Organic Livestock Specifications

A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Applied Science majoring in Agribusiness at Massey University

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2001

Abstract:

Globally the organic market now comprises approximately 2% of the total food market and is growing in the order of 20%- 30% pa (Meat NZ 2000). Pasture based agriculture in New Zealand is in an ideal position to take advantage of this growth. BioGro New Zealand and AgriQuality New Zealand are currently the two dominant organic livestock specifications that farmers must produce to.

The AgriQuality standard is based on the new European Union standard recently released. This study will investigate the requirements, implications and issues pertinent to a group of New Zealand livestock growers contemplating conversion to organic livestock production for the European market.

A detailed literature review, multiple case study analysis of three BioGro farms and focus group discussion was conducted. The major distinction between the two standards is in the animal welfare and conversion period requirements. The AgriQuality standard permits up to three medical treatments per year, per animal without loss of organic status and the conversion can be quicker. Motives for the case study farmers converting to organic included, environmental, market opportunities and a desire to bring the soils, pastures and animals into 'balance'. Best management practice of the soils, pastures, animals and water on the farms was about accepting and minimising where possible the production risks through timing and proactive management with a preventative focus.

Sourcing information, developing new skills and a drive to find new and different ways of answering conventional problems is critical. A lot of thought and energy goes into off farm marketing and value adding projects for market control and personal satisfaction.

These differences in the standards could provide opportunities to farmers keen on a more environmentally friendly farming system that don't want to go to the full BioGro standard

and conversion process. There may also be the opportunity to attain organic premiums from moving to the EU standard.

Opinion on the EU standards was mixed. Some saw the EU standards as an easier option that gave the 'organic brand' a bad name. They felt having more than one organic label would confuse the consumer and be of detrimental value long term to the New Zealand organic industry. None of the case farmers would revert back from their BioGro Standards.

Financial performance measures were not defined in this research. It would be unwise for a conventional farmer to convert to an organic system for financial reasons. Non-financial drivers such as the environment and social indicators are important measures.

For progressive farmers that are after a more sustainable farming system the EU standard offers an opportunity. For these farmers financial and non financial performance measures will be important and attainable. **The EU standard has the potential to 'out perform' conventional and BioGro systems - proving the hypothesis.**

Acknowledgements:

Special thanks go to my supervisors Nicola Shadbolt and Tony Rhodes for their guidance and perseverance, throughout the course of my Masters. Their knowledge and professionalism to the task at hand was invaluable to my overall learning experience.

Thanks must also go to the case study farms and focus group members that agreed to participate in my research thus making it possible.

Special mention must also be made to Agriculture New Zealand and the Bright Futures Scholarship scheme for funding my studies over the last year.

I would also like to acknowledge the other farm management staff and postgraduate students who contributed to making my time at Massey highly enjoyable and a valuable experience.

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Introduction

1.1 Organic farming in New Zealand - the current situation

The organic industry in New Zealand started in the 1950's but began to develop into its current structure between 1983 and 1990 as a more coherent industry with a central certification body, BioGro (Skinner 1999). Until 1990 the sector was characterised by philosophically committed organic producers focusing on the domestic market. However since then, the development of the export sector has encouraged the expansion of organic farming. World-wide the environmental movement has been booming with discontent about the overproduction in many developed countries, underproduction in developing countries and the negative impacts of agricultural practices on the environment. The effect of this movement can not only be seen in the range of policies which give greater weight to environmental considerations, but also in the growth of the organic movement and the market for organically produced food (Meat NZ 2000). Globally the organic market now comprises approximately 2% of the total food market and is growing in the order of 20% to 30% pa (Meat NZ 2000).

Estimates of certified BioGro members show an increase from 232 in 1992, to 310 in 1998 (as at April 1998) and now reaching 700 members in 2000. BioGro currently trademarks over 100 million worth of organic products per year, of which approximately 60 million is exported (BioGro 2000). In a recent study by Campell *et al* (1998) investigating the market for organic food it was concluded that on the New Zealand domestic scene growth was rapid at 50% per annum over the three years to the end of 1999. Research data presented in the same article from the Foreign Agricultural Service (FAS) found that the average growth rate for the organic market over 21 major countries was 35%. Only Australia and the United Kingdom had experienced higher domestic growth rates than New Zealand. On average from this study by the FAS premiums of 35% were being paid for the organic produce.

With its outdoor legume based pastoral system, New Zealand is in an excellent position to take advantage of the market opportunities that growth in the demand for organic food creates (Mackay *et al* 1998). In the UK for instance the annual market for organic products is expected to surpass the 1 billion pound sterling mark by 2001, with around 70% of all organic food sold imported (Holden 2000; Lohr 1998). Germany's retail market for organic products had an approximate value of $1.6 billion in 1997 of which 60% was imported (Lohr 1998). Holden cites organic meat products as an obvious example of an opportunity for prospective New Zealand exporters to Europe.

The conversion to organic livestock production provides many opportunities and risks. The opportunity to tap into a relatively new and rapidly growing niche market where substantial premiums are paid by consumers' world-wide. However, there are risks from adopting different and more restrictive farming techniques that may or may not result in increased or even the same performance they currently achieve and in a young and unproven market. This study will investigate the requirements, implications and issues pertinent to of a group of New Zealand livestock growers contemplating conversion to organic livestock production for the European market.

1.2 Research Question

What farming systems changes will New Zealand livestock growers need to make to comply with European organic meat production standards, and what are the implications?

The introduction of a new EU organic meat production standard will certainly spark interest amongst the many farmers considering moving to organics. It may offer an opportunity to farmers on the fringe of going organic the opportunity to achieve many of their conventional farming goals whilst moving more in the organic direction. This new standard needs research and analysis to understand how it may benefit livestock farmers and the wider meat industry.

1.3 Hypothesis

"That by producing to European Organic meat specifications, New Zealand livestock growers can out perform their conventional and BioGro systems".

The ability to 'outperform' is the key aspect of the hypothesis as performance can be measured in so many ways (e.g. financially and non-financial measures). In this study, the definition of performance relates more to overall management satisfaction rather than only financial measures. It will require investigating what and how organic and conventional farmers measure performance in relation to their goals and values. From here some broad assumptions can be made to whether the EU standard will out perform BioGro and conventional livestock systems.

1.4 Research Objectives

1. **Compare and contrast the BioGro and European organic livestock production specifications for the production of livestock.** This is needed to ascertain the important differences between the two standards. These differences will have implications to growers, processors, the wider organics industry and consumer perceptions.

2. **Gain an understanding of the philosophical drivers and best management practices by which soils, water, animals and feed are managed to meet the two specifications.** This objective is needed to find out how, what and why organic farmers do things differently. This is important to understand the motivational factors, values and satisfactions that may or may not be achieved with a different organic standard.

3. **Establish the methods by which performance can be measured when converting from a conventional farming system to an organic system.** If an EU standard is going to out perform BioGro and conventional farming livestock systems, then specific performance measures need defining.

4. **Estimate the biophysical, financial and social implications of altering conventional farming systems to meet the two organic specifications.** Objective four considers the wider implications of having less conventional farming systems and more organic. There are many important economic considerations that need thought and discussion.

Literature Review

2.1 Introduction: Food Markets of the Future

Few things are certain in this world, especially when you're a farmer. For many, variations in weather patterns, stock prices and rugby results are more than enough to keep them busy. Little time is spent thinking about the future of world food markets and where to place their farm business on the agricultural industry "value chain". Where to position themselves at line-out time holds much more relevance! For other, more professional farmers however, the ever changing global food market provides themselves with many exciting and challenging opportunities. Christie (2000) sums it up well when he says:

"...in the future we can be certain that there will be more mouths to feed, but what will they be eating? Where will they be eating it, and more importantly for us (New Zealanders) where will it come from?" (Christie 2000, Pp 43).

Winger (2000) identified five important mega trends influencing food industry decisions today:

- diet and health linkages
- natural and organic foods
- environmental issues and sustainability
- food safety, quality, acceptability and,
- information technology and education.

2.1.1 The Consumer

The profitability of New Zealand agriculture lies in the supply of premium products to wealthy consumers in niche markets. Food and clothing have become statements of

privilege, lifestyle and meaning for the wealthy. They have the time, money and energy to be concerned about animal welfare, chemical residues, sustainability and related issues. Their purchasing power will force the agenda and New Zealand's primary production will definitely come under increasing scrutiny (Fielden 2000).

Seen through North American or Western European eyes there is much about our farming operation that is barbaric. Induced calving, lambing outdoors in bad weather without human aid, docking tails, controlled starvation whilst body reserves are mobilised, sawing antlers off deer; the list can be trebled with thought. What many New Zealand farmers see as efficient and low cost production can easily be characterised as cruel and brutal. People with the discretionary time and money will exercise their discretion as they see fit - not as New Zealand farmers believe. Further, if agricultural protectionism is diminished by GATT, it will resurface as non-tariff barriers under the guise of factors like animal welfare and chemical residues (Brenton-Rule 1999, Shadbolt 2000).

2.1.2 The Organic Movement

The trend on organic foods is the strongest of all consumer trends as we enter the new millennium. In the United States, organic foods outperformed the average of all food categories by 30% over the last year and represents a market worth $25.3 billion. Organic foods are now worth $4.2 billion with 20-25% annual growth. The key drivers for this trend relate to personal health, pesticides, and environmental contamination. In Sainsbury's, organic foods increased from 42 products in 1996 to 400 products in 1999 and sales of 2 million pounds per week. The total UK market will be worth 440 million pounds by 2000, up from 250 million pounds in 1998 (Winger 2000) and around 70% of this organic produce is imported (Lohr 1998).

As part of this increased interest in organic food in July of 1999 the European Union released a set of organic livestock production standards to which all trading member countries (or potential third countries, such as New Zealand) must produce. Potentially

these standards seem well suited to New Zealand farming systems and possibly more easily attainable than our current organic standard equivalents (personal communication, Shadbolt, 2000).

For a top conventional farmer in New Zealand these impressive organic industry figures and new organic production standards will signal an opportunity. An opportunity to convert from current conventional farming practices to a more consumer friendly and environmentally sustainable system that can increase farm profits through organic product premiums.

2.1.3 What's Ahead

This research will investigate whether the European Organic Standards are in fact more lenient, and more profitable than our New Zealand equivalents, and most importantly what management skills will be necessary for our farmers to succeed in making the change.

The section will begin with a review of business management, it's many functions and terminology. Preceding this will be a section outlining current and past conventional livestock farming systems in New Zealand with a focus on top conventional farm management practices, their evolution and characteristics today. Organic farming systems will then be introduced, including; organic philosophies, definitions, the NZ industry, standards and regulations and managerial requirements. The final section is on performance measurement systems, both financial and non-financial.

2.2 Management

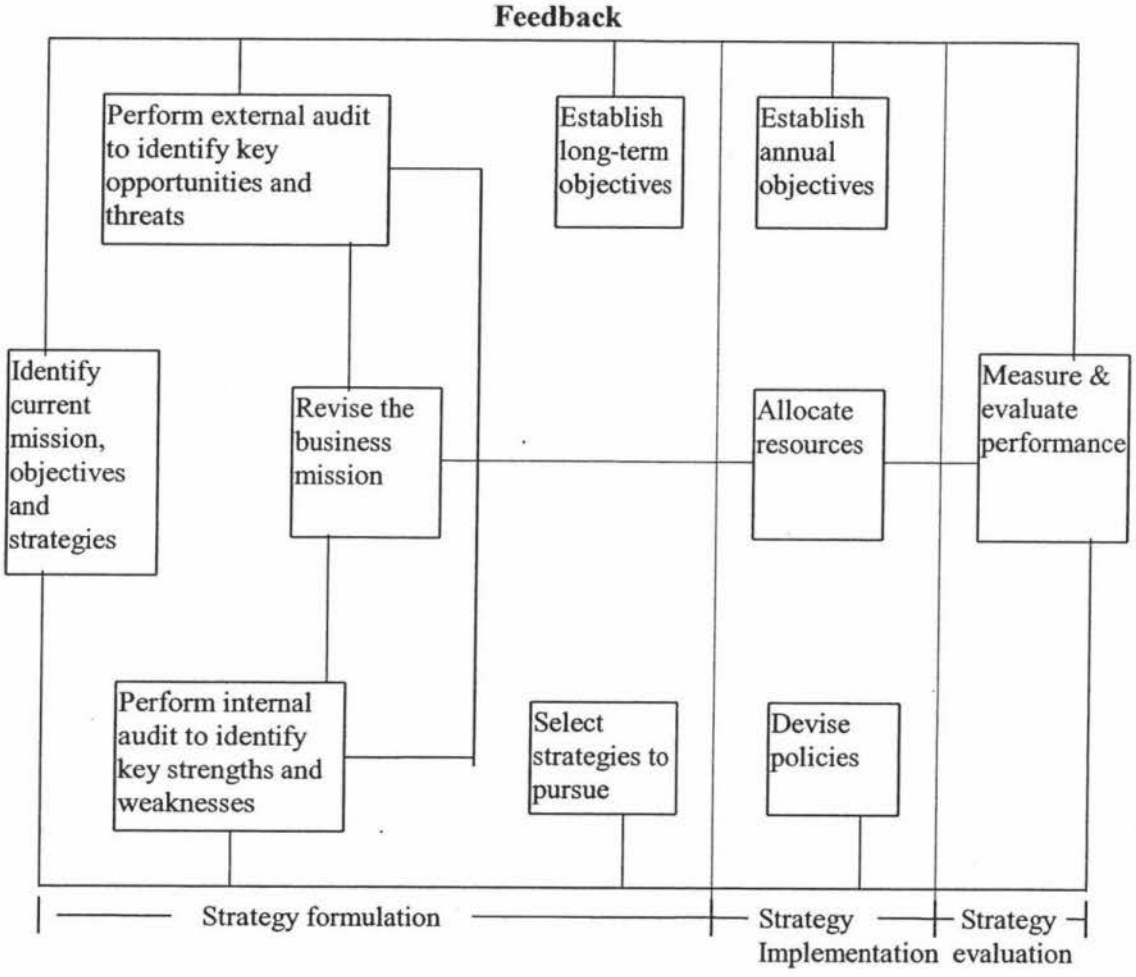
2.2.1 Introduction

The nature of agricultural production sets it apart from most economic activities, like manufacturing. Agriculture is greatly influenced by unpredictable random events such as droughts, floods, and pests (Steigagen *et al*, 1998) not to mention fluctuating export prices and changing consumer needs (Martin 1994). Thus to be successful in the long-term the modern farm business must be structured to buffer business uncertainty, but at the same time, provide flexibility to respond to new opportunities in the market place and the capacity to generate sufficient funds to support growth in real terms. The appropriate process for determining how a particular farm business might best achieve these outcomes is strategic management (Parker *et al* 1997). The purpose of this section of the literature review is to present an overview of strategic planning in the context of grassland farming and clarify the use of associated terminology.

2.2.2 The Strategic Management Process

Strategic management is concerned with determining the future direction of an organisation and implementing decisions aimed at achieving the organisations objectives (Clarke-Hill and Glaister 1991). The best strategy for a given firm is ultimately a unique construction reflecting its particular circumstances (Porter 1985). Three major components make up this process; planning, implementation and control. In brief planning is concerned with "bridging the gap" between the present and future, implementation involves action plans so that they become reality, and control focuses on measuring and correcting performance so that the outcomes specified in plans are achieved (Parker *et al*. 1997).

Figure 1. A Comprehensive Strategic Management Model.



Source: David (1995).

A central aspect of the strategic management process is the analysis of the external environment in which the firm operates, equally important is the internal assessment of the firm. These processes enable the firm to develop a profile of its competitive position, strengths and weaknesses. The firm can then devise its business mission and begin to identify suitable competitive strategies and objectives.

Barnard and Nix (1982) use a broader definition of farm management by highlighting the role of decision making, which they see as the essential role of management. Decision-making is required for all stages of planning and control whether it be on a day to day

basis or longer term. They also highlight the role of the farmer in this decision making process as he/she is often the sole operator of a property and has the sole responsibility for making all the decisions.

2.2.3 Farmer Goals, Values and Behaviour

It is frequently assumed that business people, including farmers, have only one goal - profit maximisation. Boehlje *et al* (1994) suggests that farmers possess numerous goals including: maximising profit returns, increased net worth, control a larger business, avoid a low return or losses, reduce borrowing needs, increase family living, increase leisure time, have a neat and well kept farmstead and provide a community service.

All authors regard the setting of key business and personal goals as the corner stone of the strategic planning process. Poole (1989) suggests that the three most important items of farm management are (1) having clear goals, (2) making correct decisions, and (3) business control. Kay and Edwards (1994) insist that goals be written to allow everyone involved to see and agree on them and provide a record for review at later dates. Kay and Edwards (1994) also state that goals be specific to provide a sense of accomplishment and a time to think about defining new goals. In addition goals be measurable, so that a manager can determine the progress towards the goal and what remains before reaching it. Goals should also have a time-frame, which provides deadlines to keep managers focused on the goal. Parker (1996) summarises these key points into a useful acronym stating that goals must be; Specific, Measurable, Attainable, Realistic, and Timely.

Goals are defined as ends or states in which the individual desires to be or, things he/she wishes to accomplish. A course of action may be viewed as the achievement over time of a concentrated series of goals where attainment of one satisfies an immediate need and also provides a stepping stone to a more ultimate goal (Gasson 1973)
Gasson (1973) defined values as:

"...a more permanent property of the individual, less liable to change with time and circumstances. A value is a concept of the desirable referring to any aspect of a situation, object or event that has a preferential implication of being good, bad, right or wrong. Values are felt to be justified by reason, moral or aesthetic judgements...Values are ends in themselves, pursued for there own sake. They serve as standards influencing the selection from among available modes, means and ends of actions".

Gasson (1973) presented a list of dominant values that are likely to be associated with the farming occupation. She created four major categories:

Table 1. Dominant Values Associated with the Farming Occupation.

Instrumental	Making maximum income Making satisfactory income Safeguarding income for the future Expanding the business Providing congenial working conditions- hours, security, surroundings
Social	Gaining recognition, prestige as a farmer Belonging to the farming community Continuing the family tradition Working with other members of the family Maintaining good relations with other workers
Expressive	Feeling pride of ownership Gaining self-respect for doing a worthwhile job Exercising special abilities and aptitudes Chance to be creative and original Meeting a challenge, achieving an objective, personal growth
Intrinsic	Enjoyment of working tasks Preference for a healthy, outdoor farming life Purposeful activity, value in hard work Independence – freedom from supervision and to organise time Control in a variety of situations

Source: Gasson (1973)

Robbins and Wallace (1992) identified three factors that are intrinsic to a successful family business: rational business principles, family characteristics, and a clear

understanding of the strengths and weaknesses inherent to such an operation. These are detailed in Tables 2 & 3.

"To succeed in business a family must have strong emotional bonds. They must have practical business skills and they must adopt effective and rational business structures and practices. But more than this they must adopt and encourage the natural strengths of family life and reduce the effect of the natural weakness" (Robbins & Wallace 1992).

Table 2. Success Factors for the Family Business.

Rational business principles	Family characteristics
A legal partnership	Trust
Good leadership	Affection
Effective decision making skills	Loyalty
Strategic business planning	Respect
Clear lines of responsibility	Emotional security
A motivated workforce	Conflict resolution skills
Fair and consistent rules	
Good communication	
A willingness to change	

Table 3. Strengths and Weaknesses of a Family Business.

Strengths	**Weaknesses**
Trust	Lack of trust
Loyalty	Rivalry
Motivation	Lack of ambition
Sacrifice	Nepotism
Communication	Lack of privacy
Conflict handling	Conflict
Continuity	Lack of talent

Source: Robbins & Wallace (1992).

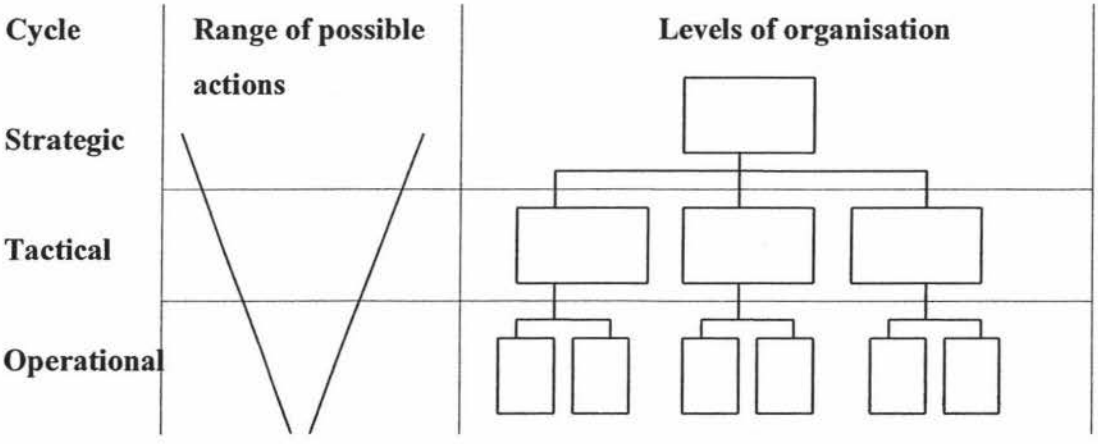
Ollson (1988) suggests that farmers with clear, well-established values follows a structured decision making process thereby providing them with the greatest opportunity

to be successful. These farmers are also characterised by being able to deal with internal and external disturbances. Conversely, farmers with only poorly defined values, have not thought about how they run their business and do not have formulated goals and therefore tend to be less structured in their decision-making.

2.2.4 Planning

Planning or '*strategy formulation*' as David (1995) describes it, includes developing a business mission, identifying an organisations strengths and weaknesses, evaluating external opportunities and threats, establishing long term objectives, developing alternative strategies, and choosing particular strategies to pursue. It takes place in an ever changing economic, political, social, natural and legal environment (Giles & Renborg 1990). Three levels of planning (and by association, also management) can be distinguished in farming: strategic, tactical and operational (Figure 2).

Figure 2. The Planning Framework.



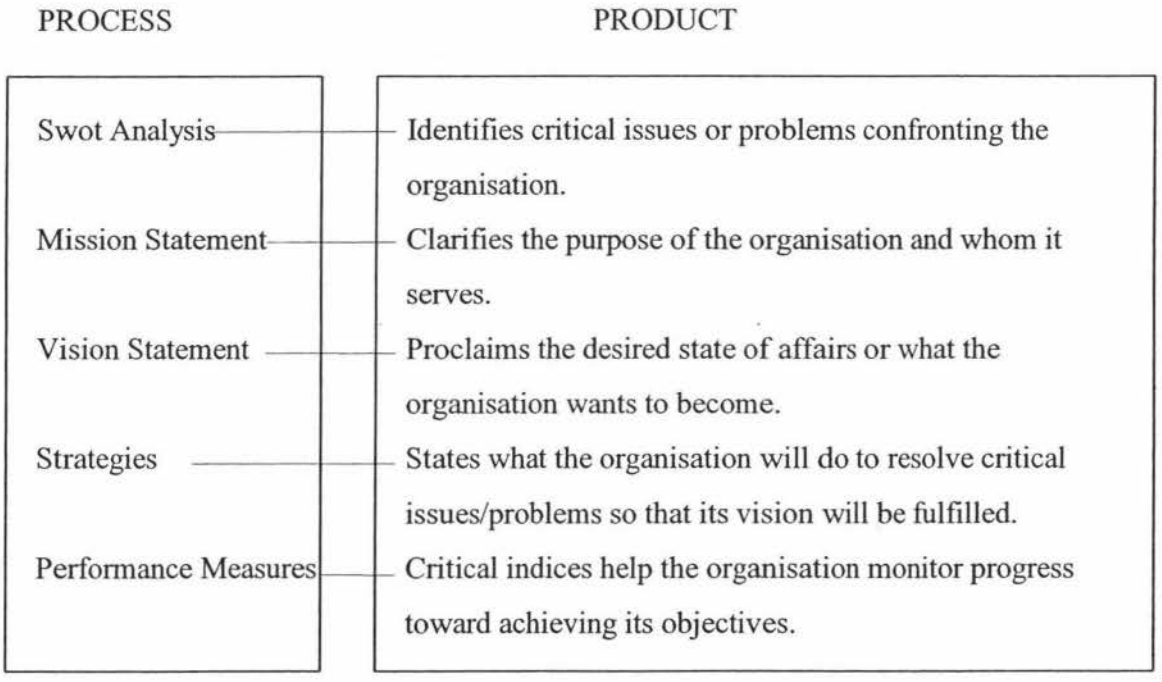
Source: Dermer (1977).

At the strategic level key questions are asked. For example, what should be the particular focus, mission or purpose of our farm business? What should the product market scope of our operations and why do we believe we can be successful in our endeavour? On what

basis do we say yes to some proposals and no to others ? (Curtis 1993). These plans relate to the whole farm business, are focused on means to achieve future needs and according to Parker *et al* (1997) need not be highly detailed. It should also be emphasised that the strategy formulation or planning process is dynamic, continually changing and evolving and should be updated whenever appropriate (CCH Management Manual 1994).

Rea and Kerzner (1997) presented the key processes of strategic planning and clarify the products that evolve from each process as outlined in Figure 3.

Figure 3. Key Processes of Strategic Management.



Source: Rea and Kerzner (1997)

2.2.5 Implementation

Strategy implementation is the process of putting a plan into action. It requires motivation, skill, and ability but also that planning and control systems exist at the same

level as implementation does (CCH Management Manual 1994). Implementation will be restricted to what an individual believes they can influence. This in turn determines what control systems can be utilised and reflects on the relevance of the initial plan.

In order for a strategy to work individuals must be motivated to implement the chosen strategy, this process will be more effective if all the stakeholders in the farm business have played a part in the formulation of the strategy. Implementation like all aspects of the strategic management process requires decision making.

2.2.6 Decision Making

Decision making could be regarded as one of the most important aspects of a managers job because decisions are continually being made; they normally have a lasting or far reaching impact on what is achieved; and they can influence how well things are achieved (Giles and Stansfield 1990, Harrison and Pelletier 2000). Unless good decisions are made, goals will not be achieved (Hardaker *et al* 1970). Coupled with this, often decisions have to be made at a particular point in time, based on information from a previous time, about events that will happen in the future. Harrison (1999), cited in Harrsion and Pelletier (2000) defined a decision as:

"...a moment in an ongoing process of evaluating alternatives for meeting an objective, at which expectations about a particular course of action impel the decision maker to select that course of action most likely to result in obtaining that objective".

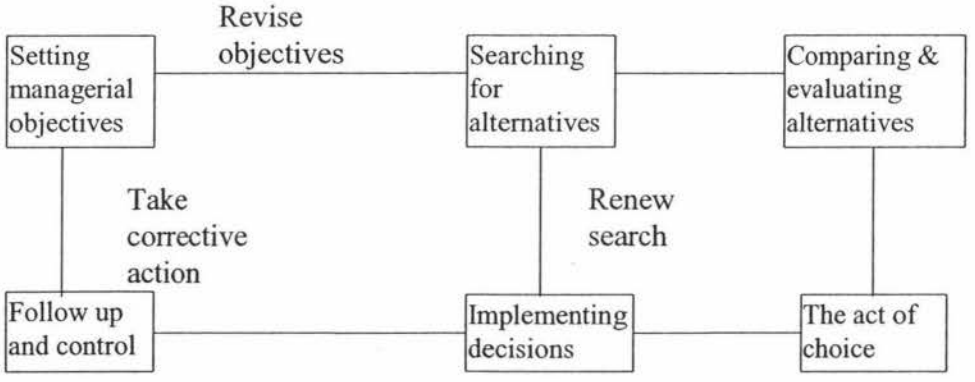
Makeham and Malcom (1993) suggest that farmers often make decisions intuitively, frequently based on past decisions that have worked out well. David (1995) stipulates that intuition, based on past experiences, judgements, and feelings, is essential to good strategic decision making, especially in situations of great uncertainty. According to Giles and Stanford (1990) the farm manager goes through a sequence of thinking when decision-making. Experience, judgement, and familiarity help managers to make quick

decisions when the situation requires, however, with more important situations the manager tends to move through some or all of a formal decision making processes. To help explain this process researchers have developed models of the decision making process. The process can be described in five steps (Greenley 1989, Boehlje & Eidman 1984);

1. Define the problem or opportunity.
2. Identify alternative courses of action.
3. Gather information and analyse each of the alternative actions.
4. Make the decision and take action.
5. Accept the consequences and evaluate the outcome.

Harrison and Pelletier (2000) follow a similar process but add in a follow up and control step to their model.

Figure 4. The Managerial Decision-Making Process



Source: Harrison & Pelletier (2000).

In order to make good decisions, it is vital to have clear objectives so that the decision will have purpose and direction (Giles and Stansfeild 1990, Poteet 1991, Boehlje and Eidman 1984). Good information is also vital because it is often sparse, unreliable, and of doubtful relevance, which can increase the uncertainty surrounding a decision (Hardaker

et al 1970, Harrison and Pelletier 2000). One way to reduce this uncertainty is to simply collect more information. Farm records and accounts can play an important role in farm management decision making. Managers who read widely or otherwise keeps themselves informed on the markets and technology etc., are more likely to make good decisions than a manager who concentrates solely on the day to day running of the farm is.

Harrison and Pelletier (2000) refer to decisions as the 'core transactions' of organisations. They go on to say that successful organisations 'out-decide' their competitors in at least three ways: they make better decisions; they make decisions faster; and they implement decisions more.

2.2.7 Control

Once a strategy has been implemented, it is important that it is controlled. All strategies will require modification in the future as external and internal factors which are part of the strategy formulation process are constantly changing. Parker *et al* (1997) breaks the control function into three parts: monitoring (measurement) the actual outcomes for plans as they are implemented; comparing actual and planned values; and correcting if required, deviations from these by either modifying the original plan or formulating a new plan (Parker *et al* 1997). Planning for future events and developing contingency plans is a critical aspect of control. Without active and ongoing planning in business there can be no control. Boehlje and Eidman (1984) put it nicely when they say;

"...plans without controls are subject to the 'whims' of the farm environment rather than the directing influence of management".

Control can take one of three forms; feedback (or lag), concurrent and feed forward (or lead) (Kaplan and Norton 1996).

2.2.7.1 Feed Forward (leading indicators)

Feed forward controls (or indicators), are those, which tend to be unique to a particular business as they reflect the business units' strategy (Kaplan and Norton 1996). Feed forward control is the monitoring of standards and adjustments of the system to maintain objectives and goals. It is very important to tactical management. The feed forward control standards are referred to as '*lead*' or '*driving indicators*', because they are the markers on the way to achievement of the final outcome (Shadbolt and Rawlings 1999).

The feed forward control procedure can be broken down into five important inter-linked steps: monitoring, comparing actual performance to standards, the identification of significant deviations, the diagnosis and cause of the deviations, and selection of a suitable contingency plan (Shadbolt and Rawlings 1999). Critical to control is the determination of which '*key*' indicators to set and how best to monitor them in response to any deviations (Boehlje and Eidman 1984).

Boehlje and Eidman (1984) define indicators as being the criteria against which actual performance can be measured and they are derived from goals specified by the farmer and family. The key performance indicators are those, which have the most, effect on, and are the drivers of, goal achievement. Typically they should be a mix of financial and non-financial indicators (Kaplan & Norton 1996, Shadbolt & Rawlings 1999).

Indicators must be:

- Specific
- Written down to show consistency in calculation
- Realistic yet challenging
- Timely
- Represented in relevant units
- Reliable

When devising new measures there are three questions that should be asked:

- Given our strategy, what are the most important measures of performance?
- How should these measures relate to one another?
- What measurements truly predict long term success in our business? (Eccles cited in Shadbolt and Rawlings 1999).

As has been discussed earlier, the environment in which a farm business operates can be extremely variable, so management need contingency plans in place to cope. This can be achieved by either reducing variety, or developing systems that have equal or opposite variety (Dalton 1982). Therefore in the long run a manager's ability to offset variability will impact on the systems performance and is why some managers are less affected by extreme conditions than others.

Wright (1985) argues that managers are likely to accept variability in performance within the system if they have a limited repertoire of contingency plans or management responses. Wright (1985) goes on to say that this can occur because the manager is unaware of options available to them or the manager is uncertain of the environmental variety possible. Kaine *et al* (1994) states that a managers ability to control variability is affected by their *'loci of control'*. Cost of contingency plan compared to benefits or risk will also affect the number of strategies available (Wright 1985).

2.2.7.2 Loci of Control

The concept of the loci of control relates to the perceptions of individuals with respect to elements within their operating environment that they believe they can control or influence. Perceptions of control are influenced by differences in learning, experience, and knowledge. Differences in perceptions obviously lead to differences in business farming/goals and strategies that are developed in order to attain them (Kaine *et al* 1994).

There are two recognised loci of control: the internal locus of control and the external locus of control. An internal locus of control is said to exist when an individual believes that their actions and behaviour determine the outcome of an event. That is there is a perception that a casual relationship exists between their actions and the event, and event result is a reflection of their personal success or failure (Kaine *et al* 1994). The external locus of control represents the reverse of the internal locus of control in that the individual perceives that forces outside of their control determine the outcome of the event. Since these individuals believe that they cannot alter the outcome through exercising their skills or knowledge, the event is not associated with personal success or failure (Kaine *et al* 1994).

The locus of control is said to influence the way in which farmer's rank objectives, which means it will have a bearing on how different farmers manage extremes in conditions, on and off the farm.

2.2.7.3 Feed Back (Lag indicators)

Feedback control attempts to ensure conformance to expectation by comparing actual performance against original expectations and then adjusting their performance or plans to diminish any deviation that exists. These outcome measures may be for example; profitability, market share, customer satisfaction or employee skills (Kaplin & Norton 1996). Feed back in this sense tells the farmer whether the objectives have been achieved and if the standards are appropriate to the process. One key point in this control process is the time gap between when any significant deviation from the standard is noticed and corrective action is taken. Control obviously is most effective when this deviation time is minimised (CCH Management Manual 1994).

2.3 Risk

2.3.1 What is Risk in Farming?

We live in a world of uncertainty. There is an old saying *" nothing is certain accept death and taxes"*. Managers find that their best decisions often turn out to be less than perfect because of changes which take place between the time the decision is made and the time the outcome of that decision is finalised. Many agricultural decisions have outcomes that take place months or years after the initial decision is made (Kay & Edwards 1994).

Risk and uncertainty have been defined as distinct terms by Hardaker *et al* (1997). Uncertainty has been defined as imperfect knowledge (e.g. seasonal weather) and risk as uncertain consequences, particularly exposure to unfavourable consequences (e.g. the risk it may be a drought). Fleisher (1990) suggests that risk creates opportunities for farmers to face both gains and losses. It is accepted that the down-side of risk has negative effects but there are also gains made from accepting risk which benefit some individuals and can lead to innovation.

2.3.2 Sources of Risk

There are a number of risk sources that farm managers must be aware of in order to successfully manage a farm business. The literature identifies business risk (which is associated with the operations of the farm) and financial risk (which is tied directly to the farms capital structure) (Gabriel & Baker 1980). The sources of business risk impacting on most New Zealand sheep and beef farms include; production risk (which impacts on yields) and market risk (which impacts on input and output prices) (Martin 1996). Other business risks include technological risk, legal and social risk, and human sources of risk (Sonka and Patrick 1984).

2.3.2.1 Production and Technical Risk

Production risk includes; weather, diseases, insects, weeds, feed conversion and soil fertility. In a study of New Zealand sheep and beef farmers Martin (1996) found that on a scale of 1-5 (1 - not important, 5- extremely important) farmers rated the production risks of rainfall variability, other weather factors, and disease or pests as 3.6, 3.0, and 3.2 respectively. Another source of production risk is new technology and whether its introduction will be successful (Kay & Edwards 1994).

This type of risk is particularly relevant to this research. For a conventional lamb or venison grower changing to an organic production system there will be a multitude of changes. Many of the conventional control functions such as veterinary drenches, dips, and chemical fertilisers will be lost to the manager replaced with non-conventional methods and in some cases nothing at all. Potentially the production risk in an organic farming system could be considerably higher than that in a conventional system.

2.3.2.2 Market or Price Risk

Another major source of risk is price variability. Commodity prices vary from year to year as well as day to day, due to reasons beyond the control of an individual farmer. Similarly, short run fluctuations in input prices can cause a variation in farm income and cashflow. Martin (1996) found that New Zealand sheep and beef farmers rated change in product price and change in input costs as 4.2 and 3.7 respectively. Change in product price was the most important risk source to farm businesses. *(Martins results must however, be put in context with high inflation leading up to 1992 and the survey period).*

In an organic lamb or venison system the market or price risk could be reduced. It is currently a niche market where in some countries premiums of between 30-100% are being paid for organic produce (Meat NZ 2000). Demand is high meaning price stability

and the ability to secure forward contracts may be improved lowering the market risk to the grower.

2.3.2.3 Financial Risk

Financial risk is incurred when money is borrowed to finance the operation of the business. This risk is caused by uncertainty about future interest rates, a lenders willingness to continue lending at levels needed now and in the future, changes in market values of loan collateral, and the ability of the business to generate the cashflows necessary for debt payments (Kay & Edwards 1994).

Production, marketing and financial risk exist on most farms and are interrelated, i.e., the ability to repay debt depends on production levels and prices received for the production . Financing the production and storage of produce depends on the ability to borrow the necessary capital. Therefore, all three types of risk need to be considered together. How these risk combinations fit together and alter in an organic system compared to a conventional system may make an interesting topic for further research.

2.3.2.4 Human Risk

Human sources of risk may be associated with the labour and management functions of the farm and include the vulnerability of the sole operator and the availability and reliability of labour. Human sources also include changing objectives of the individual and family members, which may affect the farm long run position. Martin (1996) found the risk of accidents and health changes in a family situation were rated as 3.6 and 2.9, respectively.

2.3.2.5 Legal and Social Sources of Risk

Legal and social sources of risk are becoming increasingly important for New Zealand farmers. As the farm firm grows larger, it tends to rely more on outside sources of labour and capital, and legal risk can become important. Marketing techniques such as forward contracts, government policy, tax, trade, credit and resource legislation, all pose forms of legal risk for farmers. Sheep and beef farmers in Martin's (1996) study rated regulatory risk as quite important with a value of 3.2 and miscellaneous risks (theft, labour, contracts) a value of 2.0.

Again in an organic farming situation labour requirements could increase, and legal and marketing issues regarding the 'organic' label can become complicated. Trade issues regarding the 'organic' processing, access, and trace-ability of lamb and venison products could also increase the legal and social risks. Conversely a change to organic production generally means a more sustainable system with some potential social and legal advantages, for example, Resource Management Act requirements.

2.3.3 Risk Management

Farmers vary greatly in their willingness to take risks and their ability to survive any unfavourable outcomes. Therefore, the level of risk, which a farm business should accept, is very much an individual decision (Kay & Edwards 1994). Gabriel and Baker (1980) suggest that individuals balance risk by way of trade off between business risk and financial risk. It is assumed that a decision-maker maximises net returns subject to the constraint that total risk does not exceed a specified level. Total risk is seen as a function of both business and financial risk.

The objective of risk management is to reduce the probability of not being able to meet the cost of capital while at the same time maximising the firm's expected return (Martin 1996).

Risk management strategies can achieve this objective in two ways: controlling the level of risk exposure or controlling the impact of the risk. In order to control the level of risk exposure - reduce outcome variability, the probability distributions of alternative outcomes must be changed. This can be done by smoothing prices and yields, which requires strategic selection of enterprises, diversification, forward contracting of prices, spreading sales or by cutting off troughs in either prices or yields using insurance.

Strategies, which control the impact of risk, do not alter the distributions of the alternative outcomes, but rather increase the capacity of the firm to absorb the affects of downturns. One method could be to reduce business risk by increasing yields and prices received for output or by obtaining off-farm employment - thus lifting the Net Operating Profit After Tax (NOPAT) and reducing the cost of capital respectively. Another method would be to reduce the financial risk by changing the firm's capital structure, maintaining a cash reserve and matching debt servicing to income (Martin 1996, Martin & Mcleay 1997).

2.4 Entrepreneurs

Entrepreneurs as Olsson (1988) describes, are those farmers who use advanced management techniques, are flexible and responsive, spend time planning and are tuned in to market signals. Duncan (1991) cited in Giera (1999), in his advice to management accountants, suggests that entrepreneurship is the creation of new ventures by individuals where nothing previously existed. He ads that the study of entrepreneurship is therefore, particularly focused on individuals rather then enterprises. Meredith *et al* (1982) also concentrates a definition of an entrepreneur at the individual;

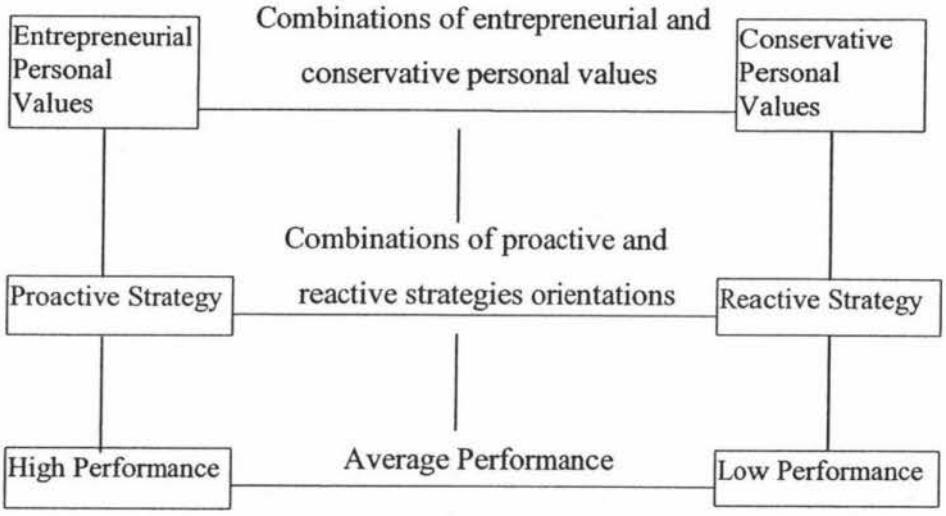
"...entrepreneurs are business leaders who have the ability to see and evaluate business opportunities; to gather the necessary resources to take advantage of them; and initiate appropriate action to ensure success".

Sher and Sher (1994) make similar comments to Meredith stating;

"...it is useful to think of entrepreneurship in broader terms than a specific commercial venture owned and operated by a particular person. The essence of entrepreneurship is not business management, but rather the cultivated ability to see and seize opportunities, where others see only problems - or nothing at all. The classic traits of successful entrepreneurs - perseverance, creativity, an ability to marshal and use available resources, attention to detail, open mindedness, and the ability to learn from experience- all would hold communities in good stead".

Kotley & Meredith (1997) have very similar definitions to those mentioned (in Sher & Sher 1994) and identify similar characteristics for entrepreneurs. In contrast to this however, they have identified a lower value to be placed on the same characteristics for conservative owner/managers but higher on values of equality, affection, compassion and social protection. Kotley & Meredith (1997) also argue that entrepreneurial values are associated with above average business performance and is primarily due to pro-active management strategies (See Figure 5.).

Figure 5. The Association between Dimensions of Personal Values of Owner/Managers, Business Strategies, and Enterprise Performance.



Source: Kotley and Meredith (1997).

2.4.1 Characteristics of Entrepreneurs

In 1984 a study was carried out by the United States Department of Agriculture attempting to identify characteristics of small business entrepreneurs or individuals with entrepreneurial potential (Little 1984b). The interim findings of this survey indicated that rural entrepreneurs were often 'urban refugees' (or new comers into rural areas) who had experienced a break in there lives. That 'break' may have arisen from or through an emotional trauma such as divorce, bereavement, or unemployment. The findings suggest that these types of experiences make some people more likely to initiate new ideas and to learn new processes. These people may be more likely to accept the risks associated with establishing a new venture (Little 1984b).

Teal (1981) cited in Taylor *et al* (1997) describes the literature on entrepreneurial identification and development as examining a wide variety of economic, sociological, psychological and political factors that determine the likelihood of person becoming an

entrepreneur. Economists, she states, focus not on the individual's characteristics, but on the availability of technical and managerial knowledge and financing as the primary determinants of entrepreneurial development. Whereas sociologists suggest that family background is a major factor influencing entrepreneurial tendencies. She cites a Californian survey of women business owners, which found that half the respondents had family members with entrepreneurial experience. It was concluded that a family tradition of entrepreneurship gave individuals a certain degree of entrepreneurial 'readiness' and a set of attitudes that enable them to recognise and take action on opportunities. In attempting to isolate the personality traits of entrepreneurs Teal (1981 cited in Taylor *et al* 1997) came up characteristics such as a need for achievement, a need for power, creativity, risk taking behaviour, independence, and leadership skills.

Being entrepreneurial means combining personal characteristics, financial means and resources within an ever-changing environment. It is important to recognise that although particular personality traits and characteristics have been identified for entrepreneurial managers and owners each farmer will be uniquely different in the ways they manage, control and the risks they are prepared to take with their farm businesses.

2.5 Conventional Farming Systems in New Zealand

2.5.1 Introduction

The purpose of this section is to describe conventional farming systems in New Zealand. The key areas that are covered include how the conventional systems have evolved and what they are like today. Particular attention will be paid to the critical managerial requirements in these systems, what tools are available to them and how top conventional operators are managing.

2.5.2 The Development of Conventional Farming Systems

For over 30 years in New Zealand, the real rates of returns for commodities produced by the New Zealand pastoral sector have been on the decline (Baily 1997) (Table 5.). Despite this the contribution of agriculture to the New Zealand economy is substantial (Table 4.), earning in 1997/98, 61% of our export income (NZMWBES 1999).

Table 4. N.Z.'s Total Exports to all Countries for the Year Ended March 2000.

Sector	Last 12 months ended March 2000 ($NZ Million)	% of Total
Meat	3,193	13.8
Dairy Products	4,528	19.5
Fish	1,277	5.5
Fruit & Vegetables	1,514	6.5
Food & Beverages	685	2.9
Primary Products	3,588	15.5
Industrial Raw Materials	661	2.8
Metals	1,395	6.0
Manufactured Products	5,757	24.8
Other	612	2.6
Total	**23,214**	**100**

Source: Statistics New Zealand, Overseas Trade (2000).

Table 5. Export Price Trends and Productivity (inflation adjusted price changes)

	US % Change	NZ % Change
Cotton	-66%	-
Wool	-79%	-72%
Lamb	-45%	-42%
Beef	-69%	-28%
Broilers	-85%	na
Dairy	-55%	-49%
Wheat	-69%	-

Source: NZMWBES (1998).

New Zealand farm profit (before tax) has dropped. The NZMWBES 1998/99 report for the sheep and beef sector stated the following:

1975-76 to 1984-85	$67,200
1985-86 to 1994-95	$37, 000
1997-98 (provisional)	$30,800
1998-99 (estimate)	$28,400

Source: NZMWBES (1998).

To maintain profitability during this time, farmers and industries have responded in a number of ways, including:

- The introduction of new management systems and technologies to increase the efficiencies of production, e.g., superior animal genetics and improved pasture species.
- Increased the size of there operations. Diversifying and intensifying their land use (Baily 1997, Brown 1996, Manhire 1999).

The reason for this is simple. They have had to achieve significant productivity gains to offset price declines and this has happened through the use of technology that now enables one person to manage a farm that is three or four times the size compared to 1950 (Baily 1997, Shadbolt 1999).

Table 6. illustrates trends in key production parameters over time. In both sheep beef and dairy industries efficiencies have been gained through economies of scale (particularly labour costs). Sheep beef and cattle farms have increased their size from 237 hectares in 1970 to 604ha in 1999 (NZMWBS 2000). Dairy production per cow has almost doubled in the last 80 years, wheat yields are two and half times greater than what they were in the 1920's, and broiler chickens eat 50% less food today than they did in 1967 to achieve the same weight gain (Brown 1996). The trend towards larger farms is increasingly separating ownership/management from labour and has led to skilled labour shortages in some sectors (Parker *et al* 1997).

Table 6. Physical production trends, New Zealand averages.

	Description	**1975**	**1995**	**1997**	**1998**	**1999**	**2000**
Wool	kg greasy/sheep wintered (kg)	5.5	5.9	5.8	5.7	5.5	5.6
Lambing %	lambs tailed/ewes wintered (%)	93	108	117	109	115	117
Lamb weight	Average, NZ kill	14.0	14.8	15.9	15.5	15.8	16.6
Dairy Production	kg MF/cows in milk, 1 Dec	128	156	165	159	148	171
Dairy herd size	1918-145 settlement block numbers. Thereafter average herd size.	117	193	208	220	229	236
Wheat	Total production/area planted (t/ha)	3.1	4.6	4.7	5.1	5.5	6.15
Broiler chicken	Average dead weight (kg)	1.28	1.48	1.54	1.59	1.60	1.64

Source: Brown (1996); Nimmo-Bell & Company 2000.

New Zealand farmers have been very good at developing and implementing new technologies and systems as a means of maintaining profitability in the face of declining real returns. Aerial top-dressing, electric fencing, motorbikes, new herbage cultivars and contract shearing gangs are all examples of means used to lift productivity per hectare and per labour unit (Brown 1996).

2.5.3 Changes in the Farming Environment

2.5.3.1 Food Safety and Quality

Changes in consumer purchasing trends mean agricultural products today are no longer the bulk commodity products of the past, but premium quality, value added products aimed at niche markets and wealthy consumers (Taylor 1997, Brenton-Rule 1999).

The example of New Zealand lamb exports can be used to illustrate this. In 1998/99 over 75% of lamb exports were further processed beyond the carcass stage prior to export. This compares with 48% in 1990 (Nimmo-Bell 2000). Technology allowing chilled product with a significant shelf life has encouraged the growth in exports of this type (Table 7.).

Table 7. NZ Lamb Exports Product Mix: 1996-99

	1995/96	1996/97	1997/98	1998/99
Frozen Carcass	30.6%	25.8%	16.7%	14.0%
Frozen Cuts	62.1%	64.4%	73.3%	74.5%
Chilled Product	7.3%	9.8%	10.1%	11.5%

Source: Nimmo-Bell (2000).

The rise in the share of higher value cuts (both frozen and chilled) coupled with the decline in low value frozen carcasses exports has been quite spectacular over a short four

year period. In 1991 chilled volumes represented just 2 percent of total lamb shipments while developed carcasses accounted for more than 35% of the total (Nimmo-Bell 2000).

Management changes have been required both in marketing, production, and quality assurance from the farmer through to the retailer to produce these products. In many instances processors have adopted ISO standards or TQM (total quality management) approaches, however it seems unlikely ISO standards will be adopted at the farm level (Shadbolt 2000). Processors today, in response to consumer demand are putting pressure on farmers to develop quality management systems. For example, Wattie frozen foods, a subsidiary of Heinz Ltd, a large exporter of vegetables including organic crops, requires farmers to provide it details of their crop spray programmes before they will accept the products or pay a premium for it (Garret 1995, cited in Shadbolt 2000). The deer industry that serves high value niche markets overseas with its Cervena ™ product strongly encourages deer farmers to adopt a quality management system, which covers on-farm facilities, animal health and welfare, and production practices.

It is not yet universally acknowledged by farmers that quality systems are not necessarily designed to gain a price premium, but to preserve market access and price. The need to document on-farm practices for quality assurance and to meet more stringent quality standards (e.g. lowering of somatic cell counts in milk) increase compliance costs for farmers (through time and/or materials), and this is a concern to those whose margins are already tight. Further, on farm recording systems need to be modernised in most cases; the traditional farm diary does not provide sufficient detail or reliability to meet requirements (Parker *et al* 1997).

2.5.3.2 Environmental concerns

Interest in sustainable agriculture has increased over the past decade due to increasing consumer concern for food free pesticide residues, farmer's concern for their own health and that of others, and the concern of the public and policy makers about the degradation

of the natural environment through various conventional agricultural practices (Neher 1992, Morris 1998). In short, there is a fear that agriculture is not sustainable (Bockman *et al.,* 1999).

The Resource Management Act (RMA) introduced in 1991, seeks to ensure the sustainability of natural resources for future generations. This legislation directly effects farmers who use about two thirds of New Zealand's land area (Ensor, 1995, cited in MAF 2000). The requirements and standards to which farmers must comply to are set by regional councils through a process of extensive public consultation. The immediate effect, other than increased monitoring of water quality, on many farms has been small, but where farmers have wanted to pursue further development of there land, or to alter their farming enterprise (e.g. add irrigation) compliance costs have been very high (Parker *et al* 1997).

Farmer views on farm business sustainability as identified in a survey by Rauniyar and Parker (1996) included a conflict between environmental and financial management, concern about the ability of RMA to improve farm profitability, and the imperative for changes in the management of physical resources to be profitable.

2.5.3.3 Technological Advances

Considerable gains have been made in areas of genetic improvement in livestock. To illustrate, this a study by Jopson *et al* (2000) on the impact of recently (1992) imported East Friesian (EF) genetics will be reviewed. East Friesian genetics were imported into New Zealand with the expectation of improving performance in prolificacy and milk production in our traditional breeds and breed crosses (Meyer *et al* cited in Jopson *et al* 2000).

Specifically the study was aimed at assessing lamb and ewe performance of East Friesian x Coopworths relative to pure-bred Coopworths (COOP). The paper reviewed presented

results on growth, ultrasonic fat and muscle depths, wool, dagginess, host resistance to internal parasites and reproductive performance of EF x Coopworth progeny relative to their pure-bred Coopworth contemporaries.

Results showed that on average, the EF cross progeny had a liveweight advantage of 1.9 and 4.2kg at weaning and 6 months of age, respectively, compared to the COOP. Ultrasonic eye muscle depth did not differ between sire breeds after adjustment for liveweight. EF cross progeny had lower fleece weights at 12 months than COOP. Sire breed differences in resistance to parasites were not significant. EF cross ewes performed considerably better in lambs born per ewe lambing than the pure-bred COOP for both two-tooth and mixed-age classes. The high lambing percentage in EF cross ewes meant that more than 70% of mixed age ewes had three or more lambs per lambing (Jopson *et al* 2000).

Barker *et al* (1999) reported some useful information on the potential of improved pasture species and superphosphate fertiliser use on hill country farms. In a simple trial at the Ballantrae research station four farmlets (9ha) were designed, to treat half of two farmlets with 'Grasslands Wana' cocksfoot and half of the other two farmlets with superphosphate fertiliser. The effects of pasture production were modelled using Stockpol. Pasture, bull and financial performance was measured within the four self-contained farmlets (Barker *et al* (1999).

The 'Wana' farmlets on average generated $42.80/ha greater income than the control farmlets, and an 80% average greater return from the application of 40 kg P/ha ($715.26/ha) compared to nil fertiliser (397.84/ha). With a cost of fertiliser of 2.44/kg P applied ($97.60), the predicted return was highly profitable (Barker *et al* 1999). Both the use of improved pasture species and fertiliser provided substantial benefits for farm production.

Ectoparasites of sheep, principally blowflies and lice, cost the New Zealand farming industry and estimated $60 million each year (Cole and Heath 1999). This figure includes

the cost of chemicals and labour used to treat flystrike and lice, together with lost production.

In an attempt to stem these costs a trial was set up by Cole and Heath (1999). An Integrated Pest Management (IPM) trial project involving four groups of farmers (overall total 15) in four regions of New Zealand was set up with the aim of adopting a holistic approach to managing these parasites. Procedures were set up to reduce insecticide residues in wool by using techniques such as jetting which apply less chemical to the sheep but target it more appropriately and maintain or improve protection against flystrike and control of lice.

As a consequence of this technology, savings in chemical and labour costs have been made. On two farms in particular, savings on items ranged from $578 (27% reduction) on a property with 2000 Corriedale ewes to $3608 (52% reduction) on the other property with 8000 Romney ewes (Cole and Heath 1999).

2.5.4 Changes in Conventional Management Thinking

Globally conventional farming systems today operate in a very different environment to that of the past (Parker 2000).World-wide, agricultural industries are in the midst of major structural changes- changes in product characteristics, in world-wide production and consumption, in technology, in size of operation and in geographic location (Boehlje 2000, Parker 2000). Because of these new concepts, management and strategic thinking have had to change to remain successful. Some of the key management changes comprehensively summarised by Boehlje *et al* (2000), include those presented in Table 8.

Table 8. Management of Conventional Agribusiness Firms Today

Old Concept	New Concept
Commodities	Specific attribute/differentiated raw material
Staple Products	Fashion/niche products/projects
Assets drive the business	Customer drives the business

Hard assets (land, machinery, buildings) are the prime source of strategic competitive advantage	Soft assets (people, organisation, plans) are the prime source of strategic competitive advantage
Blending of commodity products from multiple sources	Separation of identity-preserved raw materials
Geographically concentrated production sites	Geographically dispersed/separated production sites
Owning Assets	Control of assets
Money/finance/assets are the prime source of power and control	Information is the prime source of power and control
Labour is a cost and equipment an investment	Labour is an investment and equipment a cost
Sell product and give away service	Sell service and give away product
Impersonal open markets	Personal/negotiated/closed markets
Adversarial relationship with suppliers and purchasers	Partner with suppliers and purchasers
Impersonal sourcing and selling	Relationship sourcing and selling
Market (price) risk	Relationship risk
Independence	Inter-dependence systems
Stability	Change/chaos/flexibility
Agriculture is an art form	Agriculture is primarily science based
Technical skills critical to success	Human/personal/communication skills critical to success
Technological change and innovation	Institutional (ways of doing business) change and innovation
Core competencies	New/different/unique skills and capabilities
Tradition/remembering	New ideas/forgetting
Public/open information and research and development	Private/proprietary/closed information and research and development

Source: Adapted from Boehlje *et al* (2000).

Earlier parts of this section have highlighted how conventional farming practices have changed. Management has also changed as can be seen in Table 8. In an attempt to interpret and further summarise all the information contained Table 9. The Balanced Scorecard format will be used. In summary, the Balanced Scorecard is a set of financial and non-financial performance measures that reflect factors that are critical to the businesses success. Table 9. illustrates how these 4 measures have changed in relation to conventional management.

Table 9. Summary of Managerial Changes

	Old Management	Today's Management
Financial	Money/Finance/Assets Hard Assets	Control of Assets Relationship Risk Soft Assets
Internal Business Process	Commodities Farming is Art Resource Exploiters Traditional Practices	Differentiated Raw Products Farming is Science Based New & Innovative Ideas Resource Protectors
Learning & Growth	Technical Skills Critical Labour is a Cost Technological Change	Human Skills Critical Information is Power Institutional Change
Customer	Assets Drive Business Sell Product & Give Service Impersonal Business	Customers Drive Business Sell Service & Give Product Relationship focus

In order to survive in this increasingly competitive and unforgiving business environment management has adapted (Boehlje 2000, Christie 1999, Shadbolt 2000 *pers com*, Winger 1999). Operations are run to standards and management practices which ensure compliance to complex economic, environmental and social issues because they have had too (Rhodes *et al* 2000, Shadbolt *pers com* 2000).

Formal production codes can now be found in the form of Meat processing contract supply agreements and quality assurance schemes, the Resource Management Act, Occupational Safety and Health, and environmental policies, which most conventional farmers must now comply too. The managers of today juggle a diverse range of on and off farm issues in a society where they are seemingly answerable to anyone. They are the human resource managers, environmental department, the strategic planners, marketing managers, customer services, complaints department and every other part of big business that can be imagined. These skills really define the modern day farmer.

2.5.5 Top Conventional Farming Systems

Like most things that are done by people in this world, some people are better at it than others. This concept definitely applies to farming. The following farm description and

discussion is an example of a top conventional farming system, and its management. The aim is to illustrate the scale and intensity of the operation and how management techniques, particularly the planning, monitoring, control functions, are used by this successful conventional farmer to minimise risk.

2.5.5.1 Te Puna Farm Details - Hawkes Bay

Area:	385 ha effective
	328 ha sheep and beef
	57 ha deer
Contour:	Predominantly flat to easy rolling hill country
Climate details:	Average rainfall 850mm per annum
	Typical Hawkes Bay country with winter wet and very prone to summer dry
Ownership Structure:	Farmed in partnership with wife and parents
Stock Numbers:	Sheep 1800 MA ewes
	500 Ewe Hoggets
	20 Rams
	Cattle 135 R1yr Bulls
	180 R 2yr Bulls
	Deer 400 R1yr Stags
	120 R 2yr Stags
Sheep Policy:	600 ewes lambing out of season to supply Mark's and Spencer pre-Christmas chilled trade.
	1200 ewes mated to one half East Friesian Romney cross rams to provide one-quarter East Friesian, three quarter Romney replacements.
	Ewe hoggets mated to supply market.
Cattle Policy:	Bulls wintered in cell systems, flexible policies to offset the effects

	of climate.
Deer Policy:	Stag trading supplying Cervena specification venison for year round market.

The farmer of this property outlined in a paper the key systems he had developed to successfully manage this farm (Petersen 1999) and enhance the ability to farm to market specification for sheep, beef and deer.

2.5.5.2 Feed Planning

"...Intensive feed monitoring and planning has been of the most important tools that we have used to enhance our ability to farm to market specification. Our business is about growing grass, harvesting it through animals and turning it into dollars. The whole process must be done as efficiently as possible, and in order to do this we must be able to put some figures to feed and feeding levels." (Petersen 1999).

Every planning or analysis decision made in this business is based on the amount of feed consumed relative to the income earned from it. A computer model to monitor pasture covers and feed intakes has been established with four years of data. Monthly pasture growth rates have been recorded, established and planned for. This modelling system enables the farm business to be more responsive to pasture surpluses of deficits and manipulate for success so the farm meets it's contractual supply agreements.

2.5.5.3 Farm Monitoring

"...In order to successfully farm to specification, we must have a very clear picture of the parameters that are going to influence our ability to meet our contractual requirements. Regular and intensive monitoring is vital to establish our position relative to our targets, and adjust them if necessary" (Petersen 1999).

Climatic factors such as rainfall and soil temperatures are monitored regularly, as well as stock liveweight gains. An effective health plan is also in place to ensure that low liveweight gains are not compromising the farms ability to farm to specifications. A high importance is placed on soil fertility with regular testing. Financial monitoring is also carried out.

2.5.5.4 Development

"... There is no doubt that in order to produce to specification without compromising stocking rates, a high standard of development is essential" (Petersen 1999).

Development is continual on this property. Plans are in place for additional subdivision (80 paddocks to 100), and raising the Olsen P from a 20 - 35 range to a 25 - 35 range and an extension of the water system. It is seen as critical to increasing productivity.

2.5.5.5 Summary

Although difficult to portray, this farm system through its management, has greatly improved its productivity, efficiency and ability to meet the markets requirements. An obviously highly motivated and determined farming family has planned, monitored and controlled its system to achieve their goals. This has been achieved with a very high intensity in day to day production and the quality skills of the operators.

2.6 Organic Farming

2.6.1 Introduction

During the last few decades, agriculture has changed character with the development of new knowledge, machinery and the chemical industry. Although this has boosted food production, it has not been without side effects (IFOAM 1998).

Simultaneously farmers, conscious about ecology and the environment, have developed agricultural methods and processes, which they consider ecologically sound and sustainable. This farming system is based on the dynamic interaction between the soils, plants, animals, humans, the ecosystem and the environment and is commonly called organic farming (IFOAM 1998).

2.6.2 What is Organic Farming?

What's in a name? To those of a scientific bent 'organic' means that branch of chemistry where carbon atoms are present in a molecule structure. To the farmer, however, the term describes a way of growing food or crops and to others it is simply just the old fashioned way of farming (Wright 1994). Throughout the world organic agriculture is known by many different terms; 'biological agriculture or husbandry'(Strickland 1981), 'ecological farming', 'alternative farming', 'regenerative farming' or even 'low input agriculture'(Reganold 1990). The terms are all virtually synonymous and aim towards that buzzword of the nineties -'sustainability'.

Framing a short, sharp, clear definition of organic farming is difficult (Lampkin 1990; Blake1987). Many exist, however, mostly focus their definition on the avoidance of agro-chemicals and do not capture all of the concepts and visions that provided the fundamentals underpinning the international organic movement by its pioneers (Fleming *et al* 1999). Clarke (2000) agrees with this but stated that the avoidance of agri-chemicals

by the organic farmer reflects not simply the distaste for the hazards of chemicals, but more importantly, rejection of the linear thinking underlying the use of chemicals. Chemical control deals with controlling the symptoms rather than causes. She went further to say that, the single most defining element of organic farming is that it seeks to avoid problems rather than to solve them after the fact.

Blake (1987) said it is a lot easier to say what organic agriculture is not rather than what it is. This is partly because it is often perceived only as farming without sprays or chemicals, and partly because any definition tends to be long and complex. Organic agriculture is a very different way of looking at farming, and this can make its concepts rather difficult to grasp, especially for those new to it.

"IFOAM" (International Federation of Organic Agriculture Movement) is the world organic authority and is based in Germany. It has drafted 17 points to form the "The Principle Aims of Organic Production and Processing". They are all-important and are not necessarily listed here in order of importance (IFOAM 1998);

1. To produce food of high quality and sufficient quantity.
2. To interact in a constructive and life-enhancing way with natural systems and cycles.
3. To consider the wider social and ecological impact of the organic production and processing system.
4. To encourage and enhance biological cycles within the farming system, involving micro organisms, soil flora and fauna, plants and animals.
5. To develop a valuable and sustainable aquatic ecosystem.
6. To maintain and increase long term fertility of soils.
7. To maintain genetic diversity of the production system and its surroundings, including the protection of plant and wildlife habitats.
8. To promote the healthy use and proper care of water, water resources and all life therein.
9. To use as far as possible, renewable resources in locally organised production systems.

10.To create a harmonious balance between crop production and animal husbandry.
11.To give all livestock conditions of life with due consideration for the basic aspects of their innate behaviour.
12.To minimise all forms of pollution.
13.To process organic products using renewable resources.
14.To produce fully biodegradable organic products.
15.To produce textiles which are long lasting and of good quality.
16.To allow everyone involved in organic production and processing a quality of life, which meets their basic needs and allows an adequate return and satisfaction from their work, including a safe working environment.
17.To progress toward an entire production, processing and distribution chain which is both socially just and ecologically responsible.

Fleming *et al* (1999) describes the fundamentals behind the 17 points of the organic movement. These are the concept of health, the concept of sustainability and the vision that, by providing farmers with the skills to grow food organically, a crucial vehicle for bringing about a more equitable, healthy and genuinely sustainable world will be developed. Blake (1987) states that organic agriculture aims to be in harmony rather than in conflict with natural systems. This idea pervades all aspects of the farm, from how pests and diseases are controlled, through the treatment of livestock and the integration of the farm with the natural environment, to marketing, labour relations and health. The powers of nature are harnessed and developed to their fullest extent rather than dominated.

For organic farmers' world-wide, the IFOAM principles/standards provide the basis for day to day farming practices. They directly give rise to the techniques of organic agriculture, such as composting; the use of wide rotations which utilise leys and green manure's; the avoidance of soluble fertilisers; the prohibition of intensive livestock operation; the avoidance of antibiotic and hormone stimulants, the use of mechanical and thermal methods of weed control; the emphasis towards on-farm processing and direct

sales to the consumer; and the use of extra labour when not strictly necessary, as a positive contribution to the farm and rural community (Lampkin 1990).

2.6.3 Definitions of Organic Farming

The following sections are definitions for organic agriculture from some of the key organic bodies both within New Zealand and around the world.

2.6.3.1 The United States Department of Agriculture (USDA)

The USDA has framed a handy definition of organic farming, which although it misses out some important aspects provides a description of the key practices (Lampkin 1990).

"Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilisers, pesticides, growth regulators and livestock additives. To the maximum extent feasible, organic farming systems rely on crop rotations, crop residues, animal manure's, off farm organic wastes, and aspects of biological pest control maintain soil productivity and tilth, to supply plant nutrients and to control insects, weeds and other pests" (Lampkin 1990).

The concept of soil as living system that develops the activities of beneficial organisms is central to this definition (Lampkin 1990).

2.6.3.2 The International Federation for Organic Agricultural Movements (IFOAM)

The IFOAM definition for organic agriculture states:

"Organic agriculture includes all systems that promote the environmentally, socially, and economically sound production of food and fibres. These systems take local soil fertility as a key to successful production. By respecting the natural capacity of plants,

animals and the landscape, it aims to optimise quality in all aspects of agriculture and the environment. Organic agriculture dramatically reduces external inputs by refraining from the use of chemosynthetic fertilisers, pesticides, and pharmaceuticals. Instead it allows the powerful laws of nature to increase both agricultural yields and disease resistance. Organic agriculture adheres to globally accepted principles, which are implemented with local social economic, geoclimatical and cultural settings. As a logical consequence, IFOAM stresses and supports the development of self supporting systems on local and regional levels" (IFOAM 1998) .

2.6.3.3 BioGro New Zealand

"Organic production which includes such terms as biological husbandry, eco agriculture, natural, sustainable and bio-dynamic, seeks to produce food of optimum quality, and to manage productive ecosystems according to a total concept that endeavours to make them sustainable and non-polluting of the environment, while providing an appropriate level of income to the producer, families and communities" (BioGro 1998).

2.6.3.4 AgriQuality New Zealand Ltd.

"Foods should only refer to an organic production method if they come from an organic farm system employing management practices which seek to nurture ecosystems which achieve sustainable productivity and provide weed, pest and disease control through a diverse mix of mutually dependent life forms, recycling plant and animal residues, crop selection and rotation, water management, tillage and cultivation. Soil fertility is maintained and enhanced by a system which optimises soil biological activity and the physical and mineral nature of the soil as the means to provide a balanced nutrient supply for plant and animal life as well as to conserve soil resources. Production should be sustainable with the recycling of plant nutrients as an essential part of the fertilising strategy. Pest and disease management is attained by means of the encouragement of a

balanced host/predator relationship, augmentation of beneficial insect populations, biological and cultural control and mechanical removal of pests and affected plant parts" (AgriQuality 2000).

2.6.4 Organic Farming in New Zealand

The organic agriculture movement in New Zealand arose from a wide coalition of interests: urban food consumers, lifestyle in peri-urban areas, European migrants to NZ in the 1950s and 60s, and direct contact with the British soil association. By 1983 this loose coalition had institutionalised itself as the New Zealand Biological Producers Council which administered the standards for production under BioGro certification (Saunders *et al* 1997).

There has been a trend in consumer demand towards buying food that is perceived to be healthy, with low chemical residue levels, and produced in environmental friendly ways with concern for animal welfare (Ministry of Agriculture and Fisheries 1994). Organic food consumption has been linked with subjective factors in consumer purchasing by clearly situating the rise of organic food trading within consumer reactions to food scares and health concerns (James 1993, cited in Campbell and Coombes 1998).

Alvenlsben and Altinann (1987, cited in Lampkin 1994) summarises the basic conditions behind the rising demand for organic produce as:

1. The socio-cultural background: changing values in the society ("post-materialism" scepticism against economic growth and modern technology, environmental movement)
2. General discontent with the present food supply (concern about residuals)
3. Positive image of organic food (health, taste, etc.)
4. Health consciousness of consumers
5. Discontent with the mass distribution system (alienation)

6. Positive income elasticity, negative price elasticity of demand.

Many consumers perceive that organic products fulfil this demand. Market growth will depend largely on how much of the market for environmentally friendly, low residue products is supplied by organic products (Ministry of Agriculture and Fisheries 1994). Campbell and Coombes (1999) state that the growth of organic food exporting in New Zealand is synergistically linked to the environmental and health threats to conventional exporting. Between 1983 and 1990, there were a number of changes within the organic agriculture movement. Within that period, NZ organic agriculture developed stronger links with international organic bodies such as IFOAM. In addition to this, the standards for organic production were formalised, and an inspectorate to administer them was set up. The New Zealand Biological Producers and Consumers Council (Inc) was set up in 1984 to promote the interests of organic production in New Zealand. This council now trades as BioGro New Zealand (BGNZ) organisation, and is the main labelling agency in the country. Two other certification agencies exist, one operating under the Demeter label as the New Zealand Bio-Dynamic Farming and Gardening Association and the other Agri-Quality New Zealand who operate to recent (1999) European organic standards.

2.6.5 Structure of the New Zealand Organic Industry

According to Saunders *et al* (1997), two developments in the 1990s have strongly influenced the structure of the industry. These developments are: the professionalism of BioGro, and the development of organic exporting. BioGro has been a professional inspectorate since 1994, when fees for inspection were significantly increased for this purpose. New Zealand had very low levels of organic food production prior to 1990. A Ministry of Agriculture and Fisheries (MAF) report estimated the total value of organic food traded in New Zealand was NZ$1.1 million (MAF 1991).

Since that time, organic food production has escalated dramatically. The period from 1990 to present has been characterised by the conversion of conventional farmers at the

bequest of export agribusiness (Coombes and Campbell 1998). In 1990, Watties Frozen Foods (later to become Heinz-Watties NZ) and the New Zealand Kiwifruit Marketing Board (now Zespri International) began to experiment with organic products. Given that the nature of large corporate firms and that of the organic agriculture movement are apparently incompatible, the relationship was unlikely to be easy. The arrival of the large corporate entities placed pressure on both the institutions behind the organic certification system and the ideological loyalty of many long term members of the organic movement (Campbell and Coombes 1999).

In 1992, a Tradenz Joint Action Group produced a report on the prospects of organic food in export markets. By 1995, the rate of growth in organic exports was such that Tradenz fostered the establishment of the Organic Products Exporting Group (O.P.E.G), and assigned a Tradenz officer to help facilitate the development of organic exporting. These actions were the most significant moves by the NZ government to actively support the development of organic food production in NZ.

The economic structure of organic farming in New Zealand is characterised by two types of farms: the first (and original) organic farm in New Zealand is the independent lifestyle, domestic, small-scale production type. The second type is the export-orientated, commercialised organic farm (Coombes and Campbell 1998). The traditional organic farm generally supplies the domestic market and is likely to be of the mixed farming type, particularly market gardening. The motivation for many of these producers to farm organically appears to be because of philosophical viewpoints. They may have a strong concern for the environment and/or be farming organically for lifestyle reasons, generally not because of strong financial incentives (Saunders *et al* 1997).

The second type of farm is largely aiming at production for the export sector. These farms are of two kinds; those producing permanent crops and those on broadacre production systems where the export crop is rotated with other crops. The number of these export-based farms has grown since early 1990 with large processing companies such as Heinz

Wattie New Zealand, and Zespri International marketing organic produce. To illustrate this, Heinz Wattie from a New Zealand production base comprising one grower and just seven hectares of peas in 1990/91has expanded to over 50 growers farming a total of 600 hectares (Nimmo-Bell 2000).

It has been said that organic farming is conventionalising, with large firms from conventional agriculture "commandeering" the 'organic label' (Buck *et al* 1997 cited in Coombes and Campbell 1998). Accordingly, the influence of such firms is believed to have regulated organic certification, thereby debasing the meaning of organics to allowable inputs, rather than sustainable practices. This process of 'corporate greening' may negatively transform organic agriculture, with a possible dilution of standards for organic certification. However, Coombes and Campbell (1998) maintain that small-scale organic producers can coexist with agribusiness involvement in the organic industry. This is evident as the introduction of agribusiness in the industry has not been at the expense of the smaller, earlier organic farmers.

The organic producer sector is therefore likely to be made up of two different groups of people who are likely to hold varying beliefs and ideologies, which may potentially conflict with each other.

2.6.6 The New Zealand Organic Export Market

New Zealand's major markets for organic produce are Japan and the European Union (EU). Demand is also increasing in North America, Australia and East Asia (Taiwan, Korea and Hong Kong). Japan is the largest market for New Zealand organic exports taking 47.3 percent in 1999. Europe was the next biggest market (32.5 percent), Australia third (5.3 percent), the USA fourth (3.8 percent) and other markets (11.2 percent) (Nimmo-Bell 2000). A recent survey by O.P.E.G. shows that the EU market is growing strongly, however base production is still very low compared with conventional products.

Export opportunities in Europe and Japan are expanding. The value of New Zealand organic product exports has been estimated by O.P.E.G to be as high as NZ$40 million for the 1998/99 year (75 percent member response rate). The group believes that organic product exports could earn New Zealand $65 million by the year 2001 (O.P.E.G cited in Nimmo-Bell 2000).

Table 10. is a compilation by the Foreign Agricultural Service (FAS) to show the value of organic products bought, corresponding per capita expenditures, the annual growth of organic markets and the premiums paid in a number of countries (Ritchie 2000).

Table 10. Compilation of FAS Global Data on Organic Food Purchasing

Country	Value of organic market ($US millions)	Per capita consumption of organic products ($US)	Annual growth in organic market	Average premiums
Argentina	$3	$0.08	25%	N/A
Australia	$132	$6.95	60%	35%
Austria	$152	$19.00	N/A	10-50%
Brazil	$150	$0.87	20%	25-35%
Canada	$571	$18.42	25%	10-50%
Denmark	N/A	N/A	N/A	30-50%
France	$610	$10.34	25%	25-50%
Germany	$1,800	$21.95	10%	30%
Hong Kong	N/A	N/A	15%	15%
Italy	$900	$15.79	20%	20-200%
Japan	$3,000	$23.81	N/A	10-30%
Korea	$61	$1.30	N/A	50%
Mexico	$15	$0.15	N/A	30-40%
New Zealand	**$16**	**$4.44**	**50%**	**10-100%**
Philippines	N/A	N/A	10-20%	20-30%
Poland	N/A	N/A	N/A	10-30%
Portugal	N/A	N/A	N/A	10-15%
Slovakia	N/A	N/A	N/A	15%
Spain	N/A	N/A	N/A	20-50%
Taiwan	$9.5	$0.43	30%	Up to 400%
UK	$650	$11.02	100%	25-100%
USA	$6,000	$21.98	20%	10-20%
Total	**$14.07 billion**			
Average		**US $10.44**	**35%**	**35%**

Source: Ritchie *et al* (2000).

For this group of 21 countries, the organic market presently exceeds $US14 billion and is growing annually at an average rate of 35%. The biggest organic markets are in the United States, Europe and Japan. Organic imports to Japan are currently less than 4% of the total sales of organic food. This suggests that even if a substantial amount of the food producing land in Japan is converted to organic there will still be a significant demand for organic imports, which New Zealand might be in a position to fulfil (Ritchie 2000). The same scenario will probably apply in a number of other countries like the European countries and South Korea (Brehm 2000 cited in Ritchie 2000), as there organics markets grow.

2.6.7 Standards and Regulations

2.6.7.1 BioGro

BioGro standards have evolved since 1984, and there are procedures in place which enable these standards to be reviewed (every two years) (BioGro 1998). The standards have evolved in dialogue with international organic groups like IFOAM and the Australian organic agriculture body NASAA. The great majority of exporters have decided to use the BioGro standards rather than the alternative biodynamic Demeter label (Saunders *et al* 1997).

The key principles of the BioGro standards are that they prohibit the routine use of drenches, vaccines, antibiotics, dips and other chemical remedies unless an individual animal is suffering or shows signs of ill thrift (Mackay 1998). These standards are held in high regard overseas, and the overall structure of the industry is strongly influenced by the certification and labelling system. The standards can be found at http://www.biogro.co.nz

BioGro accreditation in New Zealand is considered a high level of certification both domestically and internationally. The transition and certification process takes years (3-years minimum) with regular monitoring by BioGro authorities. It is particularly strong on restricting the use of synthetic drenches and vaccines on animals and the use of fertilisers and soils and pastures. Some exceptions are made, but this is common with almost all organic standards today (Mason 2000). Any animal treated will lose its certification status for a minimum of 12 months and will have to be quarantined for a specified length of time.

New animals arriving on an organic property will also have to be quarantined on designated areas. These areas can sometimes cause complications for farmers and make the monitoring of animal movements very important compared to a conventional farming operation.

Farmers who eventually attain certification are then allowed to market and sell their products under the BioGro label. Products produced and sold under the BioGro certified organic label pay a levy (1.5%) to the organisation for all products sold. BioGro is New Zealand's largest, most commonly known and successful organic standard so far. The BioGro label is the most well known organic label on New Zealand retail shelves (Mason 2000).

Change is common amongst organic certifying agencies that comply with international standards and BioGro is no exception. Their rules and standards have changed and will no doubt undergo further change in the future.

2.6.7.2 AgriQuality

In 1998 AgriQuality New Zealand (formerly part of the Ministry of Agriculture and Fisheries) released an organic standards manual. These standards which are in direct competition to BioGro are based on the recently released EC regulation 1804/1999,

adapted to New Zealand conditions. They are audited by a separate certification body (Certenz) which has gained international recognition (ISO 65) required ensuring market access for customers in the European Union. Certenz is the first organisation in New Zealand to gain ISO 65 accreditation. The standards can be found at http://www.agriquality.co.nzThe AgriQuality organic standards are based on the Codex Alinorm 99/22, the EU regulation and the Australian National standard.

Applicants are not restricted to the AgriQuaility standard, if a customer requires that a farmer is audited to an individual standard such as the EU regulation or Australian standard then AgriQuality will audit to that standard (Quinn 2000).

The AgriQuality standard is considered to have some distinct differences to the BioGro and other organic standards. Transition/conversion periods to full certification are shorter by as much as 1 year compared to the BioGro standard. Some use of synthetic drenches and vaccines is tolerated and could have significant advantages for lamb production in particular.

The standards state that a animals are permitted three treatments in a year without losing organic certification status. This is perhaps the most significant difference from the BioGro standard, where even one treatment can lose an animals organic status.

As well no animal quarantine areas are required meaning the whole farm can always be used for organic production.

2.6.7.3 European Regulation

The European (EU) Regulation (1804/1999) covering the production of organic livestock came into effect in August 2000 (Keatinge *et al* 2000). These detailed standards are the new minimum requirements for all EU member states and potential third countries, like New Zealand (EC 1999). Member states are required to interpret the regulation to

national circumstances, including the option to adopt tighter standards if appropriate. AgriQuality New Zealand is the only company in NZ who has adapted the EU regulation to NZ conditions. It is thought that potentially the EU regulation is an easier standard to attain for some NZ growers than the current BioGro standard (Rhodes and Shadbolt *pers com* 2000). This is primarily because the new regulation introduces a restriction on the number of 'allopathic' treatments which may be given before an animal loses its organic status (Keatinge *et al* 2000), and the 12 month conversion period that can be attained (EC Regulation 1999).

In addition to these standards for organic issued by either BioGro, Demeter or AgriQuality, all primary producers in New Zealand are obliged to meet the requirements of the New Zealand Resource Management Act 1991, which defines sustainable management as:

"Managing the use, development and protection of natural and physical resources in a way, or rate, which enables people and communities to provide for their social, economic and cultural well-being for their health and safety while:

- *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- *safe-guarding the life-supporting capacity of air, water, soils and ecosystems; and*
- *avoiding, remedying or mitigating any adverse effects of activities on the environment.*

(Amended Resource Management Act 1991: s5)

2.6.8 Managerial Requirements for Organic Farming

Management for an organic farming situation is going to differ in many ways from that of a conventional system. The farming risks are different, controls for these risks are different and the planning and monitoring required to detect and manage these risks unique to the organic system (Shadbolt *pers com* 2000).

In the organic farming philosophy, one of the main goals is to maintain the health and welfare of animals' through top husbandry and good management practice. Table 11. highlights some key differences in the management practices and tools of organic and conventional farmers.

Table 11. Organic versus Conventional Management

Management Practice	Organic	Conventional
Grazing management	Cross-over rotations, high cattle to sheep ratios (35:65), selective breeding, (Mackay 1998), topping (mechanical & animal), lower stocking rates	Higher stocking rates, intensive mob stocking of single animal classes and crossover. Less breeding stock, more finishing.
Fertility maintenance	Organic composting, reapplying animal manure's (Sims 1980), RPR and elemental sulphur fertilisers (Mackay 1998), use of legumes and crop rotations (Lampkin 1990).	Synthetic and natural fertilisers (e.g. urea, superphosphate), use of clover.
Animal health	Homeopathic drenches, herbal remedies (e.g. garlic), selective breeding (e.g. nematode resistance) (Lampkin 1990)	Synthetic drenches, vaccines, antibiotics, dips and other animal remedies.
Weed control	Biological control agents (e.g. spider mites & thrips), cutting (e.g. manuka), grazing (e.g. ragwort & Californian thistles) (Mackay 1998).	Chemical sprays.
Information and support	Limited information and technical support services (Rhodes *pers com* 2000).	Extensive information and support available throughout the entire industry.

Table 11. shows some of the key differences between organic and conventional farming systems. Controls such as spays and chemicals are generally prohibited limiting options to management and increasing the risks of disease and animal health problems. Monitoring of individual animals becomes more important in an organic system in order to identify these potential problems early and make contingencies (Lampkin 1990).

2.6.9 Farmer Reasons for Converting to Organic

Although organic farming may look economically attractive, at least to some, many farmers converted to organic production when the economic outlook was less positive. A number of studies have attempted to determine farmers' motivations for adopting organic farming (Freyer *et al* 1990). These studies generally indicate that farmers chose to adopt organic farming for largely non financial reasons which broadly fall into the following categories (not necessarily in order of importance) (Lampkin and Padel 1994, Rigby *et al,* 2000):

Husbandry
- problems with soil structure and fertility
- problems with livestock health
- ineffectiveness of agricultural chemicals
- produce better crops
- experience with organic production in own garden
- experience with extensive production methods on the farm

Environmental
- concern about damage to soil through chemical use
- more in harmony with nature
- less use of energy and other non renewable resources

Food Quality
- concern about pesticides residues in food
- desire to produce healthy food

Ethical/Religious
- Christian ideals of land stewardship
- concern for future generations

- concern for animal welfare
- Anthroposophy (bio-dynamic farming)

Political/philosophical
- protection of smaller, family farms
- decentralisation of food system
- closer producer/consumer links
- opposition to industrialisation of agriculture
- anti-materialist sentiments
- mankind-nature relationship
- farming as a vocation, not a business

Financial
- lower production costs
- self-sufficiency
- premiums for organic production

Personal
- concerns about use of chemicals on health of farmer and family
- ill health on part of farmer/family
- dislike of using chemicals
- job satisfaction and self-respect (desire to be valued by consumers)
- creative instinct

For many farmers, the motivations rose predominantly from negative experiences with conventional management, such as economic difficulties, animal health problems, aversion to the use of pesticides and problems with soil compaction and erosion (Vogtmann, Freyer *et al,* 1990). More recently environmental reasons have become a key factor (Freyer *et al,* 1990).

Financial motives appear to be becoming more significant, but are not yet dominant among the reasons given for the conversion (Freyer *et al,* 1990). Fisher (1989) argues that if incomes are similar or lower for organic farming compared with conventional farmers, then profit motive can not be a major reason for adopting organic technology.

Some studies have made a distinction between those who have converted from an existing conventional system and those who started farming as new entrants to agriculture. Converters tended to have larger operations, rent more land, come from a farming background, be older and have more farming experience. They tended to emphasise husbandry and personal motivations. The 'always organic' farmers tended to have smaller operations, be more highly educated and tended to make less money, partly as a result of farm size and fewer capital assets (an indication that the businesses were at an earlier stage in the cycle of investment). This group tended to emphasise environmental and political motivations more strongly (Lampkin and Padel 1994).

Although economic factors play a role, there are clearly a large number of other objectives or motivations which can influence a farmers decision to convert to organic farming, and which should be included in any analysis of the implications of conversion and the performance of established organic farms.

2.6.10 Farmer Reasons for Reverting from Organic Farming

Although it is clear that the size of the organic sector has been increasing, there has also been a number of farmers who have discontinued their certification as organic growers, choosing instead either to return to conventional agriculture or to quit farming altogether. Rigby and Young (2000) appear to be the only study to date to explore the reasons for this 'reversion'. For their study the UK Soil Association (SA) provided a list of growers in Great Britain who had been certified by the SA as organic growers but who had left the scheme in recent years. Most of these growers had been registered for less than 10 years.

The most common factor identified for prompting the ending of organic production was the unavailability of 'market outlets' while a 'lack of technical experience' and the costs associated with organic 'inspection' and also 'investments' were commonly identified. A relatively large portion of the 35 farmers interviewed in this study had severe problems selling their produce or, or had problems obtaining the organic premium necessary to cover the costs of organic production. These cost included not only the investment and production costs associated with establishing and maintaining an organic enterprise, but also the costs of Soil Association membership/inspection. There was a geographical aspect to this problem of marketing, with producers in certain areas too far from suitable processors (e.g. abattoirs, packers) or wholesalers for economic viability (Rigby and Young 2000).

Some producers had experienced severe problems regarding the agronomic aspects of organic production (such as weed and pest control and soil quality etc.). This it appeared was related, in some cases, to an almost naïve understanding of what organic production was going to be like. In some cases the expectation was that organic production would be either simply conventional production minus chemical inputs, or even just 'allowing nature to do its work'. This failure to grasp the labour and management intensive nature of organic farming produced problems later on. Even amongst those producers with a better grasp of the realities of organic production, there were problems regarding the availability of practically orientated information and advice. This again suggests the importance of the role of informal networks of organic producers in close proximity to each other. The dangers in terms of geographical isolation were not simply in terms of marketing but also in terms of information and advice on the practicalities of production (Rigby and Young 2000).

Other key factors that were found to increase the likelihood of a reversion were,

- age and education of the producer (older producers and those with higher education's were more likely to revert)

- gender of producer (female producers are more likely to revert)
- motive for going organic (cost reduction)

Perhaps of particular note is the effect of different motivation on the probability of reversion. Namely, those who entered with an economic perspective were found to be more likely to opt out of the scheme at a later date.

2.7 Performance Measurement

2.7.1 What is Performance Measurement?

Performance measurement is aimed at improving the quality of the managers' decision-making, and is the basis for the adage that "you can't improve what you can't measure". It is particularly important for the control function of management (Boehlje 1993) and can assist managers in making effective planning, implementation, and control decisions. The measures can be used as warning signs or indicators that corrective actions are needed to improve the firm's position. Primarily the information from performance measures help managers to make strategic plans and track their progress relative to the firm's goals (Purdy *et al* 2000). What to measure (in terms of a balance between financial and non-financial measures) and what to do with those measures are the critical questions managers must answer.

2.7.2 What to Measure?

There are many criteria for judging performance but management and industry analysts have tended to pick one measure, which they feel symbolises success or failure (Rawlings, 1999).Traditionally this measure has been financial, however, in recent years there has been a move away from treating financial figures as the foundation for performance measurement to treating them as one among a broader set of potential performance measurement tools (Eccles 1991). Shadbolt (1998) believes in this and states;

"*...that from a farm business perspective it is important to account for both the short - and long-term issues, the cash and non-cash outcomes and the direct and indirect consequences of actions being taken. It is simplistic to focus on only one aspect of the business, e.g., cash surplus, as by doing so, it is easy to overlook the other outcomes that are being targeted by all stakeholders*".

The business paradigm has changed; increasingly businesses operate as services, relying on relationships with customers, suppliers and employees who are organised as processes rather than functions (Binnersley 1996). The new management style has resulted in the need for performance measurement systems that record financial indicators but also measure operational indicators such as customer satisfaction, internal processors and the organisation innovation and improvement activities. Without these operational measures financial performance will suffer.

2.7.3 Financial Performance Measurement Tools

Evaluating financial performance is essential to the successful management of any farm or agribusiness firm (Bohlje 1994). To monitor financial performance, business must utilise 'gauges' or measures to monitor progress. Many different business performance measurement tools are available. Some are used individually, but more commonly a combination of measures is used. Barry *et al* (1995) regard these absolute measures as having limited generality and that there primary use should be for the evaluation and monitoring of an individual business overtime. Boehlje (1994) viewed financial indicators as having a two-part role: to evaluate the overall financial performance of a business and to evaluate the performance of financial management itself.

2.7.3.1 Boehlje's eight indicators for financial performance

Boehlje (1994) describes eight areas of financial indicators that provide a well-rounded overview of farm business performance (Table 12.).

Table 12. Indicators of Farm Business Performance.

Area	Indicator	Formula
Risk bearing ability (solvency)	Debt to asset ratio	Assets (adjusted for current market values): Liabilities
	Net indebtedness	Liabilities- current assets
	Owners equity	Assets - liabilities
	Gearing ratio	Liabilities : owner's equity
Profitability	Gross farm Income	Sales - purchases +/- changes in inventory
	Total expenses	
	Net income	Net income / owners equity
	Return on equity	
Debt servicing capacity	Liquidity	
	Current ratio	Current assets: current liabilities
	Working capital	Current assets - current liabilities
	Debt servicing % of GFI	Interest / GFI
Capital efficiency	Asset turnover ratio	GFI / assets
Labour efficiency	Revenue/employee	GFI / # of employees
	Revenue: labour ratio	GFI : Cost of labour (inc. unpaid labour and management)
Revenue generation and cost control	Economic farm surplus (EFS)	Net income + interest - value of unpaid labour & management - one off income + one off costs
		EFS / assets
	Return of assets	EFS / GFI
	Operating profit margin	EFS - national tax payment
	NOPAT	
Cost composition	Fixed cost %	(Depreciation + interest + tax + rates + insurance)/ total expenses
	Operating expense	Farm working expenses / GFI
Savings behaviour	Reinvestment rate	Change in owners equity / net income

Source: Boehlje (1994).

Financial measures such as these are at the core of many performance measurement systems. They periodically summarise the organisation's performance for the benefit of shareholders, lenders, creditors and statutory authorities (O'Mara *et al* 1998). However, if managers were encouraged to make decisions based solely on improving these type of performance indicators they would initiate short-term strategies aimed at improving bottom line results, perhaps to the long-term detriment of the business (O'Mara *et al* 1998, Shadbolt *pers com* 2000).

For this reason, increasing attention is now being placed on performance measurement systems that combine many different financial and non-financial performance indicators that ensure the long-term sustainability of a business.

2.7.4 Non-Financial Performance Measurement

To highlight the importance of non-financial performance indicators the balanced scorecard approach will be illustrated. A number of other non-financial performance measures will also be identified. The importance of this small section is not the actual performance indicators but the realisation that there are many different ways to measure farm performance nowadays. As the hypothesis stated, if farmers complying with European standards are to ***"out perform"*** their current conventional or BioGro systems then some explanation of performance measurement must be reviewed.

2.7.4.1 The Balanced Scorecard

The under utilisation of non-financial key performance indictors in business control was one of the key findings that led to the development of the balanced scorecard by Kaplan and Norton (1992). The balanced scorecard integrates traditional financial measures with operational and softer customer and staff issues, which are vital to growth and long-term competitiveness (Newing 1995). It gives managers important information from four different perspectives, and allows them to consider all of the important strategic measures at the same time, letting them see whether improvement in one area is achieved at the expense of another (Shadbolt 2001).

The four perspectives as identified by Kaplan and Norton are:

- The **financial perspective** that looks at how the business' strategy is affecting its ability to deliver to shareholder expectations.

- The **customer perspective** that asks the question "How do existing and new customers view and value us?"
- The **internal business** perspective that focuses on the skills, competencies and technology of the business and its ability to meet the needs of the customer as well as the potential to add value to customers businesses.
- The **learning and growth** perspective focuses on the business' ability to change, improve and adapt their products and processes as well as the ability to develop and introduce new improved products and services (Kaplan and Norton 1992).

The balanced scorecard approach is to allocate each of the businesses goals to any one of the four perspectives of the business. The absence of goals or abundance of goals in any one perspective gives a quick, visual indication of whether the business is "in balance". The key performance indicators for each goal, both the outcomes (lag indicators) and the drivers (lead indicators) are then specified. The crucial step in the balance scorecard approach is then to identify any linkages or cause and effect relationships that exist between them all. Non-financial indicators are usually drivers, that is, they inform the manager of likely future performance (Shadbolt 2001). For example, the learning of new knowledge and skills is a lead indicator of the organic farm staffs ability to ensure best practices are put in place. Without investment in staff learning and personal growth the business has less ability to deliver to the organic livestock specifications it must comply with for product premiums.

There are three perspectives of the balance scorecard that are non-financial performance indicators, internal business/production processes, customer and learning and growth. While agricultural science has delivered a plethora of indicators for the production goals there is not the wide range of recommended indicators available for the other two perspectives. Also, although there are a number of operational and tactical non-financial indicators used on the farm, their link to strategic goals has perhaps not been well enough

defined in the past. Some examples of non-financial performance indicators from a thesis by Rawlings (1999) are shown in Table 13.

Table 13. Non-Financial Performance Indicators (Rawlings 1999).

Physical	kg MS per cow = total kg MS / number of cows Nutrient audit (kg NPKS applied versus kg NPKS removed) Breeding values or indices Feed conversion efficiencies Pasture utilisation = pasture consumed / pasture grown
Customer	Supplier service and feedback MS grades per season Supplier responsiveness on requests Customer demand/ retention rate
Learning & growth	Staff satisfaction Rate of staff turnover Labour efficiency of 150 cows per labour unit

The Dairy Research and Development Corporation (DRDC) have also identified a set of recommended performance indicators for Australian dairy farmers (Cummings 1999). These include some non-financial measures shown in Table 14. Only the non-financial measures will be shown and not the complete table.

Table 14. DRDC Recommended Performance Indicators

	People Measures
Key Performance Indicators	Holidays in the last 12 months Training days per labour unit per year Hours worked per week per labour unit
Secondary Indicators	OH & S -days per annum due to accident and illness Do you have a written business plan? Yes/no Staff turnover (average length of service for permanent staff = years per person
Tertiary Indicators	Do you have a written succession plan? Have you updated your wills in the last five years? Hours of off farm work paid per week Do you have insurance cover for loss of income?
	Sustainability of Natural Resources

Key Performance Indicators	Nutrient balance (input compared to output) Production per unit of water (e.g. litres/ha/100mm rainfall and irrigation water used) Is there a written whole farm plan?
Secondary Indicators	Involvement in Landcare initiatives in days per farm per annum Does the farm have an animal welfare plan?
Tertiary Indicators	Percentage of farm area with trees/shelter cover Rate of pasture renovation (% farm covered with improved/renovated pasture per year) Irrigation intensity (ML/ha)

2.7.4.2 Social and environmental performance indicators

A September 2000 study by the Ministry of Agriculture and Forestry (MAF) on North Island hill country farmers identified a number of environmental and social considerations to be considered as performance indicators. The report identified evidence of a substantial commitment by North Island hill farmers to sustainable land management. The study found that their case farmers had significant environmental concerns and implemented performance measures to address these. Their important measures included:

- The planting of shelter belts
- Erosion control measures
- Establishment of conservation reserves
- Concern for the aesthetic quality of the land
- Concern for animal welfare
- Concern for water quality
- Biological and chemical free weed control

The study found that there was no evidence that efforts to support sustainable farm management are linked to either farm size or profitability. Indeed moves to implement

sustainability since 1976 are shown to have been made against a background of declining levels of farm profitability. Against an often-gloomy financial background, farmer's commitment to sustainability and environmental management is explained in terms of an array of personal, community and social values, which frequently override financial conditions (MAF 2000).

In the past most rural communities have functioned as close knit groups, frequently focused around the activities of sporting clubs, churches, schools and pubs. Today this has changed. Rural depopulation and a drop in traditional employment opportunities have resulted in a decline in the importance of the agricultural population relative to other rural residents. Many rural communities have experienced an inflow of life-stylers and welfare recipients. These changes have occurred in combination with the closure of many rural churches, schools, banks and other traditional facilities.

Together these changes have had a fundamental effect on community dynamics. What has also emerged is the extent to which the changing nature of rural communities poses a threat to the sustainability of agriculture within these communities. Farmers in this study highlighted social indicators such as:

- The cost/price squeeze – larger farms with fewer people
- Opportunities for new generations
- Changing community values
- Leadership and vision
- Loss of services

In performance measurement environmental and social values can often outweigh financial performance measures. An important consideration in relation to organic farming systems and this study.

2.7.5 Summary

The purpose of this section is highlighting the importance of some of the different non-financial performance measures used in farm business today. For farmers, success and failure is measured by many varied and personal values and goals as well as traditional measures. To simply hang a financial and or production measure on a farm system and deem it a success or failure compared to another is too simplistic. Instead what is needed is a balanced mix of traditional financial and production measures combined with personal, family and customer business measures/desires that look not only on the farm and in the bank, but at the farm family to find out what makes them perform and drives their success.

The mix of these performance measures and there relative importance to conventional and organic farmers may often differ. Some conventional farmers may for example, place a great deal more priority on financial performance than organic farmers. It is important to understand what range of measures are being used day to day so that farmers can monitor the most appropriate measures of success for their own personal, financial and non-financial goals and objectives.

From the view point of this study it is also important to understand the management process, understand organic and conventional farm systems, and review performance measures to assess whether changing to the EU standard (AgriQuality), livestock growers will be able to 'outperform' conventional and BioGro systems.

Methodology

3.1 Selection of Research Method

Selection of research method is critical as it allows necessary data to be collected and analysed (Yin 1994). Common research methods include surveys, experiments, archival analysis, histories and case studies, and they each have their strengths and weaknesses. Choosing the research method (Table 15.) that best suits the research is dependent on the proposed research question, the level of control the researcher has with regard to the occurrence of events, and whether historical or contemporary events are more significant. Research methods are used to answer the 'who', 'what', 'where', 'how' and 'why' research questions (Yin 1989).

Table 15. Relevant Situations for Different Research Methods (adapted from Yin 1994).

Research Method	Form of Research Question	Requires Control over Behavioural Events	Focuses on Contemporary Events
Experimental	How, why	yes	yes
Survey	How, what, where, how many, how much	no	yes
Archival Analysis	Who, what, where, how many, how much	no	yes/no
History	How, why	no	no
Case Study	How, why (who, what, where (Gummesson 1991)).	no	yes

The effectiveness of each research method for the research questions was investigated. The experimental method was inappropriate for this study as it focuses on events in the past as well as the future. Similarly, surveys although useful for answering the who, what and where questions to gather background information, were not appropriate for obtaining in-depth information associated with management techniques (the how and why

questions). Archival analysis, although excellent at providing historical information, provides little means for establishing the base on which decisions are made.
The case study research method on the other hand seemed most appropriate for the proposed fieldwork because as Eisenhardt (1989) stated, *" the case study method focuses on understanding the dynamics present within a single setting"*. It provides an in depth study of a particular situation because it not only answers the who, what and where questions, but also the important how and why questions (Gummesson 1991). Eisenhardt (1989) also suggested that case study methods should be used for new research ideas and for developing theories, which was applicable to the research topic.

3.1.1 Introduction to the Case Study Technique

The case study technique enables evidence to be collected and in a wide variety of formats, such as documents, open- and closed-ended interviews, and quantitative analysis of archival data and direct field observations (Yin 1994). The multiple sources of data should be used in a converging manner to reach conclusions. Both qualitative and quantitative data are relevant to the case study technique. The ability to multiply data sources through a case study approach allows both processes and outcomes of the research to be covered (Yin 1994).

Yin (1994) characterised case studies as requiring an extensive degree of preparation so that the following questions can be answered:

1. How are you going to define your case?
2. Is it a single or multiple case study? If multiple, should they be done sequentially or in parallel; and if sequentially, in what order?
3. How should the case be bounded with regard to time, participants, and relevant evidence?
4. What are you seeking to prove, conclude, or observe?

5. How should you decide who to interview and how long should each interview be? What type of interview instrument should be used?
6. How should other sources of evidence be dealt with, and what happens if events change drastically during the case?
7. What will happen to notes and other material when it is time to write up the case?

The design of case study research must be based on a comprehensive understanding of the aims of the research (Yin 1993).

Nieto *et al* (2000) stated that case studies could have different purposes (analytical and/or descriptive to a different degree) and use diverse methods, gathering information procedures and evidence analysis techniques (interviews, surveys, field observations etc.), as is the case in this research. It is not therefore a concrete technique but a research strategy. For Yin (1989,1994) it refers to an empirical study with the following distinctive features: a contemporary phenomenon is examined or investigated in its real surroundings; the boundaries between the phenomenon and its context are not clearly evident; and multiple sources of data are used.

In case studies researchers seek explanations to a determined phenomenon, to know *what* factors influence it, *how* and *why.* Its application requires the analysis of various cases of which the first will be longitudinal and will have a descriptive and explorative orientation. The rest of the studies can be transversal studies an/or longitudinal, with a more explicative purpose (Nieto *et al* 2000).

3.1.2 The Multiple Case Study Research Process

The multiple case study design was selected as being the most appropriate for testing the hypothesis that, ***"by producing to European Organic meat specifications (AgriQuality), New Zealand livestock growers can out perform their conventional and BioGro***

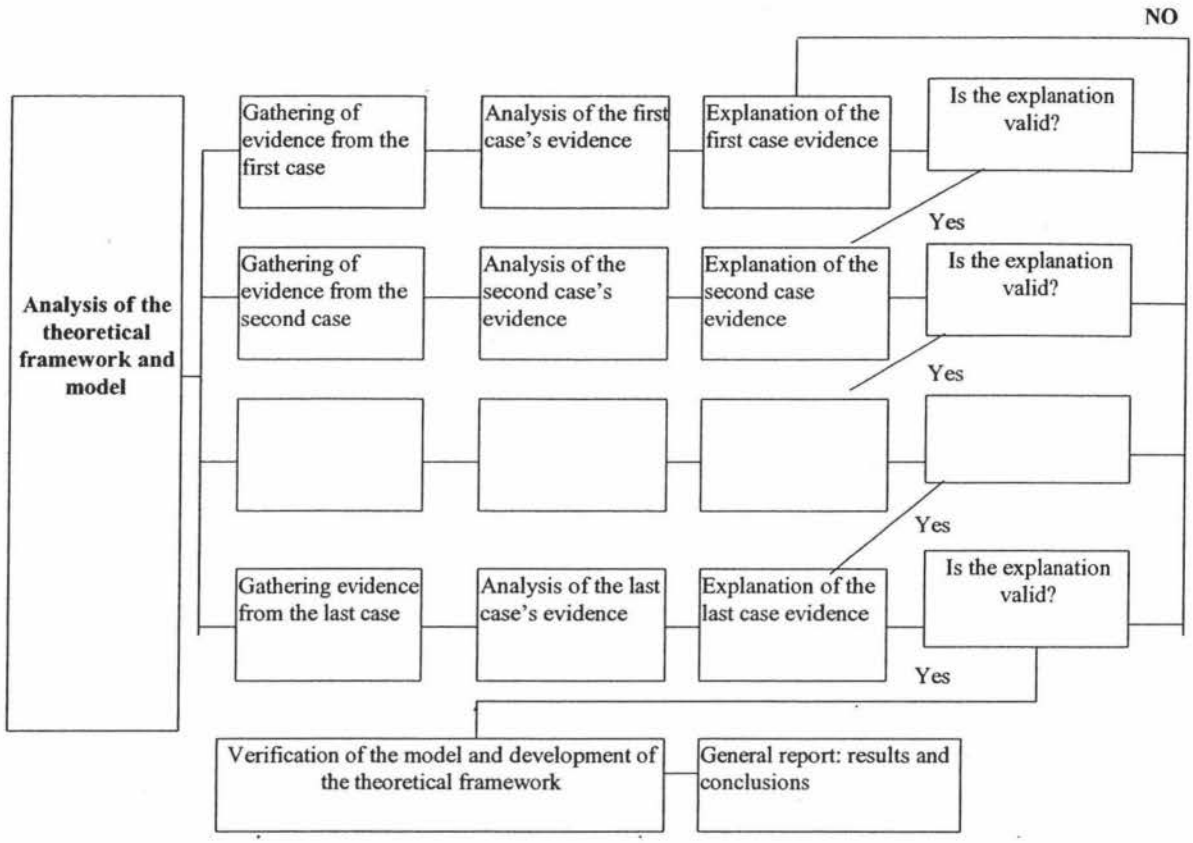
systems". The aim was to collate the findings across cases (or replication) so that trends and findings could be summarised with respect to the hypothesis. Case studies were conducted in parallel, that is, they were conducted during the same period: the overall sequence of cases was not considered an important factor, however a pilot case study would be conducted first to provide a framework for the other case studies (Figure 6.).

3.1.2.1 Theory Development

Theory development forms an essential part of case study research (Yin 1994). It acts as the blueprint for the study, and provides direction in deciding which data to collect and how best to analyse it. In order to develop the theory, literature on the principles of farm management, conventional and organic farming, the standards for organic livestock production, and performance measurement theory were reviewed. This literature was used as a conceptual framework to design the data collection protocol and guide the analysis (Figure 6.).

The "replication logic" is illustrated in Figure 6. From the theoretical framework, one selects the most appropriate cases for the objective of the investigation. Each individual study will be treated as a complete study in itself, so that evidence sought is analysed to find an explanation to the studied phenomenon (Yin 1994).

Figure 6. The Replication Logic



Source: Nieto *et al* (2000) adapted from Yin (1989)

For this research the *replication logic* model was followed. A pilot case study was to be undertaken to create a framework for which to build the following case studies from in a coherent design.

3.1.3 Selection of Cases

One of the most critical stages in the case study method is the selection of the appropriate cases. These should provide the best possible understanding of the phenomena of the study (Yin 1994). The objective of the study was to investigate whether a change to European organic livestock production standards meant that conventional lamb and

venison growers would out perform their current system and BioGro New Zealand systems.

Suitable cases for this study would, therefore, need to posses expertise in conventional and organic farming systems. Experienced organic farmers that have converted from a conventional farming background were the most suitable choice. These farmers possess expertise in both conventional and organic farming systems and the knowledge required for this research. It is acknowledged that the possibility of bias was likely with this approach. Questionnaires and instructions were worded to try and minimise this.

The implications of these bias's could in fact have a large impact on the research results. Farmers that have experience in both farming systems could be more bias towards organic techniques and methods than the more balanced perspective that is needed. The only way to deal with these bias's is to obtain separate case study farms that are either solely organic or conventional. It will be important for the researcher to be aware of the bias's that may come through in the research and attempt to apply a balanced approach.

The criteria used to select case farms are determined also by their accessibility. Gummesson (1991) concluded that obtaining access is the researcher's number one challenge. Access here refers to "the ability to get close to the object of study, to really be able to find out what is happening". It includes access to the system (that is, the farm business), and access to the individual'(s) in the system (the farmer and his family).

In the North Island of New Zealand the number of organic livestock farmers is very limited, nine farmers were contacted through contacts at BioGro New Zealand and Agriculture New Zealand. Four agreed to be involved in the research. Access to the other five organic farms was denied due to the commercial sensitivity of their knowledge, and their unwillingness to share this information with the two institutions involved in the research; Massey University and Agriculture New Zealand. These farmers were also unwilling to share information with organisations that were not 'committed' to the

organics industry. Time constraints and a lack of interest in the topic were also cited as reason's for farms not willing to take part. The participating farms were located in the Manawatu, Southern Wiararapa, and Southern Taranaki.

3.2 Design of Data Collection Protocol

The data collection protocol contained procedures and general rules, which needed to be followed when data were collected and recorded so that the analytical requirements of the study were met. Based on Yin's (1994) classification the data sources used during this research were interviews and direct observation.

Interviews provided a wide range of data. Typically for case study investigations, the questions are open-ended to allow the respondent to provide factual data as well as personal opinion. The interviewer also has the option of asking the respondents to purpose their own insights into a particular event or occurrence (Yin 1994). The interviews in this research were unstructured, that is they took on the appearance of a normal day conversation (Minichiello *et al* 1996). However, the conversations were controlled, as data had to be collected about particular topics. Questions were asked in an open-ended manner and respondents were encouraged to express their feelings and opinions. McCraken (1989) highlights the role of the investigator as a kind of instrument in the collection and analysis of data. The investigator " *cannot fulfil qualitative research objectives without using a broad range of his or her own experiences, imagination, and intellect in ways that are various and unpredictable*". Therefore while every attempt was made by the interviewer to remain objective it is often difficult to claim total objectivity.

3.2.1 Data Collection Process

The data collection process for this research was broken down into two parts. The first part (Part A) was the analysis and collection of data from *case study farms*, and the

second part (Part B) was to participate in a *focus group* with a selection of farmers (both organic and conventional) and industry professionals interested in organic farming.

3.2.1.1 PART A – The Case Study Farms

Initial contact was made with the case study farms over the phone, where the researcher outlined how he had acquired their phone number and why. The research projects were outlined, whom it was for, and case study farmer requirements. At this point the potential case farmers had the option to decline involvement. After agreement to be involved by the farmer the address of the case farm was recorded.

The first step in the data collection process was a pre visit package which was sent to each farm detailing their requirements, a consent from, information sheet, and four short questionnaires (farm background, values and goals, control and risk management) (Appendices A, B, C, & D). The questionnaires were filled out by the respondents prior to the researcher visit to speed up the process. Also as all this information was personal, the farming family was given time to identify the information. The worksheets were collected off the case farms at the researcher visit.

3.1.2.2 Analysis of the questionnaire results:

The general farm information was presented in a descriptive summary with a table showing key farming statistics and information. The values and goals and locus of control questionnaires pertained to certain key areas. The case study farmers scored how strongly they agreed with each value or goal statement question. These statements were known to the researcher to indicate values that were:

- Instrumental
- Intrinsic
- Social

- Expressive

The Gasson (1973) question can provide the 'key' to which questions pertain to each grouping. These results were then presented in a spider graph. The same approach was taken with the goals analysis. These goals were grouped into four key areas relating to the balanced scorecard:

- Financial (F)
- Internal business processes (I)
- Learning and growth (L)
- Customer C

Which questions pertain to these groupings is shown in Appendix B. Dividing these goals into these categories was done to highlight any differences between conventional and organic farms in both financial and non-financial goals. Would an organic farmer have more non-financial performance measures than a conventional grower? This was the thinking in constructing this survey analysis. The same reasoning applies to the values and control questionnaires.

As was mentioned earlier their will likely be a weakness with the same person filling out the same questionnaire twice. The researcher found no literature to support this as a sound methodology but was forced to proceed due to limited case farms. The focus group farmers (discussed later) also completed the goals and values questionnaires. Some of these farmers were conventional and others organic farmers. All the farmers were interested in organic farming. These farmers were only required to answer each questionnaire once and then post it back to the researcher.

During the visit an informal interview and farm walk were undertaken to gather descriptive information about the business and to assist in the rapport building process (Williams 1997). Questions from the farmer, pertaining to the research were answered in

more detail if required at the conclusion of the visit. Both partners were asked about their experiences as conventional and organic farmers, how their management, goals and performance measurement had changed after conversion to organic, and their opinions on BioGro and AgriQuality organic livestock standards. If given permission the interviews were tape-recorded.

After each visit the interview information would be summarised into notes and questionnaire data analysed. Due to the length of time it took some farmers to complete and return the four questionnaires the second visit explanation of the questionnaire results was substituted for a phone call. Results of the questionnaires were explained, and clarification by the researcher and respondent of any areas of concern or questions they may have.

3.2.1.3 PART B - Focus Group

As a second part to the data collection the researcher was involved in an industry focus group workshop run with farmers and industry professionals interested in organic livestock farming. This part of the data collection process was conducted after the case farm visits had been completed.

The relationship between the case studies and the focus group is not well defined. A great deal of information and experience would have been gathered through the case study analysis and the focus group provides an opportunity to verify some of the views and thoughts collected. It is also an opportunity to put into perspective some of the perhaps bias views on organic farming to a group of conventional farmers interested in going organic. Although the focus group will not be run specifically for the research it will be an excellent opportunity for the researcher.

3.3 Focus Group Design

Focus groups are typically composed of 6 to 10 people, but the size can range from as few as 4 to as many as 10. The size is conditioned by two factors: it must be small enough for everyone to have an opportunity to share insights and yet large enough to provide diversity of perceptions. When the group exceeds a dozen participants there is a tendency for the group to fragment. Small groups of four to five participants afford more opportunity to share ideas (Krueger 1994). They also have distinct advantages in logistics, i.e. where the focus group can be held.

Focus groups should also be conducted with groups of people who are similar to each other but preferably who don't know each other. The topics of discussion and there sequence should be carefully planned with open-ended questions (Krueger 1994) controlled by the moderator(s). One of the unique elements of the focus group process is that there should be no pressure by the moderator to have the group reach a consensus. Instead, attention is placed on understanding the thought processes used by participants as they consider the issues of discussion (Krueger 1994).

The focus group the researcher participated in consisted of 14 members. Seven were farmers interested in organic farming (1 farmer was currently registered with BioGro). The other five members were made up of the researcher and industry representatives from MAF, Massey University, a local Meat Company, BioGro New Zealand and Agriculture New Zealand.

The workshop was run on a weekday at AgResearch in Palmerston North. The structure of the day was well planned out in advance in the questions and sequence pre-determined (Appendix E). The information gathered at the meeting would be primarily of a qualitative nature. Information was recorded on photocopied sheets from the writing board. The researcher had no major part in organising the day or the topics of discussion.

3.3.1 Purpose of the Focus Group

The focus group was brought together by the Ministry of Agriculture and Forestry (MAF) and Agriculture New Zealand in order to develop an organic farm model. Both the Certenz (EU organic livestock standards) and the BioGro standards were modelled. One of the researcher's supervisor's, Mr Tony Rhodes (Ag NZ) planned the day and the discussion.

The purpose for the researcher's involvement in the workshop was to contribute to the discussions on the guidelines for the organic model farms and to gather goals and values data from the farmers interested in converting to organic farming. The same combined Gasson (1973) and McGregor (1994) questionnaire that was used with the case study farms was used with these farmers. Farmers completed the survey at the end of the workshop, or posted the survey back to the researcher.

3.4 Data Analysis

The analysis of data is conducted progressively and iteratively through a series of activities such as fact-finding, data-bit location, sampling and comparing, contrasting, classifying and cataloguing (Miles and Hubberman, 1994). In a multiple-case study such as this thesis, both data collection and analysis processes are conducted to: reveal similarities and differences between cases, guide the decision making as to whether given ideas should be followed up or abandoned, and to achieve an understanding of the subject being studied (Crawford 1996). By carrying out these two processes iteratively, the researcher can modify the data collection techniques whenever required during the research period to ensure that accurate and complete data for analysis are obtained (Miles and Hubberman 1994).

The first step in the data analysis process was to summarise interview notes and field observations into five key areas; reasons for converting to organic, organic philosophy,

management changes, control, and opinions on the European Union (EU) Standards. Key quotations and ideas of the respondents were recorded (by tape or hand) relating to these areas. Contrasts and comparisons between the four case farms could then be made.

The second step was to quantify and graph each case study questionnaire result (values and goals, control, and risk management). The values and goals information was used to gather an idea of the farmer's strategic intent both as an organic farmer and conventional farmer. To do this, each farming couple was asked to complete two values and goals questionnaires. One set was answered with them remembering back to when they were farming conventionally and the other set as they are today as organic farmers. The aim was to test whether the case farmer's values and goals have changed from when they were farming conventionally. Theory says they should not (Gasson 1973).

The values and goals questionnaire was a series of value statements sourced from the literature (Gasson 1973, McGregor *et al* 1995). Farming couples were asked to grade these statements between 0 (not important at all) and 5 (very important). A semi-formal worksheet was left with farmers so that information about their values and beliefs could be collected. As this information was personal, the farming family was allowed to identify the information in their own time and when all family members were present. This approach had been successfully used in the past by Rawlings (1999). The worksheets were then retuned to the researcher. This information could then be used to assess if there were important differences in the values of organic and conventional farmers.

The control questionnaire (Appendix C) also comes from literature (Rotter 1966). The respondents are asked to make 29 ((a) or (b)) choices to a variety of statements relating to an internal or external loci of control (See section two, pg.18). Six of the questions are irrelevant (fillers). Results of this questionnaire were graphed to estimate whether respondents had an internal or external locus of control. This information can then be compared back to interview data on control. For example a case may describe their

organic system as having a great deal more control than their previous conventional farming system, yet the respondent has a very external loci of control. Attitudes towards control is an important and interesting aspect of farming and some mechanism is needed to capture information on the subject.

The risk management questionnaire involved 2 parts. In the first part respondents had to rank19 common sources of risk in New Zealand (Martin 1996) (0 meaning not very important and 5 meaning very important). The second part required respondents to rank 22 risk management responses to these 19 risk sources. The same grading scale was used. The risk sources and responses were taken from a New Zealand survey conducted by Martin (1996) of 800 sheep and beef farmers. The results from the case farms were then compared to that of the survey by Martin (1996).

Combined the information collected provided a knowledge of the case farms attitudes and opinions towards conventional and organic agricultural management practices and the new European Organic livestock production standards. The research outcomes are presented in Chapter four

Results

4.1 Introduction

The format for the result section is to firstly outline the key differences between the European Union organic standards and the BioGro standards. Following this the results for each case study farm will be presented.

4.2 Differences Between BioGro and the EU Organic Livestock Standards

Note: The EU standards in New Zealand are represented by the AgriQuaility Standards and are also often described as the Certenz Standards. For the purposes of this research both names refer to the EU standards.

Key differences between the BioGro and EU standards have been established though an independent examination of the individual standards and informal interviews with industry officials. The keys on farm differences in the standards are summarised in Table 16.

Table 16. Summary of the Key Differences in the EU and BioGro Organic Livestock Standards

	European Standard	**BioGro Standard**
Conversion Period	6-12 months – 3 years	Min – 3 years
Fertilisers	Restricted to unprocessed fertiliser products, no urea or superphosphate	
Trace Elements	Restricted to a "demonstrated need"- decline in use with time	
Pastures	No synthetic herbicides or pesticides	
Weed & plant pest control	No herbicide for direct drilling, tree releasing	
Animal	Routine use of synthetic animal remedies prohibited	
Pests & disease control	Animals are permitted three allopathic treatments in a year without losing organic certification status No animal quarantine area required	One treatment results in the loss of certification for 12 months

For most aspects of an organic system there is little difference between the standards. Fertiliser policies are effectively the same, as are plant pest and weed control. The major distinctions between the two standards are in the animal welfare and conversion periods. Under an EU organic livestock standard some animals, (e.g. lambs) could be sold as organic after 6 to 12 months. The minimum period of conversion for BioGro is 3 years.

Animal health is the other major difference between the standards. Under BioGro any animal treated with an allopathic drench (chemically synthesised drenches commonly used on conventional farms) will loose its organic status for 12 months, plus double the withholding period. Effectively for finishing stock such as lambs any drench will cause a loss of organic status as the finishing period is well less than 12 months. Under the EU standards however a mature animal can have up to three allopathic drenches per year and a finishing lamb 1 drench in its lifetime without loosing its organic status.

4.2.1 Cost of Registration and Inspection Fees

A variety of registration fees, auditing fees and producer levies are charged under the BioGro and EU systems. These are outlined in the following section and were sourced directly from officials at BioGro New Zealand (Cadwalder *pers com* 2001) and AgriQuality New Zealand (Brown *pers com* 2001).

4.2.2 European Union Standard (AgriQuality)

There is no registration cost and the annual audit fee is $800-1200 (Brown *pers com* 2001).

4.2.3 BioGro New Zealand

Each farmer must pay a registration fee each year and be audited each year. The conversion process is over three years with auditing requirements each year. In year one of the transition a BioGro auditor will make two visits at a cost in 2000 of $1901. In the following years (two, three and at full certification) one visit per year is made at a cost of $1181/annum. Once the conversion is complete there is a 0.5% levy on all products sold with the BioGro label (Alan McCare, Cadwalder *pers com* 2001). On $200,000 worth of sales this would amount to $1,000.

4.3 RESULTS – PART A.

4.3.1 Introduction: Case Farm One

Case farm one is a 52ha mixed cropping and livestock farm. A second-generation family farm, the property is owned by the farming couple. Both partners also have employment off farm. They are a young farming couple with a young child. Enterprises on the farm include; cereal and green feed crops as well as a small breeding ewe flock, and finishing

weaner steers through to 18 months. The farming couple is planning to expand their farm business through purchasing more land and diversifying to offer organic grain storage, drying and some milling facilities. They market and sell some of their own organic grain products.

The farm receives an annual rainfall of about 900-1000mm and the predominant soil type is silt loam. It is prone to summer dryness while movements in the water table can make winters wet.

Table 17. CF1 Background Summary

CRAWLEY	
Farm Type	Mixed cropping and livestock finishing
Farm Area (ha)	52
Years Organic	8
Total Stock Units (s.u.)	410
Sheep : Cattle Ratio	6:1
Lambing Date:	July/August
Lambing Percent: (%)	140
Lamb CWT Target (kg)	15kg
18 Month Cattle CWT (kg)	220-260kg
Fertiliser program	Annual RPR, plus some trace minerals.

4.3.2 Value & Goal Observations:

The value statements used during this research were classified into the four categories as suggested by Gasson (1973) and are represented in the following plots (Figure 7.). The four areas represent the dominant values normally associated with farming and include instrumental, social, expressive, and intrinsic values. Farmers were asked to fill out the questionnaires thinking firstly as conventional farmers and then secondly as organic farmers. The goal statements (McGregor 1994) were summarised into the four key areas of the "balanced scorecard" (Kaplan 1992). These are financial, customer, internal business processes and the learning and growth as described in section 2.7.4.1. The distribution of the goals results into the balanced scorecard format was decided by the researcher and it was felt there was a distinct lack of goals with a customer focus in the

McGregor survey. The spread of goals was 15 financial, 4 customer, 8 internal and 8 learning and growth.

4.3.3 Value Results

These value plots demonstrate that this group of farmers has a range of values that are spread mostly away from the social value side. It is spread evenly through the other quarters of the spider graph. The social value quarter is where farming is undertaken for the sake of interpersonal relationships with workers and family, acceptance by the community, gaining recognition and prestige, and continuing the family tradition (Gasson 1973).

Figure 7. CF1 Values Summary for the Conventional System

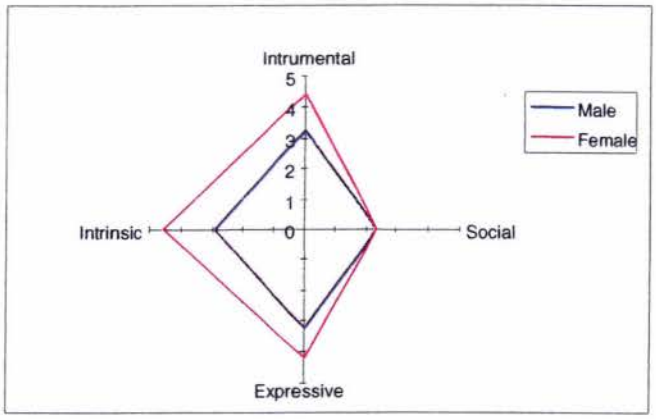
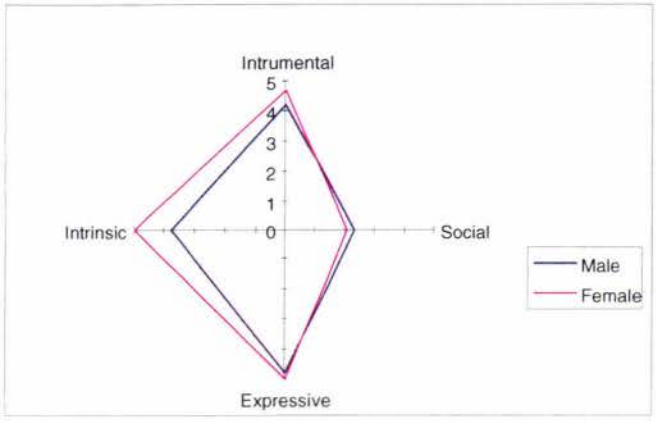


Figure 8. CF1 Values Summary for the Organic System



CF1 did exhibit a shift in their values since converting to organic farming from conventional. Their values are slightly more expressive, intrinsic and instrumental, meaning they find organic farming more personally fulfilling (expressive), they place more personal value on organic farming (intrinsic), and value organic farming more as a safer, and rewarding means of making money (instrumental).

4.3.4 Goal Results

The purpose of the goal section of the questionnaire was to get a feel for the focus of the farming business and where their priorities were. The results of the goal questionnaire for CF1 show a balanced spread across the four sectors of the balanced scorecard. The customer quarter is the least represented but as was mentioned earlier can be attributed to the lack of customer goal related statements in the survey instrument. The learning and growth quarter focuses on the business's ability to change, improve, and adapt their products and processes.

Figure 9. CF1 Goals Summary for the Conventional System

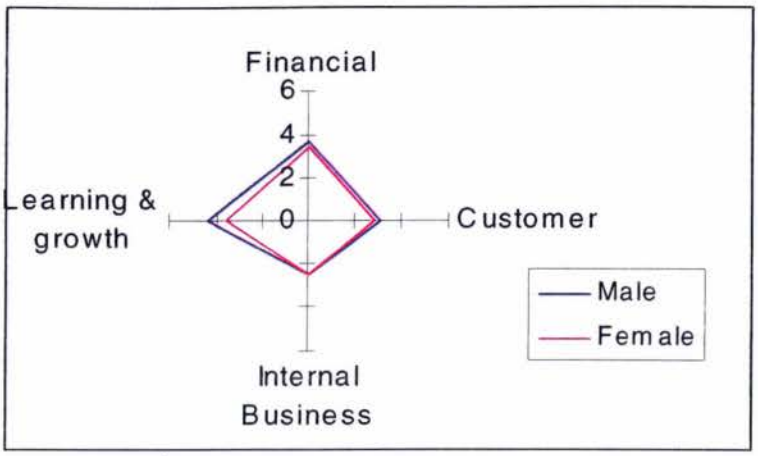
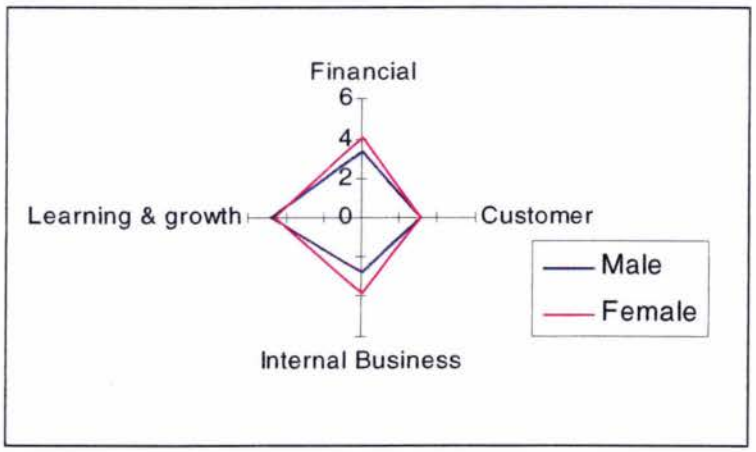


Figure 10. CF1 Goals Summary for the Organic System

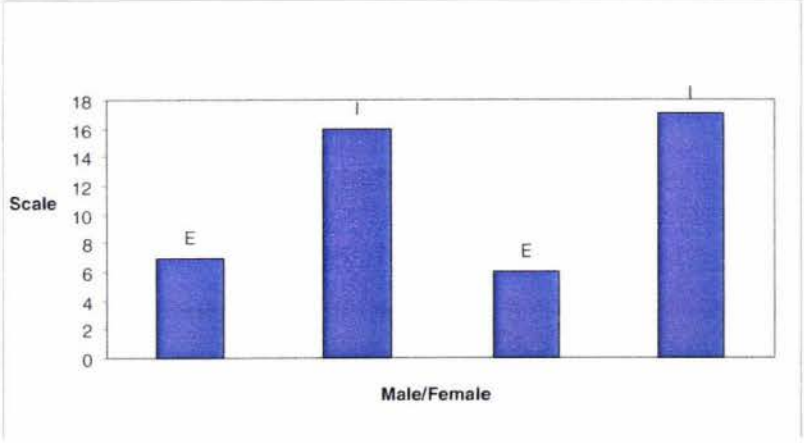


For CF1 the change from conventional farming to organic did mean a marked change in their goals. Slightly less emphasis was placed on internal business processes and more on financial goals.

4.3.5 Control Questionnaire and Observations

The concept of loci of control relates to the perceptions of the individuals with respect to elements within their operating environment that they believe they can control or influence (Kaine *et al* 1994). Both partners of each case farm (see Appendix C) completed the control questionnaire, (Rotter 1966). The aim was to determine whether he/she had an external or internal locus of control. Primarily this tells the researcher to what degree each farming couple perceives they are controlled by events. This could then be related to the control results from the informal interview.

Figure 11. CF1 Locus of Control



Note: The 'E' stands for External Locus of control, and 'I' stands for Internal Locus of control. The male results are the two bars on the left side of the graph and the female results are on the right. Also the scale in the Loci of control graphs was determined by the number of questions answered pertaining to an internal or external locus of control. There was potential to answer 23 questions as either internal or external and 6 filler questions. Each farmer scored differently which is why they have a different scale in each graph.

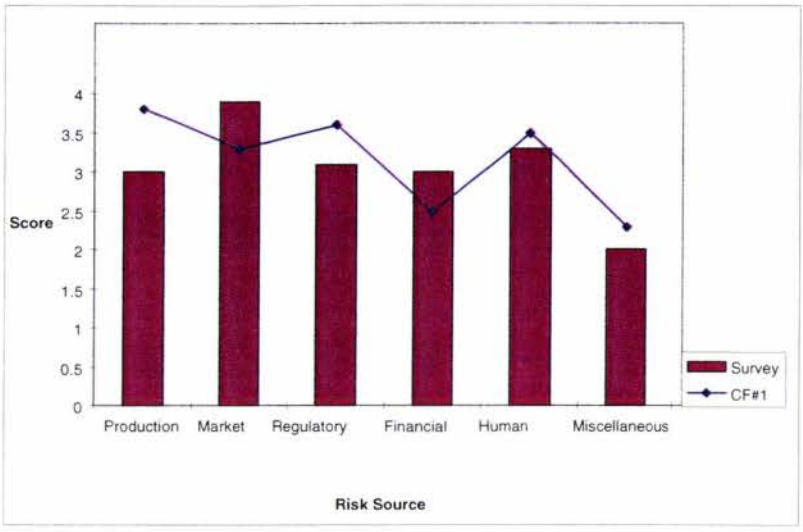
Results for CF1 show that both partners have a distinct internal locus of control. They perceive to have a good control over events that confront them in their lives and farming endeavours. This correlates well with the CF1 response to the informal interview questions on control. CF1 felt they had more control as an organic farm, meaning they should have a more internal locus of control.

4.3.6 Risk Management

The risk management section involved case farms completing two short questionnaires based on a survey conducted by Martin (1994) to 800 conventional sheep and beef farmers throughout New Zealand. In the first part of this survey 19 sources of risk were identified in six key areas. Farmers were asked to rate on a scale of 1-5 the importance they placed on each source of risk (See Appendix D). The results are shown in figure 12. In the second part of this section the farmers were asked to rate (on the same scale) the importance of 22 risk management responses identified in the survey.

The ***sources of risk*** identified in the Martin (1996) survey were, market, financial, production, regulatory, human and miscellaneous. In summary market risk related to changes in product prices, changes in the world and New Zealand's economic position and changes in input costs. Financial risk related to changes in interest rates and land prices. Production risk related to rainfall variability, other weather factors, diseases or pests and disasters. Regulatory risk related to changes in government or local body laws and policies, and changes in producer board policies. Human risks related to accidents, health problems or a change in family situation. Miscellaneous risks related to theft, staff problems, changes in technology, and contractual obligations.

Figure 12. CF1 – Sources of Risk Compared to the Martin (1996) Survey Results

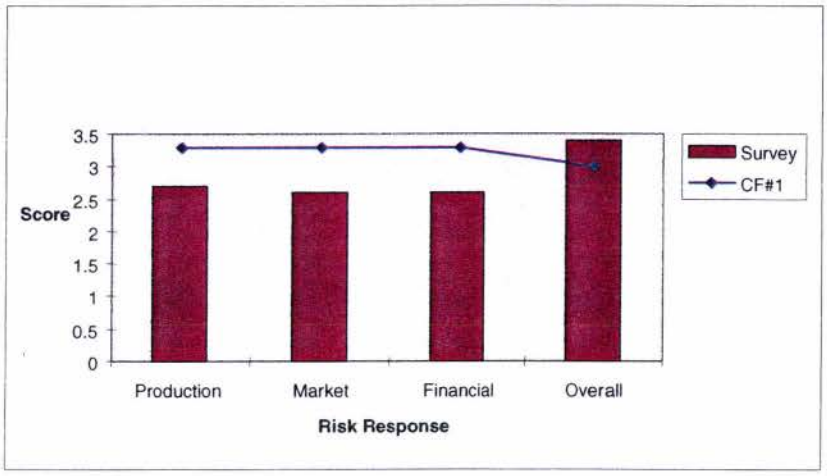


Results show that CF1 ranks production, regulatory, human and miscellaneous sources of risk higher than the survey results. This means factors such as rainfall, climate, disease or pests, government and local body and producer board changes are seen as greater risks to CF1 than the Martin survey respondents. Market risk, including, product price changes, world and national economic and political situation, and input costs are seen as a lower source of risk to CF1. Financial risk is also ranked lower than the survey results. Overall case farm one perceives there to be more risk in its organic farming system than the 800 conventional farmers in the survey results.

The ***risk management responses*** were derived from the same survey. They were summarised under the headings, production, market, financial, and overall responses. Production responses encompassed activities such as routine spraying, diversifying plant varieties or animal breeds, monitoring for pests and climate, and irrigation. Marketing risk management responses included information, spreading sales, enterprise diversification, forward contracting, and futures markets. Financial responses were to keep debt low, manage capital spending, have overdraft reserves, manage debt, have financial reserves, insurance, off-farm investments, and having off-farm work. Overall

responses related to having short-term or long-term flexibility. The aim for the researcher was to identify the importance and any significant differences that the case study farms placed on the survey risk management responses compared to the conventional farm respondents.

Figure 13. CF1– Risk Management Responses Compared to the Survey Results



Case farm one rated the risk management responses for production, market and financial areas higher than the survey results. These three sources of risk make up the bulk of the 22 sources of risk identified in the survey. The production responses revolved around spreading plant varieties, stock breeds and production techniques, under producing, and monitoring. Marketing responses included, market information, spreading sales, forward contracting, and futures markets. Financial risk responses revolved around arranged financial reserves, off farm investment, and off farm work. Overall CF1 generally placed a greater emphasis for their organic farm on the responses than the conventional farm respondents did to the survey.

4.3.7 Interview Results and Field Observations

Each case farm was informally interviewed with a set of guideline question areas. The results of the interviews were summarised into nine key areas (Table 18.). Each farmer and wife was present at the interviews where their thoughts and opinions were asked and recorded on a variety of areas. The interview guideline can be seen in Appendix E.

Table 18. CF1 Interview Summary

Interview Areas	Response Summaries
Motives for organic farming	Market opportunities, dislike of chemicals
Goals from organic farming	Market/financial and personal
Management changes	More proactive planning, more strategic thinking, better timing, monitoring is more important (no easy fix)
Performance measurement changes	Financial, personal and customer satisfaction
Key skills required	Relationship and marketing skills.
Financial changes	Making more money
EU standards & opinions	See them as a transitional standard. They don't hold they same prestige as BioGro
Control and Risk	Have more control. Taking the product a step further, have a better feel for the market, which meant more control, and less risk. Flexibility in some aspects is limited through the ability to source stock.
The conversion process issues	Difficulties with livestock

Case farm one entered into organic farming because they saw a market for the products and valued the principles involved. Changes in management have evolved since they converted to organic farming; *"a much more strategic and proactive line of thinking is*

required as you don't have the quick fix's available that you do when farming conventionally". CF1 felt they had more control farming organically as their farms ability to ride out variations in the system was increased. *"The soils and pastures were better set up to handle variation"*. This is in line with the results of the control survey, which showed that CF1 had a predominant internal locus of control for both partners. They perceived there organic system had more control and the control survey results backed this up.

Timing, measurement and monitoring all have become more crucial to case farm one. They don't necessarily measure more but do monitor some different aspects, such as, customer satisfaction. Production wise, livestock are more closely monitored by eye for signs of disease or ill health. Relationships and marketing skills are noted by CF1 as more important in an organic farming system. Although no accounts were analysed by the researcher, case farm one was adamant they were making more money now compared to when they were farming conventionally. This was achieved through production and better marketing (vertical integration).

European Union organic livestock standards (AgriQuality) were perceived to fit well into the organic philosophy by CF1. They felt that BioGro should be the benchmark and anything less is merely detrimental to the organic industry as a whole and confusing to the consumer. The major problem that CF1 had with the conversion process was sick livestock. This may seem to contradict CF1 sentiment in the summary table above where they see the EU standard as a transitional one. This is because CF1 see the BioGro standard as the primary aim and that the EU standard if it can be linked into the BioGro framework may be of long term benefit to organics. They would not like to see the EU standard as a separate and competing standard to BioGro.

4.4 Introduction: Case Farm Two (CF2)

Case farm two is a 150 ha mixed cropping and livestock enterprise, which is 100%, BioGro organic registered and certified. The owners have been on the current property for 15 years. They have a young family and have been farming organically for 15 years. The main enterprises on the property are potatoes, carrots, onions, forestry, a breeding ewe flock and a small number of beef cattle. The operation has undergone some changes in the last few years to now see mostly potato crops grown. These are then processed into frozen fries, marketed and sold under the farm label throughout many supermarkets in New Zealand. The farm is prone to summer dry and winter wet conditions, the soil type is predominantly Egmont Ash.

Table 19. CF2 Background Summary

WHEELAN	
Farm Type	Mixed cropping & livestock
Farm Area (ha)	150
Years Organic	15
Total Stock Units (s.u.)	258
Sheep : Cattle Ratio	36:1
Lambing Date:	August
Lambing Percent: (%)	130%
Lamb CWT Target (kg)	15kg
18 Month Cattle CWT (kg)	-
Fertiliser Policy	Annual RPR

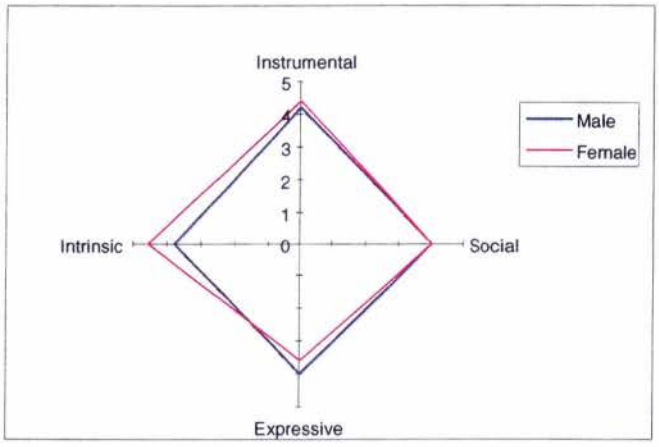
4.4.1 Goals and Values Observations

Both partners in CF2 were fairly evenly spread across the four areas of the value and goal spider graphs. The social and expressive areas were the least represented by both partners and no changes have been made between farming conventionally and organically.

The social value quarter is where farming is undertaken for the sake of interpersonal relationships with workers and family, acceptance by the community, gaining recognition

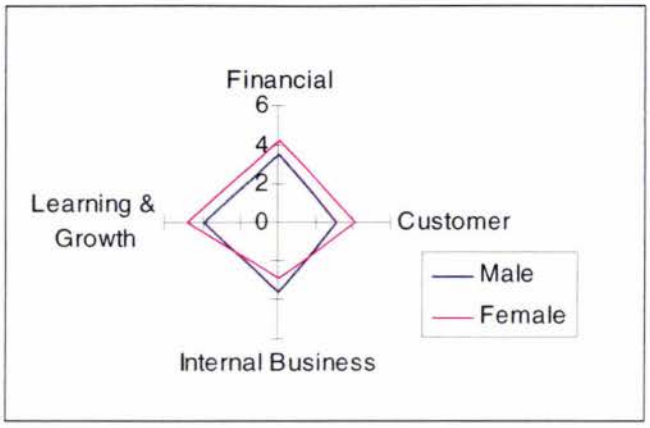
and prestige, and continuing the family tradition (Gasson 1973). The expressive area is where farming is undertaken to fulfil a feeling of pride in ownership, self-respect, for a chance to be creative and for personal growth. Both of these sectors were only marginally less represented than the other two areas.

Figure 14. CF2 Value Summaries for the Conventional and Organic System



No differences occurred in the results for the goal survey either for CF2. The results were very evenly spread through the four quarters of the balanced scorecard.

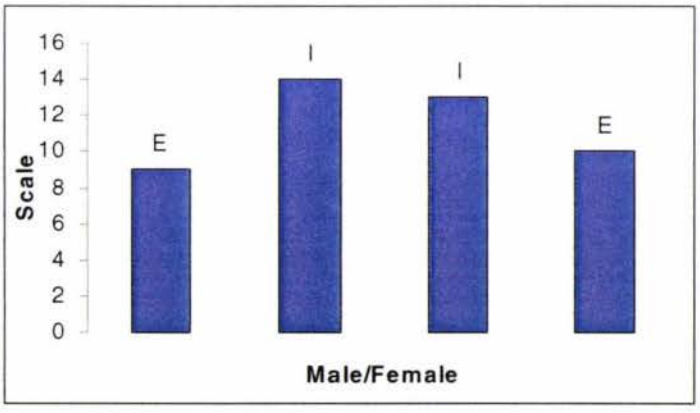
Figure 15. CF2 Goal Summaries for the Conventional and Organic System



4.4.2 Control Questionnaire and Observations

Case farm two results show a more internal locus of control for both partners. They perceive to have control over farming and personal events occurring in their lives. The distinction between an internal and external locus of control was not as clear cut as CF1 with a high proportion of external results shown in Figure 16.

Figure 16. CF2 Locus of Control



4.4.3 Risk Management

Case farm two (CF2) ranked production, human and miscellaneous sources of risk slightly higher than the Martin (1996) survey respondents (Figure 17.). The overall spread was very similar. Production sources of risk were where the biggest difference occurred. CF2 rated factors such as rainfall variability, disasters, and diseases and pests as more important sources of risk on their organic farm. Overall the spread and ranking of the other risk sources was very similar.

Figure 17. CF2 – Sources of Risk Compared to the Survey Results

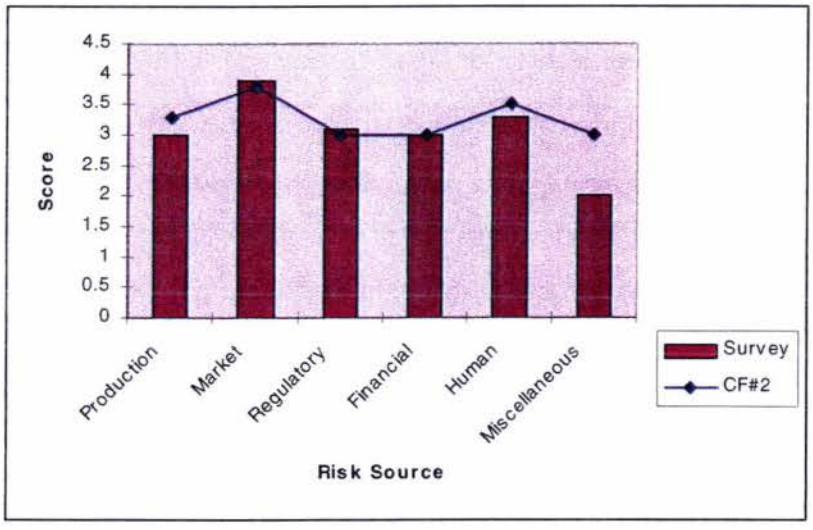
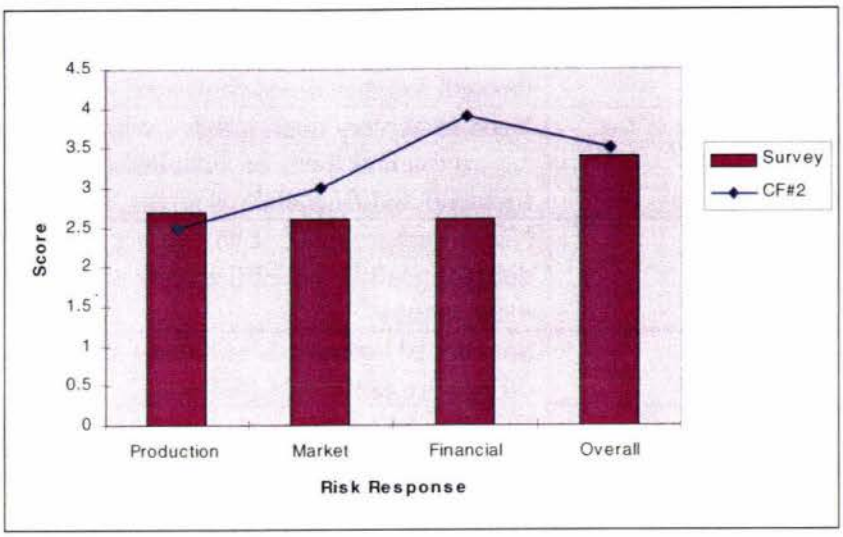


Figure 18. CF2 – Risk Management Responses Compared to the Survey Results



Market and particularly financial risk responses was rated vastly higher by CF2 compared to the Martin (1996) survey respondents. Financial risk responses included keeping debt low, managing capital spending, arranging overdraft reserves, debt management, having financial reserves, having insurance, investing off-farm, and having off farm work for the main farmer and other family members. Marketing responses also had more importance placed on them. These included, gathering good market information, spreading sales, diversification, attaining forward contracts and futures markets.

4.4.4 Interview Summary

Both partners were present at the interview for CF2.

Table 20. CF2 Interview Summary

Interview Areas	Response Summaries
Motives for organic farming	Believed in the philosophy, saw it as niche market opportunity that was economic, environmental reasons.

Goals from organic farming	Initially related to getting certified but are now more marketing and customer focused.
Management changes	Greater strategic thinking, planning further ahead, more importance on "timing".
Performance measurement changes	Financial and personal satisfaction of seeing there end products on the shelf. Performance of the farm through tougher times compared to neighbours.
Key skills required	Need to be very open-minded with an environmental focus on sustainability of both non-financial and financial resources. Marketing skills.
Financial changes	Not at the moment but will be very soon. Have a definite positive belief that they will be making more money.
EU standards & opinions	Saw the EU standards as having a negative effect on BioGro premiums (deflating).
Control and Risk	Felt they had more control and less risk as the farm was better set up to handle environmental variability through deeper rooting plants and more varieties. By marketing they had more control of the end product.
The conversion process issues	Saw negatives from the amount of paperwork.

Similar to CF1, CF2 entered into organic farming partly because they saw a market opportunity for the products, were environmentally conscious, and had previous experience on an organic livestock farm. The key changes in management that have evolved since the move to organic farming include *"a more long-term planning focus, and open-minded approach to ideas and solutions traditionally fixed through conventional methods"*. CF2 also felt the farm was a lot better set up to handle the variations in climate compared to when they were farming conventionally. Primarily this was because, *"the plants were deeper rooting into a better quality soil, and there were more varieties of plants"*. This was felt by CF2 to give the organic system more control.

Planning, timing and a more open-mind are the key areas of management that have become more critical to CF2. Their thinking is now on preventing the problem from happening in the first place rather than looking for controls after it has happened. This requires greater forethought. A great deal more thought is put into the product after the farm production stage by CF2. Marketing, supply contracts and business relationship

skills were the key skills identified when contemplating a shift to organic farming. Again as with CF1, no accounts analysis was completed by the researcher, but CF2 were adamant the conversion to organic farming was more profitable.

The EU standards (AgriQuality) were perceived to have a negative effect on the premium paid on BioGro registered products in the longer term. BioGro was seen by CF2 to be the top of the organic standards. Lesser standards were seen as detrimental to the organic sector.

4.5 Introduction: Case farm three (CF3)

CF3 is a 325 effective ha sheep and beef unit. A second-generation family farm the property is managed by the farming couple on behalf of the family. They have been involved in the BioGro organic conversion process for the last 3 years and plan to gain full organic status in July of 2001. They have been interested in organic farming for approximately 14 years. One partner has part time employment off the farm, and the farm employs one full time worker. These organic farmers see themselves at the top end of organic beliefs and more BioDynamic in philosophy.

Enterprises on the farm include a 1400 ewe flock for lamb finishing (hoggets are mated in good years), a 145 cow beef cow herd and 50 dairy grazers. A small amount of milling wheat was grown in 2000/01 and pasja crops for finishing lambs. All up around 30ha of cropping is done each year.

The property is mainly flat with some small hills. It is generally a summer dry, winter wet property and receives an annual rainfall of 900-1000mm.

Table 21. CF3 Background Summary

CF3	
Farm Type	Sheep & Beef
Farm Area (ha)	325
Years Organic	14
Total Stock Units (s.u.)	3300
Sheep : Cattle Ratio	7:1
Lambing Date:	Late August
Lambing Percent: (%)	126%
Lamb CWT Target (kg)	15kg
18 Month Cattle CWT (kg)	-

4.5.1 Value and Goal Observations

The value plots for CF3 were fairly evenly spread between the two farmers. Generally speaking there was a greater social representation in this results set than the other case farms. Particularly in the female results for CF3. No change in values was noted by CF3 from when they were farming conventionally. The female partner in CF3 records a greater social perspective in this plot. Belonging to the community, working with other members of the family, maintaining good worker relations and gaining recognition as a farmer are all social aspects identified by Gasson (1973).

Figure 19. CF3 Value Summaries for the Conventional and Organic System

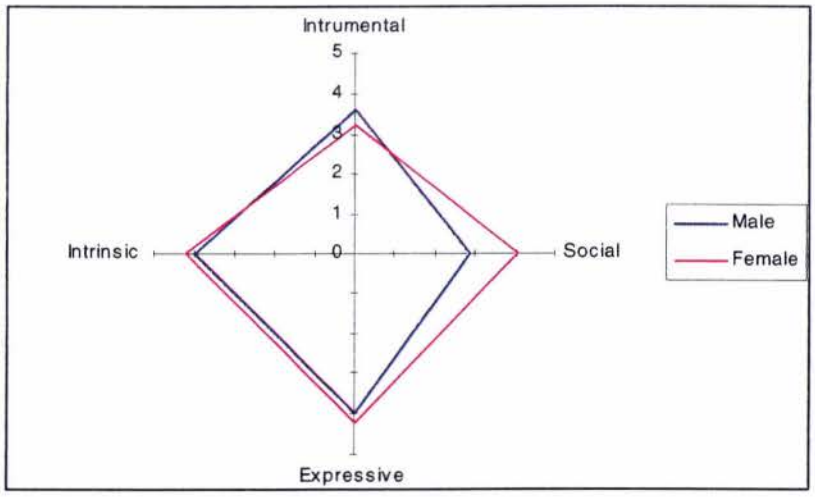
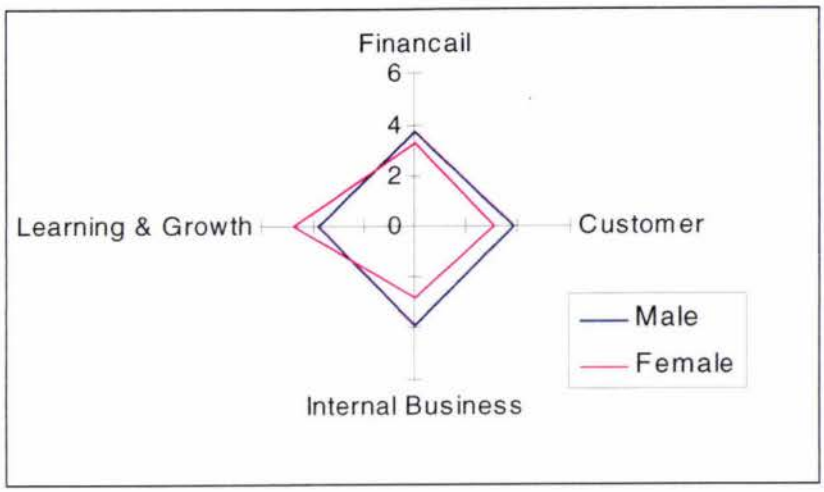


Figure 20. CF3 Goal Summaries for the Conventional and Organic Systems

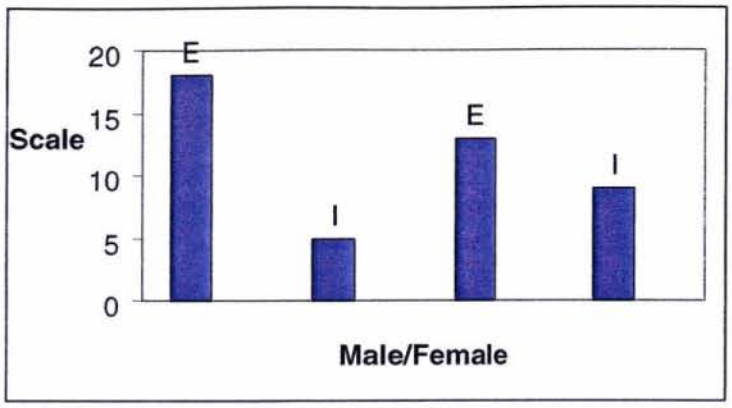


The goal plot results for CF3 were fairly well spread for male respondent. The female respondent had identified more importance for the goals in the learning and growth area and less in the internal business processes quarter. This means the female partner for this organic farm business places greater importance on the business's ability to change, adapt and introduce new products and processes.

4.5.2 Control Questionnaire and Observations

Both partners of CF3 showed a predominant external locus of control to the questionnaire results. The male participant showed the greatest level of external answers between the two. This means that both partners perceive that outside factors have a large impact on the outcomes of their farm business and that there is nothing they can do about it. This is in contrast with the results of the interview summary where CF3 felt they had a great deal of control in their organic farm business.

Figure 21. CF3 Locus of Control



4.5.3 Risk Management

For CF3 all sources of risk were rated as less important than by the Martin (1996) survey respondents except for the production and miscellaneous sources of risk. Miscellaneous risk covers theft, problems with hired labour and contractors, any changes in technology and breeding, and issues relating to contractual obligations. These were rated as a higher source of risk to CF3. Production risk sources were also rated higher and were made up of weather factors, pests, diseases and disasters.

Figure 22. CF3 – Sources of Risk Compared to the Survey Results

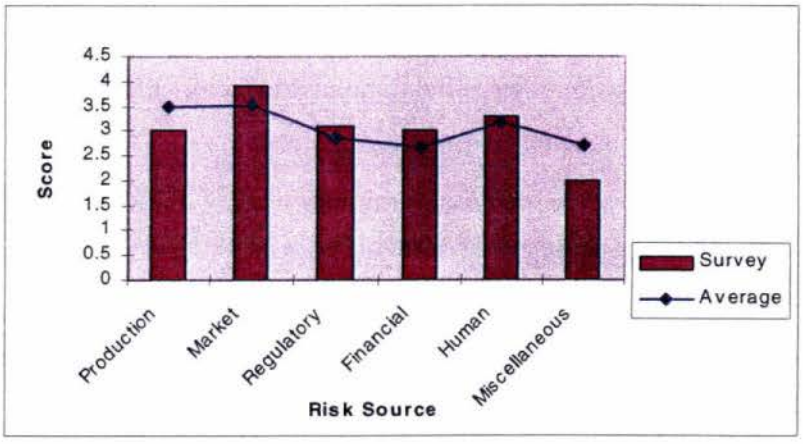
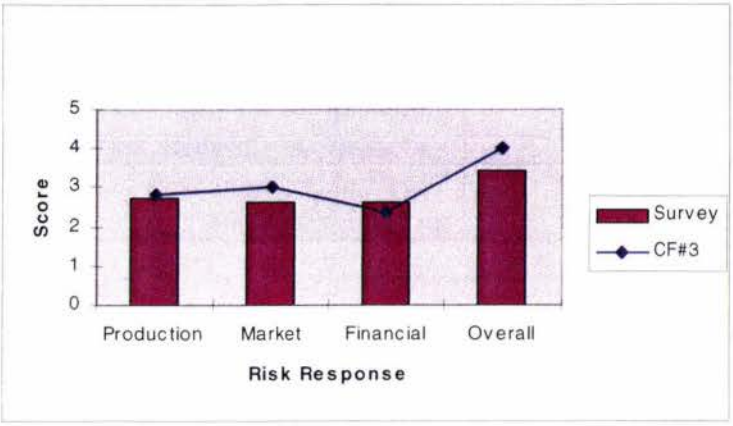


Figure 23. CF3 – Risk Management Responses Compared to the Survey Results.



The importance's of risk management responses identified by CF3 were quite similar to those in the Martin (1996) survey. Slight increases in importance were noted for the overall responses and market responses to risk management. Overall responses related to having short and long-term flexibility within the farm business. Market responses included having top information sources, spreading sales, and having forward contracts and futures markets and diversification of enterprises.

4.5.4 Interview Results and Field Observations

Table 22. CF3 Interview Summary

Interview Areas	Response Summaries
Motives for organic farming	Environmental and human health reasons, for overall sustainability and to increase the labour units on the farm
Goals from organic farming	To get a certified livestock farm up and running
Management changes	Management hasn't changed for these farmers too much as they have always farmed organically
Performance measurement changes	They still monitor bottom line financial performance as a key measure but also look for improvements in their farm resources, e.g. tree

	plantings, stock health, soil health etc.
Key skills required	Need to be a successful conventional farmer, with a good farm who is proactive and open-minded.
Financial changes	They are not making more money at the moment but perceive they will be in the future.
EU standards & opinions	They feel that any step towards organic farming is a good one.
Control and Risk	They feel they have more control farming organically as the farm can ride out climate variations and the stock are more robust.
The conversion process issues	They had problems with stock health issues and the quarantine paddock.

The key motives for CF3 to convert to organic farming were their concern for the environment, the sustainability of their farm, personal health reasons, and the sustainability of the rural community. They also saw it as an opportunity to make more money for the farm in a system that suited them. BioGro suited them as they have been farming with organic intentions for 14 years.

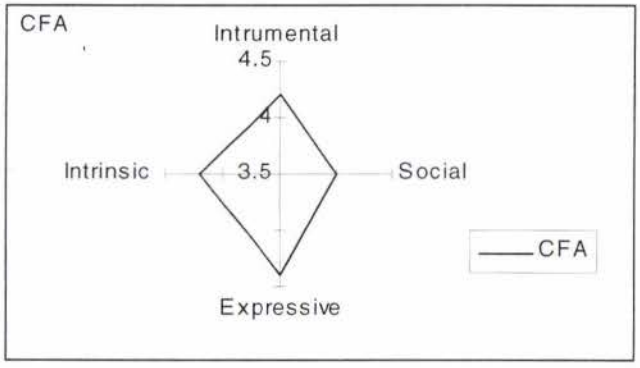
Their goals and values haven't altered throughout their conversion process as was reflected in the section (Figures 19 & 20). Management and key skills identified by the farmers related to *"proactive management aimed at prevention rather than cures"*. The farm resources were also identified by CF3 as crucial to the success of an organic system. *"Its one thing to be a top conventional farmer, but you just might not have the farm to do it"*. A high natural fertility, no serious weed problems and good water were rated as the key inputs.

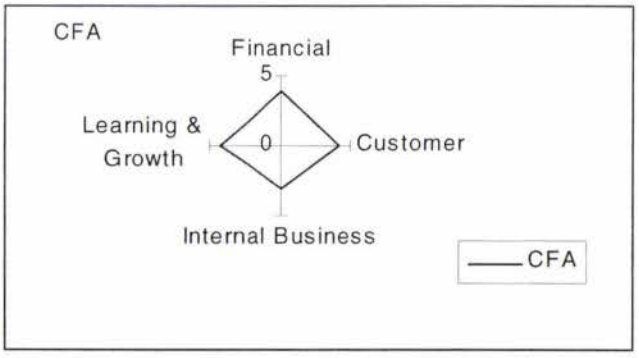
Financially CF3 was doing a lot worse off than what they thought they would be doing if they were farming conventionally at this point in time. In the future they were confident of out performing a conventional comparison. *"After 14 years we are still only producing at 85% and we'll get that extra 25% in the coming year, then we will be better off"*.

4.6 RESULTS – PART B – FOCUS GROUP

Seven farmers filled out the values and goals surveys during the focus group day. Six of the farmers are currently farming conventionally and interested in converting to organic farming methods under BioGro or AgriQuality (EU) standards. The other farmer is a current organic farmer registered with BioGro. All the farmers were livestock sheep and beef growers. They were asked to fill out the value and goal questionnaires in order to make comparisons with the organic farm results collected during the case study analysis. The focus group results are presented in Figures 23. to 29.

Figure 24. CFA. Values and Goals

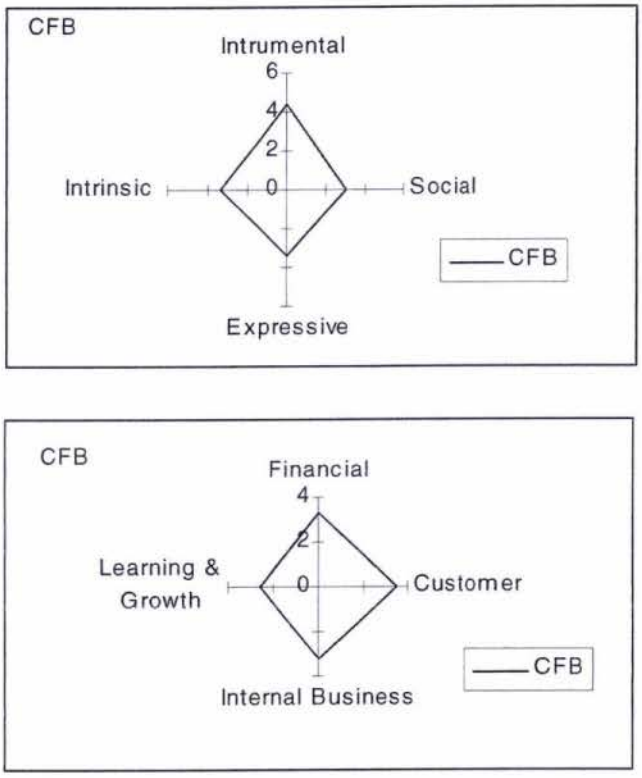




CFA displayed more expressive and intrinsic values than social and instrumental. This means CFA was farming more as a means to express themselves in terms of pride in ownership, self-respect, creativity and challenging. Intrinsic values are related to the

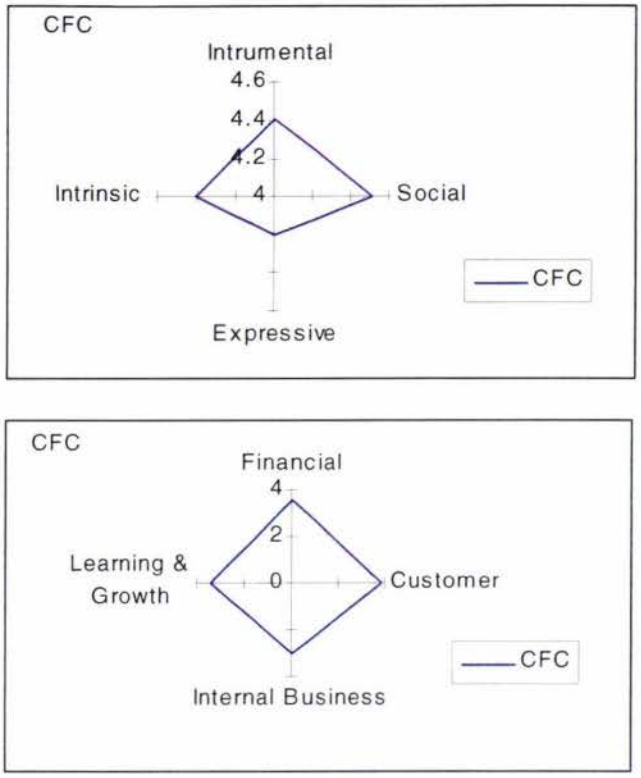
enjoyment of work tasks, the outdoor lifestyle, independence and purpose in work. The goals spider graph was quite evenly spread but tended slightly more towards learning and growth and financial goals.

Figure 25. CFB. Values and Goals



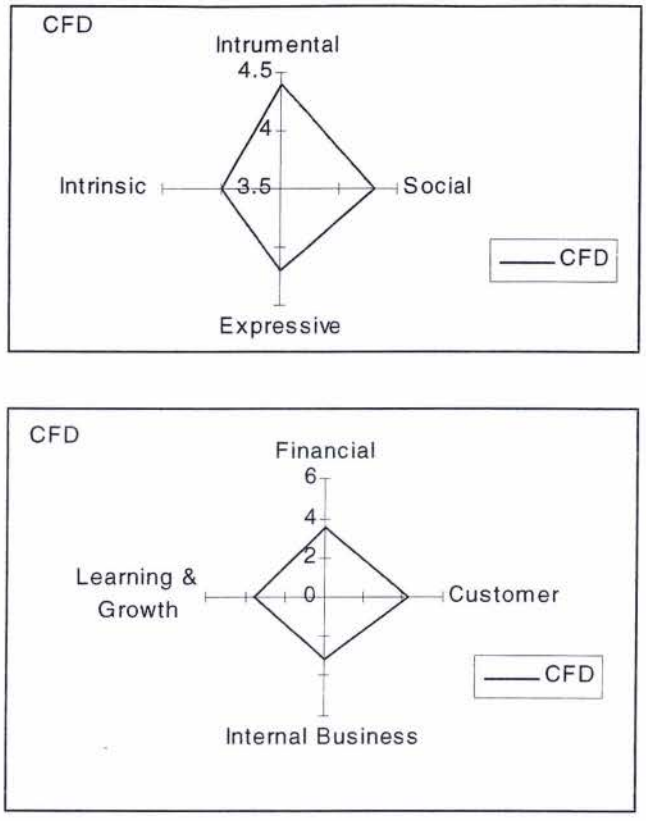
CFB had values that were most strongly represented in the instrumental side relating to making maximum income, expanding the business, safeguarding the business and providing congenial working conditions. Results from the goals spider graph showed an even spread of importance placed on financial, customer and internal business process goals. The low importance area was placed on learning and growth which focuses on the businesses ability to change and adapt.

Figure 26. CFC. Values and Goals



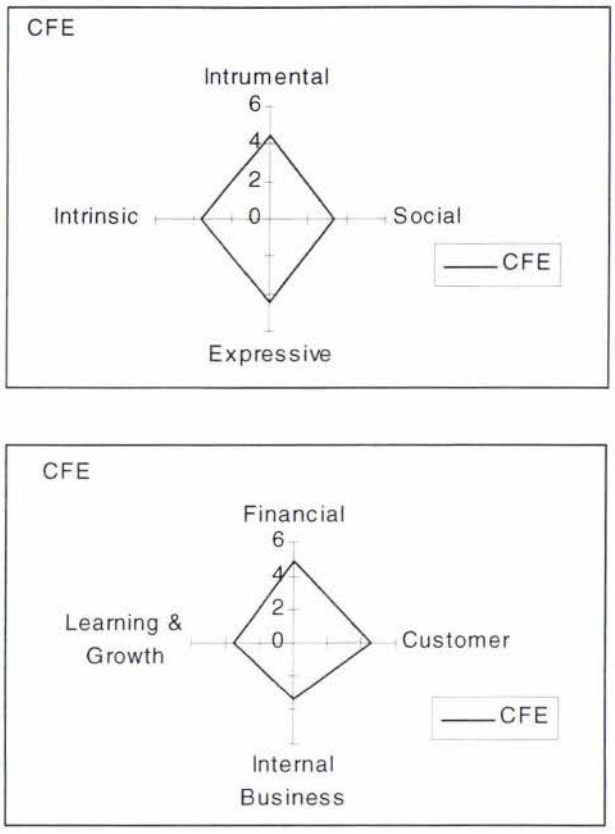
CFC has values that are very skewed in favour of instrumental and social aspects. This means a high importance is placed on the business ability to make and retain money, expanding the business and providing good working conditions. Social values that had a high importance placed on them include, belonging to the community, gaining respect as a farmer, working as a team and working with family members. The goals were evenly spread throughout the four sectors with slightly more importance placed on the customer goals.

Figure 27. CFD. Values and Goals.



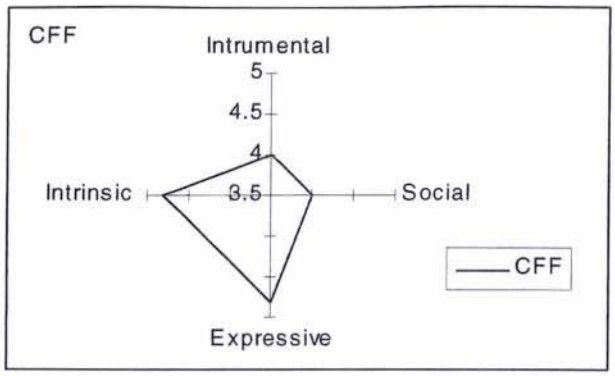
Instrumental and social values had the most importance placed on them in CFD, with expressive values also important. The goals also had an even importance placed on them but were overall lower than the other case farms.

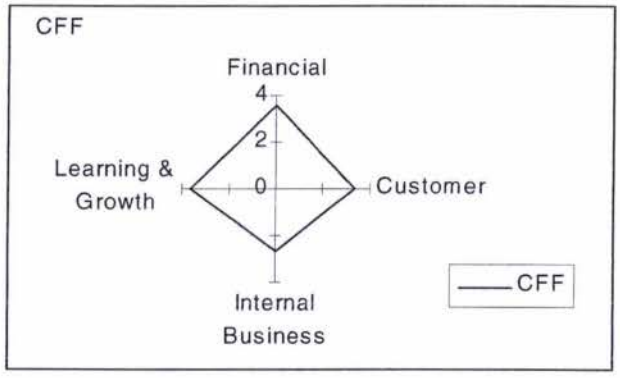
Figure 28. CFE. Values and Goals.



The values for CFE are very evenly spread through the four different areas. No particular value sector seems to dominate. The goals are also well spread, but slightly more importance is placed on financial and customer goals for this case farm.

Figure 29. CFF. Values and Goals.





CFF shows a distinct favour towards expressive and intrinsic values. These relate to the farmer feeling pride in ownership, self-respect and creativity from the farming activities for expressive values and enjoyment from work tasks, independence, control and purpose to the farming business from the intrinsic values. The goals favoured the learning and growth and financial quarters.

Discussion

5.1 Introduction

The central purpose of this study was to investigate the hypothesis that *"by producing to European Organic meat specifications, New Zealand livestock growers can out perform their conventional and BioGro systems"*. The methodology used to determine this was to undertake a detailed literature review, multiple case study analysis and focus group discussion. From this the researcher aimed to clearly determine the differences in the two organic standards, to determine what success means to farmers in both systems and to develop an understanding of organic farming methods and philosophies so as to be able to draw conclusions and recommendations.

The discussion section will be presented in the same order as the research objectives, which are listed again below.

1. Compare and contrast the BioGro and European livestock production specifications.

2. Gain an understanding of the philosophical drivers and best management practices by which soils, water, animals and feed are managed to meet the two specifications.

3. Establish the methods by which performance can be measured when converting from a conventional farming system to an organic system.

4. Estimate the biophysical, financial and social implications of altering conventional farming systems to meet the two organic specifications.

5.1 Objective One

"Compare and contrast the BioGro and European (AgriQuality) livestock production specifications".

Both the BioGro New Zealand organic livestock standards and the European Union (EU) (AgriQuality) standards were reviewed in depth. AgriQuality New Zealand, formerly part of the Ministry of Agriculture and Forestry (MAF) has reproduced the EU standard for New Zealand conditions and is the EU standard's official (EU) auditor. The interpretation of the specifications is as for the EU standard but is reproduced under the AgriQuality format. The AgriQuaility standard also has equivalency status in Australia meaning growers can export AgriQuality certified product to Australia (Linn *pers com* 2001).

The key areas of difference between the standards are in the conversion process and animal welfare regulations. Conversion can be as fast as 6-12 months in some instances under the AgriQuality standard. This is because stock can be purchased from non-organic off farm sources and finished and sold organically after 6 months. Under these circumstances bought in lambs would be hoggets after the six-month transition period. Under BioGro the majority of stock (90%) must be purchased from organic breeding stock (10% are allowed not to be), and this stock can not be used for meat production until it has undergone a 12-month conversion period. Generally, a very good reason for purchasing non-organic stock would need to be given.

The auditing program undertaken by BioGro is also more frequent than AgriQuality. In some circumstances the conversion period under AgriQuality will only have one audit visit. Under BioGro at least 4 visits are completed over a 36-month conversion period and the whole process is more structured (Masson *pers com*, 2001). The conversion period is a minimum of 36 months under BioGro. AgriQuality auditors take into consideration the previous management and history of a property wishing to convert to the AgriQuaility standard. They will review farm accounts, soil test results, animal health policies,

fertiliser history etc. It is possible for a farm to have no conversion period and sell product as organic straight away. An example of this is a BioGro farmer wanting to change to the AgriQuality specifications. Interestingly, if an accredited AgriQuality farmer wishes to convert to BioGro specifications it must still undergo a 36 month conversion period (Brown *pers com* 2001).

In the near future (12 months) a universal MAF (Ministry of Agriculture and Forestry) standard will be introduced to New Zealand (Brown *pers com* 2001, Mckay *pers com* 2001, Food Industry Weekly 2001). This will mean that any organic farmer producing to either BioGro or AgriQuality specifications will also have to comply with the MAF minimum standard. This will effectively be the New Zealand benchmark standard for organic exports into Europe. This standard is different from the EU regulation, which AgriQuality has adopted and is perceived to be a slightly harder standard. BioGro New Zealand has strong links with the UK Soil Association that has strong ties with many of Europe's leading supermarket chains, possibly placing BioGro at an advantage over AgriQuality for European export opportunities (Brown *pers com,* 2001).

The animal welfare regulations for AgriQuality allow up to three courses of medication per animal, per year before that animal will lose its organic status. The three-treatment maximum allowance pertains mainly to breeding stock. For a finishing lamb under AgriQuality standards the limit is one treatment through the course of its lifetime (3-4 months). A course/treatment can relate to allopathic or chemically synthesised drenches, dips or sprays, or antibiotics. Under BioGro standards, any animal that receives any form of treatment medication (unless homeopathic and approved) loses its organic status for 12 months and double the withholding period. This is a very important difference between the two standards as the use of medication or chemicals in an organic system seemingly goes against the organic philosophy. It is perceived by many in the organic sector and certainly the case study farms, that allowing synthetic/chemical treatment of livestock makes the AgriQuality standard easier to achieve than the BioGro standard.

The reason for the allowance of animal treatments/chemicals is that in Europe consumers are very concerned and proactive about the welfare of farm animals. Fielden (2000), Brenton-Rule (1999), and Shadbolt, (2000), all agreed that European society increasingly has the time, money and energy to be very concerned about animal welfare, sustainability and related issues. No longer it seems, can organic farming be defined or labelled as solely low or no chemical agriculture, as today it is becoming more about animal welfare and other environmental issues. As an illustration of this point currently the number of treatments per animal per year allowable under the EU standards is restricted to a maximum of three, in the future however this limit could be extended (Shadbolt *pers com,* 2000). The reason for this is so that restricting treatments to achieve an organic standard does not compromise animal welfare. Much debate amongst veterinarians and industry representatives continues on this topic in Europe (Shadbolt *pers com,* 2000).

BioGro and AgriQuality have provided livestock farmers with two different production standards for products that will compete on the same market. BioGro is an organic label recognised world-wide through a reputation built up over many years, whereas AgriQuality is a fairly new standard relatively untested in the market place. BioGro is viewed a much tougher standard to achieve compared to AgriQuality. BioGro currently has IFOAM accreditation and AgriQuality expects to also be accredited by the end of 2001 (Brown, *pers com* 2001).

Opinion on the standards by the case study farmers and focus participants was mixed. Some case study farmers saw the AgriQuality standard as an easy option that gave the organic label a bad name. They felt that having more than one organic label was confusing to the consumer and ultimately detrimental to the long term value of the New Zealand organic industry. None of the case study farmers would revert back from their current BioGro status to the AgriQuality standard. The focus group farmers however shared a different view on the two standards. These farmers viewed the AgriQuality standard as an opportunity to farm in a more environmentally friendly way where they could sell their product on the organic market for a premium with higher productivity.

Many made the comment throughout the focus group day, *"why farm to a tougher standard when the consumer doesn't require you to"*. These farmers didn't view the AgriQuality standard as being detrimental to the organic industry in New Zealand but rather a step in the right direction. They saw it as an effort to farm in a more environmentally friendly way while remaining economic.

5.3 Objective Two

"Gain an understanding of the philosophical drivers and best management practices by which soils, water, animals and feed are managed to meet the two specifications".

To gain a good understanding of the best management practices on any farm system it is important to establish the goals and values specific to the farm business. Management practices and on farm issues relating to soils, water, animals and feed can then be linked back to these goals and values to aid a better understanding of the system by the researcher. The goals and values for this research were recorded with the farmers both from their memories of being conventional farmers and as current organic farmers. Attitudes towards risk and risk management response's and control were also established through questionnaires.

Gasson (1973) when developing her values and goals questionnaire stated that over time farmers' goals may change but their values will remain the same. However, from the results of the three case study farms in this research one farm did exhibit a change in values. The other two case study farms showed no change.

CF1 showed some change in the relative weighting of values. They also rated the same values as more important when farming organically. Both partners in CF1 evenly displayed this shift. The increases occurred in the instrumental values, intrinsic values and expressive values. Their social values had also had a very slight increase. Effectively their values haven't changed but they place increasing importance on these areas as

organic farmers compared to when they were conventional growers. This could be because as organic growers CF1 felt more pressure to succeed financially and personally to meet their challenges. The greater increase in these other values for CF1 compared to the social values could also be a response of the negativity many organic growers have felt from their conventional counterparts. This could be the reason why social values didn't increase in proportion to the other areas.

Interestingly, CF1 was the only farm which showed a change in goals between farming conventionally and organically. Financial goals, learning and growth goals and internal business processes goals all increased in importance. These increases were greater for the female partner of CF1 than for the male. As was the case with the values analysis, the increases in the importance placed on these goals could be attributable to the higher expectations and personal beliefs held by the farmers. Higher expectations came from increased performance pressure and negative public perceptions of organic farms and the personal belief that they will and do achieve more from organic farming both personally and financially.

The other two farms recorded no change in goals. A possible part explanation for this is that both CF2 and CF3 have held organic beliefs for many years, 15 years and 14 years respectively. To ask these growers to think back to when they were farming conventionally and remember their goals and values was a considerable ask by the researcher and was acknowledged by these case farmers. CF1 had been interested in organic farming for only 8 years and was more easily able to distinguish between their conventional and organic farming careers. From an analysis viewpoint the researcher thought that the lifecycle phases of agriculture (entry, consolidation and exit, Gasson (1973)) would have caused some change in the case farms goals.

Each case farm was producing to the BioGro organic livestock production standards as no case farms producing to AgriQuality livestock standards were available for this research. As a result, the information gathered on the best management practices from the case

farmers pertains only to the BioGro specifications. Each case study farm system and how it was managed was defined as best as possible by the researcher in the available time. The case farmers' views and perceptions of AgriQuality standards and production were gathered and recorded. The focus group day provided an opportunity to compare and contrast the production and best management practices between the two standards. As was stated earlier, one of the key objectives of this day was to model both systems. The thoughts and views gained from both existing BioGro livestock farmers and potential conversion farmers were instrumental in the comparison between the two specifications.

After discussions and field observations with the case study farmers several factors became common in best management practice. These were the farm resources, timing of operations, and an attitude adjustment whereby the organic farmers learned to relinquish control and accept some risks. These principles resulted in a more proactive management philosophy aimed at prevention rather than control.

In contrast the researcher's impression after the short amount of time spent with the focus group farmers was that this mindset of "relinquishing control" and "accepting certain risks" had not been understood by most. A key factor in identifying this was that the majority of the groups believed that their current conventional farming production per hectare would not drop a great deal after conversion to the AgriQuality standard. Generally most of the focus group farmers felt that production would drop slightly on their farms over the conversion period of three years but would be quite good again soon after. In contrast to this the case study farmers felt it took 10 years to get going as an organic farmer.

As an example of the attitude adjustment CF2 explained how common problems in conventional farming such as weeds, which are identified as major problems in organic farming, don't always have to be controlled. This farmer explained that rather than going to great lengths to mechanically and hand control thistles he just accepts that they will be there. He feels he has no more thistles than do his conventional neighbours who spray and

top intensively. In contrast to this the focus group participants were asked to rank the major production issues they saw facing them as organic farmers. Weed control was ranked second on the list behind parasite control. No significant mention was made throughout the day of the philosophical requirements of organic farmers, but mostly risks and control methods. The focus group was very production orientated.

Each case study farmer highlighted the need for a property suited to organic farming. Suitability was defined as minimal weeds/pests, high natural soil fertility, good shelter, good rainfall and a clean water supply. All agreed that not all regions were suitable for organic farming particularly low fertility areas with weed problems (e.g. gorse). The focus group was also concerned about the suitability of their own farms to conversion and the effect that increasing cattle numbers would have on wet areas. Additional cattle were required for pasture control to clean up rank pastures with a different grazing pattern to sheep.

The case study farms identified the need for more proactive thinking and management as best practices for an organic farm manager. Many of the quick fix tools that were available in conventional systems aren't allowed in organic farming, so the farmers said,

"...Farmers needed to think further ahead, and think about prevention".

Monitoring also became more important, particularly with livestock and crops, with emphasis on detecting more advanced or earlier signs of disease or weeds. Signs regularly used in conventional farming could be too late in an organic system. CF3 provided a good illustration to this,

"...As a conventional farmer drenching becomes routine and poor stock can be drafted off for special treatment. As an organic farm we have to think about where that lamb came from and how to get more disease and parasite resistant stock through breeding and management".

In the early stages of CF2 conversion, strong or healthier stock (or higher nematode resistant stock) was marked to keep and breed from. Higher cattle numbers were also required for crossover rotations in order to keep pastures cleaner (prevention). Sourcing quality organic breeding stock was identified as a problem by the case farms. It was estimated by the case farmers that it would take a conventional farmer around 10 years to breed a good organic flock. Another prevention practice used was to not bring sheep into the yards very often as this was considered by one grower as a critical point of contamination, stress and disease transfer.

Flexibility in any farm system was a desirable trait, however in organic farming lack of flexibility was an issue often raised by the case study farms, which forced more proactive thinking. One case farmer with a fixed supply contract of a minimum of 10 beef cattle per month to an organic processor gave a good example.

"*...In good season's the option to bring in more finishing bulls to eat the additional feed wasn't available. Certified stock, required under the BioGro standards were difficult to find, leaving few options during high growth periods. Often feed was wasted or turned into hay or silage*".

As a result this farmer was looking to buy a breeding unit to overcome these supply problems. The focus group farmers also raised this issue. They felt in their model farms that there would be a need for more staggered lambing and calving to help partly overcome this problem. Being a smaller, niche market the focus group felt that more thought would need to go into the market requirements of their stock compared to when they were farming conventionally. The case farmers also identified the need for efficient and resourceful information finding in organic farming and excellent people skills for best management practice. As conventional farmers they had access to farm advisors, established discussion group's veterinary advice and numerous conventional media publications with scientific research funding. They also didn't feel they had as much need

to market and sell their own products. The focus group farmers also thought that their ability to find good independent information would be more difficult as organic farmers. This was one of their main concerns, particularly through the conversion period.

These information infrastructures, although in place in most organic areas of New Zealand were felt by the case study farms and the focus group farmers to be not as well developed for organic farmers as for their conventional counterparts, particularly research funding. As a result, managers in organic farming needed an open, curious and very accepting mind. Often the solution to a problem has never been researched, is only known by a more experienced organic farmer, and has no scientific backing. The consequence, highlighted by the case study farmers, is that they will often have no idea whether an idea will work or not, rather they just have to accept a suggestion, try it and adjust factors to suit their own requirements. All of the case study farmers found this way of problem solving very difficult to accept during their conversion process but nevertheless a big part of evolving best management practice.

Boehlje *et al* (2000) (Table 8.) states that in agribusiness firms today information is the prime source of power, that the relationships needed to source this information are increasingly important and that often it is in private hands, protected and difficult to get. This highlights the fact that information networking and business relationships are a critical facet not only of organic farming, but in all niche or specialised production systems.

From the results, all three case study farms rated the production sources of risk higher than the Martin (1996) survey results. Production sources of risk come from climate variability, pests, disease and disasters. Human risk was also rated higher by two of the farms and regulatory risk by only one. Logically an increase in production risk can be anticipated as the managers have fewer conventional controls, therefore, their perceptions of production risks should increase.

However, in response to this, all of the case farms felt they had increased control as organic farmers. The common theme among the interview responses was that the farmers,

"...Felt the organic systems were more robust to climatic variations, the livestock more robust and that they had more control over the end product due to additional marketing requirements".

So although they felt greater production sources of risks than the average of the 800 conventional respondents to the Martin (1996) risk survey they had developed the management responses to them. This ties in with the attitudinal adjustments discussed earlier. Two of the case farmers accepted that they had increased production risks, but believed their organic systems (soils, pastures, stock) were better set up to handle these risks and were preventative. Only CF1 rated production risk management responses higher than the conventional respondents did in the survey. Production responses encompassed activities such as routine spraying, diversifying plant varieties or animals breeds, monitoring for pests and diseases and having irrigation. This is of interest since production sources of risk were rated higher by all the case study farms yet only CF1 rate production risk responses higher.

This again could tie in with the attitudinal adjustments mentioned earlier. They don't place a high importance on short term or 'reflex' control as it goes against the organic philosophy. One of the key principles of organic farming stated by Clarke (2000) was that it wasn't so much about the avoidance of agro-chemicals, but more importantly the rejection of linear thinking underlying the use of chemicals, hence the low importance placed on production risk responses. For example, if gorse is appearing on a hillside it often shouldn't always be controlled through chemicals or cutting, rather that land area should be retired and perhaps planted with trees. This attitude towards control would explain the low recognition of conventional production risk responses used in the survey by CF2 and CF3.

In contrast, CF1 who had been involved in organic farming for the least time (8 years) had the highest internal locus of control of all the case farms, which could explain their higher ratings of the production risk responses.

All three farms rated marketing risk management responses higher than the Martin (1996) survey respondents did. These responses included information, spreading sales, enterprise diversification, forward contracting, and futures markets. Two of the case study farms were currently marketing their own organic farm products. This aspect of business was a huge source of personal satisfaction for them and also a part of why they viewed their organic system with more control than their conventional. By marketing their own products the felt they had more control over their product destination, pricing, costs and therefore returns. One case study farmer mentioned that as he felt he potentially had more on farm risks he wanted to minimise the off-farm risks through marketing and selling his own brand. Best management practice for two of the farms didn't finish with the soils, water, plants and animals. Marketing and a focus on off-farm customer needs were evident with the two case farms involved in adding value to their products and was a huge part of their management strategies. It was also recognised as a good way of getting other family members involved in the business. The importance of marketing and relationship and negotiation/people skills was emphasised by these two case study farmers.

Financial and overall risk management responses were also all rated higher. CF2 rated financial responses significantly higher than the other farms, and the farmers in the Martin (1996) survey. Financial responses were to keep debt low, manage capital spending, have overdraft reserves, and have insurance, off-farm investments, and have off-farm work. Overall responses related to having either short-term or long-term flexibility. Best management practice by these case farmers involved greater financial and overall risk management responses. A possible reasoning for this could be that as they had fewer production responses (than conventional growers) they looked for other ways to minimise risk, meaning more importance was placed on financial, overall and marketing responses.

Best management practice of the soils, pastures, animals and water on these case farms is about accepting and minimising where possible the production risks through timing and proactive management with a preventative focus.

Sourcing information and a drive to find new and different ways of answering conventional problems is critical. A lot of thought and energy goes into off-farm marketing and value adding projects for market control and personal satisfaction.

5.4 Objective Three

"Establish the methods by which performance can be measured when converting from a conventional to an organic system".

In relation to this research hypothesis, performance measurement differences between organic farming and conventional farming are very important. To eventually conclude whether the EU standard will "out perform" their BioGro and conventional systems a good understanding of what performance measures the case study farmers currently value is important. Specific key performance indicators were asked for but financial analysis could not be conducted for each case farm. The aim was to make some estimate of how their performance measurement had changed since farming conventionally (if at all) and whether they now possibly placed greater emphasis on non-financial performance measures. Establishing each case farms motives for organic farming was also important.

All the case farms said their interest in organic farming had been long term. Even if they had only been converted for a few years, or in CF3's case not yet fully converted. Each farm has had an interest in farming organically for 8 years or more. It was therefore difficult for the case farms to distinguish between farming organically and conventionally. CF1 and CF2 identified market opportunities as the main reasons for converting. A dislike of chemicals was another reason identified by CF1. CF2 and CF3 identified environmental motives for converting and CF3 also saw organic farming as a

way of increasing the labour units on their farm. Each case farm at some stage mentioned a desire to bring the soils, pastures and animals into 'balance'. This was another of the key motives for converting to organic farming. Individual motives for wanting to convert to organic farming methods weren't established for the focus group farmers. In a general sense however, they were concerned and interested about the sustainability of the environment and the effect their farming practices had, reducing input reliance, and obtaining an organic premium for their products.

The literature review identified in section 2.6.9 some farmers reasons for converting to organic farming. All of the motives acknowledged by the case farmers and focus group farmers could be grouped under these headings in no order of preference. The sources of this motives list (Freyer *et al* 1990, Svensson *et al* 1991 cited in Lampkin 1990) noted that farmers generally adopt organic farming for non-financial reasons. Yet in this study, CF1 and CF2 both identified the "profitable" organic market as a key motive leading to their conversion as well as some non-financial reasons.

CF3 specifically mentioned a desire to increase labour units on their farm through organic farming which did not feature in the literature review list. CF3 identified themselves as more BioDynamic in philosophy and saw organic farming as a means to make a whole community more self-sufficient.

Boehlje *et al* (2000) identified most of the motives in this section in a summary table of management changes for conventional agribusiness firms over time (Table 8.). Some of the motives identified by the case farms can't be considered unique to organic farming but a reflection of how the new agribusiness environment is forcing farmers to think. For example, Boehlje *et al* (2000) in the table notes how farms today look to produce fashion/niche products rather than commodity products, place a greater emphasis on the customer rather than assets, and are resource protectors and not resource exploiters. All farmers today have to concentrate on doing things better, producing better products through better knowledge and relationships throughout the supply chain. Performance

measures in general have changed focus from traditional financial and production measures to more complex and different non-financial measures.

The results for this research showed that financial performance measures were still very important to all the case study farms. All thought that financial performance was a big part of the *"sustainability equation"* and that if a farm business wasn't financially viable then it couldn't be considered sustainable. As was mentioned in the previous section each farm placed a greater emphasis on financial risk responses than the conventional farming respondents did in the Martin (1996) survey.

None of the case study farms gave permission for their farm accounts to be analysed. The intention for the research was to do this and estimate some of the financial implications of the conversion to BioGro and gain an understanding of where the case farmers are now. The researcher did not anticipate the unwillingness of the case farms to have their accounts analysed and changes to the financial analysis had to be made. As a result the case farms were only informally questioned about the financial aspects of their business and no accounts were analysed. Instead, the key question was whether each case farm was making more money now compared to when they were farming conventionally. For CF1 and CF2 the answer was a very positive yes, indicating they were making a substantial amount more money. However, it must be remembered that many farmers were having a good year financially in 2000/2001 with some of the highest agricultural prices in 30 years achieved (AGBRIEF, 2001) for livestock growers.

CF3 was in the final few months of the 3-year conversion process and indicated they were making 25 percent less than when they were farming conventionally. They anticipated they would equal performance during the next 12 months and financially perform better in the years to come.

The focus group day model farm development showed that the AgriQuality farm would achieve higher production than the BioGro farm model. Key differences in assumptions

made by the focus group farmers were in stocking rate, the proportion of lambs finished in compliance with respective standards, and the growth rates of young animals. Opinions were divided on the size of any premium received for products and generally it was assumed there would be a difference between the two different specifications.

The key difference in performance measurement across the three case study farms was in personal satisfaction and non-financial indicators. The case study farms were extremely passionate about what they were doing, why they were doing it and received a great deal more personal satisfaction in their organic farm business compared to when they were farming conventionally. The processes of growing, marketing, selling and distributing a product provided a great deal of satisfaction to those case study farm businesses. Some of the key reasons for this were that it gave both partners an opportunity to be more involved in the farm business. They also felt they were gaining more financial control by being involved with their product outside of the farmgate. Furthermore, it was a chance to develop and use new and-different skills, contacts and abilities. For some of the older case study farm members the opportunity to get involved in the marketing/selling process was very challenging, refreshing and a big part of the satisfaction they received from their business. No longer were they only concerned about on farm profitability, but marketing strategies, customer satisfaction and how they all interrelated.

In addition to this, more non-financial measures were used. Aesthetic appearance of the farm was one indicator used, monitored, for example, by the number of trees planted each year on CF3.

All farms monitored the condition of their farm (soils, pastures, animals) more compared to conventional farms through dry periods during the year. The mix of measures appears to be more balanced than when the case farmers were conventional growers. Organic farming has forced them to think about the environment, their finances and their customers. Their performance measurement systems although not individually and very

well defined or detailed were generally a lot more about personal satisfaction through sustainable on farm performance and marketing/selling strategies for control.

Relating the research findings for this objective back to the hypothesis it appears that the ability of the EU standards to *"out perform"* BioGro or conventional farming systems will depend on the personal satisfaction achieved of adopting the standard to the individual grower. If a conventional farmer has goals of developing a more environmentally friendly system then the EU standards will out-perform their conventional system. Financially it may not, but if other parts of the farm system are developed (e.g. marketing), then there is the potential for the EU standard system to also perform financially. There is every chance EU standard farmers may out perform their conventional systems both financially and non-financially, with greater personal satisfaction as a steward of the land.

Regardless of standard the potential organic farmer is going to need to think about sustainability, learning and adapting new skills such as non-financial monitoring, marketing and relationship building. He/she will need to think hard about what 'drives' them in their current conventional farming system and ascertain whether that motivator will be compatible in an organic farming system. To simply adopt an organic system without thinking about these issues will make a successful transition more difficult.

5.5 Objective Four

"Estimate the biophysical, financial and social implications of altering conventional farming systems to meet the two organic specifications".

The biophysical level in agriculture is about all of the farm resources including the land, soils, vegetation, water, animals and management. A farmer converting to organic farming should anticipate changes to these depending on their experience with organic

methods, expertise, the availability of good advice and the organic standard aspired for (BioGro or AgriQuality).

For weeds and pests no real difference exists between the standards. Methods of control generally become more mechanical and labour intensive with no use of chemical spray allowed with either standard. All of the case farmers had planted more trees for aesthetics, shelter, forestry purposes and to control gorse. Grazing management policies, stocking rates and sheep to cattle ratios will normally be adjusted to have lower stocking rates, more cattle and cross over rotations to control weeds like - 'Californian'- thistles. Methods such as cutting thistles and feeding to cattle were used by CF1 as this increased the sugar levels in the thistle, making them more palatable for the cattle to eat.

Under either standard the suitability of the land to organic farming should be given serious consideration. Natural high fertility, low weed/pest and disease content (e.g. eczema and flystrike) and clean water are desirable traits. The capacity of the soils to handle increased cattle numbers should be estimated and the topography is also important for the mechanical control of thistles. The location of the property in respect of stock supply, selling and processing options should also be given thought as stock cartage costs may increase as processing facilities for organic produce are often more sparsely located than are non-organic facilities. These issues are equally important with either organic specification.

The conversion of livestock to organic farming is one point where the specifications may differ. The 'experienced' BioGro case study farmers used in this research recommended around ten years minimum before a good quality organic sheep flock could be bred. This should be quicker under an AgriQuality standard as maximum three conventional livestock treatments (e.g. vaccines, antibiotics, and chemical drenches) are permitted each year (when deemed necessary). This means that lower levels of livestock resistance or resilience could be tolerated under the AgriQuality standards for similar production levels.

The supply of replacement stock may be easier under the AgriQuality system as well as they don't have to be as genetically robust to organic management practices compared to BioGro replacement stock. As has been mentioned earlier, lambs can be purchased from non-organic sources, finished and sold as organic under the AgriQuality specifications. Under BioGro specifications the lambs must be purchased from organic farmers if they are to sell as organic. In general as processors require continuity of supply, lambing and calving dates may have to be more staggered to achieve this. CF3 was practising staggered lambing and participants at the focus group identified with it. Alternatively, effective management of supply from farms across a range of environmentally and climatically different zones could ensure regular supply of product for processing.

Premiums for the organic products of either specification were not established but were assumed to be the same. Discussions with focus group members and case farmers led to estimates of 10-20% premiums.

Where a difference with a financial implication may occur is in the number of stock that may be sold as organic under the different specifications. After discussion at the focus group a consensus was that around 80% of lambs finished under an AgriQuality specification would likely be sold as organic. Under BioGro specifications it was thought only 60% of lambs would be sold as organic. With the AgriQuality specification it was thought that proportionately more lambs would be able to be run (due to a lower sheep to cattle ratio) and that those requiring some medical treatment would not loose their status as they would under BioGro.

Generally a shift to organic farming would change the nature of some costs. For example, labour requirements might increase as emphasis shifted from reactive pest and weed practices (spraying) to more labour intensive mechanical methods such as grubbing/topping, monitoring costs and fuel costs may increase with more mechanical topping etc. The supply or pattern of cashflow is another area to consider. Generally the

case study farmers found that their selling times and mob numbers were smaller and more spread out for continuity of supply and processor contracts compared to conventional farmers. These patterns of supply shouldn't be very different between the two specifications.

Certification costs is an area that would be different between the standards. Currently BioGro costs around $1901 in fees for the first year and around $1200 per year for the other two years of the conversion (Cadwalder *pers com* 2001). A 0.5% levy per year is charged on all sales. For AgriQuality there is no registration fee and the annual audit fee is around $800-1200 per year (Brown *pers com* 2000).

As well as biophysical and financial affects, converting to organic farming also has social implications. These can be broken down into attitudinal and structural. Attitudinally, the case study farmers noted how they felt they were looked at differently as organic farmers. Generally they felt that the public and agricultural sector perception of organic farmers has been negative. Organic farmers need to be aware that whether they are farming to BioGro or AgriQuality organic specifications they can expect some negativity. A small amount of tension seemed to be apparent within the organic sector itself between BioGro and AgriQuality.

The opinions on the AgriQuality (EU) standards were mixed. CF1 and CF2 held a negative view towards the standard. They felt that because the standards are easier to attain they didn't hold the same level of prestige as the BioGro standard. Longer term they could see them being detrimental to the premiums received currently by BioGro producers. They could see a place for the EU standards in the transition to BioGro. CF3 had a more positive view towards the EU standard and felt that any move toward more organic farming in New Zealand was a step in the right direction. All the farmers saw a great deal of prestige in the BioGro label domestically, and world-wide.

Where to source quality information on organic farming was one of the key issues raised by both the case study farmers and the focus group members. It has an impact on the biophysical, financial and social aspects of an organic farm system. Having good information sources available would give farmers considering a conversion a great deal more confidence about the decision. More expertise needs to come from the industry, which should aid better decisions and performance. Generally both case study farmers and the focus group members felt the industry lacked support and leadership. All were passionate and positive about the market but concerned about its lack of co-ordination. Stemming from this were concerns about competition between the different organic specifications of BioGro and AgriQuality.

Conclusions

The key differences between the EU and BioGro standards are in conversion process and animal welfare requirements. Conversion can be as fast as 6-12 months under the EU standard compared to BioGro's three years. Under the EU standard adult stock may be treated with three courses of medication per year and not loose their organic status. BioGro allow no treatments. It is also possible to purchase and finish non-organic sourced stock under the EU systems, which could have significant benefits for farmers targeting the EU lamb trade.

These differences could provide opportunities to farmers keen on a more environmentally friendly farming system that don't want to go to the full BioGro standard and conversion process. There may also be the opportunity to attain organic premiums from moving to the EU standard. Hands-on marketing and relationship developing by farmers may be required to achieve any premiums.

Information sources, research, advice and industry structure are not well developed in the organic sector. Attitude adjustments to control and an open mind to solving conventional problems is critical in organic farming.

Opinion on the EU standards was mixed. Some saw the EU standards as an easier option that gave the 'organic brand' a bad name. They felt having more than one organic label would confuse the consumer and be of detrimental value long term to the New Zealand organic industry. None of the case farmers would revert back from their BioGro Standards.

Financial performance measures were not defined in this research. It would be unwise for a conventional farmer to convert to an organic system for financial reasons. Non-financial drivers such as the environment and social indicators are important measures.

For progressive farmers that are after a more sustainable farming system the EU standard offers an opportunity. For these farmers financial and non financial performance measures will be important and attainable.

The EU standard has the potential to 'out perform' conventional and BiGro systems proving the hypothesis.

6.1 Further research from here

This research had some flaws in its methodology and structure. Specifically weaknesses in the methodology include:

- Interviewing the same farmer in a pre organic and post organic farming situation getting one farmer to think as both an organic and conventional farmer.
- The small number of case study farms. It should be noted that AgriQuality and the EU standard was only just beginning at the time of this study. A large group of farmers were also approached to participate but many were reluctant.
- The lack of financial information. The small number of farmers involved didn't want to have their accounts analysed for commercial reasons. The researcher did not anticipate this.
- Overall the research was probably more biased towards the organic side from the participants. The focus group provided a valuable chance to put the research in to perspective.

More research is needed into the financial differences between organic and conventional farmers through accounts analysis. Among other things this could provide a more rigorous analysis of price premiums attained by organic farmers. Some investigation into organic product sellers and distributors would also be useful. Economic rather than financial analysis would probably be more appropriate

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Appendices

8.1 Appendix A: Background Information Questionnaire

BACKGROUND INFORMATION QUESTIONNAIRE:

Farmer Name:.....

Massey University Palmerston North

Section A

Farm Characteristics

1. How would you describe your farming operation?

_____

_____

_____

2. How long have you farmed on this property ? ☐☐ years

3. How long have you farmed organically ? ☐☐ years

4. What percentage of your land is farmed organically? ☐☐☐ %

5. Do you own the farm land? Yes/No

If no, what is your relationship to the land owner?

Lease within a family structure	☐
Lease within a third party	☐
Manager	☐
Other	☐

6. Before you, did your family farm the property? Yes/No

7. How big is your property? (ha) improved pasture _____

(ha) unimproved pasture _____

(ha) plantation timber _____

(ha) crops _____

(ha) scrub and bush etc. . _____

Total _____

8. What percentage of your farm is: steep hills % (uncultivable) ☐☐

easy/moderate hills % (cultivatable) ☐☐

Flats ☐☐

9. What stock will you winter in 2001 ? Numbers

Ewe hoggets	_____
Ewes	_____
Rams & whether hoggets	_____
Rams	_____
Other	_____
Cows and heifers to calve	_____
R2yr heifer (dry)	_____
R1yr heifer	_____

Breeding bulls _____

R3yr steers and bulls _____

R2yr steers and bulls _____

Other _____

Breeding hinds _____

R2yr hinds _____

R1yr hinds _____

R2yr & older stags _____

R1yr stags _____

Breeding stags _____

Other _____

_____

_____

10.What is the predominant grass species?

_____

_____

11. Average rainfall?

_____

12. Soil types? _____

13. Briefly describe your sheep policy (e.g. lambing & weaning dates, mating and culling policy, target weights, sale dates, shearing policy, animal health regimes, any key problems etc.) _____

14. Briefly describe your cattle policy (e.g. calving and weaning dates, mating and culling policy, target weights, sale dates, animal health regimes, any key problems etc.)

15. Briefly describe your deer policy (e.g. calving and weaning dates, mating and culling program, target weights, sale dates, animal health regimes, any key problems etc.)

Section B

Management

16. Looking at the view over your property today, how would you describe the changes from 5 years ago?

17.What specific land use/management changes have you made in the last five years?

18.Why have you made these changes?

19.What land use/management changes do you have in mind for the next five years?

Please explain:

8.2 Appendix B: Values & Goals Survey

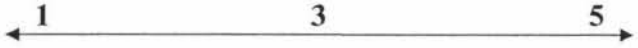
CONVENTIONAL FARM

Value and Goal Statements

Partner 1.

Name: _____

Instructions: Work your way down through the following questionnaire scoring each statement. How highly or lowly do you personally value each statement? Each partner should complete the questionnaire individually. Don't spend too much time thinking about each statement, your first thought is usually the right one.



Strongly Disagree **Strongly Agree**

Value Statements	Score
Making maximum income	
Gaining recognition, prestige as a farmer	
Feeling pride of ownership	
Enjoyment of work tasks	
Making a satisfactory income	
Belonging to the farming community	
Gaining self-respect for doing a worthwhile job	
Preference for a healthy, outdoor, farming life	
Safeguarding income for the future	
Exercising special abilities and aptitudes	
Purposeful activity, value in hard work	
Expanding the business	
Working with other members of the family	
Chance to be creative and original	
Independence - freedom from supervision and to organise time	
Providing congenial working conditions - hours, security, surroundings	
Maintaining good relations with workers	
Meeting a challenge, achieving an objective, personal growth	
Control in a variety of situations	

Goal Statements	
Maintain a standard of living	F
Reduce physical effort in farming	L
Pay mortgage and other loans on time	F
Have all year round work	L
Stable product prices	F
Show a yearly profit	F
Live in the country	L
Increase the family's standard of living	F
Know minimum gross income for the year	F
Retain 5% of turnover to invest in the farm	F
Reduce the long hours of work	I
Have an enterprise with a high return	I
Employ more people	L
Have at least one day off per week	I
Buy more land	I
Rent/lease more land	I
Involve the family in decision making	I
Have a holiday away from the farm at least once a year	I
Avoid borrowing for the farm business	F
Save for retirement	F
Be recognised as a top farmer	C
Have an investment that pays quickly	F
Have time away from the farm for other activities	I
Increase net worth	F
Keep loans below 50% of net worth	F
Increase the farm income	F
Generate a stable income	F
Have an income comparable to another job	F
Receive recognition for special achievements	C
Have a job without repetitive tasks	I
Use insurance where possible	I
Be own boss	L
Leave the business for the next generation	C
Be part of the community and/or church	C
Obtain the highest production in the area	L
Run an environmentally sustainable farm business	C

8.3 Appendix C: Control Survey

Control Questionnaire.

Partner 1.

Name: _____

Instructions: For each question tick the box corresponding to the statement that you agree the most with (either A or B). Don't spend too much time on each question. Each partner should complete this questionnaire individually.

No	Statement	Tick
1a.	Children get into trouble today because their parents punish them too much	
b.	The trouble with most children nowadays is that their parents are to easy on them	
2a.	Many of the unhappy things in peoples lives are partly due to bad luck	
b.	People's misfortunes result from the mistakes they make	
3a.	One of the major reasons why we have wars is because people don't take enough interest in politics	
b.	There will always be wars no matter how hard people try and prevent them	
4a.	In the long run people get the respect they deserve in this world	
b.	Unfortunately, an individuals worth often passes unrecognised no matter how hard he/she tries	
5a.	The idea that teachers are unfair to students is nonsense	
b.	Most students don't realise the extent to which their grades are influenced by accidental happenings	
6a.	Without the right breaks one cannot be an effective leader	
b.	Capable people who fail to become leaders have not taken advantage of their opportunities	
7a.	No matter how hard you try some people just don't like you	
b.	People who can't get others to like them don't understand how to get along with others	
8a.	Heredity plays the major role in determining ones personality	
b.	It is ones experiences in life which determine what they are like	
9a.	I have often found that what is going to happen will happen	
b.	Trusting to fate has never turned out as well for me as making a decision to take a definite course of action	
10a.	In the case of a well prepared student their is rarely if ever such a thing as an unfair test	
b.	Many times exam questions tend to be so unrelated to course work that studying is really useless	
11a.	Becoming a success is a matter of hard work, luck has nothing or little to do with it	
b.	Getting a good job depends mainly on being in the right place at the right time	
12a.	The average citizen can have an influence in government decisions	
b.	This world is run by a few people in power, and there is not much the little guy	

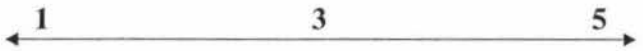
	can do about it	
13a.	When I make plans, I am almost certain that I can make them work	
b.	It is not always wise to plan to far ahead because many things turn out to be a matter of good or bad fortune anyhow	
14a.	There are certain people who are just no good	
b.	There is some good in everybody	
15a.	In my case getting what I want has little or nothing to do with luck	
b.	Many times we might just as well decide what to do by flipping a coin	
16a.	Who gets to be the boss often depends on who was lucky enough to be in the right place first	
b.	Getting people to do the right thing depends upon ability, luck has little or nothing to do with it	
17a.	As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control	
b.	By taking an active part in political and social affairs the people can control world events	
18a.	Most people don't realise the extent to which their lives are controlled by accidental happenings	
b.	There really is no such thing as luck	
19a.	One should always be willing to admit mistakes	
b.	It is usually best to cover up ones mistakes	
20a.	It is hard to know whether or not a person really likes you	
b.	How many friends you have depends upon how nice a person you are	
21a.	In the long run the bad things that happen to us are balanced by the good ones	
b.	Most misfortunes are the result of lack of ability, ignorance, laziness, or all three	
22a.	With enough effort we can wipe out political corruption	
b.	It is difficult for people to have much control over the things politicians do in office	
23a.	Sometimes I can't understand how teachers arrive at the grades they give	
b.	There is a direct connection between how hard I study and the grades I get	
24a.	A good leader expects people to decide for themselves what they should do	
b.	A good leader makes it clear to everyone what their jobs are	
25a.	Many times I feel that I have little influence over the things that happen to me	
b.	It is impossible for me to believe that chance or luck plays an important role in y life	
26a.	People are lonely because they don't try to be friendly	
b.	There is not to much point in trying to please people, if they like you they like you	
27a.	There is to much emphasis on athletics in high school	
b.	Team sports are an excellent way to build character	
28a.	What happens to me is my own doing	
b.	Sometimes I feel that I don't have enough control over the direction my life is taking	
29a.	Most of the time I can't understand why politicians behave the way they do	
b.	In the long run people are responsible for bad government on a national as well as on a national level	

8.4 Appendix D: Risk Survey

Risk Source & Responses Questionnaire:

Name: _____

Instructions: Their are two tables in the following questionnaire. The first table identifies 19 common sources of risk to farmers in NZ. Your task is to identify (using the numbered scale below) the relative importance of **each** different risk source. Simply write the score you give for each risk source in the empty column below.



Not important **Very important**

Risk Source	Score
The risk from unexpected variability in rainfall	
The risk from other weather factors such as wind, temp, frost, hail, snow	
The risk from disasters such as fire, flood, earthquakes	
The risk from diseases or pests affecting plants and animals	
The risk from changes in product prices	
The risk from changes in input costs	
The risk from changes in interest rates	
The risk from changes in world economic and political situation	
The risk from changes in New Zealand's economic situation	
The risk from changes in government laws and policies	
The risk from changes in local body laws and regulations	
The risk from changes in producer board polices and activities	
The risk from changes in land prices	
The risk from accidents or problems with health	
The risk from changes in family situation such as partnership goals, marital status, inheritances	
The risk from problems with hired labour and contractors	
The risk from theft	
The risk from being unable to meet contracting obligations	
The risk from changes in technology and breeding	
Other (please specify) below	

Risk Responses

Instructions: How important are the following for managing risk in your farming operation.

1 ← 3 → 5

Not important **Very important**

Risk Response	Score
Having more than one type of crop, animal or other enterprises on your property to reduce risk	
Using more than one variety or breed or technique of production to reduce risk	
Maintaining feed reserves to reduce risk	
Not producing to full capacity so there are in the system to reduce risk	
Having short term flexibility: adjusting quickly to weather, price and other factors to reduce risk	
Monitoring programme: for pests, crop biology, and climate to reduce risk	
Routine spraying or drenching: as a preventative measure to reduce risk	
Irrigation to reduce risk	
Spreading sales: selling each product over a period of time rather than all at once to reduce risk	
Using futures markets to reduce risk	
Forward contracting for buying and selling ahead of time to reduce risk	
Gathering market information on prices and trends to reduce risk	
Arranging overdraft reserves to borrow above normal requirements as an extra buffer	
Maintaining financial reserves and easily converted financial assets as a reserve to reduce risk	
Main farm operator working off property to add to farm income and reduce risk	
Investing off farm for other sources of income and investment to reduce risk	
Managing debt and working with lenders to ease debt burdens in bad times	
Keeping debt low or maintaining a low level of debt to reduce risk	
Having long term flexibility to make major changes in the longer term to reduce risk	
Planning of capital spending: pacing investments and expansion to reduce risk	
Having personal or business insurance to reduce risk	
Other (please specify)	

8.5 Appendix E: Informal Interview Guidelines

Expand on each question area.

1). Gather background on their experiences as conventional farmers.

- likes & dislikes

2). What were there motives for organic farming (environmental, financial, personal, social) ? Are these motives still the same, were they justified?

3). Have their goals from organic farming changed at all from when they decided to convert to now? What were they at the start, what are they now?

4). Have aspects of their farm planning changed now? If yes how? How has the way you farm changed?

5). What new practical skills have needed to be developed? (marketing, networking, relationship building etc. compared to when they were farming conventionally).

6). What do they perceive to be the most important attributes of a successful organic farmer? Why ?

7). How do they value success in organic farming, and what do they measure?

8). As farmers do they see themselves as more successful now than when they were farming conventionally?

9). Are they making more money now compared to when they were farming conventionally?

10). Is this different from when they were farming conventionally? Why or why not?

11). Do they feel they have more or less control over there farm system as organic compared to conventional? Why or why not?

12). What do they see as the main positives and negatives of the BioGro conversion process? Why?

13). What are there opinions of the new EU standards? Why?

14). Where do they see them fitting within the whole organic philosophy? Why?

15). Would they consider adopting them? Why or why not?