who had dealt with growers in the past or who had been recommended based on their performance with other products. The growers also took a sample of product harvested and packed according to the ACBC’s specifications. This visit resulted in a list of five potential agents in the Melbourne markets. A number were enthusiastic to receive ACBC product after seeing the sample provided by the two growers.

On Thursday 1st of February, an ACBC member and the researcher visited the Brisbane markets at Rocklea. We found that the Brisbane market for bamboo shoots was at the time very limited. Some agents had dealt with bamboo in the past but only three of them were interested in continuing to sell bamboo. The remainder felt that the market was too limited to bother. The three agents were shortlisted as potential agents for the ACBC in the Brisbane market. Growers were asked to send shoots to all three agents and provide feedback.

Identifying and getting feedback on the performance of the agents in each of the three major domestic markets was the first step in identifying the agents that the ACBC may wish to deal with in the future. The information generated by this process could also be used to refine product specifications for the domestic market.
Issue 6: Product identification under a unique brand image

A domestic brand distinct from the export image already being developed was recommended by the domestic marketing group. Members were asked to forward suggestions to the group and as a result the group generated a list of several dozen potential names for consideration by the board. The board was to determine which of these names would be adopted and implemented in the 2001-2002 season.

Issue 7: Promotion of bamboo products in the domestic market

On a visit to Melbourne, ACBC growers visited a number of retail outlets to see ACBC product for sale and gather information on product quality and price. The growers were only able to find fresh shoots in a few Asian grocers. When questioned, the proprietors revealed that the market for shoots was predominantly elderly Asians (Vietnamese, Chinese and Cambodian). Some retailers felt that canned product was preferred over fresh by many consumers because of convenience and the lower price; however, if the price of fresh shoots was lower, consumption should increase. This information in conjunction with an apparent oversupply in the Sydney markets in December 2000 convinced the ACBC that the domestic market was smaller than originally thought.

The ACBC’s tight budget meant that promotional activities were limited; however, the action groups recommended that the ACBC use a number of inexpensive methods to promote bamboo shoots. These methods included:

- the production of brochures detailing basic cooking instructions
- contacting and encouraging television chefs to use bamboo shoots on their programs
- contacting magazines, newspapers and other print media with stories relating to bamboo shoots.

In order to move sales beyond the Asian community, the ACBC considered in-store cooking instructions and recipes as a promising promotional tool. The ACBC president requested that the researcher design brochures and labels for the domestic marketing effort. The board appeared to lack focus and an increased research workload was the result. It was not possible to carry out this request and the board was asked to look to other means of addressing promotional issues. At the ACBC’s AGM in February 2001 the board appointed a promotions committee. Members were accepting more of the expanding workload.

Other issues addressed during the 2000-2001 season

Growers visiting the Melbourne markets identified the retail price of fresh shoots as ranging between A$6.50 per kilogram for poor quality shoots to up to A$9 per kilogram for shoots of high quality. At the same time the wholesale price for ACBC quality shoots in Melbourne markets was averaging between A$3 and A$4 per kilogram.

In the domestic markets, shoots packed to the ACBC standards were considered to be of high quality but were only achieving prices marginally higher than low quality shoots. Retailers claimed that the reason for this was that most consumers were purchasing fresh shoots based on price with the quality been only a secondary consideration. Now that high quality product was making its way into the market and consumers could choose between high and low quality shoots the retailers believed that an increasing number of consumers would use product quality as the primary consideration in determining purchases. As consumers recognised the value of high quality shoots the prices would change to reflect this.

The packaging system used by the ACBC members was well received but there was still a deal of variation between the packaging materials used by different ACBC members and between the quality of shoots from different ACBC members. Some growers were pushing to send all the ACBC shoots to just a few select agents who had earlier been shortlisted. Growers were requested not to favour particular agents at this early stage as product quality was still highly variable between growers and the lack of professionalism exhibited at this stage could reflect negatively on future dealings with these agents.
As the season progressed the board decided the ACBC would complete the 2000-2001 season with growers sending to all agents listed in each of the three major markets. The feedback generated would be used to make a decision on which agents the ACBC would deal with in its next season when the quality system and brand image would be ready to implement.

**Board problems**

From late November 2000 through to February 2001 several emails circulated between ACBC members. The majority of these emails were initiated by board members dissatisfied with aspects of the progress of the ACBC and the project. This negative communication between members developed into a general feeling of disillusionment with the board amongst many of the ACBC’s members. The issues raised in the emails were highly emotive and in attempting not to alienate any of its members the ACBC board appeared to become increasingly indecisive. Several of these issues were resolved by having the ACBC board members communicate amongst themselves to resolve issues of contention or to find solutions.

The issues addressed by the board in this period included:

- The role of large plantations in the industry’s development.
- The Japanese market’s apparent dislike of one of the major plantation species in Australia *Dendrocalamus latiflorus*.
- Concerns over confidentiality of the ACBC’s intellectual property and lack of open and honest communication between members.
- The geographical distribution of growers was causing communication problems particularly for growers in north Queensland who felt left out of discussions due to their isolation.
- The appearance of misinformation in north Queensland markets caused considerable concern for some north Queensland members.

**Japan market research (Trip 2)**

Several weeks prior to the second Japan market investigation several growers were contacted to determine if they could supply shoots as a contribution for export market development samples. The growers contacted agreed to contribute; however, the need to obtain samples of all three of our major species proved difficult. Export quality shoots of *Dendrocalamus latiflorus* and *Bambusa oldhamii* were readily available in reasonably large volumes. Only limited supplies of *Dendrocalamus asper*, the species that the Japanese market was keen to sample, were available. The immaturity of plantations and the genetic diversity of the *D. asper* plantations meant that only a small portion of the shoots available would be of export quality.

On the 1st, 2nd and 3rd of February samples for export were harvested, cleaned, cooled, packed and transported to the freight forwarder at Brisbane airport who would topload them with another shipment. On the 3rd a total of six, five kilogram samples of export quality Kangaroo Bamboo shoots were packed into lined styrofoam cartons. Five of the cartons contained five kilograms of *D. asper* shoots, the species that the Japanese had expressed a preference for during the last market investigation. The sixth carton was packed with both *D. latiflorus* and *B. oldhamii*.

The shoots were inspected by AQIS, given phytosanitary clearance and dispatched from Brisbane airport on the 3rd of February. The shoots arrived in Japan on the 4th and were passed through Japanese customs and couriered by the exporter’s contacts to each of the stakeholders with whom meetings were to be held. The mixed sample along with one box of *D. asper* were sent to the Queensland Department of State Development (DSD) office in Tokyo; the rest were sent directly to importers and wholesalers in Tokyo, Osaka and Fukuoka. They were asked to store the shoots under refrigerated conditions until meetings during the following week.

From Sunday the 7th through to Saturday the 17th of February 2001 the second market investigation trip to Japan was undertaken. The ACBC representative who had been on the first trip once again accompanied the research scholar as the group’s representative. Meetings were held with the wholesalers and importers who had received our first visit positively. These included:
• a wholesaler in Tokyo who claimed that he would be happy to receive some Kangaroo Bamboo for trial marketing if it was supplied through his importer.

• a large importer who supplied produce to the Tokyo markets. They asked for a further sample to be sent so that they could send it to wholesalers and restaurants for assessment. They felt that restaurants appeared to be the most suitable target for the Australian product. A follow up sample was dispatched within a week of our return.

• a second wholesaler and his importer gave another positive response to the *D. asper* shoots. The importer requested that we supply a small sample shipment of 100 cartons at five kilograms each, 30 of which would go to the wholesaler who was at the meeting and the remaining 70 would be sold through other wholesale contacts. The trial would be initiated by the ACBC setting a minimum price that the importer would guarantee. The shoots would be sold at the highest price available and from which a commission of five percent would be deducted. It was agreed that the product should be available in early December of the 2001-2002 season

• a meeting in Osaka with a large wholesaler who identified that promotion would be the deciding factor as to whether Kangaroo Bamboo shoots would be a success in the local market. He offered to distribute samples around the markets and suggested that we provide two 10 kilogram samples, four weeks apart, at the beginning of the 2001-2002 season. He refused to reveal a preferred importer

• a meeting with an importer in Fukuoka who had established a lucrative trade in shoots by establishing buying companies in China and two processing factories in Japan, one in Osaka and the other in Fukuoka. Some statements and attitudes were confusing and inconsistent. On the one hand it would be difficult to sell our product against the Chinese imported shoots. On the other hand they stated that it was essential that we appoint them as our agent as they were the biggest and best, and they would sell Kangaroo Bamboo on consignment.

While we were in Osaka the wholesaler also assisted in organising an informal taste testing session in the Osaka wholesale markets to compare Kangaroo Bamboo shoots with the domestically produced Moso shoots. The quality of Kangaroo Bamboo was praised as very high “but different”. Kangaroo Bamboo shoots were assessed as sweeter, slightly softer in texture, and slightly more fibrous than Moso.

The results of this second trip appeared very positive and on return a second sample was sent to the importer in Tokyo.

**ACBC annual general meeting**

The ACBC held its AGM on the 23rd of February 2001. A new board was elected with several of the members of the previous year’s board continuing, including the president. A briefing on the second trip to Japan was presented, highlighting the progress of the ACBC in developing domestic markets and progressing the issues raised in workshop two. Members were again requested to assist in addressing the recommendations from the action groups at the second workshop. Several recommendations made at the workshop had not been diligently followed up and more assistance was required to develop promotional materials. While some members were working to promote bamboo in their local area, a coordinated approach was essential. This required a domestic brand name to be urgently selected and a logo and labels had to be available prior to next season. Improved communication of marketing results was absolutely essential and growers needed to voluntarily supply details of their market interactions over the season.

The members formed a promotions committee to address the above issues. The committee would consist of five members and would report regularly to the board through the board representative elected to be part of the committee.

A member suggested the formation of a committee to investigate uses and markets for bamboo timber. This was one of the 16 goals established at the earlier workshops. Significant volumes of timber would not yet be available, but the suggestion highlighted that members were looking at wider markets for products. A committee of two members was elected.
Post 2000–2001 season activities

Japan trial marketing negotiations

The responses of the importers and wholesalers visited in Japan were discussed and the ACBC recognised there was limited funding for the development of export markets and Japan would be an expensive market to operate in. For these reasons the board decided to concentrate on the developing the Tokyo market before extending into the markets of southern Japan. The supply chain management based export marketing system that the group was developing was based on the development of committed relationships between supply chain partners. It was recommended that the ACBC should choose only one of the two Tokyo importers.

Importer ‘A’ had offered to pay for 100, five kilogram boxes next season and was keen to promote Kangaroo Bamboo. Importer ‘B’ wished to promote Kangaroo Bamboo to the high class restaurant trade, but only offered to deal on a consignment basis. It was decided that ACBC should wait for feedback from Importer ‘B’ before making a final choice of import agent.

On the 7th of March 2000 a report was received from Importer ‘B’. The shoots were once again well received as the importer had supplied shoots to wholesalers who dealt with high class restaurants in the Tokyo area. One of the wholesalers had asked an expert for comment. The expert claimed that D. asper was a bamboo called “Bokutake”. He pointed out that in the past a Japanese company had failed to develop an import market for this variety. He also felt that the shoots had several negative characteristics. They were:

- watery
- excessively bitter in flavour, and
- there were no internode holes in the shoot flesh such as those found in Moso.

These comments seemed to contradict our findings from the Osaka taste trials and the feedback from those interviewed in Japan.

The importer advised that if Kangaroo Bamboo could be supplied from September to October when no bamboo shoots were available in Japan, the product would sell well. The Australian season was from November through to May and could not be brought forward to September without changes to plantation management practices and planting of alternative species. The ACBC therefore needed to look at a different market within Japan for Kangaroo Bamboo.

The board was reminded that using one importer was necessary as the supply chain system that was being implemented advocated the development of close relationships based on mutual commitment. Importer ‘A’s’ offer to guarantee a minimum price on the first trial shipment was seen as a willingness to share risk and a sign of the importer’s willingness to commit to a supply relationship. While Importer ‘B’ was still willing to deal with us even after the negative results from the second sample, he was only willing to work on consignment basis. A decision was made to pursue market development through Importer ‘A’.

The researcher was requested to determine the minimum price that should be set for the trial shipment. Growers were contacted to determine an indicative cost of production, freight forwarders were asked for quotes on transportation and the impacts of taxes and other charges on the cost for a 500 kilogram sample landed in Tokyo’s Narita Airport were calculated. A farm gate price of approximately A$2.50 per kilogram was required to cover the average grower’s expenses and a further A$3 to A$4 per kilogram to cover other costs. It was recommended to the ACBC that a minimum price of between A$5 and A$6 was required in order to break even on the shipment.

Experiences in trying to obtain the small trial shipment samples indicated that the present immaturity of plantations made it unlikely that growers could supply the requested 500 kilogram of fresh shoots. If all the growers with sufficiently mature plantations could contribute, the total harvest was estimated to approach 500 kilograms per week for the coming season. It was likely that only 50 to 60 percent of all shoots harvested would reach export quality standards so it was therefore not possible to send a single shipment of 500 kilograms. In May of 2001 the board was advised to go ahead, but they would
have to supply total quantity as a number of smaller shipments over a longer period. Based on production and transport costs the minimum price should be 500 to 600 yen per kilogram.

**Season 2000-2001 performance**

Over the 2000-2001 season a number of ACBC members sold their bamboo shoots through the agents shortlisted by the ACBC in the Sydney, Melbourne and Brisbane markets. These growers sold shoots under their own name using the ACBC recommended postharvest handling and packaging systems.

The growers who sent shoots to the domestic market forwarded a total of 8563 kilogram of shoots to seven different agents, three in Sydney, three in Melbourne and one in Brisbane. This volume fell short of the 11,000 kg forecasted in the pre season survey; however, if other growers who had indicated that they would sell shoots in this season had been either willing or able to market shoots, the total quantity would have exceeded the original estimate of 11 tonnes.

Despite the predicted shortfall in product the agents confirmed there was as a glut of product in early January. This glut resulted in a reduction in the price paid for shoots, not an unusual situation in a horticultural market.

Figure 4.1 shows the weekly volumes and the average weekly price achieved over the 24 weeks of the 2000-2001 season.

![ACBC Weekly Wholesale Price and Throughput Data for 2000-2001 Season.](image)

**Figure 4.1** Average Price and Volume of Shoots Sold by ACBC Members in the 2000-2001 Season.

The data in Figure 4.1 clearly demonstrates the inverse relationship between price and volume, as would be expected. Of particular interest to growers was the reduction in trade in fruit and vegetables over the Christmas/New Year period and traditional holidays such as Chinese New Year. This change in consumption habits in line with traditional celebrations was particularly important because market information received from wholesalers and retailers indicated that consumers of Asian descent constituted the majority of the ACBC’s domestic market.

The average price per kilogram (return to grower net of selling costs) over the entire 2000-2001 season was A$3.01. The highest price received during the season was A$6 per kilogram, but sustained high prices varied from A$3.50 to A$4.00 per kilogram. The lowest price was A$0, for a number of boxes unsold over the Christmas period. Typical low prices were around A$ 2.00 per kilogram.
The small number of growers sending shoots to the markets meant that not all agents shortlisted in each of the markets had product forwarded to them. As a result the group only had feedback on the market performance of seven of the thirteen agents shortlisted. Feedback supplied by growers concentrated on the volume of shoots sold and price obtained. The growers claimed that none of the agents had been forthcoming with constructive advice or had responded to their queries with reassurances that their product was good.

**Telephone survey of domestic agents**

In late May 2001 a survey was conducted of the domestic market agents that ACBC growers had used in the 2000-2001 season because the information generated from grower feedback did not provide a comprehensive picture of their performance. This survey was designed to reveal:

- their impressions of bamboo shoots and their expectations for the future of bamboo shoots
- their impressions of the quality of bamboo shoots, including packaging specifications
- whether they would be interested in discussions relating to the prospect of sole agency over ACBC product in the future.

All but one agent was happy to respond. They all believed that while the quality of shoots in the 2000–2001 season was acceptable, a much higher standard was possible. A large number of different growers were sending shoots of varying quality to both the Sydney and Melbourne wholesale markets and some quality and presentation standards were needed.

The agents supplied information on preferred packaging and handling procedures. They believed that growers needed to work to standardize quality and packaging and to develop a marketing system. Despite this all of them were interested in working with the members of the ACBC in the next season.

The results from this survey were combined with a summary of the growers’ 2000-2001 season performance and copies distributed to board members and the growers who had contributed. This gave growers an opportunity to compare agents’ performances before a decision was made to appoint a sole agent for ACBC shoots in the next season.

**Retirement of ACBC President**

At a board meeting in June 2001 the president stood down because health issues were preventing him from being able to put in the time and effort required to fulfil his duties. While he could not continue in the role of president, he felt that he could still contribute to the ACBC and expressed a wish to continue as a board member. It was determined that the retiring president would continue in the role of research officer.

The board asked that a letter be drafted to the Japanese importer explaining that the ACBC wanted to reduce the size of the proposed shipment to 250 kilogram and proposing a price of 500 yen per kilogram. The board realised that the development of a Japanese market was a long term project and likely to take several years to achieve. The researcher was asked to continue helping to develop this market and to look into other potential markets that might be easier to access. The retired president suggested that the ACBC should look into value added markets and an approach was to be made to the Queensland Department of Primary Industries, Centre for Food Technology (QDPI CFT) to seek assistance.

Other issues covered at the June 2001 board meeting included:

- A promotions manager was appointed.
- The appointment of a marketing coordinator was deferred until position specifications and a responsibilities statement had been drafted.
- The export and domestic brand names, logos and trademarks were registered.
Table 4.5 provides a summary of the activities undertaken during season two, showing the time frame of each activity.

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<th>Activity</th>
<th>Timeline</th>
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<td>May</td>
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<td>Cyanide problem</td>
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<td>Japan market analysis</td>
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<td>Novel foods legislation</td>
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<td>Workshop one</td>
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<td>Export brand name</td>
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<td>Trip 1 to Japan</td>
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<td>Workshop two</td>
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<td>Drafting of quality manual</td>
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<td>Postharvest trials</td>
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<td>Sydney market visit</td>
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<td>Brisbane market visit</td>
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<td>Postharvest quality field day</td>
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<td>Contact Australian exporter</td>
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<td>Board problems</td>
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<td>Trip 2 to Japan</td>
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<td>ACBC AGM</td>
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<td>Japan shipment negotiations</td>
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<td>Domestic agent phone survey</td>
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**Lessons learnt from season two**

Season two resulted in the heaviest task load not only for the group but also for the researcher, requiring more time and involvement in ACBC activities than either of the other two seasonal periods. This season was divided into two parts, with the first part largely devoted to the development of an understanding within the ACBC as to what its members wanted to achieve, how they would achieve their objectives and particularly the development of programs that would enhance members’ contributions to the development of an effective marketing group. This first part of the season required the group to reflect on its achievements prior to this season (reflective observation) in order to conceptualise and develop theories and concepts (abstract conceptualisation) that could be used to formulate action plans (active programming) which would introduce the group to the second part of the season. This part was task related requiring members to be actively involved and it was designed to achieve the group’s goals (concrete experiences).

The ACBC advanced swiftly in this season and identified early the need to develop a quality branded product while increasing the available quantity of shoots by addressing the group’s production capabilities. The season achieved five important milestones in the ACBC’s development, these being: the group setting its goals and identifying the means by which it wished to achieve them the emergence of commitment to the ideals of the group by a committed core of members who also represented the majority of the ACBC
- the development of postharvest handling procedures and quality standards based on a detailed understanding of the needs and wants of consumers
- the identification at an early stage of the need to develop an export market
- the identification of an exporter willing to aid the ACBC in its market development efforts.
Six significant lessons were learnt during this season. Perhaps the most important was the need for growers to become more aware of the operational details of production, postharvest treatments and the different approaches required to marketing in the export and domestic markets. The first two workshops during this season provided an interactive forum to identify the issues the group must focus on and how it could proceed to achieve its goals and individuals’ needs. This was then followed by several concrete experiences during the season when growers sold shoots domestically and when they forwarded samples to the Japanese market. The processes of sending shoots to markets using the ACBC’s postharvest, packing, and grading systems significantly assisted growers to develop an understanding of what processes individuals would be required to undertake in developing markets. This provided opportunities to understand the new standards developed by this research and how these requirements would impact on everyday business activities of the individual grower. The adoption and understanding of the new standards by growers who had participated in this first season ensured they were able to make a sound and reasoned judgment on whether, as a grower, they were prepared to make the initial efforts required and to lead by example to ensure the continued development of their industry.

The second lesson was that the group must learn to respond to signals from consumers. When consumers indicate a particular specification, then, as a group, producers must address their ability to meet consumers’ needs. It was evident that there was no future pushing unwanted products into unwilling markets. During the season several growers who produced shoots from inferior species were disappointed at their inability to participate in export market development, but this was one of the realities of dealing in a knowledgeable market such as Japan. The growers had to accept that they would play a limited role in the Japanese market and therefore must look to other markets to determine if a particular species would be received more favourably elsewhere.

Two Japanese importers advised the ACBC that if it should supply shoots in September, no matter what the quality, they would be accepted because shoots are not normally available at this time of year. The group failed to act on this invitation to explore the possibility of supplying this window of opportunity because it involved growing monopodial species, the only ones that could fill the gap. Growers learned that the process of market development using the market itself to assist in determining specifications for product is a test of their willingness to participate within the limits set by the market.

The third lesson of season two was the realisation that some group members could be an asset and others at times could be a liability. Several group members appeared to be happy to sit in the background and reap the benefits of the bulk of the group’s work while making little direct contribution. This became a point of contention amongst growers and several of the group’s “fence sitters” who were not actively participating or contributing except to criticise, appeared to be marginalised by the majority of the group. Several of the “fence sitters” apparently along for a “free ride” left the group, and this was considered a positive by members who felt that by allowing these fence sitters along for a free ride the group was being taken advantage of.

Of greater concern was the exit of one of the more active participants, just prior to the second workshop. Several reasons were proffered for his leaving including his perception that the ACBC’s postharvest and harvesting requirements were unrealistic. Personal differences with group members were also blamed for the departure. Although disappointing at the time it was recognised later in the season that the exit of this individual would not impact significantly on the group’s continuing development and that personal and philosophical differences may have resulted in even more problems if the individual had remained.

Lesson three of this season led to the realisation by group members that shareholders in effect volunteered to join the ACBC. As such the ACBC may experience difficulty ensuring its members volunteered the time and effort required to ensure its long term success. If the ACBC needed to run its affairs as a business it should therefore consider remunerating/reimbursing individuals for their contributions.
The fourth lesson was the need to develop a production, postharvest and quality system that would lead to the development of a branded product which the group could supply and which would lead to consistent quantities and quality. To develop this system a detailed knowledge of product and quality specifications was essential. Combining the results of the in-market investigation with input from growers provided a realistic starting point from which to develop standards to guarantee a consistent supply of a standard quality.

The fifth lesson was that the continued development of the production, postharvest and quality system depended on accurate and timely feedback from the market. To facilitate this there had to be a reliable mechanism for providing market feedback to the ACBC and growers during the season. This season also highlighted that poor communication of information between domestic market agents and growers had reduced the group’s ability to effectively continue to refine its production, grading and quality system. Agents appeared to be unwilling to supply critical feedback to growers, a situation which sometimes meant that when a grower’s product was of an unsatisfactory standard or type they were not informed and would continue to dispatch substandard product often resulting in continued low prices.

The sixth lesson related to the group’s goals and direction. During the active programming phase of this season a concerted effort was necessary to ensure the group remained focused on its medium and long term goals. During season two the group tended to focus on immediate results from the market which subsequently raised concerns over the smaller than anticipated domestic market, lower market returns and the difficulty for north Queensland and Northern Territory growers in accessing available markets. While these were important immediate concerns that had to be addressed, a change in the group’s focus to address these issues meant that longer term goals would suffer.

The lack of focus on the medium and long term goals of the group was reflected in the board’s inability to accept criticism of the product from the market. As a result the board discarded the second Tokyo importer based on a single negative report. This narrow focus failed to reflect the consumer orientation that the group was trying to build and may have resulted in the loss of a potential supply chain partner who had shown a very high level of enthusiasm for the ACBC product, Kangaroo Bamboo, irrespective of some initial negative perceptions.

**Relationship development lessons**

In the 2000-2001 season a series of market trials were conducted with samples going to defined prime targets in both the domestic and export markets, thus affording the opportunity of relationship building within the group and along the supply chain.

**Supply chain relationships**

The development of relationships along the supply chain was in its early stages during this season. Relationships were developed with stakeholders in both the domestic and export markets. The partners in these relationships were identified through the existing contacts of the ACBC’s members, through the contacts of the researcher, and through market investigations to identify prospective partners.

The ACBC made contact with a number of domestic market agents and representatives visited markets in Sydney, Melbourne and Brisbane. Past commercial experience formed the basis of initial investigations into these potential partners. Regular communication between the agents and growers was essential to ensure agents were aware of the ACBC and allowed the group to gather information on agent performance, which would assist in partner selection during the next season. Methods including phone interviews, performance evaluations and meetings between ACBC representatives and representatives of potential partners were all used as means of familiarising the ACBC with these parties and gathering information on performance and goals. It was hoped that over time this initial contact would facilitate the development of trust.
The information generated during this season would be used to determine which potential domestic market partners the ACBC would approach with the intention of discussing the development of business relationships during the next season.

The export market initiative resulted in a number of importers being approached in Japan. This action was the first of a series aimed to move relationships through the stages of partner selection, defining purpose, boundary definition and on to the fourth stage of creating relationship value.

**Group relationships**

Workshops and other activities early in the season helped to identify those growers who would form the ACBC’s core group. As the season progressed, coalitions between group members formed and conflict developed over leadership and ACBC authority. The group had to deal with internal conflict as some major and several minor decisions drew opposing opinions from members. Tension among group members characterised many of the group interactions. The group struggled but managed to address these conflicts and in doing so improved its cohesiveness and sense of responsibility. The group made important decisions on issues such as the export branding, but at times exhibited an inability to address simple issues and concerns. For example, they could not choose a domestic brand name.

Group members slowly moved from a situation where they were more concerned with testing each other’s input to one where they were working more co-operatively to solve problems. Members clarified and further elaborated their goals during workshop two. Attention started to shift to obstacles that were in the way of achieving the group’s goals and group members began to understand one another’s motivations and abilities. Individuals appeared to make an effort to achieve group goals while still satisfying their own business goals. Strong leadership by the board and the emergence of commitment to the group characterised this period of season two.

Towards the end of the season the core members of the ACBC came together as a coordinated, cohesive group and the number of disagreements and conflicts reduced dramatically. Leadership roles were shared, with some board members accepting tasks related to leadership roles while others took on responsibilities for relationship development and group maintenance. Social elements were introduced to ACBC functions and face to face meetings and interaction encouraged development of interpersonal relationships within the group. The level of trust increased as interpersonal relationships among group members improved. The increasing maturity of the group saw a recognition of limitations by acknowledging that some issues such as the novel foods standards were too difficult to address at this stage. These issues could be set aside and addressed at a later stage in the group’s development.

The constructs of group leadership, strategy, commitment and cohesion were all targeted through the intervention process in this season. The ACBC board took on a leadership role and started working with group members to address issues of concern. The group members were brought together and workshops were held to determine what the members of the ACBC wanted to achieve through their membership of the group and to take initial actions to address these issues. A plan of action was then developed through discussions and development of activities that would achieve the goals and objectives highlighted in the lists. A process of increasing awareness of how the group operated, how it needed to operate in order to be competitive and how other supply chain members might perceive the group helped to develop group strategy, commitment and cohesion.

The development of these elements was influenced by communication of accurate and relevant information to the members of the ACBC. As a result, the perceptions and expectations of group members were oriented towards the importance of relationships that would enhance the performance of the group. The use of a relevant benchmark in the form of the Australian persimmon industry also aided in the development of these constructs; that is, the persimmon industry served as an example of what could be achieved and how to achieve it.

Group members became aware of the importance of a consumer orientation and market research continued to explore what the market wanted and provide feedback to ACBC members. The finance
action group established at workshop two addressed the issue of capital in an attempt to develop a sound financial base for the continuing development of the ACBC. The development of the ACBC over this season was swift and a more mature group was evident by late in the season.

**Consumer orientation lessons**

The development of a consumer orientation can be assessed by reference to the marketing orientation matrix. During season two, information was gathered or decisions were made that affected the following cells of the matrix:

- **Production/quality interaction and production/quantity interactions**
  During season two there was extensive discussion on production issues and some basic guidelines for plantation management were developed. This action effectively continued to address the issues associated with the production/quality interaction of the matrix. The member survey conducted during season one generated information utilised in season two to address the issues associated with the production/quantity interaction of the matrix. This information and the experience of the group members over the second season helped the group to develop an understanding of their production capabilities.

- **Production/time interaction**
  During season two, market research in Japan revealed that the market for shoots was strongly seasonal and that shoots were in short supply from November to March, a time that coincides with the Australian season. However, importers identified the period prior to our season in September and October as the optimal time to supply shoots. With certain species Australian growers could supply during this period. Crop manipulation practices that could extend the season to cater to this peak demand were also identified during the Japan market research and during a grower’s visit to Thailand. This information was a key first step in addressing the issues relating to the production/time interaction of the matrix.

- **Production/price interaction**
  Information on costs of labour, irrigation, management and material inputs was gathered and a basic cost of production was calculated during season two. This costing addressed issues associated with the production/price interaction of the matrix.

- **Postharvest/quality interactions and postharvest/quantity interactions**
  In season two market investigations in Japan followed a similar process to those used in Taiwan during season one. The investigations aimed to determine the quality characteristics the market required. The information from market investigations, together with grower input, were used to develop a packhouse quality assurance manual based on HACCP principles. This was the first stage in developing a quality assurance system. The development of this manual addressed both postharvest/quality and postharvest/quantity related issues by incorporating harvesting guidelines and grading and packing specifications.

- **Postharvest/price interactions**
  Information on cost of labour and materials during postharvest treatment was gathered and a basic postharvest costing was completed. The costing addressed the issues associated with the postharvest/price interaction of the matrix.

- **Marketing/quality, marketing/quantity, marketing/time and marketing/price interactions**
  Japanese and domestic market investigations helped to identify market needs in relation to quality, quantity, timing and price. Fees, commissions, tariffs, duties, phytosanitary requirements, political and physical barriers that may prevent ACBC product being sold in the target market were assessed. The opportunity presented by these markets was analysed as a function of the size of the market, the price paid for shoots in the market, the cost of getting shoots to the market, product characteristics in the market, and who were potential supply chain partners and who were competitors. During market visits desirable product characteristics were identified. The quality criteria used in the early development of the quality assurance system was based on feedback from these markets and endeavoured to match product as closely as possible to the attributes identified in the market. Promotional activities were undertaken in the domestic market in an effort to inform consumers and influence their perceptions of the ACBC’s product.
In season two the ACBC continued to address cells of the matrix that had started to be addressed in season one. It also addressed several cells that had not been addressed up until this point. Lesson two of this season strongly indicated that the ACBC was beginning to recognise the importance of a consumer orientation, and of how such an orientation could be achieved.

**Information and communication lessons**

The information gathered over this season highlighted the importance of accurate information by disproving much of the industry hype that had surrounded early development. Growers realised that much of the early information was not accurate and that domestic market potential and potential early yield projections had been overstated. In addition growers had been misinformed about some aspects of plantation management.

Much of the second season was spent addressing the ACBC’s information needs identified in season one. Preharvest information including basic plantation management was generated and discussed during workshop two and a recommendation was made that a basic manual detailing growing practices be produced, but this was yet to occur. Postharvest information was generated through a series of trials and a preliminary set of harvest, grading and packing guidelines was developed and communicated to growers at workshop two. Product specifications were developed and the first steps taken in the development of a quality system. Information on the Japanese and domestic markets was gathered and disseminated to growers with information starting to flowing two ways from the market to growers and from growers to the markets.

The communication action group established at workshop two identified the need for the ACBC to develop an effective communications infrastructure among growers, the ACBC and supply chain partners. The group made a number of recommendations, the majority of which were acted upon, the exceptions being regular communication of market information among growers during the season and the sending of this information so that it could be collated and analysed, and the development of a web site on which market information and production updates could be posted, incorporating a chat room or bulletin board for members.

The face to face interactions at workshops and meetings in addition to regular newsletters served as the main means of communication between the ACBC board and members. Information from the project was still disseminated principally through the president to the board and from there to the membership. Complaints that members who were geographically removed from northern New South Wales and south east Queensland were being ignored led to the formation of regional groups. As a result the board decided that it needed to have representatives of the different grower regions. It was decided that the board must always contain at least two members from each region so that members could communicate with their local board members who would pass on comments and information to the rest of the board.

The ACBC identified the need to appoint a marketing manager who could facilitate communication along the supply chain. It was recommended that two individuals be appointed, one an export market coordinator and the other the marketing manager. These two individuals would work closely together to facilitate distribution of product, and appointment of these positions would be made as soon as possible.

Growers who sent shoots to the market this season sent to a select group of agents whom the ACBC had identified. As in season one these growers communicated directly with the agents selling their product but the information was also communicated to the ACBC. In general they felt that the flow of information from agents was not satisfactory. Information flow was primarily one way, with growers still getting limited feedback from agents about their product’s performance. Thus the communication between agents and growers was an issue that needed further attention in the next season.

Export communications channels started to develop during season two. Face to face meetings during the market investigation trips were followed up by email discussions and telephone conversations.
visit by a representative of the Queensland Government Department of State Development Tokyo Office (DSD) to the Japanese contacts on behalf of the ACBC was also conducted. Communication with the Japanese importer from the board was through one of three paths: by email, the Australian exporter, or the DSD. While effective at this stage the ACBC was aiming for a communication system where the exporter was brought into the ACBC as a board member with access to the ACBC’s commercial information. In return for the group’s exclusive business the exporter was expected to act as the ACBC’s export market coordinator, which required him to work closely with the group’s marketing manager to supply export markets. The exporter would sell the ACBC’s product to approved importers, wholesalers and retailers, and feedback from the market would be provided to the group. In addition, the growers would be encouraged to visit the market to gather information on the performance of their product.

At the end of season two there was one more season left with the group under this research project. At this time it was important that the research scholar start to scale back involvement by encouraging the members to continue to undertake more of the expanding workload.

A major criticism of this season was the fact that the action groups which were formed at workshop two failed to live up to expectations. Rather than continuing to address issues arising from their recommendations, the groups made no contribution beyond the reports following up workshop two. Despite this, the general consensus appeared to be that the group was moving along at a hectic pace and that there was a range of issues that needed to be resolved before the beginning of the next season. These included:

- continuing negotiation for shipment to Japan
- finalising and publishing the packhouse quality manual
- further development of quality standards and training of growers to implement them
- the development of communication channels along the supply chain to encourage better feedback
- the appointment of a marketing manager to facilitate communication in the domestic marketing chain
- addressing brand image for the domestic market
- exploring value added products
- promotion in the domestic market, including the development of promotions material
- development of labels and other packing materials.

**Season three: 2001-2002**

**Pre season activities 2001-2002**

The retirement of the ACBC president at the end of season two impacted significantly on the group’s activities. The new board members found it difficult to immediately take over tasks that the retiring president had carried out and as the 2001-2002 season was swiftly approaching the retiring president spent substantial time informing the board of issues that should be addressed. The issue of poor record keeping by previous office holders became a point of frequent discussion and with many of the issues outstanding from the previous season still unresolved, the lack of records made the board’s job even more difficult.

**Japan trial shipment negotiations 1**

During season two a letter was drafted to the Japanese importer explaining that the ACBC wished to reduce the size of the proposed trial shipment from the originally discussed 500 kilograms to 250 kilograms. The letter also requested that the minimum price of Kangaroo Bamboo be set at 500 yen per kilogram for the trial shipment. This letter was drafted and after substantial revision was sent to the exporter in July 2001.

The importer’s reply asked for advice regarding packing specifications to be used and explained that 500 yen was too high, particularly as Japanese consumers were not familiar with Kangaroo Bamboo.
The ACBC considered 500 yen per kilogram was the minimum price required to cover production costs; however, at this price the importer was unsure of his ability to sell the product.

The importer advised he would not be available until August and that he would appreciate our packing specifications at this time. He also implied that he would like the ACBC to reconsider the minimum price they were requesting. The ACBC president, the researcher and the grower who had been on the Japan trips were asked to formulate a reply.

**Workshop three**

On the 19th of August the ACBC board organised a meeting at the Department of Primary Industries, Centre for Food Technology (CFT) in Brisbane. The meeting was to discuss potential value adding options for bamboo shoots with CFT staff. This meeting provided a good opportunity to hold a workshop to finalise the previous season’s activities and to consider the group’s activities for the coming season. The meeting with CFT was scheduled for the afternoon of the 19th and the workshop was to be held in the morning.

Board members, promotions committee members and those members who contributed shoot sales information for the 2000-2001 season were invited to the workshop as it was felt that they could make valuable contributions to the discussions. A summary of the previous season’s performance and a copy of the results of the telephone survey were forwarded to all participants a week prior to the meeting to ensure sufficient time for comment. The major items on the agenda for the meeting are discussed below.

**Item one: The role of the domestic marketing manager**

Prior to workshop three the board was provided with a duty statement for this position that had been called marketing manager. The duty statement was discussed and accepted with the understanding that it would undergo minor revision by the board before volunteers were asked to fill the position. The board decided to ask for a volunteer who would be appointed at the next AGM to take on this role. Until this time the researcher was asked to fill the role of the marketing manager.

**Item two: The selection of domestic market agents**

The performance of the domestic market agents in each of the markets was discussed. Performance was rated on the volume of product dealt with, the prices achieved and the quality of feedback. The results of the telephone survey were also discussed. The consensus from these discussions was that two agents had performed well in Sydney and two others in Melbourne. However, there was not yet enough information to make a decision on which agent the group might like to deal with exclusively. Furthermore, the results of the domestic market investigations had indicated that the ACBC might be better served by having more than one agent in each market.

The board decided to use the feedback from the market to determine the best approach. If they felt an agent might be dishonest they would retain the right to introduce a second agent for ACBC product. The board decided that for the coming season four agents, two in Sydney and two in Melbourne, would be approached by the group for discussions about being the ACBC’s agents in their respective markets. The information generated from agent performance over the 2001-2002 season could then be used to determine if the ACBC would deal with two agents in each market or would restrict itself to a single agent in each market. The board requested that the researcher accompany an ACBC member on a visit to the Sydney and Melbourne markets to discuss the group’s intentions with these agents.

**Item three: Postharvest handling and packaging specifications**

A complete draft of the packhouse quality manual was presented for consideration by the board. The manual was developed using hazard analysis of critical control point (HACCP) principles and detailed the requirements for the ACBC export product. The manual had been designed to incorporate photographs to aid colour grading and the identification of product defects. These were yet to be developed and growers needed a means of seeing the defects so that they would recognise them. A lack of experience and differing interpretations of the written descriptions meant that the implementation of the standards could be haphazard and inconsistent. It was clear that growers would
require training in the implementation of the quality system so it was proposed that a series of workshops be presented.

The researcher was asked to distribute copies of the manual to the board, the quality action group from workshop two and the promotions committee members for further comment. The manual was sent on the 22nd of August 2001 accompanied by a request for a swift response so that workshops introducing members to the quality system and the specifications in the manual could be organised during the first weeks of the season in late November and early December.

Item four: Brand name selection
The issue of the ACBC’s domestic brand name was discussed. Members expressed a preference to use the export name Kangaroo Bamboo for both markets. Based on the experience of the persimmon industry it was decided that it was important that the group differentiate their export and domestic products to prevent practices such as sending of domestic grade product to export markets.

A list of more than 40 names developed by the domestic market action group was considered before and during the workshop and a shortlist of names was generated for further review. The names Cockatoo Bamboo, Bamboo Grove, Bambuko, Boomerang Bamboo and Panda’s Choice were the preferred options. Shortly after the workshop the options were narrowed down to just the first three. Most board members felt that Bamboo Grove was the best name but all three names were to be presented to members for comment.

Item five: Labels and labelling
Labels for the domestic market needed to be produced; however, the prior selection of a brand name was necessary. A draft label showing the details that would need to be included was presented to the board, which agreed that printed colour labels presented the most professional image and would therefore be used in their first season. The board requested a member obtain quotes to produce different labels while they further considered the draft label.

Item six: ACBC levy
The finance action group from workshop two had recommended that the ACBC introduce a growers’ levy to finance future activity. The board felt that it had two options for the collection of the levy: a set levy collected by the agents appointed by the ACBC and paid direct to the ACBC, or a levy on labels, where the ACBC would purchase labels for use by group members and sell them to growers with a per label fee applied.

This issue had been discussed at the previous AGM and there was general agreement that such a levy would be implemented; however, the specific details had not been determined. The board felt that the details of the levy could only be introduced after a vote at the next AGM. The board decided to have members vote on the application of a 10 cents per kilogram levy on product sold through the ACBC, to be collected by agents in the domestic market and by importers in the export market.

Item seven: Promotion
The promotions committee that had been appointed at the AGM had been busy implementing the recommendation resulting from workshop two. Members of the committee had contacted a variety of media outlets and during April 2001 had supplied shoot samples to a number of magazines and chefs in Sydney. A member had also travelled to Sydney to meet with these chefs and magazine writers to promote bamboo shoots. The committee had also developed and was circulating a simple pamphlet titled “Cooking with Bamboo Shoots”.

Item eight: Poor record keeping
The membership of the ACBC had reached 84 by this time and poor record keeping by previous office holders meant that the ACBC’s database did not contain information relating to what members had planted and the age of plantations. This information was considered critical because it had been revealed in the last season that the supply of D. asper for the trial shipment to Japan may be difficult to obtain because plantations were still too immature to get large enough quantities to supply 500
kilograms of *D. asper* shoots in one week. The board needed to confirm if the analysis of the situation was accurate.

When appointed, one of the roles of the marketing manager would be to determine probable weekly volumes available and inform agents of the amount of product that would be available at the beginning of each week. Without accurate records, estimations of yield were not possible and the role of the marketing manager would be unduly complicated. The board decided that a member survey to answer these questions would need to be conducted before the beginning of the 2001-2002 season.

A meeting with representatives of the CFT was held after the workshop. This meeting resulted in CFT agreeing to supply the ACBC with a proposal detailing how it would approach the development of value added products, what types of products it would endeavour to develop and the costs associated with this. This proposal was received two weeks after the meeting and detailed the development of a range of products from bamboo shoots. While appearing promising, the proposal was for a lengthy project that would cost in excess of A$43 000. This cost was much too high for the group to consider pursuing this avenue of product development. The board decided to ask growers to individually look at value adding possibilities over the next few seasons and to readdress the issue at a later date.

**Growers survey 2001**

In September all members were sent a survey asking for information on species planted, the number of clumps planted, the age of these clumps, the maturity of clumps measured by the average diameter of culms from the last season, an estimate of shoots per clump in the last year, availability of irrigation, and whether they wished to sell through the ACBC brand in the coming season. The feedback generated was to be put together with the ACBC’s records and the results of the grower survey in season one to give the group a clear understanding of their production potential and to determine if they would be able to generate enough *D. asper* shoots to send a 250 kilogram sample to Japan in December.

Fourteen out of 84 members returned the survey. The 14 who responded were all enthusiastic to sell their product under the ACBC brand name in the coming 2001-2002 season. However, only 9 of these 14 members had *D. asper* planted and only 2 of these 9 were confident of their ability to supply substantial quantities of export quality shoots over the season. It was determined that between these two growers, and by obtaining a small number of shoots from other growers, that the ACBC would be able to guarantee between 200 and 400 kilograms of *D. asper* shoots in a one week period in December of 2001.

**Cyanide revisited**

During season one the board had made the decision to ban the sale of the species *B. balcooa* through the ACBC marketing system. One of the board members was now questioning this decision, maintaining that this species accounted for a substantial proportion of some growers’ plantations, and that shoots from this species had been sold by members under their own names and had been at least as well received as any of the other species. The board member claimed that the group’s concerns over cyanide in this species were largely unfounded.

However, research had credited *B. balcooa* with having a very high cyanide content averaging around 6000ppm and in some cases, particularly with the larger more mature shoots, reaching as high as 8000ppm (Bagchi and Gunguli 1943). Species such as *D. asper*, *B. oldhamii* and *D. latiflorus* all averaged less than 2000ppm. In addition, while the use of preharvest bagging had been shown to reduce the cyanide content of shoots by as much as one-third, the high cyanide content of *B. balcooa* meant that, even with bagging, its cyanide content was still more than double that of the other shoot species being sold through the ACBC. Thus with a species such as *B. balcooa* the possibility of poisoning was three times more likely than for other species. This was the risk that the board had originally decided could be avoided by not selling this species through the ACBC. The board discussed this issue extensively and finally decided to uphold the decision of the board from season one.
**Japan trial shipment negotiations 2**

The Japanese importer wanted the ACBC to set a lower minimum guaranteed price than the 500 yen per kilogram originally suggested. However, the cost estimates available at the time indicated that a farm gate price of approximately A$2.50 per kilogram was required to cover the average grower’s expenses and that transportation and other costs to dispatch the sample to Japan would amount to between A$3 to A$4 per kilogram. The exchange rate at the time was 63.2 yen to one Australian dollar. This required the ACBC to ask for between 348 and 411 yen per kilogram just to cover its costs.

The ACBC asked the Australian exporter for assistance in determining how it would proceed with negotiations for the trial shipment in December. The exporter advised the board that for such a small shipment the ACBC would be freighting shoots at a cost of around A$3.00 per kilogram. Using this approximate freight cost and adding a margin for the cost of transport from farm to the airport and any documentation fees, the board determined that the total cost per kilogram of shoots would be close to A$6 or just under 380 yen per kilogram.

The board was concerned that if the original price was set below cost the ACBC could be put in an untenable position for future price negotiations. The relationship developing with the importer was not yet at a stage were the ACBC felt that they could trust the importer to look after their best interests. The group realised that for this initial shipment they may have no option but to bear a loss, but if there was not sufficient indication of profit potential, they did not believe that many growers would be willing to supply a second shipment. Thus it was important that the group ensured that the importer was clearly aware that the ACBC could not sustain a price below about 450 yen per kilogram.

The ACBC board proposed that for the first shipment the ACBC could accept a price of 435 yen per kilogram but the importer must realise that at this price trade was not sustainable. At the same time they provided the importer with packing information that had been requested in earlier communications. The importer responded with an email stating that these terms sounded “okay” and to please keep him informed.

**Domestic market agent negotiations**

The four domestic market agents selected by the board were contacted after workshop three. All four were happy to accept the board’s offer to be agents for the ACBC’s product in the coming season.

On the 18th and 19th of October a group including an ACBC representative and the researcher travelled to Sydney and Melbourne to meet with these four agents. The purpose of these meetings was to familiarise these agents with the ACBC and to set the operational parameters for the coming season. Each agent was informed that the ACBC would be operating through four agents, two in Sydney and two in Melbourne, and that the ACBC intended to judge their performance to determine if they would continue to deal with those agents in future seasons or move to a sole agency arrangement. The agents expressed appreciation at the group’s openness about its plans for the coming season and all agreed to work with the ACBC to obtain the best possible outcomes. A number of other issues were also addressed at these meetings including:

- Packaging requirements and product grading
- Payment details and ACBC levies
- Communication

The agents agreed to help in any manner they could and stated that they would contact growers when problems arose. They requested a copy of the quality and packing standards so they knew what to look for in ACBC product and they also asked for any promotional material the ACBC could supply.
**Preparation for shoot season**

Over the weeks following workshop three the board’s comments on the quality manual were received. The members who responded highlighted a number of concerns that they had with the manual.

- **Grading**
  The manual proposed size grading as a means of ensuring consistency of appearance within boxes. The standards required growers to grade shoots into categories: small, medium, large and extra large. This requirement was judged unfeasible by some smaller growers who believed that they would have difficulty filling boxes with shoots all in the same size grade.

I advised the growers that the grading criteria were based on objective feedback from detailed interviews with wholesale market agents and Asian retailers and that the agents had emphasised the importance of the appearance of shoots when opening boxes. A haphazard mix of different sized shoots took away from the appearance of the pack and thus its value.

The goal of the size standards was not so much uniformity of weight but uniformity of appearance. Growers who could not make up uniform boxes asked that a mixed shoot grade be included. Consultation with the board led to the decision that shoots larger than 2.5 kilogram and boxes of mixed shoots would not be sold under the ACBC brand in the coming season. Feedback from agents during the season would be used to determine if this decision should be reversed in the future.

- **The manual did not stipulate domestic standards**
  This issue was easily overcome by the production of a document summarising the ACBC’s domestic marketing specifications. The summary outlined the standards for the packhouse manual as they were to be applied to the export market but with three basic exceptions:
  1. The grading standard placed on colour of domestic shoots would not be as strict.
  2. Domestic shoots would not necessarily need to be bagged.
  3. The packaging standards will differ with the domestic product being placed in individual plastic bags and packed into 10 kilogram boxes.

- **The requirements were too complicated for small growers**
  The manual was developed for the export market and had been designed using HACCP principles to ensure that in the future the development of an accredited system using the manual was as simple as possible. Smaller growers felt that they would not have product runs of sufficient size to be able to effectively implement the requirements of the manual, including such processes as sampling procedures. It was quickly realised that the full implementation of the manual would only be possible for large growers and for centralised packing operations.

- **The use of a hydrocooling system incorporating ice was criticised as too expensive for large operators.**
  The hydrocooling system was recommended based on its effectiveness. Refrigeration based cooling had been shown to be comparatively ineffective, taking several days to reduce the core temperature of the product to acceptable levels. With a product where freshness is one of the key quality characteristics it was deemed important that the cooling system be as rapid as possible.

It was agreed that hydrocooling would not be feasible for large plantations and that alternative means of cooling needed to be investigated. The manual was adjusted to allow for the use of any cooling system that growers could demonstrate to the board’s satisfaction would cool as effectively without adverse effects on product quality.
Once the above issues were resolved a two page promotional document for retailers and a summary of packing and grading standards was sent to agents. This was followed by a letter from the ACBC to each of the agents formally acknowledging the arrangements that had been made for the season. The letter also informed the agents of the ACBC’s intention to appoint a member to the position of marketing manager during the season. This person was to maintain regular contact with the agents and ensure that members were kept informed of market requirements and that the agents were kept informed regarding product availability. The agents were asked to try to communicate through email. They were also reminded of their agreement to comment on failure by members to meet the ACBC standards and to collect the group’s levies.

**Domestic brand name**

In early October the board had finalised the domestic brand name as “Bamboo Grove” and asked the secretary to look into having this name registered along with Kangaroo Bamboo. The board started to seek quotes for the development and printing of a Bamboo Grove label and in November a company was commissioned to design a label for the ACBC. In late November the name Bamboo Grove was found to be already registered. This was a major setback for the ACBC and a new brand name was required swiftly. The question of brand name was once again put to the board and due to the need for quick resolution it was suggested that they adopt “Cockatoo Bamboo”. This name was catchy and fitted with the export name. A quick check showed that it was not registered to any other business. A decision to change the brand name to Cockatoo Bamboo was made and the label company was asked to redesign the label in line with the change in brand name.

**Packaging materials**

With the decision on brand name made and the packaging regulations in place, along with the quality specifications, the ACBC needed to have labels printed and distributed to growers. The use of printed sealing tape was suggested by a board member and it was agreed that it may serve to draw attention to Cockatoo Bamboo. The tape was printed and distributed to growers. The agents agreed that the tape was a good idea and helped consumers to identify Cockatoo Bamboo from a distance.

In December 2001 the first print run of Cockatoo Bamboo labels and sealing tape was made available to growers. Shortly after this ACBC growers commenced selling shoots under their domestic brand, Cockatoo Bamboo.

**Japan trial shipment negotiations 3**

In November the ACBC contacted the Japanese importer to finalise arrangements for the upcoming trial shipment. The importer replied through the Queensland Government Department of State Development Office in Tokyo. The reply asked for clarification of the minimum pricing the ACBC wished to set. A reply was sent reiterating the 435 yen minimum price that the ACBC had understood to be agreed on from earlier communications. The importer replied that he had not agreed to set this minimum price and was not prepared to guarantee any minimum price but would only take the ACBC shipment on a consignment basis.

This news shocked the ACBC who had believed that they had an understanding with the Japanese importer. The researcher was asked to investigate this development and help to determine a course of action. It was determined that the cost of sending the shipment would increase as the ACBC would now need to cover all costs incurred in Japan. The cost to send the trial shipment would be in excess of A$2200. If the importer failed to deliver a return, such a loss would be more than the ACBC could afford.

Opinions were sought from the Australian exporter, the Queensland Government Department of State Development and a number of Dr Collins’ industry contacts. The general consensus among them was that the Japanese economy had suffered a major blow in the weeks leading up to November 2001 and that on top of the pre-existing recession in Japan, many importers were wary of investing in products
that they perceived as even a slight risk. Several contacts commented that a similar thing may have happened no matter which importer the ACBC had been working with.

Unfortunately the ACBC could not afford to send a shipment on a consignment basis as failure would leave them in an untenable financial position. Bearing this information in mind it was recommended that the ACBC postpone the trial shipment until economic conditions in Japan were more favourable to market development or until it was in a better economic situation. The Japanese importer was subsequently contacted and informed that due to conditions outside the control of the ACBC they would not be able to proceed with the trial shipment.

**The 2001-2002 bamboo shoot season**

**Quality assurance workshops**

A series of three workshops were held in late November and early December 2001. The workshops were held at growers’ properties. The first was on the 21st of November 2001 in northern New South Wales, the second on the 28th of November 2001 in South-East Queensland and the third on the 8th of December in Atherton, north Queensland.

These workshops were designed to teach ACBC growers how to implement the quality management system using a hands on approach where members with more experience helped those with little or no experience to understand how specifications should be interpreted. The training was divided into three modules each covering a particular area that growers were to master by the end of the module. The modules were divided into three parts, an introduction where the skill that was to be mastered was outlined, background where information needed for the particular skill was presented and finally a practice exercise designed to reinforce learning and check if the grower had mastered the skill. These modules were designed so that the ACBC could add to them and they could be repeated in the future to serve as a refresher for existing growers and introductory training for new growers.

The growers participating in the workshops were enthusiastic, they appreciated the hands on approach and felt that the workshops would result in a higher quality product and because all of the growers had now seen examples of different quality shoots, grading across the brand would be more consistent.

**The drought and NQ problems**

Expected yields were well down this season and growers who had sent shoots in the previous season were concerned that yield had in some cases halved. Many growers had not had substantial rainfall since the 2000-2001 season and levels in dams and water storages were low. The dry weather appeared to be stalling the growth of the bamboos resulting in shoots that were woody and of poor quality. Growers were alerted to this problem and asked to make an effort to ensure that no substandard shoots went to market under the Cockatoo Bamboo name.

Growers in north Queensland were also having problems due to their distance from domestic markets. North Queensland and Northern Territory growers estimated that the cost of packing materials for growers in their area was as much as 15 percent higher than for those in the south and that the transportation costs were also much higher. The larger distance to market also meant that shoots from this area were commonly reaching the domestic markets at higher temperatures, and they were substantially older than shoots from other areas. The board was concerned over this issue but could not find an immediate solution and the problem was left to be addressed at a later date.

**Export market investigations**

After the disappointing failure of the trial shipment to the Japanese market the board requested investigations of other potential export markets. Referral back to the IMS process resulted in Singapore and Hong Kong being identified as promising markets.
Utilising the contacts of the ACBC’s exporter and Dr Collins, contact was made with a second Australian export company familiar with the Singaporean vegetable market. This exporter made contact with importers, wholesalers and retailers in Singapore on the ACBC’s behalf. They reported that the Singaporean market may have potential. One of their representatives would be visiting the market and they asked the ACBC to supply promotional material to accompany this representative. The representative reported that the importers were enthusiastic to receive a sample of our product and that it would be distributed to wholesalers and restaurateurs for comment. The representative identified potential competition in the form of fresh Chinese shoots and processed product from Taiwan, Japan, Thailand and China.

The ACBC supplied shoots from its three main commercial species. These were top loaded on the exporter’s other product and sent to Singapore. The comment received, as a result of the samples, was very positive with the quality of the shoots once again praised. Importers asked for information on the cost of shoots and for more samples to distribute to their customers for comment. A second sample of shoots was sent through the importer along with a costing. The costing was much lower than for Japan because of the reduced cost of sending product to Singapore with the cost of production and transport to market totalling A$4.30 per kilogram.

The response from importers from the second sample was not as positive as the response from the first. They advised the ACBC that the price quoted for Kangaroo Bamboo was much more expensive than the equivalent Chinese product. Furthermore they claimed that a trend towards convenience products meant that the market for fresh shoots was declining. When asked if any of the importers would be interested in receiving a shipment of Kangaroo Bamboo the reply was negative and the exporter subsequently advised us to look to other markets.

The Hong Kong market was investigated by the exporter on the ACBC’s behalf and the response was similar to that in Singapore. The exporter believed that competition from Chinese product would make Hong Kong an even more difficult market than Singapore.

**Board workload**

The workload taken on by the board increased dramatically over the shoot season and a number of issues arose and others re-emerged that the board was required to address. In order to facilitate this, the board met face to face four times over the season and started using regular teleconferences and email as a means of discussing issues and finding solutions. Some of the important issues addressed by the board during the season included:

- The appointment of a domestic marketing manager
- Remuneration of officers
- Financial issues
- Record keeping
- Promotions
- Bulk purchasing of labels, tape and packing materials.
Network development

Over the 2001-2002 season the membership of the ACBC worked hard to develop a network of contacts that could be useful to future market development. The researcher accompanied board members to meetings with:

Queensland Department of Primary Industries (DPI)
Environmental Protection Agency (EPA)
Queensland Department of State Development (DSD) Brisbane office, and
Centre for Food Technology.

Each of these groups was briefed on the ACBC, its role in developing the bamboo industry, and the RIRDC project. They then briefed the ACBC on their capabilities and how they may be able to be of assistance to the ACBC.

I also accompanied the ACBC’s timber committee to meetings with representatives from Hyne and Son, and the Fibre Composites Design and Development group (FCDD). Hyne and Son, a company that deals in a wide range of timber products from design and fabrication through to sale, informed us of the potential of bamboo as a fibre composite material. Most of the discussion centred on the possible utilisation of bamboo timber in manufacture of fibreboard products. The unique fibre strength of bamboo timber was highlighted at the meeting. The representative of Hyne and Son offered to help the ACBC look into possible applications for bamboo fibre, an offer readily accepted. Hyne and Son referred the ACBC to the FCDD a group from the University of Southern Queensland. This group specialised in applications of fibre products and after discussion informed the ACBC that the best market for bamboo timber in Australia would be the artefact market. Based on its cost of production it was deemed unlikely that bamboo timber would be able to compete with other products such as hemp as a source of fibre.

ACBC annual general meeting

The AGM was held on the 8th of March 2002. At this meeting the domestic marketing manager was appointed and a new board elected. A report on the group’s marketing activities during the 2001-2002 season was presented. The lack of administrative procedures was discussed and one of the members was asked to head a committee to look into this issue.

After the meeting an informal growers’ workshop was held to discuss issues of concern. The majority of the time was used to clarify questions about the quality assurance system and to brief growers on some of the most recent refinements to the quality manual. The problem of the cost of freight and the temperatures of transportation between north Queensland and domestic markets in Melbourne and Sydney was discussed. Unfortunately no solution could be identified at the time. A number of growers volunteered to work on this issue and were asked to report back to the board as soon as possible.

Growers were concerned about improving the communication of information and the members were asked to make an effort to have access to email for ease of communication within the group. Growers also suggested that continued effort was needed in export market development and asked that some of the markets outside Asia be investigated. Some growers felt that markets such as the United States and Canada may present better opportunities as problems such as preconceived ideas on quality of species and appearance of shoots may not be as great as those encountered in Asian markets.

Post 2001–2002 season activities

Season 2001-2002 performance

The newly appointed marketing manager requested the ACBC president to write a letter thanking agents for their efforts in this first season of selling Cockatoo Bamboo and introducing him to agents. This was followed shortly after by a visit to the market to meet face to face with agents and discuss the...
past season. The marketing manager and agents discussed the volume of bamboo shoots that moved through the market over the last season (November 2001 – May 2002), they examined fluctuations in demand and supply of shoots over the season and discussed the agent’s impressions of Cockatoo Bamboo in regard to:

- quality compared to other bamboo shoot labels
- consistency of quality
- consistency of freshness
- consistency of size grading, and
- consistency of packing.

The marketing manager developed and sent a questionnaire to the 15 growers who had sent shoots to the market during the 2001-2002 season. Only 9 of these 15 responded but this provided the manager with enough information to develop a picture of the ACBC performance over the 2001-2002 season. The nine growers sent a total of 16 630 kilograms of Cockatoo Bamboo shoots to domestic markets over the 28 weeks of the season at an average price of A$3.94 per kilogram.

The market was yet to start differentiating between the different species of shoots with all three of the major species receiving the same prices. Shoot size influenced price in a more direct way, with growers receiving up to 50 cents per kilogram less for small shoots when a good supply of medium and large shoots was available in the market.

**Workshop four (ACBC Board Workshop)**

Since mid season the researcher had been scaling back involvement with the ACBC. The major task in the last months of the 2001-2002 season was to ensure that growers were informed of the results from the domestic marketing activities, information that would form the basis for the group to reflect on its performance over the season so that planning could begin for the next season.

In the weeks following the appointment of the new board at the AGM a number of issues that needed addressing were highlighted by board members, including: funding, novel foods, administrative issues, the role of committees, and the mission statement and business plan of the ACBC. The board attempted to address these issues but was having difficulty. There was a need to communicate to the board the importance of continuing on the path that had been set and to ensure that they had an understanding of what would be required for the next season.

The board proposed a meeting to address outstanding issues. It was suggested that to facilitate the researcher’s exit from the group and to ensure that the new board had a full understanding of the issues that needed to be addressed, a two day workshop could be organised. The board agreed and a workshop was set for late June. The researcher’s role in the planning of this workshop was limited. The majority of the organisational responsibility was taken on by the executive committee. The workshop was held at The University of Queensland over two days from the 29th to the 30th of June 2002.

The workshop was designed to serve two functions. It was to be a critical review of the past season’s performance and a chance for board members to discuss and resolve outstanding issues in order to plan for the coming season. The board members were therefore involved in an action learning process where they reviewed performance (reflective observation) and developed plans to address issues highlighted in the review process (conceptualisation and programming).

Prior to the workshop, one of the board members suggested that the Queensland Fruit and Vegetable Growers (QFVG) might be able to assist the ACBC in addressing some of the administrative problems the ACBC was facing. The QFVG was contacted and an industry development officer attended the first day of the workshop to tell the board members about the QFVG and how it may be of assistance. As a result of this presentation the board organised to meet with representatives of the QFVG in July 2002 to determine how the two organisations could assist one another. This meeting resulted in the QFVG drafting a proposal detailing what it could do for the ACBC. This proposal was to be reviewed by the board to determine if the ACBC would align itself with the QFVG.
The QFVG presentation was followed by a report from the marketing manager detailing the ACBC market performance over the 2001-2002 season. The agents were all happy with the quality, freshness, packing and grading of product. However, they felt that the ACBC had not yet achieved enough consistency of product between different growers. Of the four agents used by the ACBC over the season only one had failed to perform to the standards that the ACBC had anticipated. The board decided that this agent would not be used in the future. On the advice of the marketing manager the board also decided to have growers send to a different agent to take the place of this agent so that there were still two agents in each market. The performance of the agents would be reviewed again at the end of the next season.

The marketing manager raised a number of issues highlighted by his discussions with the agents. These issues needed to be addressed before the next season and included:

- Inconsistent net weights in boxes
- The need for an on-farm food safety program
- Inconsistent supply to agents and poor information flow between agents and growers.

Finally, the problem of collection of the ACBC levy by agents over the season was addressed. The marketing manager informed the board that the agents had been reluctant to deduct the levy without official authorisation from the ACBC board. The board agreed to draft a letter to send to agents authorising the deduction of the levy and giving information on how the levy was to be paid to the ACBC.

Other issues addressed at the workshop included bamboo shoots as a novel food and organic certification of growers. A board member volunteered to negotiate with the ANZFA to determine how the ACBC could meet its requirements under the novel foods standard with minimal cost to the group. This individual was supplied with all the relevant information on the Act and the ACBC’s past attempts to address the issue. The board put the question of organic certification to the growers. If enough interest was shown the board would look into the matter further.

Substantial time was spent reviewing the ACBC’s business strategy. The board developed a basic mission statement: *The ACBC mission is to provide dynamic leadership through unification, promotion and service to its members to maximise their collective commercial success*. The board also looked at the ACBC’s administrative procedures and developed protocols for executive decisions, reporting, and dissemination of information.

By the end of the workshop the board had achieved a considerable amount of work and had a clear vision of how it would lead the ACBC over the coming season. The board had successfully established the ACBC’s future direction and re-established the group’s goals, a positive step towards the group’s future. Table 4.6 provides a summary of the activities undertaken during season three, showing the time frame of each activity.
### Lessons learnt from season three

A great deal of activity took place during season three, resulting in improvements in a number of areas of the ACBC’s operations. This season was a season of consistent incremental improvements. These were achieved through planning based on critical reflection on the results of the previous season. The ACBC continued to address the goals it had set for itself in workshops one and two and achieved seven important milestones in its development. These were:

1. The ACBC successfully launched its branded domestic product, Cockatoo Bamboo.
2. The demonstration of maturity in decision making processes evidenced an effective and confident approach to the group’s affairs.
3. A more businesslike approach to the running of the ACBC had developed.
4. The quality system was implemented and was positively received in the domestic market.
5. Relationships were established with domestic market agents.
6. At the end of the season a domestic agent who did not perform was removed.
7. A marketing manager was appointed.

Five lessons were learnt over the season. The most important lesson related to the continuing development of the group’s focus and clarification of its vision. As research involvement in the ACBC was reduced, the group started to review its goals and looked towards where the ACBC would go from this point. The board considered how the goals of the ACBC had changed since workshop two and developed a set of goals that reflected the ACBC’s position at the end of the RIRDC project. The ACBC’s goals were to:

- promote the Australian commercial bamboo industry
- facilitate communication and discussion between ACBC members
- continue to learn about markets and bamboo and inform members of developments in the bamboo industry
- continue the development of the ACBC’s quality system and expand it to develop a system for bamboo timber
- gather production information and develop comprehensive production manuals,
- enhance the financial returns for growers, and
- continue research and development.
These goals effectively encompassed the goals set at workshop two while also reflecting the achievements over the past two years. This process served to further develop the group’s focus and clarify its vision for the future. The lesson learnt from this was that the group needed to ensure that it understood its goals in order to maintain a focus for continued development.

The second lesson learnt from season three was the willingness of the board to address complex issues provided they had sufficient background. During season three the ACBC was faced with a large number of complex issues. The departure of the longstanding president at the end of season two and the retirement of several other long serving board members at this time meant that the new board did not have sufficient background to make some of the more complex decisions. The new board members found themselves in a situation where they were being asked to address a multitude of complex issues without the benefit of their predecessors’ knowledge. Early in the season the board displayed a willingness to address these issues, provided that they were supplied with background information and had the benefit of the input of the research team when requested.

As the research scholar’s workload reduced the work required of the board increased substantially. More effort, more information, more experience and increasing self confidence explained the board’s willingness to handle large and more complex issues. Towards the end of the season the board started to take better control of the decision making process and there was no expectation from members that the researcher would help direct group processes where potentially contentious decisions had to be made. The board demonstrated that it was willing and capable of debating such issues and arriving at feasible solutions, so long as it had sufficient background to fill the gaps in information. Examples of some of the important and contentious issues addressed over the season include the imposition of levies and the removal of one of the group’s domestic market agents.

Lesson three relates to lesson two. By addressing the complex issues facing the ACBC the board members grew to accept the responsibilities of their offices. The board realised that some of their predecessors had failed to keep effective records and that the group’s financial and other records were not current. The board had to address important administrative procedures to enable it to maintain sound business practices in the future. The lesson learnt was the need to ensure that that the group had a sound business structure that facilitated the effective running of the business.

Lesson four relates to the development of export markets. The lesson was that export markets can require a great deal of time and effort to develop and that the economic and cultural foundations of a market have a significant influence on the ability to access a market and the attractiveness of markets. The ACBC expressed great disappointment at not sending a trial shipment of Kangaroo Bamboo to Japan during the 2001-2002 season. The board had been warned that the development of the Japanese market would not be easy but after the initial failure the board had effectively dismissed Japan and looked to other markets. The Japanese market still holds great potential for the bamboo industry but the development of markets in this country will require long term commitment from the ACBC.

Lesson five was that the development and application of the quality system would be an ongoing process. A number of ACBC members appeared to believe that a quality system could be developed over just one season and that it would require little effort to implement. The reality was that the system had not been fully implemented, was a long way from being accredited and will require continuous monitoring and updating.

**Relationship development lessons**

In the 2001-2002 season ACBC members sent product to domestic market under the Cockatoo Bamboo brand for the first time. They also sent a number of samples to potential export markets. These processes afforded the opportunity to continue relationship building processes within the ACBC and facilitated the process of consolidating supply chain relationships in the domestic markets and started the building of new relationships in export supply chains.
Supply chain relationships

The development of relationships along the domestic supply chain was advanced substantially over this season, while the development of existing export relationships stagnated and new relationships in alternative markets were sought.

Information on the performance of agents during season two, along with information generated by a phone interview, allowed the ACBC to consider its potential market agents in relation to their previous performance, their reputation and the strength of alternatives. Using these criteria the group selected two agents in each of its major domestic markets in the 2001-2002 season. These agents agreed to be wholesalers for the ACBC product. Pre season meetings with them served to define the purpose of their relationship with the ACBC. The meetings were open and friendly, the ACBC was honest about its intentions and openly discussed its goals. The ACBC explained its plan to use the coming season to gauge whether it would continue to work with two agents in each market or if it would move to a sole agent. It also related its intention to develop a system that delivered a reliable supply of consistent quality product. This exchange served to start the process of developing trust and commitment in the emerging relationship. Furthermore, these visits demonstrated the ACBC’s commitment to developing these relationships through its willingness to travel to meetings and to invest time and money in doing so.

The meeting also served to set the boundaries within which relationships would operate. Issues including the development of a branded product of standardised quality available in a reliable supply for the whole Australian bamboo shoot season, the development of a consumer orientated supply chain, the development of a self regulated quality assurance system and sole agency were openly discussed during these meetings. The agents agreed to help monitor and enforce the ACBC’s quality system and to develop channels of efficient communication. This demonstrated an unexpected level of commitment from the agents at this early stage of the relationship. The agents’ commitment to open communication would empower the ACBC with the knowledge to be better able to meet customers’ demands, which would in turn help the ACBC develop and sustain best practice resulting in the ability to deliver consistent quality to the markets at a competitive price. The ACBC is now ready to create more value from its domestic supply chain relationships.

The majority of effort at this stage was exercised by the ACBC; however, some returns were starting to emerge and the domestic supply chain partners were showing a willingness to enforce the ACBC’s quality system on behalf of the ACBC and to collect levies. This demonstrated commitment, trust and a willingness to customise their business practices to support the relationship. By reciprocating in terms of communication, commitment and the development of trust, chain partners started to define the boundaries of the emerging relationships. By defining these relationship boundaries, improved coordination between the ACBC and its new partners would be possible in the future. This could in turn lead to cooperative behaviours that would promote efficiency, productivity and effectiveness and create value through the supply chain relationships.

Two important factors in the early stages of developing these relationships were communication and people working together. Two-way communication of accurate and relevant information was a key factor in the development of trust, commitment and coordination. The role of people was also critical as relationships ultimately depend on people’s ability to work together.

The relationships being developed in the export supply chains suffered due to the failure to send the trial shipment to Japan. The relationships that were being developed still exist and can be maintained through regular contact with the Japanese importer so that the ACBC can send a shipment when the market becomes more attractive. New supply chain relationships were developed with Australian exporters and with importers in Singapore. The negative response from the market meant that these relationships were not further developed.

Over the three seasons of intervention the ACBC developed an understanding of the importance of supply chain relationships. The ACBC makes an effort to ensure that a degree of social interaction is included in all its supply chain relationships and is devoted to open and honest communication with its
supply chain partners. This is designed to lead to the development of commitment and trust in its supply chain partnerships.

**Group relationships**

Over the course of season three the ACBC began to function as a coordinated unit. The group actively engaged in community building processes and maintenance, the contributions of all group members were acknowledged, and many group issues were resolved. The level of trust increased and a core of members within the ACBC showed high levels of commitment in their efforts to resolve outstanding issues. In particular, the board’s efforts to develop business practices and their efforts in planning for the season showed a high level of commitment. A sense of closeness developed among members. Towards the end of the season the ACBC emerged as a mature, organised and well functioning group. The group had developed the capabilities to deal with complex tasks and to deal with membership disagreements in creative ways. The group was showing signs of a stable structure and the members were motivated to achieving the group’s goals.

Communication continued to improve with the appointment of the marketing manager and the development of supply chain relationships. Commitment continued to increase with growers investing more in terms of time, product and money than at any other stage of the group’s development. The board showed its ability to competently manage the ACBC demonstrating its commitment and competence while at the same time adhering to a code of ethics that resulted in them earning the respect and trust of other members. The ACBC continued to develop a consumer orientation and addressed issues relating to the attainment of capital to continue functioning.

Over the three seasons of this intervention, the members of the ACBC became aware of the importance of leadership, structure, strategy, organisation, commitment and cohesion and their role in ensuring the achievement of the ACBC’s goals. The members become empowered to meet both their own and the group’s needs and effectively developed a collective vision. The intervention effectively put the ACBC in a position where its values, beliefs and actions demonstrated a distinct consumer orientation in addition to a desire and ability to work cooperatively with other like-minded supply chain members. Perhaps most importantly, the intervention directed group members along a path where trust and commitment formed the foundations of interpersonal relationships.

**Consumer orientation lessons**

The development of a consumer orientation can be assessed by reference to the marketing orientation matrix. During season three information was gathered and decisions made that affected the following cells of the matrix:

- **Production/quality, production/quantity and production/price interactions**
  
  The continuing development of quality standards over season three required growers selling shoots through the ACBC brand names to utilise methods of minimising shoot bitterness such as preharvest bagging. In an effort to ensure shoots were free of blemishes growers were taught harvest techniques to minimise the occurrence of cuts and blemishes. These actions further addressed the production/quality interactions of the matrix. Production/quantity issues were addressed through the gathering of information on plantations in the pre season grower survey and through discussions relating to the drought and its effects on harvestable yield of shoots. The ACBC continued to address the production/price interaction of the matrix by looking at means of reducing management costs, including the adoption of bulk purchasing policies for production inputs.

- **Postharvest/quality, postharvest/quantity, postharvest/time and postharvest/price interactions**

  Postharvest/quality interactions were addressed through continuing refinement of quality specifications using input from the market. During season three issues of ice melting in boxes and inconsistency across its domestic brand were addressed by the ACBC. Specifications relating to packing, grading, storage and transport were all reviewed and refined. Postharvest/quantity interactions were also affected by feedback from the market resulting in changes to quality specifications. Allowance levels for defects were adjusted and grading parameters refined, effectively increasing the average number of shoots that were considered to be within the ACBC’s domestic
market specifications. The ACBC’s efforts to find a solution for the problems experienced by north Queensland growers wishing to send product to southern markets required the group to investigate the effect of packing and reliability of transporters on quality. These investigations addressed the issue of freshness, and as such the postharvest/time cell of the matrix. The postharvest/price interaction involved a decision to bulk purchase packing materials.

- Marketing/quality, marketing/quantity, marketing/time and marketing/price interactions

Feedback from domestic market agents helped to refine the quality standards, improving the ability of the ACBC to match its product to the market’s needs. The feedback also refined the ACBC’s understanding of the market’s quality perceptions, information that addressed the marketing/quality interaction. Information on the prices achieved in the domestic market and the potential volumes that agents believed could be sold helped the ACBC to gain a clearer understanding of the attractiveness of its domestic markets. The development of the ACBC brand led to a situation where the ACBC product became the market leader in terms of demand and price achieved. The quantity that the ACBC supplied to the market was not enough to satisfy demand and competition was limited. These factors combined to address issues in the marketing/quantity, marketing/time and marketing/price interactions.

In season three the ACBC continued to address cells of the marketing matrix that it had begun to address in the earlier seasons. By the end of season three the ACBC had addressed or was in the process of addressing all the cells in the marketing orientation matrix. The group demonstrated its adoption of a consumer orientation several times over the season. It became common for ACBC members to phrase questions in terms of what does the market want.

Information and communication lessons

The majority of information gathered over this season related to the continued development of the ACBC quality standards and to continued export and domestic market development. Face to face meetings were the most effective manner in which group members could communicate large quantities of information to each other and a number of informal and formal meetings were held during season three. The board held four face to face meetings in season three, more than in any preceding season. Teleconferences and email forums were also used by the board. The group newsletter improved in content and frequency, becoming quarterly. Towards the end of the season the board appointed a marketing manager and formalised the reporting procedures for group members. Board members started to take on the responsibility of being the contact point for members seeking information and with issues that required the board’s attention.

The majority of the communication outlined above was through formal channels, however informal communication channels also formed an important part of the ACBC internal communication system. Members utilised the annual general meeting and workshops during season three as forums for communication with other members. All workshops, meetings and field days were designed to involve some social elements such as a dinner after a meeting. These social elements aided group development and also served as a means of informal communication on a range of issues.

By the end of season three the formal internal communication channels of the ACBC were based around the group’s elected board. Figure 4.2 presents diagrammatically the internal communication system of the ACBC as it had developed by the end of season three. There are strong indications that the internal communication within the ACBC will continue to improve as the reporting procedures developed at workshop four come into effect.
The domestic market communications channel changed substantially over season three. At the beginning of the 2001-2002 season the ACBC reduced the number of agents in each market to two. Growers communicated directly with market agents and information gathered was passed on to the ACBC. The reduced number of agents and effort on behalf of growers and agents to improve communication meant that information relating to market performance and the quality of ACBC product was communicated more effectively than in past seasons. At the end of season three the ACBC appointed its marketing manager. This individual would in the 2002-2003 season coordinate communications among growers and agents. The marketing manager would become the agents’ contact point for reporting market performance and problems with product. The marketing manager would then pass this information on to growers.

At workshop four towards the end of season three the idea of having growers visit markets to generate feedback on product performance was floated and the board agreed that growers would be encouraged to do so in the future. A system such as this where growers regularly visit the market to obtain feedback directly from retailers would generate information for growers outside of their normal communications channels. This informal communication will serve as a system of checks and balances, as some growers check with other retailers and agents to ensure that the feedback they are receiving is accurate. This type of visit not only serves as a means of generating information on product performance, but also serves a promotional role by getting growers into shops talking with retailers and their customers.

Assuming that growers visit the market over coming seasons and that the marketing manager functions as anticipated, the ACBC will by its next season have developed a communication system where the growers channel their communications through the ACBC marketing manager, who regularly communicates with selected agents, who in turn communicate with retailers and consumers. The information flow will be multidirectional, with the ACBC feeding information relating to quality standards, product availability, promotion and branding through its supply chain partners. In return the partners will, it is hoped, feed information on market conditions, demand and quality back to the marketing manager who will pass it on to the growers.

The ACBC will in the future work with a select few agents with whom they have developed close relationships. Thus it should be possible to develop a situation where by giving a single agent the rights to the ACBC product in their particular market, the ACBC can negotiate better terms and conditions. In addition, by channelling growers’ inquiries through a single entity in the form of the marketing manager, the agents only need to deal with a single person rather than dozens of growers.
This makes business easier for agents and encourages the development of relationships through demonstrating the ACBC’s commitment to working collaboratively.

Figure 4.3 shows the ACBC domestic communication model as it is currently evolving. Formal communication is indicated by solid lines. Informal communication between the growers and the ACBC’s supply chain partners occurs outside of these formal channels and is indicated by dotted lines.

![Figure 4.3 The Domestic Market Communication Model Being Developing by the ACBC](image)

The appointment of the marketing manager in season three further developed the export market communication channels. The marketing manager would be responsible for working with the exporter to coordinate supply between the domestic and export markets and for overseeing the fulfilment of export and domestic orders. The export communication model is developing along similar lines to the domestic model. Both models begin with growers channelling their communications through the ACBC marketing manager. However, in the export model the marketing manager then passes information on to the exporter. The ACBC relationship with the exporter is developing towards closer collaboration. In the future it is envisaged that the exporter will be considered to be an ex-officio board member and would participate in most aspects of the ACBC’s export efforts.

The exporter will be responsible for communicating with importers, wholesalers or retailers in the target markets on behalf of the ACBC. Having so far failed to develop an export market this is as far as the model has currently been developed. However, the ACBC is working towards a system were feedback from the market would occur through the exporter to the ACBC marketing manager and then to growers. As in the domestic market, a system of checks and balances based on market visits by growers would be used to verify feedback. Representatives of importers, wholesalers or retailers with whom the ACBC will deal will be encouraged to visit the ACBC and inspect the production and packaging processes and meet personally with growers. This would be helpful in building interpersonal relationships and improving the integrity of communication channels.

Figure 4.4 is a diagrammatic representation showing the ACBC’s export communication model. The portion of the diagram shaded green has been implemented, while the side shaded red is yet to be developed. Solid lines indicate formal communication channels. Informal communication between the growers and the ACBC’s supply chain partners occurs outside of these formal channels and is indicated as dotted lines.
The activities over season three showed that the ACBC was adopting action learning as a management practice with the group meeting at the end of each season to discuss the previous season and plan for the next. This was considered a positive development and the board made an undertaking to continue to have members meet face to face at least once a year to reflect on their past season and develop plans for the coming season.

By May of 2003, the ACBC had negotiated with ANZFA and had resolved the need to meet the requirements of the novel foods standards. ACBC growers will not be required to have bamboo shoots listed as a novel food, so long as its growers comply with the requirements that may be introduced if shoots were to be listed as a novel food. This requires growers to pack shoots individually in bags labelled with cooking instructions and to grow shoots using methods such as bagging that ensure minimum cyanide content of shoots. High cyanide shoots will not be sold through the ACBC.

The ACBC has formed an alliance with the QFVG to facilitate the day to day administration of the group. Negotiations are underway to have an industry development officer (IDO) appointed to work for the ACBC for one or two days each week. The IDO’s role would primarily be the development of export markets for bamboo shoots and timber.

The ACBC has continued to refine the QA system and has approached the DPI and Freshcare\(^1\) to develop an accredited quality system for the ACBC. The ACBC has decided to make Freshcare accreditation a requirement for growers wishing to sell under its brand names.

Other achievements include:
- preliminary investigations into the American market for shoots
- a series of field days hosted and run by members early in the 2002-2003 season to discuss quality issues.

There are still a number of outstanding issues that the ACBC needs to address over coming years to remain viable. The ACBC must:
- find and develop export markets and continue to develop its domestic markets
- continue to develop its quality and communication systems, and
- maintain and build existing supply chain relationships.

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\(^1\) Freshcare is a national, on farm food safety program for the fresh produce industry. It links food safety on farm to the quality and food safety programs of the other members of the fresh produce supply chain. Based on HACCP principles, Freshcare provides independent verification that a recognised food safety program is followed by the certified enterprises.
5. Conclusions and Implications

In 1998 a core group of industry members commenced the process of industry development by forming the ACBC and with assistance from Dr R. Collins from the University of Queensland, obtained funding for the research project reported in this report. In 1999 the project began with a group of just over 40 growers who were interested in developing the bamboo industry into a commercially viable entity through the ACBC. By July 2002 the group had grown to 93 members who between them controlled more than three-quarters of the industry’s plantings. They had also developed the industry’s most recognised domestic brand name, “Cockatoo Bamboo”. They had investigated the viability of five different export markets and developed an export capability that included a grower regulated quality management system and an export brand, “Kangaroo Bamboo”.

A review of the changes that have occurred over the last three years as reported in this case study, confirms that major progress has been made. It is important to note that although the industry’s potential has revealed itself to be not as impressive as early speculation had indicated, it is still significant, especially if the ACBC can successfully develop an export market. Market research had revealed that by extending the shoot season or by planting alternative species the ACBC could possibly improve its ability to develop export markets.

The ACBC made remarkable progress over the three year period of the intervention. The ACBC has become the Australian bamboo industry’s leading industry body with members consistently receiving higher returns than their competitors as consumers purchase ACBC branded product in preference to other product available in markets. Despite this progress the success or otherwise of the ACBC has not been established. In chapter three a series of indicators of success were presented and changes in these indicators can be used as measure of the degree of success of the ACBC.

- The growth rate and current size of the industry. In 1999 the intervention process began with a group of just over 40 growers. By the end of the intervention process in July 2002 the group had grown to 93 members. The ACBC had steadily increased its domestic market sales from just over $25 000 in 2000-2001 to over $100 000 in 2002-2003. This substantial increase in membership represents a significant investment by them in the industry’s future. This is particularly relevant to the bamboo industry as the lead time prior to the first harvest of shoots can be between three and eight years. The increases in membership and turnover point to a rate of growth that argues well for the future success of the bamboo industry.

- The value of the crop in relation to the opportunity of the resources displaced by the crop. Bamboo has provided some primary producers with an opportunity to diversify into a new enterprise. ACBC members come from a diverse range of backgrounds. Some have never been involved in primary production and other include a number of canegrowers, a redclaw farmer, several cattle producers and at least three fruit producers. Most growers have planted bamboo in areas where traditional crops were not grown, or were not profitable. Very little if any traditional agricultural land use has being displaced by bamboo production. Bamboo provides a high yield from a relatively small area making it an ideal adjunct to many traditional farming systems. The suitability of bamboo as a secondary enterprise provides an opportunity to add value to farm outputs without displacing traditional land uses.

- The market share of the domestic industry At the end of 2002 the members of the ACBC controlled more than three-quarters of the industry’s plantings and had developed the Australian bamboo industry’s most recognised brand name, ‘Cockatoo Bamboo’. The ACBC is the largest single supplier of fresh bamboo shoots to the Australian domestic market.

- The extent of value added to the industry The ACBC’s activities have generated a greater awareness of the products produced by the bamboo industry, including edible shoots and building materials. The promotional activities of the ACBC and their emphasis on quality products has added value to the Australian bamboo industry by lifting the profile of fresh bamboo shoots in the domestic market and increasing returns for growers.
• The extent of employment generated by the industry
At this time the ACBC has not generated any significant increase in employment. Bamboo growers tend to plant small areas of less than four hectares, and the grower can generally manage plantations of this size. An increase in employment opportunities can be expected when an export market is identified.

• The industry’s contribution to regional stability and profitability
Bamboo may present a future opportunity to address the declining profitability of traditional crops. In areas where this proves to be the case, bamboo production will make an important contribution to regional economic development and stability.

• The impact on the nation’s foreign exchange position, either through its impact on import substitution or on export earnings
The extent to which the ACBC’s activities have succeeded in replacing some of the estimated 8000 tonnes of annual imports of canned and preserved shoots into Australia is at this time unverifiable. However it is conceivable that a percentage of the growth experienced in the fresh shoot market would be at the expense of these imports. The ACBC has explored the viability of five different export markets and developed an export capability, including a grower regulated quality management system and an export brand name. Despite this, they are yet to identify a suitable export market and have not yet generated export earnings.

• The stability of the industry
The ACBC has contributed to the stability of the bamboo industry in Australia by providing the benchmarks against which non members could evaluate their performance. They also serve as a commercial framework that non-ACBC members of the industry could emulate.

• The rate of return for the R&D expenditure on the industry
At this point in time it is not legitimate to measure the rate of return on investment from this intervention process. Its goal was to put in place systems for the future, thus the long term performance of the ACBC and its members will be the indicator of success of this intervention.

• The impacts, either positive or negative, that the industry has on the environment
The environmental impact of bamboo plantations is considered very limited. Bamboo is a natural product that provides a food crop, timber products and a source of fibre for the manufacture of paper and textiles. Some bamboos are naturally invasive but provided plantations are responsibly managed they will not spread beyond their plantation area.

Taking the above indicators into account, it is clear that the ACBC has achieved success in relation to its goals. The ACBC is as a result of this project in a position where it can take control of its own future and if it continues on the course that has been set for it, the whole industry will also continue to develop as more non-ACBC members attempt to meet the benchmarks set by the ACBC.

5.1 Supply chain management principles – the driving force

To determine whether the development of supply chain management principles resulted in the outcomes described, the objectives of the process of developing supply chain management principles in the bamboo industry and the process by which this development was achieved must be considered. The objective was to provide mechanisms to address three risks: a lack of reliable information, a lack of market orientation and a lack of collective vision among industry participants. The assumption was that if these risks were overcome, more successful industry development may result.

Over the period of the research the activities of the ACBC had been steered to help develop the underlying principles of supply chain management through a process of action learning where continuous improvement resulted from planning based on critical reflection on the outcomes of previous action. Intervention led to application of supply chain principles by generating information, developing a consumer orientation and developing relationships, both within the ACBC and along its supply chain. This influenced the group’s structure and culture and effectively led to empowerment of the ACBC to take responsibility for managing its own activities and gave the group’s members a means to determine their collective future. The motivation behind this approach was to have the
ACBC become an industry leader that promoted excellence and demonstrated a way forward for all industry members.

By demonstrating that the development of supply chain management principles overcame the limitations of a lack of reliable information, a lack of market orientation and a lack of collective vision among industry participants it is reasonable to link supply chain management positively with the industry’s development as described above. It would also then be reasonable to conclude that supply chain management principles may warrant consideration as an approach to addressing the risks to development in other horticultural industries.

**Addressing the limitation of lack of reliable information through development of supply chain management principles**

To address the limitation of lack of reliable information the ACBC needed to develop two of the underlying supply chain management principles; ensuring an effective information and communication strategy and the creation and sharing of value.

One objective of the intervention was to develop communication models that were judged by participants as the best possible for the ACBC in its present situation. The processes began by addressing major gaps in the ACBC’s knowledge base. This required contact with a network of researchers in Australia and internationally, and to conduct detailed research across a range of areas so as to provide the relevant information. A range of methods for generation of information including meetings, interviews, surveys, observation and literature research, was used. The information generated by these methods was communicated to group members by the most effective method for the particular circumstance. In a general sense all output from this research became input to the process of developing an effective information and communication strategy for the ACBC.

The simultaneous development of supply chain relationships and a market orientation combined with the development of the information and communication systems served to focus the process of information gathering. This ensured the generation of relevant information and put in place mechanisms for gathering accurate information.

At the end of season three the ACBC as a group had learnt the importance of relevant information and developed a communications strategy based on gathering relevant market and product information. This information was communicated through the supply chain by developing relationships that created value and were based on trust and commitment. Value was created and shared through the generation and communication of relevant information. The ACBC shared information about its product with its supply chain partners helping to develop an understanding of the quality characteristics of their product and how its quality is maintained. This knowledge helped wholesalers and retailers to market ACBC product more effectively and generated value for all members of the supply chain.

Without this project and the development of information and communication strategies the ACBC would not have been able to develop its network of contacts. The ACBC would have been heavily reliant on the existing contacts of its members and on the development of contacts within government bodies. The ACBC could not have financed the projects designed to generate information for the group, nor would it have been able to organise and finance the workshops and field days that facilitated the high level of sharing of information and experiences within the project. The development of information and communication systems in the ACBC allowed specific problems to be targeted through this research, then the information to be fed back to the ACBC. The implementation of supply chain management principles to develop the ACBC’s information and communication systems allowed the ACBC to effectively address the limitation of lack of reliable information.
Addressing the limitation of lack of market orientation through development of supply chain management principles

To address the limitation of lack of market orientation the ACBC needed to develop four of the underlying supply chain management principles: a focus on customers and consumers, getting the product right, ensuring effective logistics and distribution, and the creation and sharing of value.

The processes implemented through the supply chain management framework required the gathering of information in a market oriented manner and to demonstrate the importance of that orientation to the ACBC. Information on a wide range of issues, including product and packaging specifications, was generated by going to the markets and determining what consumers wanted. This information was used to develop standards and practices that delivered a product to the market that was aimed at meeting its needs. The positive response of the market to this approach demonstrated for ACBC members the importance of a market orientation. As growers developed an understanding of what it involved, it became common for the ACBC members to phrase questions in terms of what the market wants. Growers were encouraged to attend market visits and participate in the generation of market oriented information.

The processes of adopting a market orientation resulted in the ACBC developing a focus on its customers and consumers. The development of a quality system based on market feedback helped the ACBC to get the product right and ensure effective logistics and distribution. These processes in conjunction with the simultaneous development of information and communication systems and supply chain relationships led to the creation and sharing of value.

The above approach provided a practical orientation to marketing among ACBC members. By the end of season three the ACBC had made substantial progress towards developing a market orientation. When the ACBC’s progress is looked at in the context of Collins’ (1997) marketing orientation matrix for a horticultural organisation it has successfully addressed, or is in the process of addressing, all 12 cells of the matrix that represent decisions to be made or information to be gathered in order to achieve a market orientation.

Without this intervention in this project the ACBC would not have been as successful in achieving a market orientation. The combined effect of lack of access to necessary information, lack of direct experience in horticultural markets and lack of cooperative effort, would have meant that at best the ACBC could only address a limited number of the cells in the marketing orientation matrix. It is concluded that the ACBC has effectively addressed the limitation of lack of market orientation through the implementation of supply chain management principles.

Addressing the limitation of lack of strategic action and collective vision through development of supply chain management principles

To address the limitation of lack of strategic action and lack of collective vision the ACBC needed to develop its capabilities in relation to two of the underlying supply chain management principles, those of building effective relationships and the creation and sharing of value. Implemented a supply chain management framework required that relationships were developed between members within the ACBC to facilitate group development and to achieve a sense of collective vision, and to assist members to build strategic relationships along the supply chain. This in turn facilitated more effective distribution and marketing of the ACBC’s product so as to create more value and share it among supply chain members.

Group development was facilitated through a range of interventions and activities that focussed members communication, competent management, consumer orientation, commitment, group goals, group cohesion and group competencies. Group strategy and structure were influenced through workshops that focussed on developing a collective vision. The incorporation of social elements into all face-to-face interactions between ACBC members was particularly useful in improving group development. By the end of season three the ACBC was starting to perform as a collective, cohesive
organisation devoted to addressing common goals. It is human nature that not every member of the ACBC would want to be part of a collective approach where business is driven by a shared vision, and where at times individual goals become secondary to ACBC goals. However, a core group within the ACBC did emerge, and it formed a nucleus around which the group grew during the intervention, and should continue to grow in the future.

The development of strategic supply chain relationships was facilitated through market investigations to identify potential partners. Face-to-face meetings between ACBC members and these potential partners were held to discuss their intentions, define a common purpose and develop an understanding of the boundaries that would define the emergent relationships. The goal was always to create value through such relationships. By the end of the intervention the ACBC had successfully developed a number of valuable supply chain relationships and had in place procedures to continue to develop and maintain new and emerging business relationships.

The development of collective vision and strategic supply chain relationships positioned the ACBC as the industry’s core body engaged in healthy competition with other players in the industry. At the time of writing this report, the ACBC is the industry leader and is promoting industry development. Without the development of effective relationships the ACBC would not have progressed through the stages of group development as swiftly as it did because of the geographical separation of its members, lack of information, lack of ability to address interpersonal conflicts and lack of a structure that facilitates conflict resolution. It is concluded that development of relationships within the ACBC and along its supply chain has effectively addressed the limitation of lack of strategic action and collective vision. This has resulted in the development of a strong core industry group with a collective vision.

5.2 Was there evidence of action learning?

Action learning aimed to provide a process whereby the ACBC could achieve continuous improvement. The seasonal production cycle of horticultural industries and the necessity for new industries to continuously improve themselves make action learning an ideal vehicle to underpin strategic intervention in industry development. The ACBC learned how to engage in critical reflection in order to extract lessons that could be used to develop plans for the next season, typically the next seasonal cycle of the same activity.

Evidence of action learning as part of the culture of the ACBC can be found in the pre-season workshops held each year. These workshops reviewed the previous season’s activities, then critically reflected on these activities to help members understand both the positive and negative lessons that could be learnt from them. These lessons were then considered in terms of what they meant for the upcoming season and were used to formulate plans for continued improvement in that season. The actions of the ACBC over the third season showed that it had adopted action learning as a management practice. Group members were meeting at least once a season to discuss performance and to reflect on the implications of this performance in planning for the next season.

The action learning process became a vehicle for the development of supply chain management principles. Through this process the importance of supply chain principles was reinforced and growers applied these principles in their planning. Action learning was presented to ACBC members as a commonsense approach to solving problems, and this facilitated its use within the group.

5.3 Conclusion

This report identified the three major risks to new industry development and developed a framework for addressing them utilising the six guiding principles of supply chain management. The case study of the ACBC presented in chapter four showed how the framework was applied to reinforce the role of supply chain management principles and their application in the fresh bamboo shoot industry. Through the use of this framework this case study demonstrates a useful mechanism for the application of supply chain management principles in the Australian bamboo shoot industry.
In addition this case study stands alone as an example of the role that supply chain management principles can play in the development of new horticultural industries. As shown above, supply chain management proved to be an effective mechanism for addressing risks to new industry development in this case. The success of the ACBC demonstrates that the application of supply chain management principles in the Australian bamboo industry has, through a process of action learning, aided a core group of industry participants to address limitations to the development of their industry and provided a clear pathway to attaining future sustainable competitive advantage.

5.4 Research implications

Implications for theory

This report, a study of the Australian bamboo shoot industry during its formative year, demonstrates that supply chain management principles provided an integrative framework for the industry’s development. This is a single case, so caution must accompany the interpretation of its results (Yin 1994), which are most relevant to westernized countries that have similar economic and cultural conditions to Australia. Significant differences in culture and environment mean that the application of supply chain management principles using the framework developed here may not be as useful for some other countries. Despite this limitation the case contains valuable lessons for other industries by providing theoretical insights into the phenomenon of new industry development.

This study advances the model of new horticultural industry emergence developed by Collins (1997). It provides an integrated theoretical framework, based on supply chain management principles, that has been successfully applied in the emerging Australian bamboo industry. Importantly for theory development, such a framework has never been reported in any other emerging agricultural industry. The work of Collins (1997) made virtually no reference to supply chain management.

Results from the application of this framework to the Australian bamboo industry demonstrate that the development of supply chain management principles allowed three risks to new industry development to be addressed: lack of accurate information, lack of market orientation, and lack of strategic action and collective vision. Strategic intervention combined with action learning provided a vehicle for the application of this framework. Taken as a conceptual package, the supply chain management framework, when applied in this way, represents an important advance in better understanding the strategic and operational dimensions of new industry development.

Implications for practitioners and policy makers

There are two groups identified who may benefit from the insights provided by this report. The first is growers and investors in the Australian bamboo industry who can use the findings to assess their decision to grow bamboo species. This research established that there is a market for out-of-season bamboo shoots in Japan and Singapore but that the current species mix developed by the Australian industry and the present high cost of production have prevented the development of these markets. The production orientation of industry pioneers has led to a poor choice of species for production of fresh shoots. Of the four species, *Dendrocalamus asper*, *Dendrocalamus latiflorus*, *Bambusa oldhamii* and *Phyllostachys heterocycla* var. *pubescens* (moso) currently grown in commercial quantities in Australia, export markets only consume *Bambusa oldhamii* and *Phyllostachys heterocycla* var. *pubescens* as fresh shoots. There is a distinct preference for moso shoots.

Although not the purpose of this report, it does contain information covering some major issues of interest to prospective bamboo growers and prospective ACBC members.

The second group to whom the findings of this report are relevant is made up of members and managers of other emerging horticultural industries. They may benefit from the lessons learned by the
bamboo industry about the importance of reliable information, marketing orientation, relationship building and supply chain management.

There are also implications for public sector managers. Although the researcher had attempted to disengage from the ACBC at the end of three years there continued to be a heavy involvement in their day to day activities past this point. At the end of the three years the researcher had left the ACBC before achieving many of the goals set for this intervention and they would have benefited from further input. The volume and complexity of work that needs to be done over the first years of new industry development requires intervention of the type practised in this research to be implemented over a longer time frame than three years. To facilitate such intervention in the future it would be necessary to fund new industry development research over a sufficient time frame to allow researchers to follow the development of industries through to commercialisation, a process that could take five to ten years. This confirms the finding of Collins (1997) who in his research on the development of the persimmon industry found that a longer funding time frame was necessary to facilitate industry development through strategic intervention.

Implications for further research

The level of success achieved by the ACBC must be interpreted with caution. It was not possible to conclude definitively from this single study that the ACBC would not have been a success without the research reported in this report. However, it is equally not possible to determine if the ACBC would have collapsed without the intervention. It is also not possible to determine if the ACBC will collapse in the future despite this intervention. The results of this research, while very encouraging, should not be generalised to apply to other industries without taking into account these limitations.

Although it is based on a single case study, this research does provide guidance for future researchers interested in studying or influencing the development of new crop industries. The most significant future research opportunity arising from this work is the opportunity to apply the approach adopted here in other new agricultural industries to examine whether similar outcomes can be achieved in other settings. This may also help to identify more general theoretical insights relating to the application of supply chain principles in new industries.

During the course of this research it became obvious that bamboo as a natural product has the potential to provide a wide range of building products, fibre products and several niche marketed products. The development of aspects of the bamboo industry relating to these products and their utilisation also represents opportunities for further research.
6. References


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