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Understanding Approaches to Kiwifruit Production in New Zealand: Report on First Qualitative Interviews of ARGOS Kiwifruit Participants

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Executive Summary

In the first preliminary interview of those participating in the kiwifruit sector of the ARGOS programme, participants were asked a series of questions in order to record their initial ideas about topics of interest to the management, environmental, economic and social objectives of the ARGOS programme. The responses to these topics are summarised below under the headings of the questions asked in the interview. If you are interested there is a fuller report available on the ARGOS website (www.argos.org.nz), from Jayson Bengé (Field Research Manager), or from any of the authors.

The different production systems and varieties under study - KiwiGreen Hayward, Organic Hayward and KiwiGreen Hort 16A - will hereafter be referred to as Green, Organic and Gold respectively for the sake of brevity. The term 'panel' is used to describe the group of participants associated with each production system.

1. What do you call yourself?

There were 17 different answers to this question and 23 (out of the 35 participants) used the word orchardist as part of their title. Seven were Green participants, ten were Organic and six were Gold. Of the six who called themselves managers, four came from Gold orchards.

2. What that work involves

This question was usually answered in terms of the work and management associated with the yearly cycle and management practices and will be very familiar to participants, so will not be reported on here.

When the panels were compared, emphasis was given by:

- Green participants to tidiness, mowing, and concerns about use of hydrogen cyanamide (e.g., Hicane™).
- Organic participants to compost but this was not exclusive to them.
- Gold participants to the newness and novelty of the gold variety.

Out of all orchardists, three Green participants mentioned that they had changed the way they applied their fertiliser due to environmental concerns.

3. Personal vision, vision for orchard and constraints to vision

A range of motivations underlie the management strategies of orchardists participating in the ARGOS programme. Financially related visions were financial improvement, economic growth, profitability, investment, and financial gain achieved through the sale of property. The visions of others included productivity, the move to retirement, spreading the risk through diversification, producing good fruit, lifestyle, and stewardship of the land.

When the panels were compared, emphasis was given by:

- Green participants to vision of financial benefit.
- Organic participants to size of fruit, environmental and soil improvement.
- Gold participants to the orchard as a capital investment, fruit dry matter (DM), lifestyle as a commodity.

Constraints to these visions were related to the climate and physical environment, labour, financial factors such as limited capital, increasing costs, audit requirements, local and national government land use policies, macroeconomic policies/conditions, and personal constraints such as health and lack of skills.

When the panels were compared, emphasis was given by:

- Green participants to limitations in the orchard structure, such as t-bar structures.
- Organic participants to limitations imposed by the environment and/or plants (and weeds).

- Gold participants to constraints of capital and lack of knowledge/skills.

4. Orchard maps drawn by participants

Each participant was asked to sketch a map of their orchard and include all the features that they perceived to be important to their management. Table 1 presents the frequency of the grouped features drawn on the maps during this exercise.

Table 1: Features on orchard maps drawn and spoken of by participants

	Feature	Green	Organic	Gold	Totals
Spatial Organisation	Boundaries, blocks	20	22	21	63
Transport	Driveways, roads, loading areas	17	19	17	53
Buildings	Houses, sheds, packhouse	18	20	14	52
Wind	Shelter, prevailing wind, wind damage	17 ^a	13 ^b	13 ^b	43
Water	Streams and rivers, water sources, tanks, irrigation, lakes and ponds, drainage	12 ^b	20 ^a	6 ^b	38
Climate	Frost areas, frost protection, altitude, climate	11	11	11	33
Landscape morphology	Slope, aspect, gullies	10	13	10	33
Other biota	Other crops, trees, compost	7	13	7	27
Social context	Neighbours	7	8	7	22
Biotic context	Bush, <i>Armillaria</i> , soils	6 ^b	10 ^a	4 ^b	20
Overall totals		125	149 ^a	110 ^b	384

Note: 'a' and 'b' superscripts denote these results are statistically different at the 5% level of significance.

5. Productive and financial wellbeing

Participants thought that their financial returns measured by capital flow, profit, input costs and returns, told them when they were doing well financially. They considered their orchard's productivity was measured by benchmarking fruit quality and quantity, and certain vine characteristics.

When the panels were compared, emphasis was given by:

- Organic and Gold to relative returns.
- Green and Gold to fruit quality. (It was a given for Organic participants.)
- Organic participants to vine characteristics.

6. Environmental wellbeing

Orchardists felt that animals and plants indicate environmental health. Views about spray use ranged from those who thought sprays damage the environment to those who felt sprays were not harmful to the environment. Many made comparisons with previous spray programmes before the introduction of the KiwiGreen system.

Soil health was regarded as a way of assessing the environment. This was related to soil appearance and worm life. Most growers relied on 'experts' to help them determine soil health.

Specific management systems – KiwiGreen or Organic – were perceived by some as caring for the environment. These systems gave participants a sense of security and a level of confidence. For some 'cleanliness' and 'tidiness' were linked to caring for the environment. Some saw their role as caretaker of the environment and others did not want their care for the environment associated with being a 'greenie'.

Observations of animals were described in a variety of ways – as pests, as beneficial to orchard, aesthetic, or just present. The most common animals mentioned by participants at the time of the interview were rabbits (23) and possums (16). The most common invertebrates were worms (15), spiders/spider webs (11), insects (general) (11), and cicadas (10). Lizards were mentioned ten times. The most common birds were pheasants (22), sparrows (20), pukeko (17), fantails (16), blackbirds (16), tui (15), thrushes (15), rosellas (13), quail (11), and wood pigeons (10).

When the panels were compared, emphasis was given by:

- Green and Gold participants to birds as indicators. (This was often associated with the introduction of KiwiGreen.)
- Green and Gold participants to environmental care which was linked to cleanliness and tidiness.
- Organic participants to soil health. They saw themselves as ‘caretakers of the land’.

7. Personal, family and community wellbeing

Participants were very enthusiastic about orcharding. They said things like: “I feel good about what I do”, “It always gives me a buzz”, and “I love it”. They usually associated their wellbeing with the lifestyle enabled by the environment of the orchard and/or its location, both its physical features - landscape and climate - and its rural nature. Growing kiwifruit provided the flexibility and autonomy associated with self-employment.

They derived wellbeing from their work through the satisfaction they achieved from the financial return, production levels, comparison with others, achieving goals, providing for their family, ‘growing’, doing a ‘good’ job, producing a ‘good’ crop and using their skills.

Wellbeing was also associated with actually doing the work. Some found it to be a low stress occupation (though some thought the opposite). Many enjoyed what they saw as healthy physical work (though that could also be a negative). For some the switch to management of several orchards has resulted in less physical work which has not always been a good thing. They felt it was great working in a pleasant ‘outside’ environment. For many it provided something ‘active’ to do in retirement.

An orchard was seen as a good place for bringing up children and later for family to visit. Owning an orchard enables planning the succession of land or the passing on of an inheritance to family members.

Neighbours can make a big impact on an orchard operation. It was important to participants whether these neighbours were family, organic or not organic, townies or lifestylers, good or bad, and what they grew (same or different, kiwifruit or not kiwifruit).

Orchards were seen to affect the financial wellbeing of a community. Money gained internationally flows out into local businesses and orchards provide employment for a wide range of people (and their families). Also, orchards impact on a community’s environmental wellbeing through the use of sprays. For some, orchards are green oases. Organic orchardists see themselves as ‘havens’ and examples to others of good environmental care. On the other hand, communities are seen as constraining what happens on orchards.

When the panels were compared, emphasis was given by:

- Green participants to retirement options, and the orchard as an investment for retirement.
- Organic participants to life on the orchard, caring for the environment, looking after own, family’s and community’s health, and being a positive role model for others.
- Gold participants to the place outside the orchard (e.g., beaches, Bay of Plenty), land value of orchard, financial returns, and high productivity.

8. What is managed well and what is hard to manage

The most common things that participants mentioned they were managing well were: labour, vine management, timing of labour and orchard management practices (e.g., pruning, pollination, fertilising, and spraying), managing the finances, the packout result and keeping "... a tidy orchard". Many also thought that they were managing their personal lives well.

Participants mentioned that they found it hard to find a balance in fruit size ("... not too big and not too small"), spraying ("Keeping it to a minimum but having healthy plants"), and between work, family and leisure. On the orchard they had difficulties with labour – both its availability and in obtaining "quality work", getting the timing right, pruning and canopy management, *Armillaria*, maintaining and increasing production, size and quality, physical features of the landscape (soil, gullies, altitude) and making decisions about where to spend money.

Weather, in particular frosts, wind, rain, and milder winters resulting in less winter chilling, was seen as hard to manage, unpredictable and changeable from year to year.

Some found that orchard management was made more difficult by the intrusion of the requirements of ZESPRI, GrowSafe, and local council, compliance with BioGro, EUREP-GAP, OSH and ACC.

When the panels were compared:

- Gold participants were all confident that they were managing well (compared to six Green and three Organic).
- Five Organic participants had difficulty in answering the question. Most responded diffidently. Organic participants gave an emphasis to concerns about *Armillaria*, weeds and weather.
- Gold participants gave an emphasis to concerns about getting good DM in fruit.

9. Involvement in ARGOS

Participants frequently expressed great enthusiasm for ARGOS. They liked its principles, the long-term nature, the documentation of change and stories, and the questions it will raise. As one participant said, "I like involvement with ARGOS because I'm a nosey bugger ...". Participants hoped that ARGOS would help them do a 'better' job of growing kiwifruit, managing the environment, making more money, and managing continuity into the future. It would do this by giving them access to information they would not otherwise have that would help them learn and understand, and enable them to make better decisions, and by providing individual feedback. They saw ARGOS as offering them an opportunity to benchmark their performance against others in the programme, and as a way of reassuring them about their own orchard practices.

Most orchardists were quite altruistic in their expectations and hopes about who should benefit from the ARGOS programme. They felt that participation was good in itself, collaboration between the researcher and the researched, and that sustainability is most important to the future and as such, a good thing to research. They were open to whatever was found. They saw ARGOS as having the potential to be an advocate of kiwifruit growing.

The majority of participants did not express any concerns. They were pleased to participate. Some were aware that because of the long-term nature of ARGOS they might have to wait a while to get worthwhile results while others were less patient and wanted to see some benefits sooner rather than later.

The concerns that were expressed related to meeting OSH, EUREP-GAP and/or BioGro requirements, the time required and the paperwork that might be involved and fear that the findings will go against present orchard practices and lead to further restrictions on the autonomy of orchardists and compliance issues.

10. Comparisons between Green, Organic and Gold

Green is like organic:

- Same plant.
- Similar management concerns.
- Less likely to pursue capital investment on farm.
- More likely to be concerned about having a tidy orchard.

But:

- Organic unwilling to use synthetic inputs.
- Green more 'in control'.

Organic is like gold:

- Both involved in non-standard management (less chemical inputs or new variety) and therefore more actively involved in experimentation.
- Both emphasise lifestyle but for Organic it is to do with living on the orchard, whereas for Gold it is related to the area in which they live.

But:

- Same synthetic chemical divide.
- Gold more interested in quality improvement versus yield improvement.
- Organic give more priority to environment.

Gold is like green:

- Both conventional production.
- Less likely to prioritise environmental impacts.

But:

- Different attitudes toward standard management practices.
- Gold more willing to take financial or management risk.
- Green more focused on lifestyle associated with retirement.

Part A: Introduction

Chapter 1: Introducing the research and outlining this report

Kiwifruit growers (or orchardists) comprise a diverse group of individuals with a variety of perspectives on and approaches to sustainable production. This diversity is the product of a broad range of social, cultural, economic, and ecological influences and experiences. It is also possible, however, for commonalities to emerge among the orchardists based on their (possibly) shared experiences with similar social and environmental contexts in New Zealand's kiwifruit industry. One of the goals of the ARGOS programme is to determine if the adoption of a particular management system (in this case the different panels – KiwiGreen Hayward, KiwiGreen Hort 16A, or Organic Hayward) is influenced to any degree by the social characteristics of orchardists. Towards this end, a suite of social methods or approaches (including semi-structured interviews, quantitative surveys, participant observation, and interactive activities) have been proposed as means to study the social lives of participants and to draw out any relations between these and management practices – especially those that impact on sustainability. This report documents the first in a series of qualitative interviews with participants in the kiwifruit sector of the ARGOS programme.

The following report provides a catalogue of the categories applied to the initial qualitative interviews conducted by the researchers in the social objective with 35 kiwifruit growers.¹ The first goal of this round of interviews was to provide a broad introduction to the ARGOS participants, allowing them to tell us who they are and what they do. Secondly, in addition to establishing a foundation for engagement with the participants, the interview was structured to include queries that might inform the developing research in the remaining programme objectives (i.e., economic, environmental, farm management, and He Whenua Whakatipu). Thus, questions structured around the participants' visions for themselves and their farms as well as those soliciting economic indicators were proposed by members of the Economic Objective. Similarly, questions addressing awareness of the animal life on farms and other environmental indicators were submitted by the Environmental Objective. Other questions on social wellbeing and management practices were also included. As a result, the initial interviews provide a wide ranging, if not always deeply incisive, set of textual data allowing us to complete a third aim which is to explore the similarities and differences between the responses of the participants from the KiwiGreen Hayward, KiwiGreen Hort 16A, or Organic Hayward management systems. The structure of this report is intended to offer readers a tool that provides a basic understanding of the content of the interviews, an introduction to the coding and analysis accomplished from the perspective of researchers within the social objective, and an index to that coding. It is hoped that the index will encourage readers to engage with the data and members of the social objective in order to develop deeper insight to the initial interviews and to establish themes and topics to pursue in future iterations of qualitative data gathering.

The primary method for gathering qualitative data in the initial interview was that of the semi-structured interview. In order to confine the discussion to factors of interest to members of the ARGOS programme, an interview schedule listing eight areas of inquiry was developed (see Appendix 1 for the interview schedule). Each section of the interviews – with the exception of the farm mapping exercise (an interactive activity) – involved short and sometimes tightly bounded questions relating to self-perception, orchard management, and indicators of sustainable orchard management. Participants were first asked to introduce themselves as they would in a social situation. Next, they were encouraged to describe their vision for themselves and their orchard over the next five to ten years. The participants'

¹ The initial interview was also conducted with 37 sheep and beef farmers. The results of these interviews will be addressed in a forthcoming report.

current view of their orchard and the factors affecting its management were recorded in the form of a map that they created. This was followed by a series of queries on the means of assessment used by participants in gauging the sustainability of their orchard. This was followed by questions about what they managed well and what they found hard to manage. Finally, the participants were asked to share their expectations of, and concerns about, participation in the ARGOS programme. Because of the distinct focus of each section of the interview, the responses to each section are treated as a separate section in the following report.

As noted above, the first qualitative interviews contain a wealth of data. Most notably, the responses of the participants provide a substantial foundation for understanding the context within which orchard management is pursued as well as suggesting possible indicators of interest to the ARGOS programme as a whole. On the other hand, the manner in which the elements of the interview were compiled limits the extent to which a comprehensive analysis of the social (and other) aspects of sustainable orchard management can be made. More specifically, the collage of topics included in the interview (combined with a desire to avoid overtaxing the participants' patience) limited the application of a full suite of qualitative methods. Frequently, the opportunity to pursue topics of interest more deeply was cut short in the expectation that they would become central themes for future interviews. Furthermore, it is apparent that other research methods would prove more appropriate for addressing several of the issues included in the first interview (e.g., listing and ranking of indicators of importance to participants). As a result, most of the analysis undertaken to this point requires further data gathering in order to develop emergent insights into aspects of sustainable farm management among ARGOS participants. It is important to note that – while such topics are identified within the coding and initial analysis that follows – the majority of patterns that emerge in the first interview may require additional confirmation of any actual differences or similarities among individuals or kiwifruit panels. In this regard, the numbers placed in brackets after some themes indicate the number of Green, Organic and Gold transcripts in which this theme appeared.

The responses of participants were also dependent on how many people took part in each interview for each orchard (see Appendix 3, Table 1) because interviews involving two people were usually longer and therefore involved more material. Where one person was interviewed this person was a man except for one situation. In all cases where two people were interviewed (12 of the 35 interviews) they were a man and a woman, usually partners, but in one instance they were an orchard and packhouse owner/manager and one of his orchard managers. The presence of a woman usually meant that certain things may have been mentioned more frequently such as things to do with the home/house, family, or work they did together on the orchard, which may not have occurred if only a man was participating.

The final chapter in this report describes what we see as an emergent typology of the typical orchardist and then how this typical orchardist may differ depending on which management system they have been drawn to adopting and which variety of kiwifruit they have chosen to grow. It concludes with suggestions about what should be included in the next interview and an overall consideration of the value of this report.

The Appendices contain the interview schedule, the catalogue of categories developed by the researchers analysing the interviews, and the tables of participant attributes which may help to explain their responses, such as how many people were interviewed, what their 'position' was, whether they did their own mowing, pruning, spraying and fertiliser application, and whether they lived on the orchard. The catalogue of categories is provided to enable other researchers to request a copy of all the responses coded to this category, in order for them to carry out their own analyses of the interview data.

Part B: Method

Chapter 2: Qualitative research methodology

“It is not worth the while to go round the world to count the cats in Zanzibar.”
Henry David Thoreau, *Walden*. (As cited in Jones, 1988: 31)

This report contains the first analysis and summaries of the responses made by the ARGOS participants in the kiwifruit sector to the first interview. Interviewing, particularly with open-ended questions and the analysis of the resulting interview transcripts are among the suite of methods contained within the broadly defined field of qualitative research. This section of the report briefly describes and explains the main dimensions of qualitative research methodology.

2.1 The purpose of qualitative research

“What is going on here?” is the common question asked in qualitative research. Such research seeks to explore, describe and explain how we, as human beings, make meaning of our worlds. This has been described as a study of how we “... understand, experience, interpret, and produce the social world” (Sandelowski, 2004: 893). Qualitative researchers want to find the “... shared symbols, sentiments and meanings” that people have (Jones, 1988: 33). Such research aims to understand “... phenomena in ways that do not require quantification” or else the phenomena under study “... do not lend themselves to precise measurement” (Abercrombie, Hill and Turner, 1984: 200). In other words, qualitative research is not based on measurements and quantitative claims. Whole situations or contexts are studied rather than particular variables. The fabric of human life is “... seen as too complex to reduce to independent and dependent variables” (Jones, 1988: 33). The final result is “thick description” (Geertz, 1973: 37-38) which acknowledges that someone’s action (in this case ‘talking’) has been perceived and interpreted by those doing the analysis. Results from this research have various ways of arguing their validity and generalisability.

2.2 Focus and perspective

Qualitative research takes the ‘actors point of view’. It focuses on the words and actions of those studied, accepting and respecting them as they are, not as the researcher thinks they should be (Nord and Jermier, 1994), but at the same time taking account of the particular context (Rose, 1978: 244). It seeks a deeper understanding of the world of those studied (Sarantakos, 1993: 52), by positioning itself in the frame of reference of the participant (ibid. 56). In other words, it searches for understanding of the world of others from within rather than as a detached observer (Jones, 1988: 34). It shows a “... reverence of individuality, diversity and everyday life, and the hope that the inquiry can bridge the gaps that divide people ...” (Sandelowski, 2004: 894). The focus is often emancipatory in that it hopes through understanding to give people democratic power and the ability to have some control over their own daily lives.

2.2.1 Subjectivity and reflexivity

“... social researchers always remain part of the social world they are studying. Consequently their understanding of that social world must begin with their daily experience of life” (Tolich and Davidson, 1999: 37)

From the above descriptions it is obvious that qualitative research is subjective and this subjectivity and lack of detachment is often criticised by those who seek research that is objective. But qualitative researchers argue that this form of research “... makes explicit the partiality inherent in all inquiry” (Sandelowski, 2004: 894). This subjectivity is balanced by the reflection and reflexivity that is built into the research process. The researcher is

constantly considering what they are doing, what is emerging from the interviews and observations as they do them, how that informs what they do next, and how it could have been done better. Not only that, they also reflect on making explicit the part they are playing, the potential impact of their perspective on what they hear, see and find (Hammersley, 2004), as well as any influence they may have on those they are researching (Fook, 1996: 196). This is built into the research process by the keeping of notes after every encounter with participants. For this reason the personal qualities of the interviewer become important: "... a vital concern is that of rapport and trust – the intangible and personal qualities of human relations" (Owen, 1988: 34). The researcher must quickly establish a good relationship with those she is researching that enables them to talk easily.

2.2.2 The naturalistic research method

In conducting social research, researchers do not try to manipulate events but rather observe them as they unfold. They also refine and narrow down their research as it goes on (Sandelowski, 2004: 894; Perkins, 1988: 305). For example, in the interviews presented in this report the researcher subtly changed the interview questions in order to adapt them to the persons being interviewed. As they engage with additional participants researchers explore and then 'inspect' what they have found. This process is inductive. Instead of being directed by theory and the understandings of others, researchers seek to find out what is going on in everyday life. They may, subsequently, test how relevant the theories are to their findings (Perkins, 1988: 305) or construct a theory of their own. In a process sometimes called 'analytic induction' researchers may go back and forth between inductive and deductive processes.

2.3 Some issues in the debate about qualitative and quantitative research

There are those who say that researchers are embedded in a particular approach because they have certain beliefs about the world and how we know that world. Some argue that the qualitative and quantitative paradigms are mutually exclusive because their epistemological assumptions, values and methods are so different (Bryman, 2004: 895). As a supporter of this perspective Massé states, "The quest for meaning and the quest for measurement are incommensurable". In its pursuit of concrete measurement the quantitative perspective "... decontextualises, objectifies and disembodies a lived experience" whereas qualitative research methods seek to interpret this experience (Massé, 2000: 411). For example, in this research programme we are exploring wellbeing associated with the orcharding lifestyle and its relationships to sustainable management practice. We could decide that wellbeing was measured by several different qualities, and get people to assign a number to how much this resembles them. Or, we could ask them to tell us what it is about their orcharding lifestyle that makes them happy, and let them define it within their own context and life. There are others who take a more pragmatic approach labelled the 'technical' perspective, which justifies the use of any approach as long as it suits the aims of the research (Bryman, 2004: 896). From this perspective the quantitative and qualitative approaches can be seen as complementary (e.g., Owen, 1988: 34) with the qualitative approach being useful in hypothesis development for quantitative research and conversely the qualitative approach helping researchers understand why people answer the way they do in questionnaires, for example.

Qualitative research aims to maximise validity in many ways. Firstly it is reflexive (see above). Secondly, through the process of theoretical sampling, the researcher purposively seeks sources of data that will be different from those already studied (see below). Thirdly, it uses multiple sources of information, methods, theories, and observers to generate a variety of data (Bryman, 2004). This is often called 'triangulation'. Hence, in addition to the responses of the participants, data informing the analysis may be drawn from observations made during fieldwork, an organisation's reports, a newspaper account, existing published

research, or by colleagues working in the same programme. Fourthly, the numbers of responses and/or observations that have contributed to a particular understanding are regarded as reaching saturation when what is heard becomes repeated again and again, or nothing new is heard. Beyond the measures built into the actual research process, a principal indicator of the validity of qualitative analysis is simply whether a piece of work 'rings true' to others apart from the researcher. Such arbiters of the validity of an analysis may include colleagues as well as the participants themselves. The latter are considered appropriate judges of the extent to which the findings reflect and corroborate with their own experience.

"It is not the numbers that make data valid ... but rather the logical integration of data from different sources and different methods of analysis into a single, consistent interpretation" (Bryan as cited in Hill, 1984: 60).

2.4 Methods

Qualitative research uses many different methods and is used by researchers coming from many different perspectives and disciplines. It encompasses semi-structured to completely open-ended in-depth interviewing and participant observation. The open questions asked in interviews are often in the form of "What ...?", or "How ...?", or they may be of a "Can you tell me how that came about?" form. "Why" questions are used sparingly because people tend to give such questions an answer containing a rational explanation for something when this research is seeking how people make meaning.

In some situations the researcher will keep on talking to people until saturation is reached, at which point they will search for different people who may challenge this pattern (theoretical sampling, Glaser and Strauss, 1967). If divergent views are found this is incorporated to account for it or else the previous analysis is rejected. This tactic is used to seek diversity and provide a full description of the phenomena under study, hence making any ensuing theory more robust and able to withstand challenge. In the ARGOS research design, engagement with the different farming and growing systems in the programme is expected to facilitate such theoretical sampling. However, the possibility of achieving saturation may be limited by the number of participants in each panel.

2.5 Qualitative research analysis

Answers to questions asked in qualitative research are very rarely straight forward and often are given in narrative form. That is, the answer may be in the form of a story rather than a direct answer. The former situation is demonstrated in the 17 different variations in response from the 35 respondents in this interview to the simple question, 'What do you call yourself?' there were. Participants used the narrative form in responding to most of the other questions.

At first the data may be analysed in a way that summarises and describes it. This is a process of interpretation (see later), as sections of the interview are assigned to emergent themes or categories which may be researcher dependent. Qualitative variables (more likely to be called emergent themes or categories) are categorical or nominal. In other words, they are of a descriptive nature and every element that makes up a variable is considered to be of equal importance.

Researchers also look for relationships in the data. The most obvious way of achieving this involves the construction of a hierarchical structure, as in this report for example, where the concept of individual wellbeing is broken down into different components or categories. Whole groups of themes may come together to tell a particular story.

It is acknowledged that in analysing data we all come from particular perspectives or see through a certain 'lens'. One of the common perspectives taken by some social scientists, particularly sociologists, is Symbolic Interactionism (Blumer, 1969) which argues that actions and objects have no intrinsic meaning. Instead meanings are constructed and conferred through social interactions and are negotiated by actors according to the specific social context. The constructs (notably language) come to 'stand for' or 'symbolise' the objects and activities, often in a 'short hand' form. The same word or object can have different meanings and therefore significance, to different communities. Such meanings are neither fixed nor exclusive.

An example comes from our own ARGOS 'Social Dimensions of Sustainable Agriculture' rationale (p.66): "I am walking across a paddock and see an isolated plant growing above the grass ... What am I seeing? Am I seeing a beneficial species, a weed/pest, a part of nature, an indicator of pasture ill-health, an indicator of ecological good health, something for me to control, something for me to cooperate with, an irrelevant plant that doesn't fit with any of my views of what a pasture should look like so doesn't even register on my consciousness ...". We could then consider how one of these meanings becomes more dominant than another, or how the way a person saw such a plant may be linked to their agricultural practice.

Qualitative research results in rich detailed descriptions and interpretations of people and the social practices that both shape them and are shaped by them. Such results are usually related to a particular context or a particular social group of people (Sarantakos, 1992: 52). This sort of result is rarely reported as tables or figures, except in a very 'wordy' form.

2.6 The qualitative research process

It is difficult to make any generalisations about the qualitative research process. To help understand it we describe the process used to reach the results included in this report in some detail below, on the understanding that ours is only one style of implementing qualitative research.

In early 2004 an interview schedule was developed in consultation with other participants of the ARGOS programme, in order to have some transdisciplinary focus on topics of concern to all the objectives in the ARGOS programme (see Appendix 1 for the interview schedule). For example, the vision and constraints to vision questions were of interest to the Economics objective in particular, and the possible indicators of environmental, economic and social wellbeing were of interest to those respective objectives. This interview was to serve as an introduction for the ARGOS participants to the social research and to form a basis for the measurement of change over the ARGOS research time frame.

From May till November in 2004 an ARGOS researcher carried out 35 interviews of individuals or couples participating in the ARGOS programme who were also involved in the kiwifruit industry as owners, managers or lessees of 11 KiwiGreen Hayward, 12 Organic Hayward and 12 KiwiGreen Hort 16A kiwifruit orchards. These interviews lasted from 50 minutes to two hours. The interviews were transcribed, a process which took up to twelve hours per interview. Then three ARGOS researchers loaded the transcriptions into a database using NVivo software which facilitated analysis of the interviews.

In the analysis process researchers read through the interviews and coded sections of text according to themes that they felt were emerging from the data or from the questions that had been asked in the interview (see Appendix 2). These codes were often constructed in 'trees' in a hierarchical fashion. For example, all text referring to what a participant thought they were managing well was 'coded' under what type of management system their orchard fitted (Green, Organic, Gold), then 'management' and then 'well'. This involved blocking the text and dragging it into this code, which is listed on the side of the screen in NVivo. (NVivo

is really just a convenient way of keeping lots of files open all at once that researchers can copy and paste into.) The text associated with this code was not necessarily found in the transcript only at the point where the question was asked in the interview. Responses to relevant questions may have arisen in comments throughout the interview.

Following the coding exercise, the researcher is able to print out (or read) all the text that has been assigned to a particular code, read it through and put it through another categorisation process. This process may involve additional coding in NVivo or may be carried out on paper. For Lesley Hunt, it involves trying to find a word that summarises each quote, or writing down parts of the quote and grouping all the quotes and words under different headings. For example, there were different things that people felt they were managing well on the orchard such as 'labour', 'timing' and so on, and then there were other things that people felt they were managing well in their personal lives. This was examined for each panel and then the analyses were combined in a summary of what they had in common. In this example, for instance, at this point it became apparent that some people were more confident than others that they were managing everything well, and that levels of confidence varied across the panels. When writing up this analysis quotes from the transcripts may be used which summarise each of these categories or a description may be written to back up the assertions made.

The limitations of using numbers associated with how many people said what is well illustrated in Section 4.3 of this report, when one of the researchers explored the idea of a 'tidy' orchard and the greater emphasis placed on this aspect of an orchard by some Hayward green orchardists in particular. Some orchardists did not mention 'tidy' but used other words such as neat and hygienic, or spoke of well trimmed shelterbelts, mowing frequently and 'cleaning' up the bush, and so the researcher had to decide that all of these things supported the 'tidy' orchard idea. However, some orchardists talked of how they were not like those who had 'dead' strips from using Roundup and mowed their orchards every week, and so the idea of a 'tidy' orchard could also be developed from the negative comments about such orchards. Assigning supporting numbers to this idea was very difficult, and gives no indication of the richness and the complexity of the data. This also serves to explain why some of the numbers given in this report may well contradict those found in other places.

In this report a development of the data analysis took place when we considered what made a 'typical' orchardist. By then considering the differences between management systems, we developed typical Green, Organic and Gold orchardists, who encompassed the qualities of the typical orchardist and a bit more. This analysis was based on Weber's 'ideal types', in which a tendency to a particular type is used to describe that type. In other words, not all orchardists will fit their type completely but may have some of the attributes (Gerhardt, 2004)

A further development of the interpretive analysis process (which is not apparent in this report because it covers the specific questions asked in the interview) involves the development of themes which arise out of the data as a whole and are linked to something the researcher may be interested in developing further. Such topics may also have some theoretical basis and/or be associated with the work of others. For example, what drives a participant to have a 'tidy' orchard (or an 'untidy' orchard), or how do people make meaning of their work and how does that relate to their identity. These topics should have direct links to both growing sustainably and to resilience.

Part C: Results

Chapter 3: Self identification by participants of their work role

Question: First of all I am interested in what you call yourself. When you are out and someone says, "What do you do?" what do you say?

When those interviewed were asked about what they called themselves in terms of their occupation, the answers were not as simple as one could expect. (This is one of the riches of the qualitative research method!) In fact there were 17 different ways in which people spoke of what they did. The variety and frequency of these responses are demonstrated in Table 3.1. It is obvious that most people by far (21) called themselves orchardists of one sort or another, while four had the word 'grower' as part of their title. Four of the six who were managers were involved on gold orchards, the other two on Green.

Table 3.1: Answers to the question, “What do you call yourself?”

Primary type	Description	Green	Organic	Gold	Subtotal	Total in group
Orchardist	Orchardist	5	5	4	14	21
	Orchardist/kiwifruit grower	1			1	
	Organic orchardist		3		3	
	Kiwifruit orchardist		1	1	2	
	Retired lifestyle orchardist	1			1	
Grower	“I grow kiwifruit.”			1	1	3
	Organic kiwifruit grower		1		1	
	Kiwifruit grower	1			1	
Manager	Orchard manager			2	2	6
	Orchard owner/manager			1	1	
	Client service manager at packhouse	1			1	
	General manager of family company			1	1	
	Administrator/manager	1			1	
Farmer	Farmer	1			1	3
	Farmer/orchardist		1	1	2	
Generic	Jack of all trades			1	1	2
	“... do the orchards.”		1		1	
Total		11	12	12	35	35

Though most of the ARGOS participants own their orchard (see Appendix 3, Table 2) they described themselves in many different ways.

Conclusion: comparing panels for self-identification

Ten participants from organic orchards identified themselves as having a job with the label orchardist in it, compared with seven Green participants and six Gold. Four out of the 6 self-identified managers were on Gold orchards and the other two on Green. These differences cannot be explained by consideration of a popular understanding that Organic kiwifruit growers are more likely to grow other fruit apart from kiwifruit on their orchard because among those selected for the ARGOS programme this is not so (see Appendix 3, Table 4). Further research may shed light on this issue of identity.

Chapter 4: Descriptions of orcharding

Question: Could you tell me about what your work involves?

When those interviewed were asked about what their work involved, sometimes, when they hesitated, this question was extended by the interviewer asking about what was involved throughout the year. Also, when these interviews were coded the responses to other questions often involved elements that were basic to orchard management and they were included in this coding. Later in the interview people were asked what they managed well and what they found hard to manage and the responses to these questions also tell us a lot about management. As a result of this later investigation, at this point in the interview those interviewed may have only touched upon 'managing the climate', for example, whereas later in the interview they may have talked a lot more about this, and this is described in greater detail in Chapter 11. These two chapters have been kept separate to follow the order of the actual interview in this report

The primary focus of work to do with growing kiwifruit is the yearly cycle associated with the growth of a kiwifruit vine. Then there were the other things associated with growing – soil, water and weather management, labour management, maintenance, financial management, learning and innovation and so on. Finally, there was the concern many had for environmental management. Some of those saw management as about facilitating the growing of kiwifruit. Others saw it as controlling the various elements that affected growing kiwifruit.

4.1 The yearly cycle

The yearly cycle or annual routine on a kiwifruit orchard was usually described in seasonal components such as 'winter pruning' or 'flowering'. When orchardists described this annual cycle they usually started with winter. In other words it was not associated with January, the 'usual' beginning of a year. Neither was it associated with the financial year. For many of those interviewed things were not described as part of the cycle at all but as separate components of what was required to 'grow kiwifruit' such as 'canopy management' or vine management, which encompassed a whole range of tasks which could take place at different times throughout the year. These will be described within the yearly cycle.

- One Organic orchardist mentioned that after picking they "... leave the vines dormant for a month, rather than start pruning straight away, just because we feel the plants stressed a bit after the fruit's taken off and [we] sort of consider the plants as beings".
- Winter pruning is done through June to August. This involves pruning, selection of cane for leader replacement and tying the cane down (or up in the tepee structure that is becoming popular, especially on gold orchards). "I actually like to do as much as I can myself. Contractors are rough, and don't always treat the vines properly ... for your management and cane replacement".
- Structure repairs and maintenance are also carried out at this time.
- In August non-organic orchardists apply a spray of the 'bud enhancer' hydrogen cyanamide.
- September might be a break for some.
- Bud burst occurs though September to October.
- From then on the canopy needs to be managed: "We might run round and rub out lateral tips once they get to about four hundred mms something like that ..."
- In October a spray is applied prior to flowering (insecticide and/or mineral oil):

“We green tip – when the leaf is about an inch long, twenty odd mm, we do an oil spray for scale ... the theory is that young scale are easier to kill than granddaddy scales. So as they over winter and come out they're easier to control. And it seems to be working.”

- Shoot crushing, flower bud thinning from trebles to singles.
- Flowering.
- Bees are brought in for pollination through October to late November. “I have a million workers come on site and they pollinate the crop ... they are critical to size and yield.” Some orchardists also artificially pollinate.
- The major part of the spray programme (insecticide) commences:

“They do recommend a spray with BT and oil at ninety percent petal fall. I don't like doing that because the oil kills the bees so, the day the bees go out I'll spray. And then we've got ten to fourteen days later the same thing then fourteen days later again ... sometimes if leaf roller's not looking too bad or something, might miss the middle spray ...”
- Fruit thinning starts “... as soon as we've got shape of the fruit and we can see misshapes or whatever.”
- Male pruning is carried out after flowering.
- Spray applications continue: “[We] get into the monitoring system with the pack house. Spray as directed.” Under the KiwiGreen integrated management protocol spraying is not allowed after January, except with permission for special pest incursions.
- Summer pruning which involves canopy/vine management and fruit thinning continues through December to February:

“... from then on we basically just keep going round continuously. Mind you it takes you an age to get through ... we will get contractors in too, when it gets out of hand for me. You know there's four hectares and it's far too much for the two of us to do, and we probably muck around – being a bit fussy. So, we'll get our canopy done probably January. Get some guys in do a quick canopy [round] ... this year we did fruit thinning, trebles down to singles or doubles, whatever, and faulty fruit. And then we go round and do a dress up afterwards and, well, up to last week we were still taking fruit off just prior to picking.”

“And then we move into three months of summer pruning – intensive work again, which I find quite enjoyable. And because of the nature of the canopy that we've organised for our convenience um the vines start leafing up as the summer weather comes on, and working under the vines in the summertime, I say it's a large air conditioner, because the plants are transpiring moisture. Ah, they're taking the latent heat away from the canopy and underneath the canopy is actually cooler, not just because it's in the shade, but it's actually the latent heat is being extracted by the vines. So we work in a wonderfully comfortable environment. The height's right. We don't have to reach unduly or bend over. It's designed at six feet and ah, it's a good working environment there for us, so when the hot sun is out we've got the umbrella up um.”
- Note that both these speakers are talking about 'we'. Several Organic orchardists worked at the summer pruning in husband and wife teams.
- February to April is when some orchardists take time off.
- As time for picking approaches dry matter (DM) testing starts.

- Then the cycle finishes with picking: “So, we prepare the crop to go to the packhouse. We like to have about a ten percent reject, no worse if we can help it. And then we’re into picking ... out the gate.” Orchards may have different maturity areas and/or may get a KiwiStart premium for fruit that can be picked earlier to get to the market before the bulk of the crop.

4.2 Orchard management practices

4.2.1 Further pruning management ideas

Pruning is related to DM and yield and so affects the financial return. Supervision of workers and how they prune is thought to be particularly important in the winter pruning because that is seen as having a big impact later on the crop and vine management. For example, summer pruning is affected by the winter pruning. One person remarked how he had so much growth “... we’d probably have to prune it damned near twice” and so this winter he is “... going to try and tie down less buds” and use “... smaller and not so vigorous cane”.

Orchardists spoke a lot about pruning and the main and more frequently expressed ideas are covered in the yearly cycle described above. Some of the points below were mentioned by one person only.

Summer pruning – canopy management

- Management of sunlight on and through the vines was frequently commented on. Many said they like to have grass under the vines because it was an indication of the openness of the canopy. Some of the comments were: “Keep it open, tidy and thinned” and “... control the vigour.”
- Younger vines need to be ‘trained’: “There’s a lot of young five year olds in there which still need a bit of training ...”
- Labour – the employment of contractors is often dependent on how much the owner/manager can do. As one participant said, “Four hectares is far too much for the two of us”.

Winter pruning

- Creates the vine structure by the choice of particular types of cane to tie down.
- One orchardist wanted particular attention paid to laying down the canes on the side that they are growing on, which was not what he felt ‘labour’ does.
- Tidying up the vines. One person said how he and his wife went about the orchard getting rid of the “knobby bits” that contractors “bypass”.

4.2.2 Soil management (7, 6, 7)²

“Under the organic regime we try and nurse the soil.”

Soil and its quality were seen to be basic to production and soil was mentioned very frequently in connection both to artificial fertiliser programmes and other techniques used to return organic material to the soil. Some mentioned other techniques for soil improvement.

- Fertiliser programmes – soil tests, identification of soil type, how much fertiliser and when should it be applied, writing up the fertiliser programme. One person (Organic) mentioned how three tonnes per hectare was required but he put on ten because felt the orchard had been run down by the previous owner. Another (a gold orchardist)

² These numbers reflect the number of interviews in which soil management was mentioned by Green, Organic and Gold participants respectively.

said he liked to brew his own compost because he found that man-made fertilisers were too acidic.

- Aerating, adding fungi and bacteria such as trichoderma, digging out willow stumps. The latter are thought to be a source of *Armillaria*.
- Mowing and mulching the grass, shelter trimmings and vine prunings and spreading on orchard floor.
- Composting – particularly in organics. Composts, apart from composting mulches and making compost tea, were made from “fish bodies and saw dust, chicken and pig manure”, “liquid fish”, lime/dolomite and a natural sulphate of potash. As one participant described it, “My compost heap ... is part of the cycle of life ... the natural decay.”
- Compost tea – Organic orchardists often brewed their own compost teas from the mulched vegetative material mentioned above. According to one orchardist it takes 16 months to produce a “good brew”.
- Concern was expressed about contouring of the land before the orchard was planted and its impact on the soil.
- Three Green orchardists mentioned that they had changed to applying fertiliser more frequently in smaller amounts, spread over four to five months, because of their concerns about run-off and leaching: “I put a little bit on often ... during or straight after rain”.

4.2.3 Spray management (6, 3, 2)

Spray management involved various tasks:

- Writing up the programme and keeping the spray diaries which are a KiwiGreen requirement.
- Managing hydrogen cyanamide. One Green orchardist said he applied “... Hicane [to] every second block” to split the risk and this meant that when he brought the bees in they worked on the Hicane-d blocks first and then moved on to the others which flowered a little bit later.
- Concern about spraying. There is less spraying done now than there used to be, since the orchards came under the KiwiGreen integrated management system. One person felt that because he was able to do his own spraying he was able to choose the optimum time for safety and effectiveness. He felt that contractors take on too much work and so are likely to take less account of the conditions at the time of spraying. Yet another said that he was pleased to get contractors to do the work because he wanted the most efficient use of his money. If he sprayed himself he might do it more frequently as a safeguard.
- Managing own health – regular medical checkups.

4.2.4 Pollination management (2, 2, 0)

At this stage in the interview people only spoke briefly about pollination management and then in terms of how many hives to the hectare they used. Some Organic orchardists spoke about the encouragement of beneficial insects through less control of the grass sward and the use of other plants, which would also help in pollination.

4.2.5 Maintenance and capital expenditure³

- Improving the orchard infrastructure – fixing structures, replacing wooden structures with steel, removing shelter belts, putting in irrigation, frost protection.
- Weed management (3, 1, 0) – dig and pull out the weeds with “garden fork and leather glove” for two to three hours a day (Organic), comfrey – controls the weeds around posts, cross mowing, spraying (Green only).
- Shelter belts – trimming, replacement, and removal.
- Mowing.

Some orchardists placed an emphasis on having a tidy orchard, or words to that effect such as ‘clean’ and ‘hygienic’. This involved a lot of mowing (sometimes once a week), spraying with herbicide under the vines and shelter belts resulting in a “dead” or “barren strip” (according to Organic orchardists who did not approve of this practice), and trimming the shelter belts. It could also involve cleaning up the bush and boundaries. This quote illustrates this concern and one of the reasons for it.

Orchardist: ...I try and run a pretty good hygiene programme on my orchard ...

Interviewer: Can you tell me what a hygiene programme is?

Orchardist: Well um. Keeping the canopy ah very tidy, and keeping the floor of the canopy, tidy, no high weeds that will form a bridge for insects to multiply. Ah. Mowing my orchard, often but not too, too often ... at the same time ah looking after the weeds, to the point where I go through and probably hand pull any weeds ... just the odd ones around a stem and that sort of thing. I do have a sort of a swing arm mower to do that but, it doesn't always reach them so. Ah, I find that, if, if you have a nice orchard and ... there are people coming into your orchard ... they're more likely to do a better job.

4.2.6 Managing the environment

“Whilst I am a conventional grower I do study some aspects of organic growing. I'm hoping that one day the whole industry will switch over to organic.” Many of those interviewed expressed a concern for the environment. For some this was expressed as a comparison with organic methods. The above orchardist said that for him at the moment it was not financially viable. He followed on with this description:

“... when we first came here, ten or twelve years ago, we were spraying on a 21 [day] calendar programme, and I was new to the industry but bought myself a big magnifying glass and I used to spend a lot of time in the orchard trying to find out why we were spraying it. And I couldn't see – find – anything, so I cut down a lot of my sprays so, a few years later the KiwiGreen programme came into being, and I was part of that programme but I think that I was probably a couple or three years ahead of it ... [in] my first year I had a mentor looking after [me] and he asked to see the spray diary and he blew his lid ... he said that ... he'd had to put a spray on every twenty one days. I said, yes, I know that. I remember that and I wrote it down, but I said, “Just remember I'm gradually taking over control of this orchard, and I'm into meeting my own system”. And so, as a result of that, I only put about one or two chemical sprays on a year now. In fact the year before last I pulled the plug and didn't spray at all. I had an explosion of leaf roller, in the orchard, but when the fruit was picked and went through the packhouse, there was very little that had leaf roller.”

Another orchardist said, “I'm not a greenie but I certainly don't want to see my orchard going to the pack because I'm firing on all sprays and everything.”

³ When no numbers appear after a heading it is because they appear later in the subsection, or cover such a disparate range of responses that it does not make sense to include them.

Other concerns voiced were:

- Concern about the run-off of fertilisers: “And I took particular notice of um, of ah NIWA, doing a bit of work, in the harbour on the growth of lettuce and that sort of thing that indicated to me that there was a lot, a whole lot or run off.”
- Concern about spraying. One person felt that all sprays are covered by regulations “... therefore are not harmful to the environment”.

4.2.7 Managing climate and altitude (2, 0, 2)

Two Green and two Gold orchardists mentioned how they adapted their pruning because of the altitude, expected climate impact or landscape in their orchard.

- Pruning differently in wind damage prone areas of the orchard: One person said he did a “... bigger prune, to stop the blow-outs”, while another leaves more buds (30 plus) per square metre on the exposed areas and less (25 to 30) on the less exposed.
- Orchard contour/slope and orientation.

Two Gold orchardists were the only ones to talk about managing the birds and two also talked about crop monitoring as part of what they do.

4.2.8 Financial management (0, 4, 4)

- An orchard needs to be viable. It should be “... producing an income for my family”.
- One person mentioned that the money he received for this year’s crop would be used straight away whereas he felt that for some other orchardists this could be delayed for a year. Another spoke of managing his overdraft.
- Keeping budgets, past, present and future, “running the books”. The detailed attention to budgets described in the following quote is unusual in contrast to others interviewed, as this person obviously enjoys book-keeping:

“I’ve got budgets myself um that are several years in advance ... and I’ve got historical ones and it’s all just one big huge, spreadsheet um. Things are always being updated um, I can modify payment schedules – anything – so I just turn on to it see where I’m heading. I can make changes anytime I feel like it, um. Soon as I know the packhouse of these crops I’ll put that figure in and you can see straight away ... it’s always something I’m watching ...”

4.2.9 Management of labour (2, 1, 4)

There are different roles for different people dependent on whether they are owners, lessees or managers. The owners seem to be responsible for capital development on the orchard such as the installation of frost protection or changing the growing system. Owners may have different levels of input in terms of the physical labour required in the orchard itself. They may range from those who ‘do it all’ to those whose orchard is leased to or completely managed by someone else. Some owners seem to do the mowing and spray the weeds, leaving the rest to the manager and/or contractors. The different jobs that are done by those interviewed is apparent in Tables 5, 6 and 7 (see Appendix 3) which look at whether those interviewed mow, prune or spray their own orchards. It is apparent that more Green and Organic orchardists do their own spraying. A majority employ others to do their vine work.

Labour management involved:

- Organising all the different contractors who do soil tests, spread fertiliser, spray, mulch, prune etc.

“Ah it’s phone and fax. I have a consultant ... He has overall responsibility. But we communicate, minimum of once a week. I have a neighbour who does all my spraying and mowing. And ah he has a GrowSafe certificate so ... he takes that responsibility [and] looks after my spray diaries. I have another person who will do the supervision of contractors. And I just pay him a consultancy rate, to do

that, and then I have a contractor that does most of the work ... The man that does all my spraying, all my mowing ... just keeps a general eye because he's interested ..."

- Pruning – teaching or communicating to the workers by "... detailing exactly what we need".
- Getting in contractors if they fall behind or if it is too much to do themselves.

4.2.10 Managing learning and innovation (3, 0, 2)

- Working alongside contract pruners to learn.
- Attending discussion groups, visiting neighbours, upskilling, and reading: "Trying to do better".
- Doing own trialling:

"Everyone's got their theories ... you've just got to pick and trial because you know what happens on this orchard wouldn't necessarily work, you know, half way down the road. [This is] to do with the altitude 'cause we're actually quite high here and even – I've got a neighbour, just one down and they've got orchards down the bottom, and ... they actually treat them quite a bit different because yeah you get a lot more vigorous growth up here than you do down lower. So they are different areas. You do have to try and, I mean, you can still have the same sort of principles but they are slightly different. And same with the cane size ... one grower told me once to get the smallest cane. You can [use] bigger down [there] but [here] you still have to have a fairly good, you know, not big wood but I still think a fairly good sized cane's going to carry bigger fruit."

4.2.11 Managing decision making (3, 2, 0)

- Money – where to spend and what to spend it on?
- Timing – when to do what.
- Questions about male vines.
- Whether to artificially pollinate?
- When to spray, e.g., 'benefit'.
- How much attention should be paid to detail and quality of work? One participant has decided: "There's a huge benefit to you, if you do every job eighty or ninety percent, instead of doing one job ninety and the other ..."

Note that there are no Gold participants with concerns about decision making. They raised lots of questions about the Hort 16A variety but had no doubts about making decisions.

One person felt he could not manage Zespri. In particular he was concerned about the clearance Zespri gives for picking: "... every time there was a boat in the harbour, come to Tuesday and they'd start screaming for fruit for Friday for the boat". However, he felt that, "We can't control the industry very much, from this little desk here, but we um, can control what we do here and we try and do it really well."

4.3 Conclusion: comparing the panels for management descriptions

Those interviewed covered such a wide range of aspects to their work that it was difficult to discern many differences between the panels. Those who managed Gold kiwifruit talked about it more as managing a business and less about what actually happens on the orchard except for getting other people – contractors and workers – to do it. So they were more likely to talk about and place greater emphasis on labour, decision making, monitoring, budgets, communicating and liaising with others, improving the orchard infrastructure and getting information. Overall, they described the responsibilities of a manager and this is possibly

related to the fact that more were managers than in the other panels (see Appendix 3, Table 2). Two Gold participants saw Zespri as something they could not manage.

Gold orchardists said things about gold kiwifruit which were not replicated in any form by growers of Hayward Green. These are some of their comments:

“It’s a hard fruit to grow. It’s an easy one to get on the vine ... it’s an extremely hard one to get into a tray ... and to get to the other side of the world”

“I enjoy working with it, yeah. I mean I find it fascinating ...”

“... we’ve been working on this plant [green] on a commercial scale for a good 30 years say, if not longer, so the gold’s just an infant ...”

“... a hell of a lot more work”.

“Getting to know the gold plant and really how to sustain a gold orchard.”

Green participants were more likely than others to mention tidiness, mowing, and concerns about the use of spraying hydrogen cyanamide and how they used less sprays now than they used to. Three Green participants had changed the way they applied their fertiliser due to environmental concerns.

Organic participants were more likely to talk about their use of compost but this was not exclusive to them. Using composts and fish fertilisers could be one of the ways in which Organic orchardists have changed the practice of others. They did not mention learning and innovation in general at this point but many did so later. For them it seemed to be a ‘taken-for-granted’ part of growing organically.

The concept of a ‘tidy’ orchard is important in this study because it relates to particular orchard practices and attitudes which may impact on sustainability and resilience. In comparing the differences between the panels to ‘tidiness’ on the orchard, the use of the words ‘tidy’, ‘tidiness’, ‘mow’, ‘clean’, ‘Roundup’, ‘hygienic’, ‘trim’ and ‘strip’ were explored in the transcripts.⁴ Four of the Green orchardists were all for tidiness, two were for ‘tidy’ structures and vines, one liked a “hygienic” orchard and one admired the previous owner who had the orchard looking like a park. This compares with the Organic orchardists, one of whom kept it tidy with sheep, one likes tidy vines and two others who did not want their orchards to look like this. The Gold orchardists were more of a mixture. Two were all for tidiness, and each of these orchardists also grew Hayward Green kiwifruit. Another participant, a manager, kept the orchard like this because that was what the owner wanted. Two were very much against the practices involved in presenting the orchard in this way. Then when mowing was considered, a similar pattern emerged. Mowing was mentioned in connection with maintenance (8, 11, 7 respectively), and often this was associated with spraying weeds (3, 0, 4). Roundup in particular was mentioned (1, 3, 2), but Organic orchardists talked about it negatively, whereas the others just said they used it. In this connection the use of the word ‘strip’ was also explored (0, 4, 5). When Organic orchardists used the word, for two it was by way of negative comments such as, “the dead strips from Roundup” and “barren strip of ground”, while one had “strips of wild flowers”, and the other was growing a green sward strip that he was not going to mow. When Organic orchardists talked about mowing they talked about how little they did it (9), and how they liked to keep their grass long because they wanted to keep up biodiversity and reduce soil compaction,

⁴ This is not necessarily as straight forward as it sounds because each participant used the words in a different way, as we go on to illustrate. This is a good example of the depth and complexity of qualitative research analysis, particularly when it comes to making comparisons. The use of numbers to say how many mentioned ‘tidy’ in each of the panels tells us very little in terms of comparison, unless the use of the word is explored in context in the transcript.

and two mentioned having sheep. When the use of the word 'trim' was explored (3, 3, 3) two of the Green orchardists associated it having the shelter trimmed and the orchard looking tidy, compared with two Gold orchardists who mentioned it in connection with managing the airflow for frost protection, and the other was protecting his other fruit from Hicane. The Organic orchardists associated 'trim' with maintenance.

The exploration of the use of the word 'clean' added another dimension to this picture (7, 6, 3). For the Green orchardists the word was used most frequently in association with "cleaning up the bush/piles of rubbish/boundaries", whereas three Organic orchardists used it for "clean fruit" (free of pests particularly scale), and the other two in "clean and green" speaking of the New Zealand and the environment. The Gold participants were a mix of these three, with one speaking of a "clean herbicide strip".

Overall this tells us that the Green participants were more likely to be concerned about having a visually neat orchard. This 'look' is associated with frequently mown grass, well trimmed shelter, strips under the vine lines and shelter belts from spraying with herbicide to kill the weeds and grass that is not able to be reached by the mower, vines and canopy that are neatly pruned, structures that are well maintained and an orchard property containing no untidy areas of bush or rubbish. The Organic participant probably mows several times a year, but places a greater emphasis on the plant, insect and soil biodiversity that is seen to be associated with longer grass. The Gold participants are a mixture of these two perspectives to having a tidy orchard. Here, it has to be remembered that eight of the ARGOS Gold orchardists also grow Hayward Green whereas only one of the Green orchardists also grows gold (See Appendix 3, Table 3), so the attitudes and practices of growing Hayward Green could cross over into the management of Hort 16A, gold.

It is worth noting that Organic orchardists, of course, do not mention concerns about their use of hydrogen cyanamide because they are not allowed to use it under BioGro protocols. They do talk about their concern about other orchardists using it, especially if they are neighbours. It is interesting to note that this concern of both Green and Organic participants does not feature so much among the Gold participants, perhaps because fewer of them live on the orchard (see Appendix 3, Table 10).

Chapter 5: Orchardists and managers – their visions and constraints

Questions: What is your vision for your future? (What do you want to be doing in 5 years time?)

How could this be achieved?

What do you think are the most important constraints or problems that might prevent you achieving this vision?

What do you think could be done to address these constraints or problems?

What is your vision for the future of your orchard?

What ideas have driven this vision? (Where have they come from?)

How could this vision be achieved?

What are the main constraints to achieving this vision?

What do you think could be done to address these constraints or problems?

5.1 Vision

The responses of growers and managers to questions about their visions for themselves and for their orchards covered a broad range of goals and objectives, including a minority who found this a difficult question to answer. The diversity of response suggests that a range of motivations underlies the management of orchards participating in the ARGOS programme. These diverse motivations are further evident in the multitude of additional goals identified throughout the interviews in responses to questions not explicitly aimed at eliciting a vision. The latter responses incorporate specific aspects (e.g., environment, economic, or social) of vision addressed by participants in response to questions on wellbeing and management. In the following sections, text coded as vision is grouped according to financial, social, ecological and personal aspects of vision. Each of these groups is treated in order of the frequency of coding.

5.1.1 Financial aspects of orchard management

The most common element of the visions articulated by participants in the initial interview was that of financial expectations. Because kiwifruit production is essentially oriented toward the market (the fruit offers only a limited contribution to family caloric intake, although the occasional participant would indicate that self-subsistence gained through diversified production and maintenance of a vegetable garden was a goal), such a response is not unexpected. Despite the importance of financial aspects of production, it is insightful that the goals and assessment (see Section 8 on economic wellbeing, below) of participants is often limited to maintaining positive cash flow with little awareness of comparative returns to investment or levels of risk. The financial aspirations expressed during the initial interviews have been sub-divided into several codes: financial improvement, productivity, investment in farm, move to retirement, alternative products, and good fruit. Taken as a whole, there is little substantial difference among the kiwifruit panels in regard to their concern over financial aspects of production.

Financial improvement as vision

“You’ve got to be realistic. You’ve got to make a dollar.”

Financial goals were a common response to questions about the growers’ visions. Within the interviews this is especially the case among Gold growers, eight of whom express the intent to pursue financial improvement (six in response to the vision questions). In comparison, such motivations were cited by five growers in each of the Green and Organic

panels, respectively.⁵ (It is perhaps noteworthy in this case that two of the Organic growers have adopted such practices solely for financial reasons.) Within this set of responses, the desire for financial improvement reflected the pursuit of individual goals (e.g., retirement), the provisioning of the family or an indication of competent management (means of benchmarking). Several growers also include financial factors within their vision responses (included here), but represent financial aspects as subordinate to a more specific goal. Few differences among the kiwifruit panels are suggested from this data, largely because of the lack of significant numbers of responses coded according to more specific facets of financial improvement. That said, Organic and Gold growers were the only ones to emphasize economic *growth* specifically and Organic growers were the only ones to indicate that prospects for economic gain would be limited by environmental factors. (As stated above and throughout this report, it is important to remain aware that any patterns suggested in the data are based on small numbers of responses – and in this case fewer than 33% of any panel. The overall character of the responses is that of diversity and requires further, more detailed analysis.)

Responses:

- Vision as economic growth (0, 2, 2):

“So what we did was put in place a strategy to ... have a target of ten percent growth in the gross farm margin each year – which means we double the gross farm margin every seven years. And for the last twenty odd years we’ve been able to achieve that. And our goal is to continue to do that. Because it’s not in our plans to go to town and play bowls.”

Economic growth is variously seen as a means to provide ample opportunity to subsequent generations, to achieve profitability, or to better the farm as whole. One Organic grower suggests that growth is not currently beneficial because the market for organic products is not sufficiently developed.

- Profitability as foundation of vision (1, 2, 2):

“[My vision is to] make money. Well we’re not here for fun. I guess, as far as business, my way is to try and improve so that leads to increasing the productivity. If it was just increasing profit or whether it’s, reducing expenses... I’m not a straw hat, leather sandals organic.”

In these instances, there is some indication of remaining on the orchard and continuously improving economic conditions.

- Vision as investment or as securing financial return (2, 2, 3):

“My vision for the orchard is...it does do well. It would be for us most probably to um fix up the structures and move off and go and do something else. Leave this as an entity on its own that each year will produce x, y, z amount of trays and we will go off and do something else.”

The objective of such investment is to secure retirement income, facilitate off farm activities, or provide for family.

- Vision as financial gain achieved through the eventual sale of property as residential development (0, 0, 1).
- Vision as economic gain tempered by other factors (0, 3, 0): “We can only push the plants so far.”
- Vision as tempered by economic considerations (2, 1, 0):

⁵ Note that several perspectives on economic vision may be extracted from a single interview and, as such, the number of interviews given below may exceed those listed here.

“Cause we have to treat it as a commercial property – which we do. You know, this is our livelihood at the end of the day. So, if it doesn’t work, it goes out the back door.”

Productivity as vision

“[I want to] increase my yield and increase my size because we know that this game is all about fruit size.”

The desire to increase productivity or yield is closely related to that of pursuing financial improvement. Here these elements of vision have been coded separately in order to discern between objectives that are founded in purely financial measures and those that elevate productivity as the ultimate goal without necessarily considering the economic costs of achieving increased yield. The rationale behind an emphasis on productivity as compared to returns varies among the respondents including: a simple association of higher yield with higher returns; a desire to “out-produce” other orchardists, or an association between productivity and good orchard management. In some cases the emphasis on productivity is tempered by a desire to obtain a consistent yield with the goal of avoiding poor harvests to the extent possible. Several participants also suggest that productivity is only partially under their control, being subject to vagaries in climate and other environmental factors. The dispersal of responses from participants voicing this vision provides little means to distinguish among panels.

Responses:

- Vision equating yield with viability of orchard (2, 3, 3): “Well, obviously, improve the production. And improve the type of fruit and all that like the size and the weight and that. Yeah. Just them yeah.”
- Vision of benchmarking on the basis of yield (1, 2, 3):
Female: “Get the production up to, conventional um, using organic methods.”
Male: “Getting our size. We’re doing better than green conventional national average trays per hectare now. But our size is two counts and a bit down. So, if we can get our size up, we’d be more than happy.”
- Vision equating yield with proper management (2, 1, 2):
“That our land is increasing in production. The yield is increasing. Our soil tests show that our soil is in good health. Our leaf tests show that our trees and vines and pastures have a balance of nutrients in them that [is] maximising their growth and their yield.”
- Vision as consistency of yields (1, 1, 0):
“Well, in the next few years, full canopy on my T bars and just sustaining a good number each year. I mean, I don’t think you can realistically think you’re going to do eleven or twelve [thousand trays] every year, especially not up at this altitude. I mean, if you did nine or ten on average, I think it would be good. And above average size is what I’m aiming for.”

Move to retirement

“At sixty-seven, I’ve decided I’m going to take a step back.”

In discussing visions (either personal or for the orchard) numbers of growers in each panel talked about their imminent retirement. (These responses have also been coded under Financial Improvement above in cases where this vision involved that as a specifically identified aspect.) The role of the kiwifruit orchard in contributing to retirement varied within each panel by providing either a means to retire yet remain active (relying to varying degrees on contract labour); remaining as an integral part of the family business; or being sold to support life during retirement.

Responses:

- Vision of active retirement (6, 3, 4):

“I'm now sixty-two, but I would see us staying in this home. We have no plan to move or downsize to a retirement village and all those things [are] not in the game plan if we can organise it. The beauty of orcharding is that you can do as much or as little, as you chose.”
- Vision of orchard as family business (0, 0, 1):

“I'll probably continue to ease back... but I'll stay involved with the running of the business – with the boys taking over more of the job. We have a team of people here we have to employ, about five or six permanents, and they would have skills.”
- Vision of farm as retirement savings (1, 1, 0): “If you didn't have all these pressures, [I would] probably stay till I retired. Then sell.”

Investment in farm⁶

“We'll put in anything. We'll put in what's necessary.”

Few orchardists (four, all Gold growers) indicated that they were actively investing (capital) in the farm. These growers often set themselves apart as those willing to spend a dollar to earn a dollar, or needing to invest in adequate machinery. They are also generally those who have existing sources of capital to invest either from previous occupations or from the wealthy owner who hires the manager.

Alternatives

“It was a case of not putting your eggs all in one basket but, you know what I mean, just diversifying a bit.”

Approximately one-quarter of orchardists in each panel indicated that growing alternative crops (i.e., other than kiwifruit) was integral to their vision for the future. These orchardists were not wholly convinced of the long-term viability of kiwifruit. They viewed the alternative crops as risk minimising strategies and as means to access additional markets. Occasionally, a farmer would suggest that alternative crops were the result of different environmental conditions on the farm. This perspective is slightly more common among Gold growers, which may be indicative of a willingness to experiment with alternative products.

Responses:

- Vision of diversified production (1, 3, 3):

“I've often thought that, if the kiwi industry failed, we'd have to turn it into housing; but there's all sorts of other horticultural uses. You could grow flowers... Soil's so good you could grow anything. If you're taking a drive down Poles Road, they're growing palm trees for sale, you know – lot of those in pots, quite a lot of flower growing.”
- Vision of diversification (new varieties) of kiwifruit (1, 0, 1):

“Pretty much just keep going with kiwifruit. I'm gonna experiment with new varieties that come out, [but] I'll stick with kiwifruit.”
- Vision of outside employment (1, 0, 0):

⁶ Farm is used here to indicate that investment was not necessarily directed toward the kiwifruit orchard, but might include other elements of the farm.

Male: "Just because we're an orchardist people think we don't work so, you know it's no different than being a farmer at the end of the day. I must say that I have managed the orchard out this year, which has been quite good; I don't have to worry about labour or anything like that which is good."

Female: "We started another business."

Male: "Yeah, which has been quite advantageous to us at the end of the day."

- Vision of alternatives as supplementing biodiversity (0, 1, 0):

"Like our trees. You know we're lucky that we've got a bit of room round the houses. We actually have, round the edge of the bush area there, planted various other plants – to get diversity. [At the] ends of the rows we've got a few shrubs and different pieces. Just so it's not sort of, stark kiwifruit."

Good fruit

"...cause there's no point in growing rubbish."

The idea of producing good fruit relates to productivity for many growers. The Gold growers appear most keenly aware of the issue of fruit quality as a factor in consumer preferences, perhaps as a result of recent problems with negative response to the taste of the product. Green growers express similar awareness of quality, although they are more influenced by recent emphasis on dry matter (from ZESPRI) as well as past premiums resulting from fruit size. Organic growers (a slightly lower number indicated quality as a goal) are also very aware of new dry matter standards, but are more likely to subsume quality to quantity issues reflecting perhaps their perception of greater quality of organic fruit while dealing with lower productivity relative to integrated management practices.

Responses:

- Vision as growing large fruit (2, 2, 1):

"[My vision is] probably to produce good fruit. Would be the main thing... I mean a lot of large fruit."

- Vision as meeting consumer demands – taste, dry matter (3, 3, 4):

"Yeah, so basically the dry matter is the one that's driving us at the moment on pretty much everything. To get the ... dry matter – it's just very hard to explain. It's basically everything in the fruit that's not water. That varies from year to year. We don't actually understand what creates it. But to me it's the sunlight hours. It's the amount of nutrient available to a plant and water. They're the three main factors they reckon. Pollination [and] other things comes into it. All makes sense."

- Vision as growing healthy product (1, 0, 0):

"I feel so good about producing what is, probably, known as one of the healthiest food products in the world. And, given that my parents (and I did for a little while) grew tobacco, which is probably considered the unhealthiest product to grow, it's quite a major transformation."

- Vision of good fruit as indicator of proper management (1, 0, 1):

"... I mean, if you've got a whole lot of little marbles and things, there's probably something wrong with the vines. You know, the health of them or the soil or whatever. So, you know, it all [goes] hand in hand with doing the crop numbers. I mean the reason you're doing those crop numbers and the size is because everything must be fairly healthy."

5.1.2 Social aspects of farm management

The second most common element of orchardists' visions involved social aspirations. In these cases, the participants referred to their ownership and management of a kiwifruit orchard (or farm, more generally) as contributing to the wellbeing of themselves or of their

families. The lifestyle associated with rural life in general (aided by the benefits of the kiwifruit industry in regard to access to hired labour) is frequently a part of the personal vision of participants and a principal reason for remaining in the sector. Several of the orchardists contrast the labour demands of kiwifruit with those of dairy when discussing this aspect of their vision. The remaining responses focus on the contribution of orchard life to the family, both through its lifestyle and its potential for economic return. While family is often an element of vision, succession of children to orchard ownership was infrequently cited except in situations where the orchard had been in the family for more than a single generation.

Lifestyle as vision

“Ah, being outside. It’s nice being outside.”

A further commonly cited element of kiwifruit growers’ visions is their desire to pursue an attractive lifestyle. Responses that involve lifestyle as a factor either focus on financial and management aspects of kiwifruit orchard management or on the benefits to personal or family health and wellbeing (often contradicting a purely economic assessment). In the case of the first set of responses, access to readily engaged contract labour and the ability to contribute as much or as little manual labour as desired make kiwifruit a more desirable lifestyle than, for example, dairy farming. By contrast, the second group of responses emphasise benefits associated with outdoor work, human interaction, and local amenities (including rural location, proximity to beach, etc.). Possible differences between the responses of Organic and Green growers largely reflect the greater incidence of surrounding environment (e.g., bush, etc.) being an element of lifestyle for Organic growers and a greater number of growers without additional on-farm family members among the Green growers.

Responses:

- Vision as improved work-life balance (6, 3, 4):

“I enjoy working with people. But at the same time I like to have my own space... I mean, I’m out there pruning and everything on my own right now, but it’ll get to the point where I’ve run out of time. So then I’ll bring a gang of people in. I like my own time. I don’t mind my own company. But I also like working with other people. Yeah, so by doing this I can actually get a balance of relationships while I enjoy it.”

- Vision as enjoying rural lifestyle (3, 7, 4):

“My little daughter’s two and a half now and it’s amazing how your priorities change once you have a child. You know, I was doing stupid hours in Auckland and never seeing her. So we made the decision, ‘Well, let’s do the lifestyle thing.’ ... So we built a house down on the beach and I just travel out to the orchards each day. So that, on the positive side, it’s very much a lifestyle.”

Family wellbeing as vision

“[It’s] being able to give [my daughter] the best fruit.”

Providing for their family’s economic or general wellbeing often forms an element of the vision divulged by participants during the interviews. While it was seldom (0,2,1) listed as a specific response to the questions about vision (see above), the desire to provide for the family emerged as an expected end product of such intermediate goals as financial improvement or lifestyle. For those instances in which financial improvement is seen as the means to more adequately provide for the family’s wellbeing, kiwifruit (or orchard crops more generally) are identified as the most secure way of realising such wellbeing. One exceptional case is that of a participant whose children have moved away from the orchard. He suggests that the financial security of kiwifruit production allows his children to not worry as much about their parents’ future. Those who perceive the greatest family benefit to derive from the lifestyle associated with kiwifruit production list similar factors to those in the previous

section. It is interesting that in these cases, the issue of minimising spraying or protecting children from the effects of chemical sprays is a shared concern. Any patterns in responses are likely highly influenced by the age of the farm family to the extent that participants with younger children were more aware of the impact of their management choices on their families. (The majority of responses coded in this section are from younger farm households.)

Responses:

- Vision of family benefiting from financial gains (4, 3,):
“I've got a daughter who's just gone one. And so...the main thing I have to do is keep them [wife and child], provide for them. And that basically is what guys everywhere are doing. Keep the women happy.”
- Vision of family benefiting from lifestyle (1, 4, 5):
“We're very family orientated. We do a lot with the kids at school. At home, we orientate a lot of things around what they can learn and to become well rounded individuals and very happy kids that can think outside the square. That's probably the number one thing, you know, having really happy children.”

Family succession as vision

“The orchard has been in my wife's family for the last ... hundred years and we're trying to keep it going that way. So I should've had more grandchildren...”

Very few (4) of the kiwifruit growers identify succession as part of their vision, either personal or for the orchard. In most of these cases, succession is viewed as the continuation of tradition on the orchard and usually an issue for those with older children who are actively interested in managing. Due to the low number of responses within this category, it is not possible to compare responses of the different panels.

5.1.3 Ecological aspects of orchard management

Only one orchardist (Gold) discussed environmental factors in response to the vision questions. This suggests that the majority of participants do not recognise ecological goals as separate from economic or social motivations. Despite the absence of such perspectives in response to the vision questions, orchardists' discussions of nature and their interaction with it (see Chapter 9, below) indicate that many do envision their farms as an element of the natural landscape and that it is their responsibility to care for or improve the potential of that landscape. The latter ideal is more prevalent in the interviews on organic orchards, which suggests the need to further explore the extent to which a desire to maintain the land is more active in that panel. Responses that placed the farm within the natural landscape did not, however, vary substantially among the panels. Because the text coded for this topic largely comprise that coded in Chapters 9 and 10, they will be treated in more abbreviated form here.

Farm in landscape

“...basically you're just looking after the soil environment and grasses and insects and birds.”

Both Organic and Gold orchardists commonly provide a vision of their farms as being part of the surrounding environment. (The theme is notably less frequent – three as opposed to seven and six responses – in the interview with Green growers.) In all panels, the participants who include these elements in their vision claim that they either actively enhance the biodiversity on or near their orchard or are, at least, aware of the potential impact of their practices on a wider environment. In relation to this theme, it is of interest that Organic growers are less likely to describe their orchard as tidy.

Stewardship

“We want to do things and leave [the orchard] in better condition than when we come here.”

Ideas of protecting or improving the land for future generations are a theme that is more common among Organic (7 of 12) than Green (2) or Gold (3) orchardists. The responses of the Organic group are also qualitatively different to the extent that they often refer to impacts on landscape elements beyond the orchard boundaries. The Green and Gold orchardists appear to focus more exclusively on the reduction of chemical inputs. Text coded for this theme is found in responses to what participants are managing well, to indications that they are caring for the environment, or to contributions to society or community. (These responses are coded here as stewardship to emphasise the desire to improve the resource. Compare this to the discussion in Chapter 9 where the theme of Caretaker involves a wider set of responses.)

Improving soil

“[It’s] the activity that’s in there, and also when you get back to your soil test and you get into the organic matter level – it’s just slowly that’s creeping up every year.”

Farmers also discuss the need to improve the soil on the farm, although not necessarily in the context of stewardship. In this case, soil improvement is generally presented as a means to enhance the productive capability of the orchard rather than caring for the environment. Responses from Green and Gold growers (1 and 4, respectively) emphasise the structural nature of soil, although some are aware of soil biota as elements of a healthy soil. The latter characteristics are more frequently an element of these responses from Organic growers (4 growers). Because the majority of text coded for this section came in response to a question about soil health, differences between the panels do not indicate varying awareness of soils. It would be more apt to suggest that Organic orchardists are more likely to have an active programme of soil management focused on characteristics of the soil subject to improvement through management.

5.1.4 Personal aspects of orchard management

The final set of codes discussed in relation to vision involves the personal characteristics of participants that contribute to their approach to orchard management. The text referred to by the codes is found throughout the interviews and in many cases several passages from the same interview have been included. Analysis of the coded text, rather than identifying specific goals or motivations of orchard management, suggests the context within which an individual has formed a particular vision or approach to management. Being personally oriented, these perspectives can also be contrasted to vision focused on family, society or the environment.

Being in control

“...having that control at the end of the day, that’s good.”

In comparison to the farmers who frame their management in terms of caring for the land, a similarly sized group (eleven participants, 2, 3, 6) states or implies a need to realize some amount of control of the orchard. This contrasts with the concept of working with the environment evident in text coded as Stewardship above. (No interview among the kiwifruit growers is coded with both of these themes.) Among the Green and Gold growers, being in control often involves issues relating to managing their own contributions to the labour requirements of the orchard. Challenges to control of the orchard resulting from natural, political, or macroeconomic forces are cited by some of the orchardists within this theme.

Responses:

- Control of orchard management (2, 2, 5):
“I just tie down what I feel the vine is. Cause I prune my orchard myself. I cut it and I get people to come in and help me do all the manual work. But the pruning is the big one. So I do that pretty much all myself.”
- Control challenged by nature, etc. (0, 1, 1):
“So, you know, it can be very frustrating when the wind blows and the rain rains when it shouldn't. But you can't do much about it.”

Challenge driven

“Yes, life without challenge is like working on a factory floor doing the same repetitive job day in and day out. Your mind slightly goes to sleep.”

A group of farmers further described their vision of farming as that of meeting challenges. This theme (representing ten interviews) is seldom found in interviews with farmers who relish being in control (twice) and slightly more often in those with farmers who care for the environment (three). The perspective may represent a third approach to interaction with environmental and social limitations to orchard production. It is more common in the Gold and Organic panels (four interviews each) perhaps reflecting that management practices for these orchardists are less firmly established and subject to greater levels of experimentation.

Experience

“You know, there's a lot of people who are doing different ways and still getting results. But you've just got to pick and trial because what happens on this orchard wouldn't necessarily work half-way down the road.”

Another minor element of vision – although important to the growers who express it – is that of relying on experience for learning and improving. This theme was used to code text from six interviews (3, 2, 1). Due to the longer history of production for the Hayward variety, it is not surprising that most of the responses included were from Green or Organic orchardists.

5.2 Constraints to visions and management

While interview participants listed a broad range of goals and motivations in their response to the vision questions, they were also very aware of limitations and constraints to meeting these. In the following sections, the constraints are categorized as emanating either from the physical environment, financial situation, the industry, wider society, or personal factors. The constraints listed by the orchardists are discussed in order of the frequency with which the general category of constraint was identified. As was the case with vision within the interviews, coding of constraints was not limited to responses to the constraint question. Often, factors considered to be constraints would emerge in the discussions during the sketch map exercise, the suggestions for indicators of good management, or the listings of animal life on the orchard. Whereas the orchardists (in all but five interviews) readily recognised constraints to achieving their visions, seldom were these considered insurmountable. The participants were more likely to list constraints that either slowed progress to realisation of their vision or that were considered real but minor irritants as such progress was pursued. (Here, owners of those orchards faced with the imminent encroachment of residential land uses are a notable exception.)

5.2.1 Climate and physical environment

“Nature's probably the biggest enemy, I think, of any horticultural [or] agricultural undertaking.”

Aspects of the physical environment are the most commonly recognized constraints among all kiwifruit panels. Constraints emanating from the environment are recognised as a result

of their ability to limit the productive potential of the kiwifruit vines. In most cases, orchardists perceive little means of avoiding the negative impact on their orchards, although many do cite actions to mitigate the extent of that impact. Climate, with frost and wind being the most commonly noted factors, are considered to have the greatest potential impact on orchard productivity. Topography is an issue closely related to the previous two as it impacts exposure but it can also aid in protecting an orchard from frost. Soil fertility, by contrast, is rarely cited as a problem – interestingly once by a Green grower converting a formerly organic orchard – perhaps because fertility is generally sufficient for kiwifruit vines and is perceived to be fairly readily amended. There appears to be little difference among the panels relative to these types of constraints.

In addition to the impact of the physical environment on the kiwifruit vines, both Organic (10) and Gold (6) orchardists identified characteristics of the vines themselves as constraints on production. In the Organic panel, this constraint is fairly similar to that coded as Viable Inputs (below) in so far as it involves finding the means to secure consistently high production with organic practices. For the Gold orchardists, this constraint is closely linked to that coded as Lack of Experience (below) and is related to their relative inexperience with the management of the Gold kiwifruit vines. The lack of such response from Green orchardists is further evidence of their comfort level regarding the viability of the accepted best management practices for their vines (also discussed below).

Responses:

- Climate as constraint (9, 11, 10):
“Oh yeah, climate. I mean ... you can manipulate everything around you, but you can't change it. So, I sort of look at it as I've got to work with it, not against it. Everything's gotta flow with it. The moment you try and go against it you're in big trouble.”
- Topography as constraint (5, 5, 4): “We're at five-fifty feet altitude. Little bit cooler than other places and slope to the west-southwest which is not ideal.”
- Soil as constraint (2, 2, 1):
“Because we're not using a lot of other chemicals, obviously we're very limited as what we do in terms of maintaining sustainability. But what [our soil consultant is] trying to do is make the orchard produce.”
- Vines as constraint (0, 10, 6): “So, to me, the whole gold package needs to be looked at ... from one end to the other.”

Pests

“Another thing that affects my management...is pest control.”

This section includes a large number of responses (often elicited when the orchardist was asked to list animals on the orchard – except for *Armillaria*, which is a common constraint identified in interviews) in which farmers talk about those animals (e.g., rabbits, cicadas, possums, pukekos), plants (weeds), and other life forms (fungi or bacteria) that are considered pests. Occasionally, this includes pests that are not harmful to kiwifruit production itself. It is perhaps notable that weeds are only identified as pests by Organic orchardists. Pollination – included here because of its relation to the animal world – is a less commonly identified constraint (4 interviews) and apparently not a problem in Gold.

Responses:

- Animal pests as constraint (7, 7, 6):
“And for the first three years when I had the orchard, always about at budburst and the young shoots, right along in the middle of those orchards, one vine,

maybe two vines, each side of those posts were stripped. And I couldn't work out what the heck it was. My father had a theory. He reckons when the old artificial shelter was there black beetles were flying along falling down eating the leaves. But that was wrong. Actually, it ended up there was possums.”

Insects are also frequently included in a list of pests, especially Fuller's rose weevil and cicadas.

- Weeds as constraint (0, 2, 0):

“Yeah, weeds are a little bit of a problem – like blackberry and that kind of thing – which each year you've got to dig out cause there's not a spray to go and just zap it with.”

- Other life forms as constraint (2, 6, 4):

“And this area here is called Death Valley. Very important because it drives me to drink ... We have lost probably over a hundred plants down there. *Armillaria*.”

- Pollination as constraint (2, 2, 0):

“Pollination is one thing that was brought to us by fruit [that] was short and plump. That's caused through pollination. So, the last year they had seven hives. This year we're hoping to double that at least.”

Orchard structure

“When I first got here in May [those two blocks] were yellow, completely yellow...”

Orchard structure is somewhat misplaced in this section as it refers to the remnant effects of past management (thus involving cultural, social and financial – as well as environmental – factors). The existing structure of the orchard is considered a constraint by many growers who have purchased an established plantation. As such, it is most often a factor for Green growers (eight interviews) taking over older orchards. They will complain about the distribution and placement of shelter belts, the use of pergola supports, poor soil management, etc. This is seldom the case with Organic (2) and Gold (3) orchardists who are or have been engaged in a conversion process no matter the previous use of the orchard land.

5.2.2 Economic constraints

Following constraints posed by the physical environment, economic constraints were most frequently identified by the orchardists in the interviews. Included within this section of coding are those purchased factors of production for which the owner or manager had personal responsibility – that is, hired labour, inputs, and financial limitations. The reliance of orchardists on hired labour is a common feature of their descriptions of orchard management. While often cited as a beneficial element of the kiwifruit lifestyle, limited access to and the low skill level of hired labour are the basis for frequent complaints related to poor performance of an orchard. Similar complaints about inputs are largely limited to Organic orchardists (although see Outside Knowledge, below) who express concern over the lack of effective organic treatments for a crop's ailments. Finally, in approximately one-third of the interviews, participants indicate that limited access to factors of production is a significant constraint to orchard management.

Labour

“...well one thing is labour. Sometimes it's actually getting labour to do [the work].”

Labour, access to and the capabilities of, is identified as a constraint in all of the panels. It is emphasised somewhat more among Gold growers (7) who are adjusting to a relatively new crop and have difficulties getting labour to modify practices to match crop requirements. Green growers (8) are equally likely to mention the benefits of access to contract labour as to cite it as a constraint. It appears to be less of an issue with the Organic growers (6) perhaps due to a greater number of smaller orchards and reliance on family labour. Because

responses that include labour as a constraint are evenly distributed among the panels, confirmation of different attitudes toward labour as an input require further examination.

Unreliable Inputs

“There's products coming out all the time and you don't know half the time if they're snake oil or what, you know.”

As noted above, this constraint is only recognised by Organic orchardists (8) and is specifically related to limitations on inputs acceptable for organic production. Complaints about inputs for organic production include the lack of appropriate and effective treatments as well as the existence of inputs that do not perform as promoted. The coded responses are relatively evenly shared between soil fertility and pest control concerns.

Financial factors

“We're constrained financially. I've felt that there are other priorities to spend the money on and we've done that.”

In addition to labour a diverse set of financial factors are listed as constraints, although by a smaller number of growers (eight list limited capital specifically, four identify costs and seven cite the demands of outside business ventures or other interests). One grower, unique in that he does more detailed economic analysis of returns, suggests that kiwifruit does not supply a return sufficient to compensate for risks involved. Also, in some cases where alternative crops are involved, growers will dedicate more time to those than to kiwifruit reflecting their perceptions of relative returns from each. In other cases, outside business is seen as a necessary means to relieving debt from investment in the orchard. Coding includes a reference to audit compliance as a financial cost and, as such, a constraint.

Responses:

- Limited capital as constraint (2, 2, 4):
Female: “Oh yes that is one of our goals is to eventually get an early start orchard as well. But, at the same time, you know the cost of it ...”
Male: “Well, that's dead right, you know. You need big money. Let's be honest...”
Female: “And what you earn, does that you know, justify the cost of it?”
- Increasing costs as constraint (0, 1, 3):
“Constraints are rising costs... Some costs we do have some control over but not all. Obviously the increasing compliance costs – we can't do ah much about some of those. There's increasing labour costs now.”
- Outside business demands as constraint (3, 2, 2):
“And the other [job] is purely temporary it's just a means to an end. We only intend to keep it for two years I think. Just to see us through the year where our income won't be very, you know, minimal from the orchard... Because, at the end of the day, we'd like to be back at square one without owing anything and have our frost protection in place.”

5.2.3 Constraints associated with the kiwifruit industry

A third category of constraints that are found in the interviews are those specifically related to participation in the kiwifruit industry. Constraints identified within this grouping refer to factors which either limit (and require documentation of compliance!) what is considered acceptable practice on the orchard or interfere with the harvest and sale of kiwifruit. The latter set of responses is notable because it involves treatment of a completed product from the perspective of the orchardists and, thus, can only diminish the qualities that the orchardists have invested in the kiwifruit.

Audit

"It's very frustrating to have people dictating to that degree what you do."

Audit is identified as a constraint by slightly more than one-half of the growers interviewed. It is most often cited by Organic growers, largely due to added levels of audit associated with certification. Rather than inflicting significant changes in existing management practices, the orchardists indicated that the recording and documentation required for compliance – by exceeding sensible limits on time and effort – was the principal reason for listing audit as a constraint. Most growers who mention audits (we did not pursue this in the interviews) also acknowledged the positive aspects of the codes of practice, which raised awareness of consumer preferences and the potential ecological and social impacts of orchard management. With regard to the EUREP-GAP audit system specifically, participants often associated compliance with increased attention to labour conditions. (Note that some interviews were coded by more than one of the following.)

Responses:

- Consumer demands as constraint (2, 5, 5):
 - Male: "I do see a bit of ah rose weevil around that's another pest. I'm not really concerned about them. I don't see big herds of them."
 - Female: "But all they need to do is find one, is it, for Japan market."
 - Male: "Yeah, something like that."
 - Female: "Yeah, I think they're really strict."
- Excess documentation as constraint (2, 5, 5):
 - "I think a lot of that [if audits are good]. It's just putting in writing what you're doing. Continuing what you're doing. You may be doing it already, but you're just having to confirm it in writing. To prove it."
- Labour compliance as constraint (0, 0, 2):
 - "Farmers are employing contractors rather than employing permanent staff; and those contractors are using, in many cases, migrants and paying them very low wages. Employing permanent staff, everybody else just avoid[s] that: the liability, the paperwork and the drama by using Indian contractors."

Industry relations

"Every time there was a boat in the harbour come to Tuesday, they'd start screaming for fruit for Friday for the boat. I don't think that's the right way to get it off."

The relationships within the kiwifruit production chain are cited a limited number of times (5 interviews: 2, 2, 1). These responses include those growers who complain about their lack of control over the timing of harvest (dependent on pack house harvest crews) or about internal jealousies and competition within an industry that would benefit from mutual cooperation.

Poor marketing

"[Not] taking the organic profile seriously. I think that's probably our biggest constraint. Not marketing it as a separate category but just as a tack on to the golden and green categories."

Poor marketing is a constraint that is predominantly cited by Organic orchardists (7 interviews). Responses included with this code indicate concern with what is perceived as poor representation and promotion of organic kiwifruit in export markets. Most of the orchardists who commented on this issue believed that their organically produced fruit lost its distinctive quality advantage when marketed together with KiwiGreen (low input) fruit.

5.2.4 Constraints associated with social relations

In addition to the relationships within the kiwifruit industry, participants in the interviews also identified constraints associated with their relationships with society more generally. Their responses indicated three distinct sources for these constraints – the state, providers of outside knowledge, and neighbours who scrutinised their orchards – as well as a more abstract uncertainty that emerged from social, ecological and environmental concerns. As was the case with the constraints associated with the kiwifruit industry, the constraints dealt with in this section are imposed on the orchardists with little means of mitigation. As a whole, there is little differentiation among panels in regard to the tendency to recognise social constraints.

Government- local and national

Orchardists occasionally refer to activities of the regional and national government as constraints to their vision and management. Their complaints in this regard can be divided into two general categories: that of land use planning and regulation and that of macroeconomic policies. In the first category (6 interviews), orchardists residing near urban or tourism centres are keenly aware of the development pressure on their orchards. Some perceive this as a source of future wealth, but the majority describe it as an encroachment that threatens their ability to maintain ownership of the orchard. The second category of concerns include those regarding the exchange rate, trade policies, and industry communication of associated market conditions.

Responses:

- Land use policies as constraint (1, 3, 2):

“Realistically, I would've loved to have stayed here till I retired. But I [have] got to realistically look at things. The pressure of development that's occurring around me is not gonna be a viable option. You're getting pressure from development on all sides and you have spray issues. It's just getting harder and harder to run the property with development encroaching onto you. I don't think I'd like to be working on the orchard till I was sixty... If someone wants to pay that price, well, I'm happy by that. I'll take life a little bit quieter.”

- Macroeconomic policies/conditions as constraint (3, 3, 1):

“I suppose the last one I would [mention] are the politicians and their constant playing with our exchange rate, although they probably would argue that they have nothing to do with them any more. It would be good to have a nice, steady, political climate where everybody's focused on similar goals for a long term. This is a long term business really.”

Outside knowledge

This constraint is similar to that of a lack of knowledge in personal limitations, but places the blame squarely on the activities of outside research interests. Thus, among the Organic orchardists, two complain that there is insufficient attention to research of organic controls for pests, organic fertilisers, etc. Among Green and Gold orchardists, there is similar concern about the persistence of some pests (*Armillaria*, for example), but outside knowledge is more often seen as a source of improvement albeit one that requires active pursuit on the part of individuals. Finally, less experienced orchard owners acknowledge their dependency on outside expertise and are concerned that they may not have access to the best source of knowledge.

Responses:

- Lack of research as constraint (0, 4, 1):

“From a [kiwifruit growing] point of view, I think it's probably the lack of investment that's put into organic research. Because I think there's really this huge potential in the market place and a potential for innovation. There's some sort of trials and

study to improve our organic productivity which would improve the returns. Yeah, just to tap into the demand that's, particularly, in Europe and Japan for organic."

- Access to innovation as constraint (3, 2, 3):

"Well, [I want to] just learn as much as I can... Even years ago, before this focus group started up, I've even said to a few people like with the farming they used to have farm walks and that. I used to think it was a brilliant idea to go around and learn. That's the only way you can learn. Orchardists are a funny breed compared to when I was growing up on the dairy farm. They used to have farm walks and everyone'd say things; but a lot of orchardists don't want to share anything."

- Questionable advice as constraint (3, 0, 0):

Female: "It's what works best for you. We're having to rely on our team [from the pack house]."

Male: "Yeah, we've virtually got to. We haven't got any other option really."

Female: "Well, we could try and do it ourselves and mess it all up."

Male: "Yeah. And we don't want to do that."

Neighbours

Neighbours are perceived to be constraints on orchard management both because of the transboundary effects of management practices (for Organic growers this is often spray drift from conventional neighbours, for Green or Gold growers this is extended to limitations on practices because of complaints from neighbours) and as a result of a neighbour's assessments of an individual's practices (including the construction of the ideal of the "good farmer"). The latter factor establishes particular practices as more acceptable and better, potentially limiting the desire to experiment with alternative practices. This is not as much of an issue for Organic growers who are seen as being different from their neighbours and have access to few local colleagues.

Responses:

- Transboundary effects as constraint (2, 4, 3):

Male: "So we put down there conventional neighbours. That's quite important."

Female: "We need to maintain our boundary shelters... We manage [the drift] through the shelter and we get tests through BioGro. This orchard here used to be organic till last year or the year before. This is conventional too, isn't it? We're surrounded."

- Neighbours' assessments as constraint (3, 2, 2):

"You're looking for pests all the time... Pack houses do it as well. So, you're doing it yourself. I mean it's all worth something to you to get it right. You know, then the satisfaction comes when you pull your fruit off and people sort of go, 'Well, you've got a good result.' But I put the effort in. They don't know how much effort you put in. Yeah, you just feel happy yourself. It's about having your own satisfaction."

Uncertainty

"There's so many, aspects of growing sweet fruit that are undocumented at this stage. We're still learning so much about it. One year they think they've got it right. Next year climatic conditions are different and we find it's all different."

A small number of growers cited uncertainty (about economic future or environmental risk) as a constraint on their vision for themselves of orchard.

5.2.5 Personal constraints

It is also common for growers to list constraints to the management of their orchards which emerge from personal limitations – ranging from health (or age) to skill. Text coded as health includes both concerns for personal and family wellbeing and is generally considered to be a factor of spraying on the orchard. In relation to this category, some of the Organic growers identify health concerns as contributing to their conversion to organic practices. Lack of sufficient (or complete) knowledge of kiwifruit biology and management is cited particularly by those growers who have recently entered the sector (for example seven of the Gold growers cite a lack of sufficient knowledge of or familiarity with the newer crop) or who struggle with new demands for higher dry matter. It is also a constraint among Organic growers, many of whom are continuously searching for means to develop more dependable and consistent crop response to management. The comments from the Organic panel here are similar to those under Unreliable Inputs above, but focus more specifically on knowledge and management practice.

Responses:

- Health as constraint (3, 3, 3):

[Gold orchardist] "...it's the health, too, because with those sprays... Like I know, I can plan [to] take the babies off the orchard. Because, even though there's not a lot of drift, I am better off the orchard, especially with her at the moment."

[Organic orchardist] "Well, let's say we don't get sick from our spraying. But when the neighbours spray, yes, we [get] headaches."

- Lack of skills as constraint (4, 3, 7):

"We're getting new pruners in this year. To sort of start managing it ourselves so we can see and learn a lot more about it. So, if they're not doing it right, we can sort of pull them up. That's what we're doing this year, because we've been here two years. We haven't had much to do with it. We've got on down and looked and tried to learn more. I think if we start taking over, we'll learn a lot quicker. That's the plan."

5.2.6 No significant constraints

"None. Absolutely none; but I enjoy my job so I just work."

There is a small group of orchardists (relatively equally divided among the panels: 3,3,5) that recognises no large constraints to their management or vision. In some cases, this is the result of being able to accept the variability of the sector due to weather or markets. In others, it is a sense of being able to improve through learning and or capital investment. For these orchardists, it is the achievement of good management and the expectation of meeting their aspirations that overcomes any possible constraints on orchard management.

5.3 Conclusion: comparing panels for vision and constraints

5.3.1 Vision

Economic aspects of life and orchard management are a very frequent element of the visions identified by the participants, especially in relation to improving financial returns from and productivity of orchards. There are, however, few apparent differences among the economic perspectives of the three panels. This suggests that Possible variation in this aspect of vision lies in the recognition of limitations imposed on improvement by the environment or the plants themselves (only mentioned by 3 Organic growers) rather than economic conditions and the greater emphasis on capital investment in the farm within the Gold panel (4 growers compared to one or less). Finally, where producing 'good fruit' is identified as a means to arriving at better returns, there is some variation in emphasis on size (more Organic growers)

compared to dry matter (more Gold growers). This latter difference is also evident in discussions of productivity indicators discussed below.

Within the social aspects of vision, there are only spurious indications of difference among the panels. There is a fairly uniform inclusion of elements of lifestyle in the recorded visions, although Organic growers appear more appreciative of the surrounding landscape and environment when discussing lifestyle. Also, a potential difference in the contribution of the orchard to the vision of providing for family is evident in the greater emphasis on financial benefit among the Green panel, on lifestyle aspects among the Gold, and equal identification of both among the Organic. Insufficient data is available in order to locate the basis for this difference (e.g., age, life cycle, orchard returns, etc.).

Perhaps the greatest differences among the panels that is evident in the participant's response to the vision question lies in the extent to which ecological aspects form at least a part of participants' visions. In particular, members of the Organic panel appear more likely to identify improvement of the ecological health of the farm (coded as stewardship) and to conceive of their farm as part of the surrounding environment within their discussion of vision. Related to this difference is the tendency for the same panel to emphasise soil biota, as opposed to structure, when identifying soil improvement as an element of vision. While the majority of these responses did not result as direct answers to the vision question, these differences must also be treated as important themes within the qualitative analysis and form part of the typification of orchardists developed in Chapter 12.

The most difficult comparison of panels involves the personal aspects of (in this case, the drivers of) vision. Within this section of coding, the Gold and Green panels appear to entertain distinct positions from the Organic panel. For example, the Gold panel was more likely to express a desire to be in control of the orchard and the ecological processes that occurred within it. On the other hand, members of the Green panel were more likely to indicate their reliance on experience in orcharding (although in this case the three responses do not include participants who have recently entered the sector). Such variation may prove important if it is associated with different approaches to the practice of orchard management as identified in surveys and subsequent qualitative analysis

5.3.2 Constraints

Whereas the most commonly identified aspect of visions was of an economic nature, environmental factors were the most recognised constraints. Features of the physical environment including climate and soil were equally reported constraints among all three panels. Some variation between the panels is suggested, however, by greater concerns about weeds within the Organic panel (both references were from Organic growers) and about *Armillaria* within the Organic and Gold panels. While representative of only minor groups within each panel, these differences may need to be compared with data either already available or to be collected. Finally, members of the Green panel were more likely to complain about the existing orchard structure. This may be a result of participants in the other panels assuming the necessity of altering orchard structure in the process of converting to Gold vines or Organic practices.

Economic constraints recognised by the kiwifruit orchardists largely involved complaints about the cost or reliability of inputs. The most often identified constraint was that of labour, although no significant differences in response are evident from the interviews. Members of the Organic panel were most likely to complain about other inputs to orchard management. These complaints involve both the limitations imposed by the inability to employ proven chemical 'solutions' and the perceived unreliability of specifically 'organic' solutions. By contrast, identification of capital constraints is most likely to come from the Gold panel. This corresponds closely to the greater emphasis on capital investment within this panel as well and as such warrants greater attention.

Constraints associated with other social actors formed the third largest group identified by the participants. Reflecting on their relationship to the kiwifruit industry, members of the Organic and Gold panels were those most likely to complain about audit conditions. The predominance among Organic growers appears to be as much a response to the additional regulations of organic certification as to emerging audit systems. The concerns of the Gold growers are more difficult to explain and suggest that further examination of factors underlying response to audit is needed. A further variation among panels involves the perception of many Organic growers that their product is not marketed sufficiently to take advantage of its particular quality characteristics. Potential variation among the panels is also evident in their responses to outside knowledge. While a lack of innovations is recognised equally among the panels, Organics growers are more likely to perceive a general lack of adequate research directed toward organic management. Members of the Green panel, by contrast, are more likely to question the value of – while at the same time relying on – available advice. Finally, concerns about the impact of neighbours on orchard management are equally shared among the panels.

As was the case in the comparison of vision, comparisons of constraints located in the personal characteristics of the growers are difficult to assess. Thus, it is possible to identify variation in the frequency of certain responses (for example, members of the Gold panel are more likely to cite a lack of skills); but such elements of constraints require more pointed inquiry into the skill learning process, past production experience, and self-confidence among other factors.

Chapter 6: Map analysis

Question: Could you draw me a mind map/diagram/sketch of your orchard? It doesn't need to be geographically exact. It should contain all the things/features/elements/parts that are important to you and the orchard, and impact on your management of the orchard.

6.1 Introduction

As a part of the first round of interviews all respondents were asked to draw a map (or alternatively in some cases a 'picture' or 'diagram') of their property illustrating the things that were important for the management of their property. It was stressed by the interviewer that these could be positive or negative features, and that geographic exactness was not required.

This technique has been adopted from a group of action research methods which have mainly been developed in the field of rural development in underdeveloped countries (Berardi, 1998, p.439). In the context of the ARGOS program, the key feature of this family of methods is that while the field of research may be externally imposed, in this case by researching sustainable production systems, the aim is that the categories of information and the criteria for judging their importance within that field are determined by the respondents and not the researcher. This summary report presents an overview of the findings of the analysis of these maps. A more in-depth report, including statistical analysis of the data, will be available separate to this report.

6.2 Methods

The methods used to analyse the maps are known as mixed (Rose, 2001, p202). They entailed, firstly, content analysis. Maps were examined and the occurrence of features recorded in a spreadsheet. This was not done through a purely visual interpretation alone. The transcripts of the discussion which occurred while the maps were being drawn were read in conjunction with the visual examination of the maps. This was often necessary to identify features which had been drawn on the map.

In addition to reading the transcripts in conjunction with the visual analysis of the map, the text of the transcript was coded using the features which had arisen from the visual analysis. This discursive analysis provides the means of assessing the importance of features and their interrelationships, as frequencies of occurrence can not be interpreted to directly imply importance. In Rose's words, 'content analysis is a technique the results of which need interpreting through an understanding of how the codes in an image connect to the wider context within which that image makes sense' (Rose, 2001, p.65).

The third method used to analyse the data is statistical. Some of these results are included in this report but further material will be forthcoming.

6.3 Findings

Table 6.1 provides the raw data resulting from the content analysis. The brief discussion which follows has been organised under subheadings determined inductively through the process of analysis.

Table 6.1: Raw data from content analysis.

	Feature	Green	Organic	Gold	Totals
Spatial organisation	Boundaries	10	11	10	
	Blocks	10	11	11	
	Total	20	22	21	63
Transport	Driveways	6	10	7	
	Roads	9	8	8	
	Loading area	2	1	2	
	Total	17	19	17	53
Buildings	Houses	9	11	5	
	Sheds	8	9	8	
	Packhouse	1	0	1	
	Total	18	20	14	52
Wind	Shelter	8	9	9	
	Prevailing wind	7	2	2	
	Wind damage	2	2	2	
	Total	17	13	13	43
Water	Streams and rivers	1	6	2	
	Water sources	4	4	2	
	Water tanks	0	4	0	
	Irrigation	3	3	0	
	Lakes and ponds	2	2	1	
	Drainage	2	1	1	
	Total	12	20	6	38
Climate	Frost areas	4	4	3	
	Frost protection	5	5	2	
	Altitude	1	1	2	
	Climate	1	1	4	
	Total	11	11	11	33
Landscape morphology	Slope	5	5	5	
	Aspect	3	4	3	
	Gullies	2	4	2	
	Total	10	13	10	33
Other biota	Other crops	4	7	6	
	Other trees	3	4	1	
	Compost	0	2	0	
	Total	7	13	7	27
Social context	Neighbours	7	8	7	22
Biotic context	Bush	2	4	1	
	<i>Armillaria</i>	1	3	1	
	Soils	3	3	2	
	Total	6	10	4	20
Overall total		125	149	110	384

6.3.1 Spatial organisation

Blocks were the most frequently noted features across all three orchard types. They are identified by either numbers or letters on the maps. Boundaries were the second most commonly noted feature for all three production systems. The shape of boundaries can impact on management, those allowing rows to be planted at right angles to, or parallel with them being most desirable.

6.3.2 Transport

Driveways were usually only mentioned in passing. If a house was included on the map, then driveways were statistically more likely to be drawn as well. The inclusion of bounding roads, often with their names, on many maps suggests that they are seen as part of the matrix connecting the orchard to the wider landscape and community. However, the roads did have a number of other management impacts:

- Water runoff during rain.
- A dust nuisance.
- A bisecting road was described as an 'irritation'.

One KiwiGreen Hayward noted a conflict between the need to provide an adequate area for loading, and needing to install more shelter.

6.3.3 Buildings

If a house was drawn on a map there was a highly significant ($p=0.009$) difference in the mean number of other features drawn (9.3 features per map as opposed to 6.8). This was the case despite the fact that a number of people who lived on their orchard did not draw their house, and a number of people who do not live on their orchards did include houses. Positive impacts of having a house on the orchard were:

- Increased security.
- Optimum land usage.
- Mitigation of potential economic risks.

Similar proportions of respondents from all three production systems drew sheds on their maps. One KiwiGreen Hayward respondent has a packhouse on their property which is no longer functioning and which is to be converted into a house.

6.3.4 Wind

Shelter, both 'natural' and artificial, ranked in the top three features noted on the maps by orchardists from all three production systems. Management issues to do with shelter were:

- Wind protection.
- Temperature control.
- Protection from spray drift.

Shelter causes some problems for the orchardists:

- Wind dumping.
- Frost damage.
- Shading.
- Providing hosts for scale insects.

Organic Hayward orchardists noted two other problems associated with shelter belts:

- *Armillaria*, particularly associated with willow shelter belts.
- Sapping of nutrients from adjacent ground.

In addition, shelter belts clearly provide a three dimensional division of the orchard space, generally overlaying the edges of blocks, and the property boundaries.

Past noting that the prevailing wind was an important feature on an orchard little was said about it. Responses to wind mentioned were:

- Recognising certain shelter to be more essential.
- Pruning more heavily in areas prone to wind damage.
- Laying down more buds in areas prone to wind damage.

Some areas within orchards are prone to wind damage. Responses to this are:

- Removal of shelter.
- Use of pergola supports instead of T bar.

6.3.5 Climatic conditions

Orchardists from all three production systems made it clear that late spring frosts are a relatively new problem. This was described as a bigger problem for Gold kiwifruit as it flowers earlier than green. Methods of frost protection mentioned were:

- Removing the lower branches of key shelter belts.
- Sprinkler systems.
- Smoke.
- Wind machines.
- Helicopters.

Gullies were seen to provide natural frost protection.

Orchards at higher altitudes have fewer sunlight hours due to increased cloud cover. One KiwiGreen Hort16A grower said this was not a problem for Gold kiwifruit as they crop more heavily anyway.

6.3.6 Water

Streams and rivers function as spatial features, and as water sources. Water was described by one KiwiGreen Hayward grower as the most important thing for management. Three sources of water were mentioned:

- Bores.
- Rivers or streams.
- Private water schemes.

All water tanks were noted and/or drawn by Organic Hayward growers.

Sprinkler irrigation systems can double as frost protection. One Organic Hayward grower noted that he considered that over watering had been a problem on neighbouring orchards.

Two Organic Hayward growers have constructed ponds on their properties. A further two KiwiGreen Hayward growers intend to build ponds on their properties. These have practical functions:

- Drainage.
- Water source for irrigation and frost protection.

The existing ponds also have aesthetic functions being proximate to the site of one home and the intended site of another. One KiwiGreen Hort 16A grower has a duck pond.

One Organic Hayward grower has drained land creating the ponds mentioned above. This grower also has problems with runoff from a neighbouring road. One KiwiGreen Hayward grower, mentioned above, intends to dam a drain on his property. Clearly lakes and ponds and drainage are directly connected phenomena.

6.3.7 Landscape morphology

Hilly ground is generally referred to as 'contoured' ground, although one respondent referred to ground that had been levelled with a bulldozer as 'contoured'. Contoured land is problematic for all production systems:

- Water collects in the hollows.
- Frost occurs in the hollows.
- Top soil depth varies.
- Fertilisers wash away.
- Tractor work and spraying is more dangerous.

A northerly aspect is considered desirable.

Gullies are closely related to bush as a feature of the orchards as, in most cases, possible all, they are actually contiguous. They have a range of problematic characteristics:

- *Armillaria*.
- Erosion.
- Worker safety.
- Reduced winter chilling.

They are also attributed with positive features:

- Natural frost protection.
- Native birds and animals.

6.3.8 Biotic context

Similarly to gullies, bush is attributed with positive and negative characteristics:

- A source of pests including possums, deer, wild pigs, passionvine hopper, scale, and *Armillaria*. *Armillaria* is problematic and is associated with willow shelter belts by one Organic Hayward grower.
- An aesthetic feature and a source of native birds and animals

Soils were mentioned by three Organic Hayward growers, three KiwiGreen Hayward growers and two KiwiGreen Hort16A growers. Soil fertility was noted as:

- A constraint on production.
- 'Quite rich in natural nutrients'.
- Affecting management.
- 'Stuffed' by years of irrigation.
- A good attribute.
- Potentially redeemable by major earth work.

One KiwiGreen Hort16A grower noted that the Gold kiwifruit was planted on their poorest soil as it was more productive than the Green and would produce a better return.

6.3.9 Other biota

Other crops recorded on the maps and mentioned in the transcripts are not necessarily commercially produced crops. Four orchardists who grow other commercial crops did not include them on their maps, and five of those who did record, what has been deemed, 'other crops' do not grow them commercially. How these other crops might impact on the management of the kiwifruit is unclear from the data. Other trees mentioned and recorded included:

- Fruit trees.
- Forestry.
- Overgrown shelter.
- Native trees.

Two Organic Hayward growers described composting as important on their orchards.

6.3.10 Social context

Talk about neighbours referred to practical and social issues and within each of these categories positive and problematic impacts:

- Practical issues –
 - spray drift.
 - unmanaged, bush filled gully.
 - unrealistic perceptions of rural life.
 - complaints about smoke used for frost control.
 - distaste at bird control measures.
 - benefiting from neighbours shelter.
- Social issues –
 - aggressive and disrespectful neighbours.
 - 'friendly neighbours...doing the same thing'.
 - welcome visitors.

6.4 Conclusion

The map analysis as presented here must be considered as a preliminary list of respondent generated management issues which require further investigation to assess their significance and to measure any variation between production systems. The mapping process has clearly been a successful and useful technique. However, that certain features were spoken about more frequently during the map making process than were represented on the maps highlights two points. Firstly, the mapping process is clearly an effective means of eliciting the participants' perspectives of their own management concerns. Secondly, it also underlines the importance of analysing the maps in tandem with the transcripts.

Chapter 7: Measures of sustainability

Question: The ARGOS team consists of many researchers (including economists and scientists and social scientists) and we all have ideas about what needs to be measured on your orchard. But first we want to hear from you about what you think is important and what should be measured.

Thinking about your orchard, what things are important to you and to the management of your orchard, now and in the future?

Why?

What could be measured to record that?

The intent of this question in the interview was to elicit a self-generated list of measures of sustainability. It was expected that such a list would both prioritise measures already included in ARGOS research as well as potentially contributing measures that had been overlooked. The interviewer commented in her notes that participants seemed to find this question a difficult one to answer. They provided a rather diverse list of possible indicators of sustainability on their orchards (displayed as a chart in figure 5.1). Despite the suggestion that measurements might derive from various aspects of orchard management, they overwhelmingly identified measurements of factors related to environmental influences or impacts. The emphasis on environmental indicators is likely the result of sustainability being understood as largely an environmental term. When environmental features were not the first to be identified, they were generally replaced by economic indicators. Also, it became apparent that orchards are 'well measured' by many others. This may have led orchardists placing a greater trust in the results of tests conducted by consultants and packhouses employees (who come on to the orchard frequently to take all the measurements required for the spraying of pests and diseases under the KiwiGreen protocol) rather than in their own observations and other sensory powers. They did not seem to often initiate or explore for themselves, apart from some of the orchardists (usually organic) for whom this was part of their normal practice.

Soil fertility or health (5,9,4) was the most commonly identified element to be measured. In the majority of cases, participants suggested a simple test of nutrient levels in order to determine the appropriate fertiliser rates (chemical in the case of integrated growers, organic additives in the case of Organic growers) to alleviate any deficiencies. This response also included the desire to monitor soil biota, especially within the Organic panel (0,5,1). Following the condition of the soil, participants were most eager to assess the health of the orchards' vines (3,4,1). Generally, this involved leaf nutrient tests, but there were also general references to a healthy orchard (as indicated by condition of grass sward, disease presence, availability of resistant varieties, etc.). Other more frequently mentioned measures include pests (2,3,1) and climate (impact of rainfall and frost and need for irrigation or shelter 1,0,3) and management impacts on yield and fruit quality (pruning 3,0,1 and pollination 3,2,0). The actual impact of management practices on the environment was mentioned only four times (0,1,3) and included concerns with soil contamination (usually where this was already an issue) as well as the drift and run-off of chemical inputs.

Factors of sustainability not related to the environmental aspects of management include financial returns (1,2,5), determination of factors of fruit quality (1,2,3) and lifestyle (0,2,2). The first group – the larger representation of Gold growers reflects similar trends in discussion of vision and economic indicators – suggested either that insufficient data was available for assessment of economic viability or that there was some concern over the continued profitability of the sector. As a response to this question, fruit quality also reflected its inclusion as an economic indicator below. It appears to be a more important issue among Gold growers who are struggling with poor taste and dry matter levels in their fruit and Organic growers concerned about the smaller size and yield of organic vines. When

identified as an indicator, lifestyle was generally described as difficult to measure. It was, however, a factor that could counteract apparently unfavourable conditions in other (especially economic) measures.

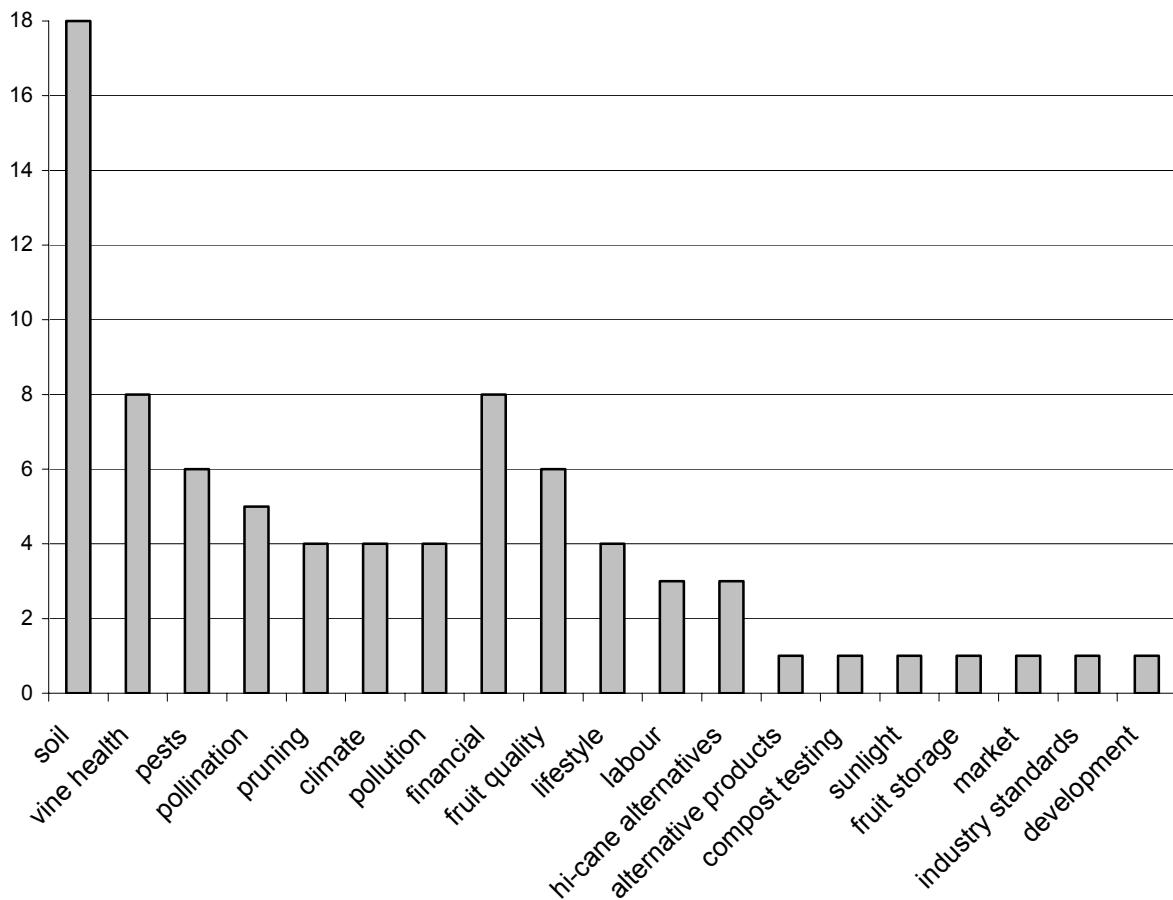


Figure 7.1: Frequency distribution of responses to question about potential measurements of sustainability.

Chapter 8: Indicators of financial wellbeing and productivity

*Questions: What tells you how productive your orchard is?
How do you know that financially all is going well?*

Responses of the participating orchard owners and managers to these two questions are combined in this section as they are generally addressed as economic factors. As such, there is often overlap in the answers which they provided in response to either question. The most common responses focused simply on financial balances following harvest with only very few participants pursuing more in depth analysis of either risk or relative returns on investment. It was more likely, in fact, for them to simply identify returns without specifying costs as such. Comparisons with industry returns in general were also used as means of assessing the level of financial wellbeing of an orchard. Very infrequently were non-economic factors introduced within this portion of the interviews. The possible exception is discussion of the health characteristics of plants as indicators of the relative productivity of an orchard.

8.1 Assessing financial wellbeing

The participants in the interviews indicated that they generally employed three means of assessing the financial wellbeing of their orchards. First among the factors which they considered was that of returns, both actual and potential. References to returns included factors of productivity, the ability to pay bills or make investments, and 'coming out ahead.' Those who focused primarily on returns commonly enjoyed relative economic security either from outside income or having already paid off the orchard mortgage. Often, assessment of returns was subject to costs, including those of inputs or – less frequently – environmental or social externalities. A final means of determining the level of returns was through benchmarking based on reports from ZESPRI and the pack houses.

8.1.1 Returns

"You know, the bigger nicer fruit you're producing at the end of the year – it's a better result financially. That's what keeps driving you at the end of the day, isn't it?"

Responses:

- Productivity as indicator returns (2,3,0):

Male: "The money we get from our crop which's just been picked we use it for this year. So, we're kind of hand to mouth. Be nice to get into a position of the other way around."

Female: "But the tray number would be the all important thing. I mean, if you've only got a few tray numbers, it doesn't matter if you've got Kiwistart or not."

- Capital flow as indicator of returns (2,2,2):

"I don't spend as much time as I should, financially analysing what is happening. Again it's complacency, I suppose. I don't have to worry, because I'm making enough money to do what I want to do, and I don't have the time to worry over this. I know the money's in the bank."

- Profit as indicator of returns (1,1,3):

"Yeah I suppose it is orchard gate return. There's no doubt about that. It's a pity that there's not a standard measure over the whole industry, but there isn't so. Hey that's the way it is. Orchard gate return is really the only measure."

8.1.2 Costs and Returns

"It's [measurement of financial wellbeing] – obviously the monetary return in relation to the financial input."

Responses:

- Input costs and returns (2,5,7):

"Your costs [have] got to be taken out... That would be a very hard figure to get, because every orchardist has got different costs. With my orchard here, I'm spending about twelve thousand dollars a year on labour units and possibly – I can't remember now – possibly about two thousand on sprays and two thousand on fertiliser."

- Externalities and returns (1,3,1):

"Well it has to be financial, but, like I was saying before, we aren't going to be driving production that hard that we go backwards on it, 'cause we can only push the plants so far. Start pushing them too far and stressing them too much, we're going to start losing things..."

8.1.3 Benchmarking

"One thing I I'm interested in is just a comparison of how, well we're doing..."

Responses:

- Industry comparison as indicator (0,4,2):

"Well, the pack house gives us a little print out that tells us what [our] return per hectare [is]. 'Cause they know all our areas and stuff... You compare with the other growers in the ZESPRI group and other growers in the Bay of Plenty and then nationally. So then you can make comparisons."

8.2 Productivity and healthy vines

"Healthy plants. Good mark. The type of fruit that the market requires and aiming at export markets..."

The final economic indicators addressed in this section refer to orchardists' assessments of orchard productivity. Whereas some of the participants' responses are included in the previous codes of this section, the text marked under productivity include discussion of aspects of the orchards and their products specifically. Kiwifruit yield, both its quality and quantity, were most commonly identified as indicators of productivity. Quality involved such diverse characteristics as fruit size, low reject rates (for either appearance or presence of insects), taste, and dry matter content. Quantity was more straight forward with reference to number of trays or trays per hectare. Frequently, both quality and quantity were identified as indicators in the same interview. Finally, some of the participants referred back to their own management practices, arguing that good vine health was the basis for higher yields. The differences in panel response share (based on similar text coded above) some factors noted earlier including the lower level of concern with quality (possible an assumed quality of their fruit) and greater attention to the ecological characteristics of the orchard among Organic orchardists. These are themes that will need to be further investigated in future qualitative interviews.

Responses:

- Fruit quality as indicator (3,1,4):

“Like, we'll talk management tools like Hicane. You can control that a little bit you know, and thinning. If you end up with huge crops every year, then you've got to rip it all off. It averages out. 'Cause fruit size is also a payment structure: taste and size, you know. You don't want your fruit too big, don't want it too small. You wanna keep it in the middle.”

- Fruit quantity as indicator (6,7,8): “Well, the main thing is, at the end of the year, the fruit size and trays per hectare, really.”
- Vine characteristics as indicator (2,5,2):

“Well, for me, it's the health of the vines: the colour of the leaf and, I suppose, the fruiting. I mean, if you've got good fruit that means the vine's doing well. If you've got a whole lot of little marbles and things, there's probably something wrong with the vines: the health of them or the soil or whatever. So, it's all hand in hand with doing the crop numbers. The reason you're doing those crop numbers and the size is because everything must be fairly healthy.”

8.3 Comparing the panels

The discussions of financial well-being and productivity by representatives of each of the panels suggest several indicators that are significant for participants and that should be considered in future research. Most importantly, participating kiwifruit orchardists look to earn some sort of positive return from the orchard. The level of that return relative to costs (or to alternative investments of capital or labour) is less frequently identified as indicative of well-being. This possibly reflects the current positive economic situation of the kiwifruit sector as well as the general expectation of escalating land values – the latter promising high returns pending the eventual sale of the property. The importance of relative returns appears to be more important for the Organic and Gold panels, perhaps reflecting either differences in the life cycle positions of the panels or the more established nature of Green production.

The most appropriate indicators of productivity appear to be fruit quality and fruit quantity. Quality is especially important to the Green and Gold panel with Organic orchardist apparently perceiving the quality of their product to be a given. Quantity, on the other hand, is recognised equally across the panels. Vine characteristics provide a third potential indicator which is more widely identified by the Organic growers. The extent to which this difference reflects basic differences in approach to management among the panels will occupy an important position in future qualitative data gathering.

Chapter 9: Caring for the kiwifruit environment and animals on the orchard

Questions: What tells you that you are looking after the environment on your orchard? (Is there anything in particular that you notice – see, hear, smell, taste, feel – that tells you everything's OK?)

Can you tell me about the animals – including insects – that you notice on your orchard?

What animals do you notice?

(Prompt for a full list of animals present at any time of year.)

Can you tell me about the birds on your orchard?

The following sections focus on two themes from the first qualitative interview which were aimed at firstly, investigating how growers think about the environment on their orchard, and secondly, getting a basic idea of the animal life that growers notice around them.

9.1 Understandings and conceptions of the environment

Question. "What things tell you that you are looking after the environment on your orchard?"

This section outlines the different understandings that growers have about the way in which they look after the environment on their orchard. Amongst the growers, these understandings cover a variety of approaches and varying emphases as to what is important in caring for the environment. The responses in this section were mainly in reply to the question above - "what things tell you that you are looking after the environment on your orchard?" Some responses, however, were coded from other parts of the interview when the topic of conversation moved onto a discussion of the environment.

9.1.1 Animals/plants show environmental health (4, 3, 4)

Nearly a third of growers used animals and plants as indicators that they were looking after the environment. Eleven kiwifruit growers pointed to one, some, or all of the following to determine the healthiness of the orchard and surrounding area: 'wildlife', animals, birds or plants.

Animals (including birds and insects) indicate environmental health

Responses:

- "I think the animal life [tells me I'm looking after the environment], birds, bumble bees, thinks like that"; "The wildlife tells you about the environment really."

Several growers mentioned birds as being important: "Well if the birds nest in the vines [everything is going well]"; "The number of birds out there [tells me I'm looking after the environment]."

Two organic growers mentioned a variety of different animals, birds and insects as indicators they were caring for their orchards, and thought the environment they were developing was more likely to encourage this wildlife:

"There's a lot of spiders in there [the orchard]. There's a lot of birds. I've been to a conventional orchard, there's no spiders [and] there's no birds...a lot of them are pretty barren."

"I think the wildlife that's starting to visit us, we've got pukekos that are encroaching on the property – they are on conventional orchards too I must admit,

but we get deer that choose to come and graze our orchard instead of the neighbour's orchard, which is a mixed blessing."

Plants indicate environmental health

Responses:

- Some growers look to the health of the kiwifruit vines as an indicator of environmental health:

"The health of the plants...the kiwifruit vines for one thing because they are living plants just like anything else, so if there was an environment down there that was detrimental to plant life, they would suffer."

"If your plants are healthy then you must assume that you are doing something right. Then if your plants start dying then you know you've got it wrong, big time ...I guess that's the only way I can actually see as such, that we're doing things right."

- Two growers also looked to the fruit as an indication they were caring for the environment:

"The colour and density of plants in the same area, the shelter, the actual kiwifruit themselves"; "I'm sort of quite convinced this is why we're continually producing food fruit, because we're looking after the property – especially the environmental part of it."

- For other growers, grass under the vines, helps to show them if they are caring for the environment: "I mean even grass, it's not only colour, it's got shine to it if it's healthy" (Green). And another said: "You look for the health of the grass."
- One organic farmer also connected his healthy grass with the avoidance of synthetic weedkiller: "We have good, good healthy grass – we don't have any dead strips around that you'll get with *Roundup*" (Organic).

9.1.2 Spray use and the environment

Ideas of caring about the environment were frequently linked to ideas about the use of sprays on the orchard. The word 'spray' was used by growers to encompass both weed killers and pesticides. These ideas, as demonstrated below, incorporate different emphases: some growers argue that spray use is inherently damaging to the environment, with others suggesting that well-managed spray use is not detrimental at all.

Responses:

- Sprays damage the environment (2, 3, 3).

"I'm making it healthy there for everything...and the fact that I'm not putting on these sprays that would ... get everything out of kilter and that sort of thing."

"You've gotta think well, what's it [spray use] going to the environment, in the long term. Then surely there's gotta be something that you can come up with that's not so environmentally damaging."

One organic grower, when asked how he knew he was looking after the environment on his orchard, referred obliquely to spray use saying: "If I can go there anytime of the day without needing gas masks".

- Previous spray programmes (2, 0, 4). Six growers emphasized that while previous spray programmes may have been harmful to the environment, they considered the current programmes to be completely different.

“In the old days every three weeks, they’d build up one mean brew and just fire it on. But it’s completely different now ... it’s a hell of a lot more controlled than it used to be.”

“I think we’ve come a long way from what we used to do...we’ve come a long way from fourteen sprays down to two [but] I don’t think you’d take the two away.”

One grower emphasized the damaging effects that he had observed DDT use had on the environment:

“So two pints [of DDT] to the acre...I did notice we had no earth worms, and when we sprayed it around you’d see a few dead thrushes and things around the place.”

The same grower emphasized that current sprays were far more environmentally friendly:

“The sprays we’re using are a lot more friendly than they used to be. I think most of them now you could probably drink them and they wouldn’t do you much harm”.

- Spray not harmful to the environment (1, 0, 1). Two growers (one Green, one Gold) specifically explained that they thought spray use was not harmful to the environment if carried out correctly.

“If you do your spray programmes right ... you don’t actually have too much of a hassle. And the environment should be harmed least by those programmes. I mean the expense is supposed to be working out so it’s not really harming the environment.”

Another grower observed the effect of the spray on animal-life and concluded it was not harmful:

“I was just so surprised, even after spraying, you’ve still got birds ... there’s still rabbits running around ... so it sort of changed my whole blinking attitude ... I mean quite often you’ll get birds nesting in the vines ... and the sprayer will go through spraying for leaf roller or something like that – it’s a pretty powerful sort of a spray. So quite often I’ve watched the nests and it just doesn’t seem to affect the birds”.

9.1.3 Soil health (2, 7, 4)

A third of growers mentioned issues connected to the soil, as a means of assessing the environment on their orchard. This was particularly of interest to the Organic orchardists.

Responses:

- According to one Organic grower: “Just the good healthy soil [tells you that you are looking after the environment] – and the fact that if you get a heavy rain it doesn’t puddle around.”

Two Organic growers emphasised that in order to determine whether their soil is healthy, they look at soil appearance and worms as indicators: “[I look to see] if it [the soil] is nice and friable and aerated. And rich in humus ... because if there’s plenty of humus then it’s usually aerated.”

“The first thing [to see if soil is healthy] is the texture and the smell of the soil - tells you a lot. The colour of it – what’s in it, you know, what’s living on top of it, what’s living in it. Worms tell you everything.”

Several growers mentioned that they relied on ‘experts’ to help them determine whether their soil was healthy:

“Our soil agronomist...will be doing a soil test and looking at the soil, and looking at the worm populations – we get a report from him.”

“I just get a consultant’s reports on soil fertility. You know, you can’t be an expert at everything and I’m not an expert on soil conditions ... so you use consultants where you’re not up to scratch.”

9.1.4 Different management practices in relation to the environment (4, 3, 2)

Some growers referred to specific management systems as a means for knowing they were caring for the environment. For these growers, there was a sense of security that the environment was healthy because of the system they used. This is not to suggest that they did not use other means of looking at the environment, but in using a particular growing system, some growers felt a level of confidence that they were looking after the environment. These comments arose without any specific prompting and therefore this is unlikely to be representative of the growers as a whole.

Responses:

- Advantages of the KiwiGreen programme (for the environment). According to a Gold grower:

“You know [you are looking after the environment]...with the KiwiGreen spray programme. We’ve cut down on a lot of our sprays and we’re not spraying regimentally anymore – we’re just spraying when there’s a problem.”

A Green grower expressed something similar: “Obviously KiwiGreen has been a great system that’s been in place into the industry and I think it’s great.”

- Advantages (for the environment) of growing organically (1, 3, 0). One organic grower began by stating the advantages of growing organically, and then mentioned that he thought ARGOS would be able to help conventional growers to become more ‘green’ through sharing of information:

“I think we are a step ahead of the conventional guys – a big step, probably. To lift them. Because you’re going to check between us and do a comparison. You’d probably find a lot of them have a desire to be more green in their ways.”

One Green grower expressed a hope that one day the entire industry would become organic:

“I’m pretty focused. We are market driven all the way down the track. But having put that in one package, I’m also conscious of the industry being environmentally sustainable – and whilst I’m a conventional grower, I do study some aspects of organic growing. I’m hoping that one day the whole industry will be able to switch over to organic.”

9.1.5 Linking ‘cleanliness’ and ‘tidiness’ to caring for the environment (2, 0, 3)

A few growers mentioned ideas of cleanliness and tidiness with regard to caring for the environment. These ideas were not mentioned by any Organic growers.

Responses:

- “I think I’m managing this property well. Full stop. With cleanliness, tidiness and everything else I’ve mentioned before in talking to you about the caring of the environment.”

9.1.6 Being a caretaker of the land (ideas of stewardship) (1, 6, 0)

While most growers identified specific indicators which let them know they were looking after the environment, a few talked in broader, philosophical terms about their role as caretaker of the environment on their property. This section links to Section 5.1.3 above, which discusses ideas of stewardship in relation to vision.

Responses:

- The following comments from Organic growers demonstrate this connection between growing organically and the perception of a wider responsibility to care for the environment:

“We’re really only caretakers of it [the environment] and, you know, while we’ve got it the idea is that you leave it better than you found it. And if that could carry on every property throughout the country, it would be a boomer country.”

“It [growing organic kiwifruit] is for the good of the planet as well as the environment as well as myself – it’s not just for the good of my ego.”

“What it really comes down to every day ... that’s one of the things you take on really when you decide that you’re gonna be an organic grower, you aim to enhance the environment rather than destroy it.

9.1.7 ‘Greenies’, ‘Green’ politics and the environment (2, 1, 1)

Although only mentioned by a small number of growers, there seems to be a negative connotation associated with the idea of being a ‘greenie.’ Several growers emphasized that while they may make an effort to care for the environment they did not want to be considered a ‘greenie’, or affiliated with Green politics.

Responses:

- “Personally I’m not a greenie, but I certainly don’t want to see my orchard going to the pack because I’m firing on all sprays and everything.”

Although organic production is frequently associated with ‘Green’ politics, one organic grower emphasised he was not a ‘greenie’.

“The best way I can see forward is...turn the country round in twenty years [and] have an organic country. Not that I’m a greenie, I don’t support the old Green Party or anything like that.”

9.2 'Noticing' animal life on the orchard

This section provides an overview of the animal life (including mammals, birds, invertebrates, fish, frogs and lizards) that growers have noticed or observed on their orchard. This section is based on the growers' responses to the follow question/s:

Questions. Can you tell me about the animals you notice on your orchard? What animals do you notice? Can you tell me about the birds on your orchard? (NB: Not all these questions were necessary asked of all growers because some had already given full responses when replying to other questions).

Growers' observations of animals were described in a variety of ways: some animals being noticed because they were pests; others because they were seen as beneficial to the orchard; others were appreciated for more aesthetic reasons, and others were just noted as being present in the environment. (For a discussion of pests as constraints on orchard management, see Section 5.2.1 above.)

The tables below summarise the mammals, birds, invertebrates, and other creatures that growers notice on their orchards. While this makes a useful place to start in regard to establishing indicators on the orchard, these lists should not be considered exhaustive. In addition, this first interview was not designed to explore how growers feel about these animals, or to gauge what degree of significance they have on the orchard; this is an important area to be explored in subsequent research. This list does, however, indicate the animal life that was most obvious to growers at the time of the interview.

Table 9.1: Mammals noticed by orchardists

Mammal	No. of orchardists
Rabbits	23
Possums	16
Mice	6
Deer	6
Hares	6
Wild Cats	5
Rats	5
Hedgehogs	5
Wild Dogs	3
Stoats	2
Wild Pigs	1
Ferrets	1
Weasel	1

Almost all the mammals identified by growers, were considered to be pests on the orchard (with the exception of hedgehogs that were generally viewed favourably. Rabbits and possums were mentioned most often, with growers highlighting the constant battle they have to keep the populations of these animals under control.

Table 9.2: Birds noticed by orchardists

Bird	No. of orchardists
Pheasants	22
Sparrows	20
Pukeko	17
Fantails	16
Blackbirds	16
Tui	15
Thrushes	15
Rosellas	13
Quail	11
Wood Pigeons	10
Ducks	9
Waxeyes	7
Kingfishers	7
Hawks	7
Finches	6
Swallows	6
Magpies	5
Bellbirds	5
Morepork (Ruru)	4
Starlings	4
Minahs	3
Cockatoos	2
Warblers	2
Kiwi	2
Yellow hammer	2
Pied stilts	2
Plover	2
Guinea Fowl	1
Seabirds	1
Crows	1
Ring-necked Dove	1
Shining cuckoo	1
Skylark	1
Pigeon	1
Linnets	1
Seagull	1
Geese	1

The majority of birds that growers mentioned were seen as positive or, at least, harmless additions to the orchard. Fantails, in particular, were spoken of quite affectionately and two growers described these birds as ‘keeping them company’ in the orchard. Pheasants were also appreciated and, although not described in such affectionate terms as fantails, many growers appear to enjoy the aesthetic pleasure of seeing pheasants on their orchard: “It’s always nice to see a few pheasants running around in the orchard.”

Several growers have adapted management practices so as not to disturb pheasants on the orchard, such as postponing mowing grass in areas where pheasants’ eggs might be destroyed.

Pukekos were viewed as the most problematic species of bird on the orchard, with growers frequently complaining about the damage they do to flower buds. As the following example shows, some growers are also unsure about how to deal with this problem: “They [pukekos] are not my friends. Not that I’m allowed to do anything about it”.

Table 9.3: Invertebrates (insects etc.) noticed by orchardists

Invertebrates	No. of orchardists
Worms	15
Spiders/spiders webs	11
Insects, general	11
Cicadas	10
Leaf Roller	7
Scale	7
Fullers Rose Weevil	7
Bees	6
Caterpillars	5
Passion Vine Hopper	5
Flies	4
Wasps	4
Bumble Bees	3
Ladybirds	2
Praying Mantis	2
Thrip	2
Nematodes	2
Mites	2
Beetle	2
Sandflies	2
Lacewings	1
Centipedes	1
Greenshield Beetle	1
Ants, flying	1
Wetas	1
Eucalyptus beetle	1
Crickets	1
Army worm	1
Dragonflies	1

Invertebrates were regarded by growers in a variety of different ways. Some species were seen as beneficial to the orchard, and (as mentioned above) indicators that the environment was healthy. An increase in the numbers of spiders (and spiders webs) on orchards was regarded as a good sign by several growers. For example one grower noted:

“I’ve noticed since I’ve decreased spraying over the past 10 years my spider population has increased in the orchard – you’re out working in the summer and you’re walking through webs all the time.”

Cicadas were mentioned most often by growers as the most troublesome pest on the orchard: “We’ve had a lot of cicadas the last couple of summers ... and they have been, shocking, and they seem to be getting worse.”

Table 9.4: Fish/amphibians/lizards noticed by orchardists

Fish/amphibians/lizards	No. of orchardists
Lizards (general)	10
Frogs	2
Skinks	2
Geckos	1
Eels	1
Flounder	1
Fish (general)	1

Fish, amphibians and lizards were not generally described in either a positive or negative way, but were observed as just 'being' on the orchard. (Note: while 10 growers said there were lizards on their orchard, this was mainly a result of being asked about the use of 'lizard lounges' on their property, rather than being a self-generated response to the question about what animals are noticed on the orchard.)

9.3 Conclusion: comparing panels for understandings and conceptions of the environment

9.3.1 Birds, animals, plants

Nearly a third of growers across the three panels used animals (including birds and invertebrates) and plants as indicators that they were looking after the environment. Different indicators were described across the panels, with growers used generic terms such as 'birds', 'animals', 'wildlife', 'vegetation', insects; along with more specific terms such as 'grass', 'bees', 'spiders', and 'leaves'. From the first round of qualitative interviews it appears that these different descriptions do not fall into any obvious pattern or differences between panels, except for the identification of 'birds' as indicators of a healthy environment. Six KiwiGreen growers (2 Green, 4 Gold) identified 'birds' as being important, while only one Organic grower highlighted birds. This is not to suggest that Organic growers do not regard birds as being important. In terms of using birds as prima facie evidence of good environmental management on the orchard, however, there is a suggestion that this is more important to KiwiGreen growers. This may be connected to a discourse within KiwiGreen, which highlights birdlife as evidence that spray inputs are not environmentally damaging.

9.3.2 Spray use and the environment

Ways of knowing that the environment was being taken care of were frequently linked to ideas about the use of sprays on the orchard. Eight growers, spread evenly across all the panels (2,3,3), thought that spray use could damage the environment, and therefore limiting spray use was one way of knowing that the environment was being cared for. There does appear to be a difference between the panels in discussions about the use of previous spray programmes. Six KiwiGreen growers (3 Green, 3 Gold) emphasized that while previous spray programmes may have been harmful to the environment, they considered the current programmes to be completely different – while no organic growers made this observation. This is, perhaps, an obvious difference to expect between the panels, but it may be important in terms of how growers measure environmental health. To some KiwiGreen growers, knowing that they are caring for the environment is achieved 'comparatively'. That is, by using the 'bad old days' as a measuring stick, KiwiGreen growers are less critical of current spray programmes because they are such an improvement on previous practices. In comparison, organic growers, who do not make this comparison, have less tolerance for any level spray use and the potential negative impact on the environment.

9.3.3 Soil health

A third of all growers mentioned issues connected to the soil, as a means of assessing the environment on their orchard with a majority of organic growers making up this group (2, 7, 4). This is a result that would perhaps be expected, given the emphasis on soil health in organic production, and is an area that requires further research to elaborate further. Of interest also perhaps, is that two KiwiGreen growers (one Hayward, one Gold) mentioned that they sought the services of soil agronomists to monitor soil health on their orchard in order to 'know' whether they had healthy soil.

9.3.4 Different management practices in relation to the environment

Some growers referred to specific management systems as a means for knowing they were caring for the environment. For these growers, there was a sense of security that the environment was healthy which was directly connected to the system they used. Interestingly, this confidence was expressed across all three panels, but obviously with confidence in different management systems. Four Hayward Green and two Gold growers felt that in using the KiwiGreen programme, they could be confident that they were also caring for the environment. Similarly, three Organic growers felt that in growing organically, they were automatically creating a healthy environment. This is not to suggest that all these growers did not use other means to know they were looking after the environment, but a certain amount of confidence was specifically associated with using a particular growing system. These comments arose without any specific prompting and therefore this is in no way representative of the growers as a whole.

9.3.5 Linking 'cleanliness' and 'tidiness' to caring for the environment

Two Green and three Gold growers mentioned tidiness and cleanliness as indicators of environmental care. However, no Organic growers suggested there was link between a tidy/clean environment and a healthy environment.

9.3.6 Being a caretaker of the land (ideas of stewardship)

While most growers identified specific indicators which let them know they were looking after the environment, a few talked in broader, philosophical terms about their role as 'caretaker' of the environment on their property. These preliminary results do point to a difference between the organic and KiwiGreen panels, with one Hayward grower and six organic growers emphasising that they see themselves as caretakers of the land with a wider responsibility to look after and improve the environment.

Chapter 10: Contribution of orchard to individual, family and community wellbeing

10.1 Contribution of orchard to individual wellbeing

Questions: How does your orchard contribute to your own wellbeing? What is it about orcharding that makes you happy?

“I feel good about what I do.”(Gold)

“It always gives me a buzz.” (Organic)

“I love it.” (Organic)

“I enjoy the whole lot.” (Green)

These were common responses from orchardists when asked about the association of orcharding with their wellbeing. Organic orchardists were more likely to talk about loving their work or the environment in which they work and live (2 Green, 8 Organic, 4 Gold), whereas the Hort 16A orchardists were the most enthusiastic by far with the word ‘enjoy’ being used more than twice as much as the other two panels (14, 12, 31). (This of course can be skewed by individuals who use these words a lot.) But what is it that they enjoy and love? There was a sense that living in this particular place or location and doing this work came together in what was generally deemed to be a particularly good lifestyle. These three themes of place, work and lifestyle will be concentrated on in the following sections and the similarities and differences that could be emerging between how the orchards are perceived to affect the wellbeing of the orchardists from the three different growing systems and two different varieties.

10.1.1 Wellbeing associated with place or location

People felt strongly that they place in which their work was carried out affected their wellbeing positively: “We’ve got an environment that we enjoy living in and working in” (Gold). This wellbeing could also be closely related to whether or not those interviewed lived on the orchard (see Appendix 3, Table 10). The Organic orchardists in particular enjoyed the environment of the orchard, the feel of the place, and the birds and insects that they saw there. For example, one orchardist said, “We’ve got spider webs galore which I love getting smacked in the face with” and another mentioned how beautiful they were in the mist. This was in contrast to the Gold orchardists who appeared to be more attached to the place outside the orchard – for example, the Bay of Plenty, the beaches, the climate, and the views of the water. For these people the land value was an important part of this attribute:

“One of the underlying things about this orchard has been the fact that it’s in the Bay of Plenty, and it’s been quite comforting to know that its value has gone up and up and up, and kept going [up].”

Many of those interviewed, but more so the Green orchardists, felt happy to know that they could continue living on the orchard as they grew older, while doing less and less of the work required through the use of contractors or managers (see ‘work’ later).

Most of those interviewed valued living in the country highly and were pleased they did not live in town. Rural or “semi-rural” living was associated with space, privacy and lifestyle (see below).

10.1.2 Wellbeing associated with work

People generally loved or enjoyed their work be it orchard management or physical work in the orchard, even though for some the latter had affected their health causing shoulder and neck problems, while the former had resulted in problems through being more sedentary! The contradictions of this are encapsulated by this orchardist who said, “My shoulder’s buggered, my neck’s buggered” but who later said, “I just love the lifestyle. I love the job”.

Orchards were seen as pleasant environments to work in (as long as it wasn’t raining). Many mentioned how much they liked working outside: “It’s just so nice working out there – no phones, listen to the birds all day,” and, “It’s a nice place to be”. There were many stories about the enjoyment people gained from birds, the fantails in particular and how they engaged in play with them: “The fantails that keep us company ... keep us entertained”. Orchards were seen as places that provided a good balance between being social and being solitary. They were social places with many visitors in various work capacities as well as those who worked on the properties for longer periods: “I get a lot of joy from that”.

Their work provided them with satisfactions and challenges, and sometimes frustrations. Satisfaction was gained from the financial returns, high productivity, a return for the hard work, the pleasure of ‘growing something’ and seeing the result at harvest, “The satisfaction comes when you pull your fruit off ... and people sort of go, well, you’ve got a good result,” and being able to provide employment for others and care for your family. The respondents from the Green orchards may see the orchard more as an investment, perhaps for retirement. For the Gold orchardists the financial returns and high productivity associated with achieving goals and increasing productivity, played a greater part in their wellbeing than they did for the other panels: “I enjoy numbers ... big numbers!” For some their wellbeing was dependent on this: “[It] depends if we’re making money,” or on making a comparison with others: “We’re the best ... average is not good enough”. Some orchardists mentioned the pleasure they obtained when visitors or workers made comments about the tidiness of their orchard, the size of their fruit, or their enjoyment of it as a working environment. For many of the Organic orchardists felt the satisfaction of knowing they were caring for the environment:

“It makes me feel I’m doing the planet good. This piece of land here – I’m treating it what I consider – we consider – [to be] better [than] what the neighbours are treating it”.

A positive comparison could also be made with past practices before the advent of the KiwiGreen integrated management system for pest control, for example. For some Organic orchardists it was a way of unobtrusively “... encouraging others to be a little more environmentally conscious”. Managers tended to talk more about achieving goals rather than challenges.

Challenges were mentioned by many Gold and sometimes Organic orchardists and were related to how important it was to them to have a challenge. This could involve moving on after adversity –such as that suffered with a bad frost. It could be “... developing everything we’re doing to the utmost ... new ways to improve crop numbers, profitability, etc.” or “... keeping up to date”.

Those working in the orchard enjoyed the flexibility of working hours that it gave them: “We don’t have to be here every day at 4 o’clock milking the cows,” and the autonomy of choosing when to do what: “... to work as hard as you want or play as hard as you want”. This gave them more choices about going to children’s school activities, for example. This also came with self-employment, which mainly was seen to be positive but a few felt it did have a negative side as well, because there was always more work to do: “We don’t know when to stop, take a break, because there’s always something going on”. As well, it was often associated with the freedom to choose how much work to do as orchard owners grew older.

Green orchardists mentioned this more often than the others and talked of the orchard as “... giving us something to do and giving us an interest”, which was very important to them, “... instead of sitting around doing nothing – you’ve gotta do something”.

For some their work had provided them with opportunities that they felt they would not have otherwise had, such as involvement in politics in organisations associated with kiwifruit or other orchard products.

10.1.3 Wellbeing associated with lifestyle

“Lifestyle’s really important.”

“It provides a good lifestyle.”

“It’s improved my own personal wellbeing heaps by coming here.”

Those interviewed generally thought that growing kiwifruit provided an ideal way of incorporating work that provided flexibility to allow them to enjoy the great location or environment in which they lived. The word lifestyle was used frequently. The location was often linked to leisure activities such as those associated with the beach. This lifestyle was strongly related to their wellbeing: “I wish I’d discovered it about 20 years ago”. It was frequently compared with dairying, a lifestyle many seemed to be familiar with personally and in which they were pleased to be no longer participating. In addition, kiwifruit growing was thought to be ‘family friendly’ and healthy. Organic orchardists felt they looked after their own health and that of their family and neighbours by being organic. They were also particularly aware of some of the negatives impacts on health related to living in orchard areas – pollution of water and spraying. A lot of people mentioned contact with neighbours in a positive way. Most found it a low stress lifestyle, but one which did have periods of high activity such as during the picking season.

The lifestyle was one which could be enjoyed now and in the future, particularly in retirement: “I hope to stay here forever”. It was contrasted with an urban lifestyle, often one associated with a past life: “I have no desire to go back to the city to live”. This was associated with busyness, traffic and stress.

10.1.4 Conclusion: comparing panels for individual wellbeing

This section summarises some of the points made throughout the previous sections. Organic participants were more likely to say that they loved their work than others but Gold participants were the most enthusiastic – with the word ‘enjoy’ being mentioned most frequently. (There were of course, other positive words used as well to describe how orcharding contributed to the personal wellbeing of these people.)

For Organic participants, personal wellbeing was more likely to be associated with life on the orchard and their enjoyment of the bird, insect and plant life. By caring for the environment they felt the satisfaction of looking after their own, their family’s and the community’s health, and being a positive role model for others. They were also more aware of the possible negative impacts on their health associated with living in an orcharding area.

For Gold participants the place outside the orchard, the beaches, living in the Bay of Plenty and other lifestyle commodity factors were important to their personal wellbeing. The land value of the orchard, their financial returns, and their high productivity were things that were also more likely to make them feel happy. Many also mentioned their enjoyment of the challenge of growing a new variety that was provided by Gold. Challenges were also important to the Organic participants.

The retirement options provided by an orchard which provided them with something “to do” for as long as they wanted some work activity, and seeing the orchard as an investment for their retirement were more likely to feature as contributing to the wellbeing of the Green participants.

It is apparent that there are some differences emerging between the panels in their responses to this question about their sources of personal wellbeing. The respondents from green orchards may be more interested in the orchard as an investment, particularly for retirement. The Gold orchardists may see the location of the orchard as a lifestyle commodity and be more focused on financial and production outcomes while the Organic orchardists might be more likely to enjoy the orchard environment.

The majority of people interviewed felt that their orchard contributed enormously to their wellbeing in various ways – the locality in which the orchard was placed, the actual environment of the orchard itself, the type of work required in this job and the satisfactions it brought, and finally how these things come together to provide a good and enjoyable lifestyle.

10.2 Contribution of orchard to family wellbeing

Question: How does your orchard contribute to the wellbeing of your family?

“A great environment to bring up kids.”

There are not “... the pressures that perhaps kids who live in the cities have and all the problems that tend [to be] there.”

The analysis of this question was not as clear cut as the others because often there were many different responses with very few the same. Because of this there is very little to distinguish the responses of those from green, organic or gold orchards. The work of orcharding obviously earns people a living and provides them with the means to bring up their families and carry out other activities. But the associated lifestyle is seen to benefit families in many different ways. Orchards also involve ownership of land and hence the land may have been owned by previous generations which can mean that it has developed important family connotations. Families too can impact on the decisions that people make and change their priorities.

10.2.1 The orchard as enabler

Provision for family

The orchard has enabled many things to happen for those who work at orcharding in one form or another. It had provided an income for people to look after their family. This income was a way of fulfilling some family dream in the future such as trip overseas, or providing a lovely home.

One of the common aspects of the rural that was valued most highly was that it was a “... good place to bring up kids”. A rural upbringing provided a healthy environment that provided freedom and more space and was free of the fear that ruled parent’s lives in town, with the bonus of still being close enough to town to participate in all the activities that a town could offer.

“Our main goal is the children, and to have a secure base to, you know, teach them and help them become independent, and we see the orchard as being a great place of that to happen.”

It was a good place to bring up children because it was a great playground. It provided “space for running around” and for them to ride on their bikes, have picnics and bonfires and so on:

“She [daughter] runs around there ... she really loves that side of it ... generally contributes to her wellbeing, yeah, being out in the fresh air and out in the sun.”

For Organic orchardists the orchard provided children with a healthy environment in which to play and healthy fruit to eat. One father (Organic) remarked that his children have "... no ongoing health problems" and that his "... kids don't get sick [from spray drift]". For two of the others there was a concern about the impact of spraying on their family's health and concern about possible birth defects: "... wondered whether [daughter] was going to come out normal ... but she's fine". One mother spoke of taking the children off the orchard when it was being sprayed, and on another orchard we met the very elderly (90+) but sprightly mother of the orchardist who was getting ready to go out for the day because of the spraying.

For those whose children had grown up it provided a place for them, and the grandchildren, to come and stay at weekends or for holidays. It meant that children "love being home" and wanted to come "back home". In this context there were the rural/urban comparisons: the country was a wholesome safe place for kids compared with the town, and orchards are convenient because they are usually close enough to town for children to be able to pursue their interests and activities. "A rural upbringing is everything. I think it's made them very wholesome and good, clean kids." One person thought that orchards were not as good a place for kids to grow up on as dairy farms because there was even more space on farms and the opportunities to ride motorbikes cross country and so on. Another had a child who bemoaned the fact that he could not skateboard in the orchard!

It was felt that children would be able to have more interaction with their parents because they lived on an orchard. Dad was always 'around' and could provide child care if Mum wanted to go out. Such flexibility of working hours also meant that parents could participate more in children's school or sports activities.

An orchard was a good learning environment for children. It provided them with "... opportunities to earn money". By being able to earn pocket money or have a holiday job on the orchard they learned the value of hard work: "It's given them a work ethic ... It's given them values". This work often involved interaction with a parent and there were plenty of jobs they could do. By being part of something that was growing they learned about the life cycles of plants.

Orchard's also provided a place for older family members and sometimes a role for them: "Because he [father-in-law] walks round at a very, ah, slow pace, because the dog doesn't walk very fast, and so he observes things." One person said of his father: "It's kept him alive". Others in the family also contributed to the management of the orchard by their observations: "My wife is quite forthright in commenting".

Succession

"Our intention is to pass the property on to the next generation, as was done for me by my uncles. My grandfather came out from England round the turn of the century to give his descendents a better way of life so I don't think it's our place to sell it all up and go and sit in the sun ..."

The orchard has also enabled owners to pass their land on through the generations and many wanted this to continue: "We're structuring it so that the boys can carry on and take over...". One couple felt rather aggrieved yet proud that they had been able to purchase their orchard without such family support: "Dad doesn't own six orchards down the road or anything like that". Two expressed disappointment that their offspring were not interested. At least four properties in each of the gold and organic orchards appeared to have been owned by at least one previous generation to the person being interviewed and formerly they were likely to have been dairy farms. Two of the organic orchards had been growing kiwifruit for a long time – in terms of the kiwifruit industry (1968 and 1980). Interestingly, many of these properties had come through the wife's family. Sometimes older parents still lived on the property or grown up children and their families lived nearby though they were not

necessarily associated with the orchard work. Some orchards provided opportunities for wife-husband partnerships. Another didn't want his family to carry it on because there were easier ways to earn money!

Family trusts are another way of keeping an orchard or at least its capital value in a way that will benefit a family and protect the family inheritance for the offspring. Many of the orchards were in family trusts and it was mentioned by some of those interviewed that they were experiencing difficulty in this situation of producing enough income for the parents who were still alive. Often it was a member of the family who was managing the orchard on behalf of a family trust. In one case the orchardist interviewed said that he had decided that he would rather be paid a salary from the trust than have another kind of financial arrangement. At least one orchard was part of a family company that involved other kinds of fruit production and a dairy farm.

Another part of succession is the security and sense of place that it brings as people feel linked to their family's roots. The orchard can also become the place of family stories.

10.2.2 Family impact on decisions and changing priorities

One older orchardist said that when he had floated the idea of selling up his grown-up children had become quite upset because they so enjoyed bringing their children to have holidays with their grandparents! Another person mentioned he had chosen to leave his life in the city when he had a child because of the less stressful and less busy lifestyle giving him more time for his child, whereas for another couple, having children had turned their orchard from a lifestyle into a business as they had to take more responsibility for providing for their family. Some mentioned the difficulty of making decisions about what to do with the orchard if no-one in the family was interested in carrying it on.

10.2.3 Conclusion: comparing panels for family wellbeing

As mentioned at the beginning of this section the responses to this question were diverse and difficult to compare across the panels because most things were only mentioned by one participant. They were probably more related to whether the participants were presently bringing up a family or had brought up a family on the orchard or not. At least four gold and four organic properties had been owned by a relation in the previous generation. (Often the line was through a woman.) At least two organic orchards had been growing kiwifruit for a long time (in terms of kiwifruit's history), one being established in 1968 and another in 1980.

10.3 Orchard's contribution to community wellbeing

Question: How does your orchard contribute to the wellbeing of your community?

The responses to this question can be described in two main ways. First of all there was an emerging picture of the communities of which these orchards were part. Who your neighbours were and how you interact with them is obviously an important part of community life. These aspects are not really a response to the original question but they are what those interviewed talked about when responding to the question. The response to the question comes in terms of what were perceived to be the contributions the orchard made to the community, which could be seen as local, regional or national, but it also has another side, again, not part of the original question, which is the impact the community has on the orchards.

10.3.1 The nature of the community

A community is seen as a place where people participate in some way or other. Hence, there is an emphasis on the different networks that are involved in community interaction. People in the community are a source of advice and hints, they share or gift orchard equipment, they are mentors, friends and employees and help each other out. Further,

community interaction could be related to children's activities, to hobbies and sport or to cooperative ventures such as involvement in a packhouse or a community water/irrigation scheme.

We suspect, from the comments of the participants that some communities in which the ARGOS orchards are situated, had more than the usual proportions of 'older' people – those who were semi-retired and whose children had left home. One couple felt they provided substitute children for their neighbours. The Green orchardists mentioned very little about their community involvement, and this may indicate that this group are older than those in the other two panels.

The rural nature of the community compared with urban life was very apparent in people's responses. Development of lifestyle blocks and the expansion of towns into the countryside meant that communities were undergoing constant change and this was often exemplified by how often neighbours changed and particularly it increased the number of neighbours orchards have. This was seen as a threat to the sort of community that most orchardists wanted, which was rural. They wanted, and had originally chosen, to live in the country not the town. Also, they felt that urbanites did not understand country life – particularly the practices that come with orcharding (see neighbours later). These attitudes in particular were thought to threaten the very existence of orcharding as a way of life.

This contrasted with another picture of the community that emerged from people's responses. These communities were also portrayed as places where crime and deviant behaviour was rife. There were many stories of burglaries of houses, from orchard sheds and of fruit, putting burglar alarms in, forming neighbourhood watch groups, and of people searching for magic mushrooms in the orchards, or growing marijuana in the gullies. Besides who knew what else went on in the orchards at night judging by the detritus left behind by 'visitors'.

"People do stop their car out in the road there and we find the odd beer bottle or something like that there and it's a fairly quiet road and, we've even found the odd pair of knickers there too, so God knows what happens."

It was thought that such activities were, of course, carried out by 'outsiders'- casual labour who familiarised themselves with an orchard while working on it so that they could return later with other activities in mind.

10.3.2 Neighbours

Neighbours are a very important part of any community. Neighbours were mainly other orchardists. They were people who knew each other and kept "an eye out" for each other. Often there was a neighbourhood watch scheme in operation.

Neighbours seem to be a point of tension. One person said, "The main problem in the Bay of Plenty is just dealing with the perceptions of the people who come into the country to live." Who the neighbours are is of utmost importance to an orchard operation. These factors seem to be important:

- Are they family?
- What do they grow?
 - same or different, kiwifruit or not kiwifruit
 - organic or not organic
- Are they townies or lifestylers, insiders or outsiders? I.e., do they have urban-based values?
- Do they run a family business?

- Is there a school close by? This was important because the number of possible 'neighbours' would then be increased to all the parents of children going to the school.
- Are they good or bad neighbours?

Lifestyle blocks and urban development are expected to create problems even if they do not do so at the moment. In other words, there is a negative perception of the people who live in such developments as they are expected to personify urban stereotypes. And, the more intensive the development became, the more neighbours could be expected to change. As one orchardist said, "The environment is changing around you," and with that change there was the continuing concern about whether the newcomers would make 'good' or 'bad' neighbours.

"You're getting pressure from development on all sides, and you have spray issues. Um, and it's just getting harder and harder, to run the property, with development encroaching onto you."

This man felt zoning was driving him off his land. These comments come from one orchardist as he was drawing his orchard sketch: "... two houses over here that I'm battling with, with spraying problems", and, "[It] looks like I've been drawing a war zone". This same person told the story of how he had been calibrating his sprayer using water and the neighbour rang up to say that he could smell spray and felt nauseous.⁷

'Good' neighbours are ones who understand what orcharding practices involve. There was an expectation and fear that neighbours would generally be 'bad':

"Most people are pretty good. But you have the wrong person come in next door to you – he's gonna be your worst – he's gonna be your neighbour from hell cause he can make your life very difficult and then you've gotta deal with the regional councils over environmental issues."

That is they would make life difficult for orchardists by complaining about noise, dust, the smell of organic orchardists' fish fertilisers, and particularly spraying. There might be very little give and take. This exchange describes some of these issues:

Orchardist: "Oh ... another thing that affects, possibly could affect me, um, would be um, ah, smoke. Smoke from fires – with ash."

Interviewer: "... who's burning off?"

Orchardist: "Oh well, anywhere in the area. Get a breeze and I've had, um, leaves, cindered leaves and stuff floating on my decks here and I've seen it once on kiwifruit ... there's fine particles of ash and that falling out of the sky. Neighbours burn rubbish. They're concerned about me spraying but they think nothing of lighting a fire, and putting smoke all over my export kiwifruit."

This same person also told of how he had to pull out the shelter belt between his orchard and the road because of the power lines but the council would not reduce the dust on the road which billowed over his kiwifruit as the interviewer observed during the interview. (This may be an over emphasis on what one person has said, but it also indicates and describes some of the issues confronted by orchardists.)

⁷ This account comes from the interviewer's notes made after the interview. It was told to the interviewer after the recording ended.

It was the neighbours who were 'townies', who complained about rat poison being put out in the orchard. They have "... got no children. They've got cats," and those cats come onto the orchard.

People seemed surprised to find that usually their neighbours were 'good' and there was good communication between them. They were usually other orchardists anyway. Comments were made such as, "We get on very well with our neighbours. We're lucky," "They don't really give us any grief ... except for avocado spraying by helicopter but [we've] never found any residues so [they] must be doing it all right," and, "Well my neighbours aren't hard to manage any more". Bush and shelter belts were seen as not only a protection of crops from wind, but also from neighbours' sprays, and as a separation from neighbours, maintaining the illusion of rurality.

Neighbours were a good source of comparison or competition. Neighbours kept an eye on each others crops, and chatted to each other about their production (trays per hectare), the average size of their fruit and their orchard practices. If a neighbour was organic then the pros and cons of organic growing were a topic of neighbourly discussion. A couple described one of their leisure pursuits in this way:

Orchardist: "We quite often go for a walk and go through the orchards – six either side of us. There's a common walkway access down the gully, down the back of us, and we'll walk down through orchards and look at their fruit. You know. They don't mind."

Orchardist's partner: "No. They do the same ..."

Orchardist: "No, they're quite open, quite open yeah. I think it's good because ... when you go and talk to X down there you'll find he is doing very well, thank you. He's doing a different pruning method and ah, very fussy, and um he is sort of, one to sort of look at, at the moment, you know if you want to do good. He can do it. No reason why people in the vicinity can't. So that lifts the whole ball game."

Hayward Green orchardists did not mention comparing and competing with neighbours' production in the way that the Hort 16A and Organic orchardists did. One Organic orchardist describes it like this:

"... a couple of years ago it was quite wet at pollination and we actually did better than the adjacent conventional fellas for some reason ... at the moment we're doing sort of thirty to fifty percent better than the average conventional grower ... we're always talking production rates and size. It's a stimulus within yourself to do better."

Another said:

"I think it was about three years ago, during the picking season, there was a big scare of frosts. You know, there was about a week of it. And ah the pack house hired choppers and everything else, and the pack house manager came to our property every time that our neighbours were down to zero degrees. Ours was three degrees. He couldn't believe it. He said ours is three degrees and the neighbour's was zero. And he said ...what's the deal here? How come you got warmer? And I was quite smiling of course, because I didn't have to hire a chopper."

(Some Organic orchardists believe that the environment on their orchard is warmer than that on conventional orchards because of their treatment of the soil and soil cover.)

Organic orchardists also liked to think that they could influence their neighbours. One neighbour applied fish fertilisers in large quantities and it became really smelly compared with the way he applied his.

“I think immediate neighbours I can influence, by for instance, X puts fish on. He gets fish from a fisherman of some sort of or another and rots it and just sprays it on the ground. It stinks like hell when he does it. I put fish on every two weeks and it doesn't smell. Um, OK his smell lasts for three or four days. Mine lasts for the hour of putting it on and that's it. ... I try to be, as unobtrusive as I possibly can ... I try to be positive ... X puts fish on, I put fish on. X's stinks, mine doesn't. X's probably a bloody sight cheaper than what mine is. Um. I'd like to think mine does more good than X's, but then X's probably trying ... his ex brother in law's organic, one of his neighbours is organic ... maybe what they're doing, may help what I do without restricting what I do. So maybe, me being unobtrusive, um, is making him think maybe what he's doing could be improved by trying/adopting some of what I'm doing, without negatively affecting what he's doing, and I think, yes, I think I can get more and more people, thinking deeper than what they think now, about what they do, then I'm doing something right. Without actually getting out there and standing on my grandstand and beating my soapbox and all the rest of it, saying do this do that, think this, think this, think that. I just think maybe, if I put my vibes out there, when I go somewhere, maybe some of it'll come back to me.”

Orchardists eyed up the neighbours' land as a source of future land for themselves or a developer and the possible consequences of each option. Some orchardists were aware that they competed with their neighbours for labour and other things. For example, one described how a neighbour used something paid for by his neighbour:

“... then there's pollination which is about a thousand dollars a hectare. But then that varies between orchardists too because some orchardists don't put many hives in you see, and they use their neighbours. {mutual laughter} There's a bit of that sort of thing goes on.”

Another orchardist found a good water supply by tracking the source of the neighbour's water supply back into their own property.

Other orchardists could also be a problem. A major concern seemed to be about avocado orchards which are subject to frequent spraying from helicopters. So they were a possible source of contamination and an annoyance because of the noise.

Organic orchardists had different concerns about their neighbours than others because if their neighbours were not organic this could create greater difficulties for them. They felt they would be a 'better' neighbour to have than a non-organic orchardist. For example, Organic orchardists saw their orchard as a “haven” for neighbours and their animals:

“But I could see there are advantages to the neighbours in that we don't have to worry about ... like if we're using Hicane we don't have to worry about um, using aggressive chemicals, near to people where people live. And worry about obviously what the wind is doing – that kind of thing ... we obviously feel happy from their point of view – it's an organic orchard alongside them so they don't have to worry about that sort of thing so much. ... I actually, feel happier walking round this place than I do some other orchards ... [In the] Hicane season the neighbours bring their dog over here for walks, you know, because [with] Hicane if the dog licks a puddle or something, a week afterwards it's dead ... the neighbour the other side quite often brings her horse for a walk and a bit of a chomp on the grass too ... so to me that's a plus that they haven't got ... And the chooks, ah the neighbours have got 65 chooks down the back of their orchard which spend most of their time in our orchard.”

Another said, “We get deer that choose to come and graze our orchard instead to the neighbour's orchard, which is a mixed blessing. Yeah the fodder must be more tasty or something here”.

10.3.3 How orchards affect the wellbeing of the community

KiwiGreen Hayward orchardists felt that they had a responsibility to the community, whereas the KiwiGreen Hort 16A orchardists felt that the community was dependent on them, and the Organic Hayward Green felt that they supported the community. For example, some of those interviewed from green orchards thought it was good to provide employment for others rather than do it all yourself, that they provided a “good product” with lots of vitamin C, and that orchards contributed to “green” areas, “sustaining animal and bird life” in a way that a town does not.

The orchards impacted on the community in two major ways, financially and environmentally. Financially the money they earned overseas flowed on into the “immediate vicinity” to be “spread” around the shops and other businesses. It was the “life-blood” of certain towns like Te Puke. Most importantly it provided employment to a wide range of people who could then support their families, and brought some stability to their lives. One person said:

“[We bring employment to] ourselves, seasonal workers, ARGOS ... contractors, Zespri employees, packhouse employees, management ... shopkeepers and all the whole supply chain ... wharfies ... Yeah, I’ll give myself a pat on the back for what I do for the world!”

Environmentally the orchards provided ‘green spaces’ compared with an urban environment. Something that was mentioned in almost every interview was the impact of spraying, and this would really be worthy of a theme in itself as it dominates neighbourly relationships and concern about the environment. (It is not included as such because it overlaps across most of the questions in the interview.) When an orchard was going to be sprayed there was a lot of communication with neighbours, telling them about when an orchard was going to be sprayed. Some people left their properties at this time. The spray of most concern for kiwifruit orchardists was hydrogen cyanamide though they were aware that other orchardists used other ‘hard’ sprays.

It was Organic orchardists who drew attention to the possibility that the rural idyll may not be what it is dreamt to be in terms of its safety. The rural areas were not only a place of criminal activity but also there were threats to health. One person mentioned his water supply (stream and tank) could well be contaminated. Another spoke of the incidence of cancer in his district. Others saw their orchards as ‘havens’ for themselves, their communities and their neighbours’ animals. This was their offering to their communities. The organic orchards were seen as a reminder to the others of what could be, and their owners also competed to be just as productive as non-organic orchards, partly to show that it could be done without the use of dangerous sprays. In this way Organic orchardists placed a greater emphasis than any others on their contribution to the community through their environmental care.

10.3.4 How communities impact on orchards

Considering this issue the other way around, it is also important to understand that communities also impact on orchards, and it is in this context that the perceived clash between the urban values brought by some of those to their life in what was seen as a rural community, and those who already lived in that community. (This has already been described in part in the section on neighbours but it is worthwhile to consider it more broadly and as a cultural issue too, rather than just one related to individuals.) As one person explained:

“... up here, we’ve been rezoned as rural production which I think Federated Farmers pushed for – to give people an idea that, you know the countryside is not a quiet environment. It is a working environment.”

It was felt that 'lifestylers' and those who lived in urban developments encroaching upon horticultural and farming land did not appreciate that. The concern of such people is seen as rather trivial as exemplified by this person who said:

"I don't think we detract too much from the world. I mean, we've got all these people complaining 'cause our neighbours down here put up red shelter cloth – ah hail netting – over their orchard, you know. I think, oh how bloody petty. I've never heard of anyone complaining 'cause the Warehouse is red. Um, yet someone puts some red cover over their apples to keep the hail off it and um, there's all hell let loose and I just wonder a bit, where people are coming from, you know?"⁸

Many mentioned how they were the dumping ground for unwanted cats, under the assumption that they came from the urban areas.

Thus, the community was seen to impact on the kiwifruit orchards more in terms of a constraint. Both community concern about spraying and concern from beyond the community had led to a reduction in its use (the development of KiwiGreen protocols), and that was seen positively. As such, the impact of communities on orchards does not have to be viewed entirely negatively.

10.3.5 Conclusion: comparing panels for community wellbeing

Organic participants were more likely to be concerned about the safety of the community – both environmentally and socially, and this is also reflected in attitudes to neighbours. They saw themselves as 'good neighbours' – their orchards providing a haven for others with whom they could share it – people, birds and animals. Organic participants were more likely to hope to influence their neighbours' orchard practices and to have expressed a greater concern about neighbours, whereas all expressed the idea of the rural as a refuge from the town. Gold and Green participants were more likely to speak of the changing nature of their communities with urban encroachment and the proliferation of life style blocks, and the difficulties this makes for orchard practices.

Organic and Gold participants were more likely to talk about competing with their neighbours. For the Organic participants this was to show non-organic growers of kiwifruit that organic practices would produce fruit in similar quantities and sizes as non-organic.

Green participants were more likely to have expressed a responsibility to the community, for example, they felt it was good to provide employment for others and they felt using the KiwiGreen protocols was a responsible thing to do. Gold participants were more likely to feel that the community was dependent on them – the community 'needs' orchards. Organic participants gave the feeling that they supported the community.

Indicators of community wellbeing

This section suggests that these points could be measured as indicators of community wellbeing:

- Community networks – what do they 'do' in the community (e.g., Social capital things such as: how many organisations do they belong to? What organisations?).
- Who and what they see themselves as supporting, having responsibility to, or who is dependent on them (e.g., how many people do they employ? What is their wage bill? How many people live in their household?).
- Attitudes to and interaction with neighbours.

⁸ The punctuation represents how the participants express themselves in vernacular speech.

10.4 Overall conclusion

The subject of spraying (insecticides/pesticides, hydrogen cyanamide – to promote bud formation, Benefit – to enhance fruit size, bird repellents etc.) seems to come up often. It is an important theme that links together environmental and social wellbeing, and management practices. Similarly, the urban-rural dissonance keeps appearing. These two things come together to be prominent issues in neighbourly relationships and environmental care.

What emerges from these interviews is that an orchard could be thought of as active in many different ways – there is the orchard as provider, the everyday, ordinary life of the orchard, the ‘good’ orchard or the orchard of the imagination (the utopian orchard) for which the neighbours are the problem, the orchard as ‘problem’ to the neighbours (‘the deviant/naughty orchard’) and the ‘secret life’ of the orchard. One orchard could have aspects of all of these different meanings.

Chapter 11: Orchard management: What is being well managed and what is hard to manage

Questions: What are you managing well? What is hard to manage?

11.1 Managing well?

When asked this question the responses indicated varying degrees of confidence in the ARGOS orchardists about their management. Six Green, three Organic and all the Gold orchardists and managers interviewed felt they were managing “everything” well, however, the Organic orchardists tended to express this more tentatively than the others. For example, one Green orchardist said, “I think I’m managing this property well, full stop,” whereas one Organic orchardist said, “Well, I’d like to think that ...”, and another, “Well, I hope ...”. Five Organic orchardists found the question difficult to answer and three of these said things like: “I think I can improve in all areas”.

Some orchardists listed the things that they were doing well and the things that they felt were difficult. Often there was a close relationship between the two because they were frequently proud of being able to manage something they thought was actually difficult to manage. This is the response of one Organic orchardist but his reply is really applicable to many.

Interviewer: “So, what are you managing well?”

Interviewee: “Um. The total orchard. Ah, it’s really, a pretentious thing to say but, you have to look after everything right to get those sort of results. One aspect that you might neglect will impact on your return, or your production, drastically, you know. If you fail to apply a nutrition in the right manner, or you don’t manage your winter pruning and put down the right cane, you don’t manage your summer canopy correctly – all those things ... don’t pollinate at the right time or put sufficient bees in to do a thorough job, or you don’t have the distribution of your male and female canopy right. It should be around ten – eleven percent ... So it’s actually ah, detailed management ... [you]’ve gotta pay more attention to detail. Your timing is critical, um, particularly when you’re growing organically, if you want to get good results.”

But what was it they were managing well? Those interviewed mentioned many things and it was difficult to group them because there were so many unique individual responses. Basically they fell into two themes: things they managed well on the orchard, and personal things. (Numbers have not been used here because it was sometimes difficult to tell when what someone said fell into a particular category.)

11.1.1 Managing well on the orchard

“Sometimes you can just sit back and look at it.”

“I think I run a really tidy orchard. The vines are in good shape ... everything’s nicely mowed and sprayed and looking tidy ... yeah, it’s not out of control.”

- Labour: one or two orchardists in each panel thought that they managed well those they employed to pick and prune to get them to do what they wanted them to. (This contrasts with the many orchardists who found this most difficult – see later.)
- Vine management – and its association with labour.
- Timing. This had two aspects. The first was managing to get labour at the time you need it. The second was getting the things done on the orchard at the “crucial” time they need to be done, such as, pruning, pollination, fertilising, spraying (hydrogen cyanamide, pest control, fruit size enhancing –‘benefit’). One orcharding couple

brought these two aspects together in this quote: "... we do things at the right time, do things in a timely fashion, that's just really critical ... so timing is everything. Having enough people on the ground to do those things." This couple had developed a strategy of having two pruning and picking contractors allocated to different blocks on the orchard, so that they had a "fall back position".

- Financial aspects: making a profit, paying the bills, managing the finances.
- Packout result – producing good quality, good sized fruit.
- Keeping "a tidy orchard", mowing.
- Paying attention to detail (see above).

One orchardist made this comparison between working on an orchard you own compared to using contracted labour:

"Definitely being an owner operator, from my experience is a lot better than ... we had previously leased out the orchards to [packhouse]. And that sort of TLC that you can give the orchard that a normal management contract or lease contract from the packhouses don't give, because they're spread across a wide area, so far as the attention to detail ... from a pruning perspective, from a general management perspective, from a soil perspective ... I think it's just a human nature thing. You know the orchard managers from the packhouses look after ten orchards so they're not going to love each orchard as its owner would."

11.1.2 Managing well in their personal lives (3, 2, 2)

Many responses were about how well people were managing their personal lives rather than things to do with the orchard. One person challenged the meaning of the question in this way: "Oh, I'd say I'm doing a pretty good job ... but what do you call manage? Is it money, or is it lifestyle, or is it happiness?"

- Managing "life" or lifestyle well. An orchardist said, "I'm managing my own life quite well compared to what I used to". He had had a heart attack while a dairy farmer.
- Good relationship with manager.
- Aspects of living on the orchard: "We grow our veggies. We've gone back to having 'the good life'".

11.1.3 Conclusion: comparing panels for managing well

As mentioned at the beginning of this section all the participants from gold orchards were confident that they were managing well compared with six from green and three from organic orchards. Five of the participants from organic orchards found the question difficult to answer and most expressed themselves diffidently.

It is hard to determine how much weight can be placed on the differences between panels when a certain response was made by a few participants in only one panel. Sometimes these responses are things that are more likely to relate to the particular variety, such as gold because it is so new, or the growing system, such as organic because it cannot use products that are not BioGro certified.

Four Green orchardists mentioned they had made good decisions – three of these were to do with leasing or having an orchard manager: "I think we've come to realise that someone else can do it better than I can". One mentioned how well they maintained the orchard infrastructure – starting from having good plants in the first place, to keeping the growing structures in good repair, having structures that were a good height for picking and fitting

vehicles under, and having good shelter belts. The latter sometimes involved the removal of shelter. One mentioned how this was the legacy of the previous owner.

Two Organic orchardists were the only ones to say they were pleased about experimenting with things and were open-minded to new things. One couple were pleased with how well they managed their sheep and chooks, another orchardist was pleased with his pest management, and two with their soil management. One of these felt he was able to produce a micro-climate on his orchard through greater soil activity. One thought the fact that he did not live on the orchard so was able to "... not take his work home", and his wife was not involved in the orchard business, were two things he managed well. One Organic orchardist said, "I can prove that we can grow organic product that is not that unattractive compared to non-organic product".

In the Gold panel two managers who were interviewed said they managed well in achieving their production targets. As gold orchards are likely to be newer than the others it was interesting to see that two couples were very proud of how well they had set up their own orchard from scratch. One couple told of how they had paid "... attention to detail and planning ... before you actually even plant the first plant". Another mentioned he was proud of his collaboration with scientists and consultants to get new techniques and technologies into practice quickly. One orchardist mentioned how he felt it was important to be able to get over losses quickly, such as those through frost. He spoke of his reaction to a bad frost:

"I remember sitting on a post for probably ten minutes and howled my eyes out and got up and kicked the post and said, "Right. Now let's get on with it," ... You know, you've gotta be able to put those things behind you ... it'll turn round and bite you in the backside fair and square."

11.2 What is hard to manage?

The things that those interviewed found hard to manage could be regarded as the challenges of orcharding. As in the section above, there were so many unique responses that it was again difficult to categorise them very much. They did fall into four broad groups: challenges and difficulties on the orchard, personal difficulties, external threats or risks to be managed, and off-orchard intrusions that made managing more difficult. Many of the things in these groups could be described as the difficulty of making decisions or finding a balance. The areas mentioned in which this was difficult were:

- Timing – managing timing when up against labour shortages, impact of weather etc.
- Deciding where to spend money.
- Fruit size – as one participant said, "... not too big and not too small".
- Spraying: "Keeping it to a minimum but having healthy plants".
- Between work and leisure – time for oneself and for family. These were some of the responses related to this issue: "I enjoy working too much", "I just go to work all the time", and "We're time paupers. We don't manage it very well".
- Between changing to a new technology or technique too quickly or too slowly.
- For the ratio of male to female plants and where to put the males.
- In the time taken for compliance compared with other work.

When orchardists have presented a particular thing as something they find hard to manage and have offered a possible solution this has been presented here because it may provide ideas that others may wish to try.

11.2.1 On-orchard challenges and difficulties

“Timing is critical/crucial/everything” (from three different orchardists).

“It’s just doing everything on time you know, and just keeping it up to scratch.”

“Trying to get a fruit of this size and of this dry matter for the taste, and so you’re dealing with a lot of juggling balls that just keep moving.”

Three Green orchardists declared similar sentiments to this one: “I don’t find any of it hard, actually”. In contrast one did say, “It’s not as easy a job as you think ...”

- Labour (3, 2, 4): The problems with labour could be summed up like this: “... the hardest challenge is actually getting labour to do what you want them to do”. These words were repeated almost exactly by at least one person in each panel.

“I’ve even tried, you know, I’ll pay them more and things like that, but I’ve found that necessarily doesn’t work ... they see like they can actually make more, so they actually go faster and do a worse job.”

- Availability of labour – “getting enough people there at the right time with the right skills”, for managers – balancing labour over several orchards.
- Training workers to prune and pick correctly. For example, one orchardist talked about how difficult it was to introduce innovative pruning practices: it is hard to teach that “... every vine is different”. Another said how training involves a lot of time.
- Getting “quality work” to provide consistent production across the orchard.
- Labour relationships.
- The apparent older age of kiwifruit orchardists means that they are less likely to do their own pruning and so need to employ other labour.

Interviewee 1: “The availability of labour ... there aren’t very many people out there, and we observe too at field days that it’s all people our age. There doesn’t seem to be any younger ones coming on, because it’s a pretty labour intensive job.”

Interviewee 2: “I think the younger ones will come on when they get to our age. I think they do their stint in the city, become professional whoevers, earn enough money to be able to buy a block of land and say, “Oh, I’m sick of the city,” and they end up being [us] ... But in reality, you need to be fairly young if you’re going to manage it yourself because, I mean, it’s hard on your back and neck ...”

(As is pointed out in this interview, the older age of kiwifruit orchard owners is possibly a reflection of the cost of buying a kiwifruit orchard which means that those who do gained their capital in a former well-paying occupation or in selling up a dairy farm, for example.)

- Getting the timing right (1, 2, 3). This is affected by:
 - The availability of labour.
 - Being able to pick or prune when the time is right.
 - The weather/season.
- Pruning and canopy management (2, 1, 3): “It’s all in the canopy management”. There are problems:
 - In filling the canopy (t-bar) and alternatively, letting light through and the relationship of this to DM. “[Gold] kiwifruit just grow and grow and grow!” “Keeping the canopy open, that’s my biggest issue.”

- Related to labour (see above) – getting workers to prune how you want them too.
- *Armillaria* (4, 7, 3) and its relationship to willow shelter belt removal: “Rotten willow is bad news”. When one of those interviewed was drawing his map he said, “And this area here is called death valley. We have lost probably over 100 plants down there – *Armillaria*”. One orchardist spoke in detail of how he follows the fresh air treatment – exposing the roots and using a chain saw to cut back all dead wood and roots. He has also tried injecting the soil with trichoderma but is doubtful of its efficacy. Several others are also trying this.
- Maintaining and increasing production, size and quality (3, 0, 1).
- Financial management – overspending (0, 1, 0), deciding where to spend money (0, 0, 1).
- Spraying (1, 0, 1).
- Scale (0, 1, 1).
- Physical features of the landscape:
 - Soil (0, 1, 1) – wet weather and the resultant pugging of the soil by vehicles, the impact of contouring on soil quality. One orchardist said, “I’m never happy with it”.
 - Gullies (1, 0, 1) – the perceived source of *Armillaria*, pests such as possums and scale, and erosion. They also posed a danger for machinery.
 - Altitude (0, 1, 1).

A Green orchardist talked about the increasing difficulty to keep up his learning and another talked of the difficulty of applying his theoretical knowledge. Another had a concern about pollination.

Organic orchardists of course, were the only ones to mention some of the things that they found difficult that only applied to growing organically. They were: weeds (2), the loss of the organic premium (1), and the certification of BioGro products that could be used on the orchard (1).

“Gold is still very new and we’re learning stuff all the time”. Gold orchardists (4) were the only ones who expressed a concern about how to get good dry matter (DM), taste, and storage qualities. “If it doesn’t taste nice you’re not going to go and buy another one.” (This response could also be related to the timing of the interviews, as the first interviews were carried out around and just after harvesting, before the issue of DM arose and the announcement by Zespri of a change to a greater emphasis in payments for high DM and taste qualities. So later interviewees were more likely to bring this up.) There were those who wanted Zespri to give them an answer on how to get high DM in their fruit and those who felt the answers were unreliable because the gold fruit had not been grown long enough for anyone to know the answers. “When they give us a problem, they’ve got to give us a solution as well. Make our life easier.” This can be compared with the orchardist who said:

“We’ve got all the information we need but that information’s based on a flawed model because the experience with the thing is – were working on what we know so far, and we’re learning all the time with it. And the experts are learning all the time with it. That is the hardest thing to manage. What we’re doing this year, what we are being told to do this year, we might be told next year not to do any more ‘cause they’ve found something else out.”

11.2.2 External threats to be managed

There were certain happenings over which orchardists had little control such as bad weather, and such things when they happened had to be managed. Those mentioned were:

- Weather/'mother nature' (2, 8, 4): Different participants said, "Nature has the final say", "You can only do so much to mitigate" to "mitigate climate effects", and, "I would say definitely the hardest thing's managing mother nature".
 - Frosts, sometimes of different kinds "... that we've never experienced before", wind (causing 'rubbing' of the fruit, rain (affecting picking, soil compaction/pugging), milder winters resulting in less winter chilling (for Gold and Organic – the latter of course, are not able to use hydrogen cyanamide).
 - The climate was thought to be hard to manage, unpredictable, changeable from year to year: "There's been no normal year yet".

One Green orchardist expounded at length on the difficulty of managing his neighbours and his concern about the encroaching housing development. One Organic orchardist wondered about altitude and decided that as an Organic orchardist it might actually be a help because it gave better winter chilling. Two Gold orchardists talked of the difficulty of dealing with wax eyes and sparrows eating the kiwifruit buds and spoke of the many ways they had tried to keep them away. One participant explained:

"Ah yeah, the waxeyes and the sparrows come in when your buds come out and they eat your buds ... they can strip a hectare out in half a day. They can really take your fruit. Yeah, they can take it all. So, I mean, we'll be trying different things ... One of the things I've been trying is putting up – you can buy these CDs, you know, at the Warehouse whatever, for ten bucks for a packet or whatever, and we're putting them on swivels, like fishing [lines], and hanging them up on boards up in the orchard and they're swivelling around and flashing and that's actually keeping a lot of the bigger birds out. The fantails don't care. They come in there and fly around but they tend to be underneath the canopy rather than on top ... We tried killing the odd magpie and hanging it up but that was a bit of a stinky mess after a while {mutual laughter} ... they were easy to catch and kill cause all you do – with a cage with a mirror on it and they just flew straight down and you'd catch them one after another. ... So we chucked away that one ... Tried plastic bags ... putting those up on poles ... All that happened is that it kept them out for a couple of days and they got blimmin used to them. That used to be frustrating as ... when the wind was blowing they made a lot of noise And the bird scarers, well, they scared us more than the birds I think, 'cause you never knew when the hell they were going off ... So, the bird scarer idea went out the window pretty quickly because I just never knew when it was it going off. So it was more me that was having more trouble than the birds."

Another orchardist was using hawks as a deterrent by tying dead possums on poles to attract them, and using a tape recording of a New Zealand hawk.

11.2.3 Personal things that are hard to manage

- Time for oneself and family, recreation (2, 0, 4). "I haven't got enough time to do everything."
- Looking after yourself (1, 0, 1). For one manager his work had become too sedentary. Some of those who worked on their own orchards had damaged their backs and necks, and the hard physical work required them to take care of their diet, because they needed to make sure they ate well enough to fill their energy requirements.

One Green orchardist was concerned about the pressure he felt during the busy times. He wished the work load of the orchard could be more spread out over the year. (Others liked mix of busy times with quiet times – see earlier.) Another Green orchard owner had difficulty not interfering in the work of his manager.

Individual responses from Organic orchardists indicated that one had difficulty managing his impatience when there were so many things to be done, and another had difficulty sorting out priorities. Another thought that managing 'life' was difficult.

11.2.4 Off-orchard intrusions that make managing harder (2, 3, 4)

Some of those interviewed in all panels had some difficulties with compliance. These were mainly to do with the time it took and the amount of paper that it generated, as these quotes show:

"Compliance probably is my main bugbear and that's with Europgap and BioGro and OSH and ACC. So much compliance is what buggers me, frustrates me. I spend so much time in here, complying. With thou shalt do this and thou shalt do that. You need to do this, you need to that."

"The level of paper that comes out of the mailbox ..."

Interviewer: "So what's hard to manage?"

Interviewee 2: "All the rules and regulations and filling in all those –"

Interviewee 1: "Oh they're [a pain]."

Interviewee 2: "All the EUREP-GAP and –"

Interviewee 1: "Even BioGro."

Interviewee 2: "And BioGro. But I mean I can see the necessity for the BioGro."

Interviewee 1: "Well I can see a necessity for EUREP-GAP too ..."

Interviewee 2: "I mean if we didn't have those then we wouldn't have sustainability that is the belief, these are in place, to try and achieve some sort of sustainability. Without them, we'd just keep on going the way we've been ..."

Interviewee 1: "We have to have rules and regulations otherwise people'll just go around throwing poisons and everything everywhere you know so, I agree with them even though I don't like them."

Other difficulties were:

- Zespri, GrowSafe, local council, bureaucrats etc.
- Compliance – BioGro, EUREP-GAP: "We're not very good at paper." "What am I managing well? Everything but this bloody compliance component."
- OSH, ACC.

One Organic orchardist was concerned about all the "shiny" paper sent out by Zespri.

11.2.5 Conclusion: comparing panels for what is hard to manage

As in many other sections and as demonstrated by the numbers in the brackets above, very little can be made of the differences between panels because the numbers are so small. Organic participants were more likely to express concern about *Armillaria*, weeds, and the weather or nature. As one orchardist said, "You don't have control over things as far as nature goes". Their concern for timing and control over things to do with the natural world could well be related to the more restricted 'tools' organic growers have to deal with pests, the lack of winter chilling, fertilisers and so on. On the other hand Gold participants were more likely to express concern about getting good DM in their fruit. However, two Gold orchardists spoke of the difficulty they had with birds at bud time (see above) and this could be also be considered as another example of the way in which 'nature' challenges orchardists.

11.3 Conclusion

As was stated at the beginning of this section the responses to the questions to do with management produced many disparate answers that could be broken down into four basic themes but there were very few further assertions that could be made from the data. These four themes could be taken up equally as being things people managed well or things people found difficult associated with orcharding. They could be viewed as 'on-orchard' aspects such as vine management and labour, or difficulties that originate 'off-orchard' such as labour supply (which is included in the on-orchard theme because it related to what gets done on the orchard), compliance and weather. The other theme that frequently arose was to do with personal things – how well one managed one's own life.

Chapter 12: Hopes and concerns about involvement in ARGOS

*Questions: What do you most hope to get out of your involvement in ARGOS?
Do you have any concerns about being involved in ARGOS?
(If concerns are raised) How can we best manage these concerns?*

When asked about his involvement in ARGOS one orchardist replied in this way, indicating that he was hoping to learn more about growing kiwifruit: “So when [I] walk ... under [my] canopy ... I look at my fruit and say, “If I was a kiwifruit what would I want out of this place?” ”

12.1 Hopes from involvement in ARGOS

The final question in the first preliminary interview was an enquiry about the expectations and concerns participants had of being involved in ARGOS. The most common expectations were to do with ARGOS as a source and a way of sharing information and learning. We have interpreted this as seeing ARGOS as another way of getting information, particularly about others in the kiwifruit producing industry, and how they are doing, and using this to learn more themselves and perhaps change their own orchard management practices. As one orchardist said, “I like involvement with ARGOS because I’m a nosey bugger ...”

This aspect of ARGOS as a source of information and learning has these features, most of which have a component of self-interest. Participants expect ARGOS to:

- Help them do a ‘better’ job of growing kiwifruit, managing the environment, making more money, and managing continuity into the future (resilience).
- Benchmark – as a comparison with others, finding where they fit in relation to others production, financial returns, environmental practices for both kiwifruit (Organic and KiwiGreen) and other orchards outside the ARGOS programme.
- Find out what is best practice versus what is common practice.
- Give them access to information they would not otherwise have. Information gives them a choice of whether or not to use it.
- Provide information that will make for better decision making.
- Help them learn: “Can I learn something out of here [benchmarking] to do what I’m doing better”.
- Help them understand: this person wants to “... go beyond doing something because that’s what you do”.
- Provide feedback tailored to own orchard, personalised: one person hoped it would provide them with a “few pointers”, while another said, “I hope it’s sort of critical of me”.
- Communicate with them about ARGOS: provide ... updates, how things are going, what’s been found, what working on ... keep us in the picture”.
- Break their isolation.
- Inform them of innovative and alternative orchard practices.
- Offer them assurance, acknowledgement and reinforcement of their own orchard practices: “Acknowledging the fact that what I am doing is right – it is for the good of the planet as well as the environment ... it’s not just for the good of my ego”.

There was some tension about who should benefit from the ARGOS programme. Should it just be the participants, the industry, the nation or the whole world? Most orchardists were quite altruistic in their expectations and hopes. They felt that:

- Participation was good in itself. This person felt that it would be a "... positive experience even if nothing comes out of it".
- It was a collaboration between the researcher and the researched:
 - "I'm not an academic. I'm a practical person and I've got skills that they haven't got and vice versa and to share that knowledge and grow the knowledge base of where we were [and] where we should be so we can plan for the future, I think is hugely important. It's not just producing kiwifruit. It's about communicating and employing and ah growing the cake."
- Sustainability is most important to the future and as such a good thing to research.
- They were open to whatever was found.
- Knowledge was good in itself.

Many participants felt that ARGOS and the information it gathered would be a good advocate for particular issues that concerned them.

- ARGOS was seen as independent, objective, an 'outsider'.
- They wanted support for organics, kiwifruit growing, horticulture and associated landuse. One participant wants ARGOS to find that, "... orchards are good for the community, good for the people that are involved in them and good for the country".
- They saw that results could provide a "... grand picture of New Zealand's exclusive attributes" as a market endorsement.
- They felt that ARGOS would provide material which supported land use applications to local bodies, Environment Bay of Plenty etc.

Participants frequently expressed great enthusiasm for ARGOS. They liked its principles, the long-term nature, the documentation of change and of their accounts of their orchard's histories, and the questions it will raise.

The majority of participants did not express any concerns, partially because it was only the beginning of the programme and they were only just becoming aware of what it involved. They were pleased to participate. Frequently they said, "I've nothing to hide", or "[I'm] happy for information to be available to every one", or "[happy if] "people want to pick my brains or look at my figures".

Some were aware that because of the long-term nature of ARGOS they might have to wait a while to get worthwhile results while others were less patient and wanted to see some benefits sooner rather than later.

12.2 Concerns about involvement in ARGOS

Issues that did come up were:

- Meeting OSH, EUREP-GAP and/or BioGro requirements.
- The time required and the paperwork that might be involved:

"So long as it doesn't add to the paper mountain of what I call, the time spent unproductively. OK, there is a trade-off in that if I spend a bit of time with you I get some knowledge back somewhere ... I don't want to have to be spending time ...

with you or on the computer for ARGOS when it's not actually contributing in dollar terms ...".

- Fear that the findings will go against present orchard practices and lead to further restrictions on the autonomy of the orchardists and compliance issues:

"... and the last thing we want, is for Zespri to say, "This is best practice. This is what thou shalt do." Um. They can come up with the recommended best practice. People can look at it and say, "Oh I can fit that into my [practice] ... I can do that." And that creates opportunity and um creativity. Um. Whereas the other way – you know, I'd get it and think, "Bloody hell. Now I've gotta do this." So you've immediately got that negative."

- Discomfort with 'talking to' researchers.

12.3 Conclusion: comparing panels for hopes and concerns about ARGOS

As is probably apparent, the diversity of the responses means that differences between the different orchard systems (KiwiGreen Hayward – Green, KiwiGreen Hort 16A –Gold, and Organic Hayward) were mainly the result of one person making a comment, and so little significance can be drawn from this. That being said, gold participants hoped that ARGOS would help to add to the little knowledge they felt they already had from Zespri about how to grow gold kiwifruit to meet Zespri's requirements. There was also a tension present between ARGOS playing a leadership role and providing advice. Fewer gold orchardists saw ARGOS as having an advocacy role.

The Organic orchardists were more conscious of their organic practices in comparison to KiwiGreen practices. There was an interesting concern about ARGOS helping them to make more money, not because they were solely interested in making money but because they were more concerned about their survival in the industry.

Part D: Conclusion

Chapter 13: Discussion and conclusion - approaching 'ideal types' and orchard/orchardist interaction

13.1 Introduction

Whereas the previous chapters of this report have focused on providing a rich description of the participants' responses within the preliminary interview, in this final chapter we discuss the construction of 'ideal types' representing each of the panels. These ideal types allow for some generalisation across the diversity of response encountered. We expect the presentation of ideal types will facilitate the engagement of others with the interview data. Next a slightly different approach is presented which considers different types of interaction between and orchardist and their orchard, which support their pursuit of a particular management practice. This is followed by a section on future research questions raised by this preliminary interview and a conclusion.

13.2 Ideal Types

'Ideal types' have an established place within sociological analysis. The concept was formally introduced by Max Weber in the early 20th Century (Gerhardt, 2004, Blaikie, 1993). He, and subsequent researchers, employed the concept as a means to develop greater understanding of case studies. In examples relevant to this research, 'ideal types' have been successfully employed for the typification of U.K farmers' strategies of adjustment and adaptation to the reduction in farm subsidies (Shucksmith, 1999), and as a way of describing the British countryside – preserved, contested, paternalistic and clientelist – as means of considering the changing contexts in which people have power to act (Marsden, Murdoch and Abram, 1997). Here, we utilize descriptive ideal types relying on the comparison of responses to questions in the preliminary interview as reported in previous chapters. This process leads to an account of the structure of the ideal type which provides explanatory insight into their practice of a particular management system. While we acknowledge there may be other groupings for ideal types in this research such as life cycle stage, we believe that their use as a tool for comparing kiwifruit orchardists across the different managements systems required for KiwiGreen Hayward, Organic Hayward and KiwiGreen Hort 16A, would be the most useful for our present task of understanding approaches to management.

In order to account for the large degree of shared characteristics across panels within ARGOS, we have constructed what we refer to as 'ovoid' ideal types. This typification reflects our understanding that orchardists share a solid core of characteristics surrounded by more fluid sets of properties which coalesce into a coherent approach to management which is distinct from the core. We have attempted to visually represent this idea in Figure 13.1. The process of developing ovoid ideal types begins with the construction of characteristics of a typical orchardist which forms the 'solid' core. Subsequently, ideal types for each of the panels are created by focusing on those differences identified as meaningful in the preceding descriptive analysis. These ideal types do not have any moral connotations, neither do they represent the perfect or best orchardist within a given panel. No single individual is expected to demonstrate all of the characteristics of an ideal type. Rather, the ovoid ideal types 'stretch' (or exaggerate) the fundamental characteristics of a typical orchardist, and by comparing actual cases to the ideal type we can illustrate the extent to which an orchardist fits a particular management system. This point causes the circular core to be stretched into an ovoid or egg shape. Hence the three stretch points of each ideal typical management system around the core form the triangle shape Figure 13.1 illustrates.

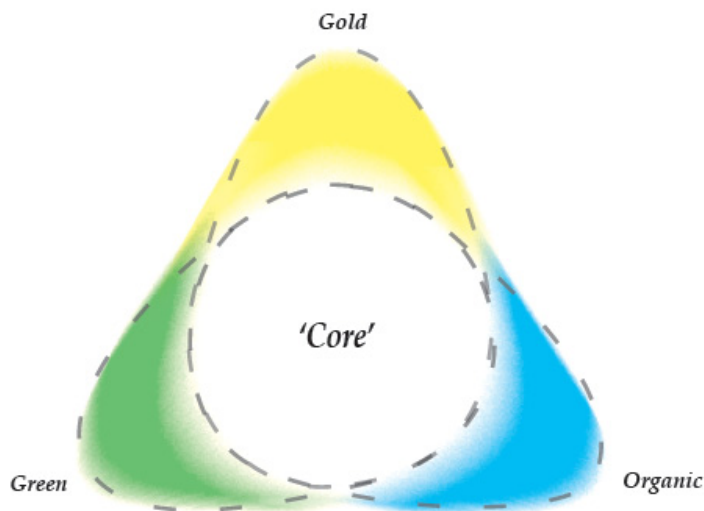


Figure 13.1: Ovoid ideal types

13.2.1 The typical orchardist

The solid core of the kiwifruit orchardist ideal type⁹ largely reflects the common management cycle and economic conditions of kiwifruit production. The typical orchardist is a male who purchased his orchard with capital obtained in past employment related activities, generally outside of orcharding (that is, the orchard is not inherited). This male is supported in the background by a female partner, who may work alongside her partner on the orchard. An orchardist relies on both their own, their families and hired labour for the production of kiwifruit. They contribute to the physical management of the orchard by doing some mowing, pruning and/or spraying, as well as keeping the books and organising other inputs, such as labour, contractors and consultants. Their on-orchard physical activities contribute to their knowledge and awareness of the orchard environment. They by and large feel confident in themselves about the general management practices required to grow kiwifruit. An orchardist utilises outside labour for pruning, spraying, fertilising and harvesting. In their management of the orchard, they pursue financial viability while maintaining a concern about the impact of their practices on the environment. The relative importance of financial factors is also evident in their aspirations in which they view the orchard as basically an enterprise that needs to be economically viable to be successful. As such, the orchard is expected to contribute to their financial wellbeing and that of their families. The orchard is also seen as an important provider within the local community by supporting a wide-ranging network of employment opportunities. Constraints on the ability of the orchard to meet these goals is perceived to largely result from environmental factors that reduce yield or social factors that affect the marketing of kiwifruit, limit management options, or impose additional (non-essential) work on the orchardist, such as the book work required to meet audit requirements. Risk is managed by adjustments to the orchard structure to mitigate the impact of frost, wind and spray drift. They also manage risk by finding alternative sources of income not directly related to kiwifruit production.

A primary motivation for being an orchardist is the lifestyle associated with orcharding. This is very much their chosen way of life. The typical orchardist takes pleasure in the work involved in their occupation. They enjoy being outside and engaging in the physical activities

⁹ The use of the term 'typical' must be qualified to the extent that it most appropriately represents the owners or lessees of orchards. Orchard managers – who comprise a minority (3) of the participants – do not fit the characterisation described here so closely.

of orcharding. As with other farmers, orchardists appreciate the autonomy of being self-employed. Furthermore, the orcharding lifestyle offers the benefit of freedom from an overly structured schedule of required daily activities. These aspects of their lifestyle are also perceived to be 'family friendly'. This lifestyle is considered to be threatened by the encroachment of outsiders from a wider, urban-oriented community. This encroachment involves both the conversion of farmland to lifestyle blocks and the expansion of urban development. As neighbours, these outsiders are perceived to lack understanding and acceptance of standard orchard practices and will, therefore, seek to impose restrictions on necessary practices. On the other hand, orchardist neighbours are also the source of constructive feedback and comparisons through observation of each others orchards and personal interaction.

An orchardist gets a broad sense that they are caring for the environment by the presence of birds on the orchard. Environmental health is also frequently linked to the limited use of sprays on the orchard. By prudent and careful use of sprays, an orchardist assumes that they are creating a healthy environment for themselves and their families as well as minimising their ecological impact. Soil health is also acknowledged as an important aspect of successful kiwifruit production. In terms of knowledge of soil and vine health, the typical orchardist routinely relies on tests and recommendations from consultants and/or packhouse employees.

13.2.2 The typical Green orchardist

The typical Green orchardist embodies the characteristics of the typical orchardist detailed above, but has tendencies that encourage adoption of a particular management system. Of the three types of orchardist, the typical Green orchardist shows the least notable modification of the core type. Overall, the Green orchardist is content with their situation and confident regarding the appropriateness of their management practices. They rely on the established production methods for kiwifruit and rarely engage in experimentation or see the need for further capital investment in the orchard. The Green growers are most comfortable about the use of sprays, because they consider current management practices to be environmentally friendly in comparison to the old spray regimes used before the advent of KiwiGreen. The impact of the use of the chemical hydrogen cyanamide on health is, however, of concern, though its use is considered to be essential for the financial viability of kiwifruit production.

The typical Green orchardist sets a high priority on maintaining a tidy orchard and takes a pride in this aspect of orchard management to a greater extent than the other types. In a 'tidy' orchard the grass is mown frequently, sometimes to the extent of looking like a lawn, under the vines and shelterbelts is kept free of weeds through the use of herbicides, the shelters are neat and well trimmed, there is no rubbish or untidy bush on the property and the canopy is well pruned and evenly spaced. There are a number of possible reasons for this emphasis. Firstly, it can be seen as a way of managing risk. Either it is feared that if not kept under control the orchard will run wild, or it is seen as being responsible. An orchardist following the latter line of reasoning believes that people working on the orchard could become injured if it is not well maintained and kept pest free. Secondly, a tidy orchard is seen as an indicator of environmental health. If the orchard's needs were not being met it would look dead or drab, and would be stressed. Thirdly, it gives the orchardist direct feedback that his management practices are correct and he is managing well. Threats to production are seen to originate from factors outside the direct control of the orchardist, for example, the climate, a gully, or the bush.

The Green orchardist felt a responsibility to the community as a provider of employment. They could see the wide network of people to whom the externally derived orchard income also provided income for other people and their families.

For the Green orchardist, the orchard is often seen as a way of managing an active retirement in which they can slowly reduce the amount of physical labour they themselves can perform on the orchard by either increasing the amount of work done by contractors or handing the orchard over to a manager while continuing to live on the property. There is a sense in which they (along with the Organic orchardist) are 'here to stay'. Succession is not seen as an issue because if the orchard is not to be passed on to the next generation its monetary value will be.

13.2.3 The typical Organic orchardist

The principal way in which an Organic orchardist stretches the 'core' is related to their philosophy about the environment. For the Organic orchardist, looking after the environment goes beyond good management practices and tends to incorporate broader ideals about stewardship of the land. They believe that they are creating an environmental 'haven' on their orchard. An Organic orchardist observes that this benefits not only them, their families and their neighbours, but also animals (both wild and domestic) who seek out this 'haven'. The Organic orchardist links their sense of wellbeing most closely to their enjoyment of their orchard as a place. An older Organic orchardist, like their green counterpart, also sees their orchards as a way into an 'active' retirement.¹⁰ Most of the constraints that they note relate to the limited management tools they can deploy in order to maintain their organic certification. For example, they are limited in the methods they have to deal with the need for winter chilling which encourages bud formation in kiwifruit vines, *Armillaria*, pest and weed control and soil fertility.

An Organic orchardist is more prepared to admit to having problems with their orchard management practices. In this sense they are less confident than the other types because they know they have not quite got the practice of growing organically worked out satisfactorily. They complain that there is inadequate research on methods which meet the constraints of organic kiwifruit production. Consequently they are most likely¹¹ to experiment with soil management by constantly developing new formulations for compost teas and composts, as well as inventing different methods of application. They like to compare their orchards with Green orchards and would like to demonstrate to Green orchardists that the Hayward green variety can be grown just as well using organic methods as under the KiwiGreen regime.

The Organic orchardist believes that there are natural limits that constrain productivity and feel they are working with the kiwifruit vine to produce kiwifruit rather than controlling it to make it produce more than it would without the orchardist's intervention. They are less likely to talk about fruit quality as a goal, because quality is understood to be an intrinsic part of their product. Rather, they are more likely to be focused on increasing their levels of production.

A typical Organic orchardist feels they support the wider community by taking responsibility for care of the environment (and hence people's health), by providing employment for others, and in their financial practices. They are, however, most concerned about their neighbours and the possible impact of their neighbours' orchard practices on their orchard and the environment. At the same time they hope that they are providing a model for others of environmentally friendly practices. They do not promote this model from a soapbox or in an overt evangelical or ideological fashion, but hope that their practices will be noticed and others will be influenced to adopt similar practices themselves. They hope that ARGOS will

¹⁰ This could also be related to a life cycle based typology.

¹¹ Occasionally we refer to 'more likely' or 'less likely'. We acknowledge that this is not intended to imply that the difference is statistically significant but by taking a qualitative approach using ideal types we are able to make inferences from the results presented earlier in this report.

be able to demonstrate that growing kiwifruit organically is just as economically viable as using other methods.

One of the biggest factors separating the Organic and the Green Orchardist is the use of the hydrogen cyanamide sprays to enhance bud formation. Some Green orchardists may have very similar orchard practices to Organic orchardists but believe that growing kiwifruit is just not financially viable without such sprays. Organic orchardists on the other hand, just could not bring themselves to use such a spray. In this sense such sprays serve both as an attractant (to the Green orchardist) and a repellent (to the Organic). Consequently, if hydrogen cyanamide was to become unpermissible in kiwifruit markets, a major point of difference between these styles of production would collapse. This would leave soil fertility management as one of the remaining differences, because some Green orchardists believe that orchard soil fertility can only be maintained through the use of chemically processed fertilisers not allowed under organic protocols.

13.2.4 The typical Gold orchardist

Whereas the Organic orchardist tends to prioritise environmental aspects of their orchard management, the typical Gold orchardist emphasises the financial aspects of orcharding. A Gold orchardist is the most willing to spend on capital investment in the orchard. They are also the most likely to complain about costs as a constraint. Costs, in addition to orchard gate return, were seen as essential to the assessment of financial wellbeing, and as such a Gold orchardist brings a sophisticated understanding of financial measurements to their awareness of how well their orchards are doing financially. If they are not getting the returns they expect from kiwifruit, they would be most likely to sell the orchard, grow a more lucrative crop or seek another challenge. As such they are very competitive with other Gold orchardists, but also compare their returns with Green. More often than not they are likely to be growing Hayward Green kiwifruit as well anyway. They see the community as dependent on them for employment (compared with the Green orchardist who feels they provide employment and the Organic orchardist who feels responsible for the employment of others).¹²

Lifestyle is very important to the typical Gold orchardist. This is seen as a commodity on which a dollar value can be placed and is related to the place or area in which they live and its attractions such as climate, scenery and beaches. Hence, the land value of their property is also very important to them. On the other hand, they are less likely to live on their orchard than the Green or Organic orchardist, and therefore demonstrate less personal knowledge of the orchard environment arising from less personal interaction with it.

The challenge of growing Gold kiwifruit appeals to the Gold orchardist. They have taken the considerable financial risk of planting a new variety of kiwifruit and want to make it a success. As a result, they are more likely to experiment with vine management.¹³ The resulting modifications of traditional vine management practice lead to frequent complaints about hired labour not pruning to their specifications. They commonly talk about the lack of knowledge of growing Gold kiwifruit. In particular, they suggest that the demand from Zespri for better taste, and a correspondingly high dry matter (DM) content, should be accompanied by a set of well researched management practices to enable them to achieve these qualities.

¹² This is an example of how, in many cases, the features of the ideal type reflect qualitative differences. In other words, meanings behind the words the participants used were different.

¹³ One of their innovations, tying the canes chosen for the following season up into a tepee formation above the canopy, is being tried by other orchardists.

13.2.5 Ideal type comparisons

The presentation of ideal types for the three orchard management systems included in the ARGOS programme provides evidence of axes of both similarity and difference among the panels of orchardists. For example, Green and Organic orchardists share many aspects of management because they both grow the same variety and, as such, respond to similar knowledge, ecological constraints, and industry conditions. They differ, however, in their relative willingness to employ synthetic inputs and the Green orchardists acknowledge less susceptibility to 'treatable' constraints such as soil fertility, chilling period, or pest control. The Green orchardists are more likely than the organic to place an emphasis on having a tidy orchard and all that entails, compared with Organic orchardists who are more likely to emphasise care for the environment and have an interest in promoting biodiversity through for example, mowing their grass less frequently, and not having strips of bare soil under the vines and shelter belts for weed control.

A similar comparison is possible between Organic and Gold orchardists who both actively explore alternatives (non-synthetic inputs for Organic and modified pruning and vine management for Gold) to the standard, more widely accepted, management practices for kiwifruit. In pursuing management systems that lack the entrenched and proven 'script' utilised by the Green orchardist, the Organic and Gold participants exhibited a greater acceptance of risk. At the same time, the members of the latter panels showed the same divide regarding the acceptability of synthetic inputs as did the Organic and Green orchardists. Moreover, the Gold orchardist emphasised the need to improve the quality of their product whereas their Organic counterpart focused more exclusively on yield. Both placed an emphasis on lifestyle but for the Organic orchardist this was related to living in the orchard environment, whereas for the Gold orchardist it was related to the attributes of the area in which they lived – sea for boating and swimming, climate etc. (and the associated land values).

Finally, while both Green and Gold orchardists lacked the commitment to the environment expressed by the Organic panel, they differed primarily in regard to their financial goals. That is, the Green orchardist focused on retirement while the Gold orchardist prioritised consistent financial return. As eight of the ARGOS participants with Gold orchards also grew Hayward Green, it could be expected that there would be some crossover between these two types. However, only one of the Green participants grew Gold as well, indicating that perhaps those orchardists who took on the Gold as a new fruit have certain characteristics different from the Green, in that they are more prepared to take on risks and enjoy challenges.

As such, it is difficult to rank members of the panels as being more or less similar to each other, although we have already suggested that the Green orchardist is most similar to the characteristics of the 'core' type. Rather, it may be more accurate to suggest that the ideal types differ from each other along distinct axes as opposed to being situated along a single axis of difference.

So, in comparison to Green and Organic, the Gold orchardists are a more distinct group. Green orchardists share considerable terrain with the Organic. The Gold group are slightly more pronounced in their differences. More than a few criteria separate them from the rest of the growers.

13.3 Orchard/orchardist interaction as an explanation of management practice

Orchards can be perceived as having a life of their own (Jones and Cloke, 2002) and therefore as entities that need to be responded to in order to produce a certain marketable product. For example, orchards can be thought of as 'enablers', providers or intermediaries. Kiwifruit orchards provide work for many people in a long supply chain, both in New Zealand and overseas. All the participants in the ARGOS programme wished their orchard to be viable enough to provide them and/or their families with a reasonable income that enabled them to participate in society in the usual way, rather than on the fringes. There is the idea that, "If I do this and this, then the orchard will enable me to get this and this". For example, "If I keep the orchard tidy looking it will produce good quality fruit and I will be able to have a good lifestyle".

We then became interested in this notion of a 'tidy orchard'. This can be seen as an orchardists response to something about the orchard. What was it that was making them keep an orchard tidy? By following this line of thought we came up with three different perceptions of orchards that could explain orchardists' interactions with their orchards in terms of their management practices – the wild orchard, the challenging, risky orchard, and the needy orchard. These concepts came out of an analysis of what participants implied was a 'good orchard' in their interviews. One of these understandings may explain all or part of an orchardists response to their orchard. That is, they are not to be seen as mutually exclusive, but one view may be more dominant than another for a particular orchardist.

13.3.1 The wild orchard

This wild orchard is such that if it is not strictly controlled it will become out of control. One orchardists partner said, "You're still knocking it back into shape". Wildness is accentuated by the bush and gullies that may mark the boundaries of a property which act as hosts to pests and weeds that threaten to invade the orchard: "Simple things like ... cleaning up the boundaries to get rid of the blackberry ... just makes it more visually – the visual impact on the eye and to the environment at the end of the day" (KiwiGreen Hayward). The kiwifruit plant is known for its amazing growth rate and therefore there is an emphasis on the pruning that is required to make the plant produce fruit rather than vegetative growth. This potential loss of control is to be feared. As one KiwiGreen Hayward orchardist put it: "It's not a healthy orchard. There's not enough light getting in ... you've got to be watching all the time". It can be seen as demanding, threatening or recalcitrant and needing to be punished, guided, controlled or manipulated to produce: "There's still a lot of young five year olds in there which still need a bit of training ...". The plant's sexuality and productivity is tightly controlled with bud formation sprays, the importation of bees into the orchard at pollination time, pruning of vegetative growth and the careful formation planting, choice and pruning of male vines. Then there are the activities of the unwelcome human visitors to the orchard during the night whose only record is what they leave behind.

The response by the orchardist to this sort of perception of an orchard is to keep it tidy. This tidiness provides visual feedback which tells an orchardist that their management is correct. One KiwiGreen Hayward orchardist said, "I'd like to see the canopy, you know, a pruned canopy ... with nicely spaced canes ... that certainly looks tidy ... yeah, a good orchard looks healthy," and another, "... shelter's nice and trimmed and it's even ... being tidy is important to me ... that's part of the health of the place, I believe". There is an equation of tidiness with health, obvious in these quotes.

Keeping a tidy orchard can also be seen as responsible behaviour because it minimises the risk to people who visit the orchard. One KiwiGreen Hayward orchardist explained how important it was for all who entered his orchard to come by his house so that he could warn them of any risks they might encounter on the orchard: "There's only one entrance to the

orchard so that people have to come to our dwelling ... I would see them before they enter the orchard, so that's a good thing." He went on:

"I try to run a pretty good hygiene programme on my orchard ... Keeping the canopy very tidy, and keeping the floor of canopy tidy. No high weeds that will form a bridge for insects to multiply. Mowing my orchard often, but not too often ... I find that if you have a nice orchard and ... there are people coming onto your orchard ... they are more likely to do a better job ... Some orchards are just shocking and you can't expect people to be looking down, where they're walking, when they should be looking up in the canopy ..."

Another response is to use all the land: "... basically everything on this property is used ... so a hundred percent of the property is utilised. There is no wastage what-so-ever" (KiwiGreen Hayward orchardist).

This treatment of the orchard means that the orchard provides security for the orchardist. It is a good investment and enables them to plan for an 'active', graduated retirement and to pass their land on to their family or realise its capital value. It provides a rural lifestyle.

13.3.2 The challenging, risky orchard

An orchard can also be perceived as a challenge. It can be a risky investment. It is wild and strange (this has been particularly so for Hort 16A when it was introduced as a new variety several years ago). Orchardists who see the orchard in this way respond to it by confronting the challenge and, "Getting to know the Gold plant and really how to sustain a Gold orchard", as a Hort 16A orchardist said. This new variety intrigued orchardists and many developed a fondness for it: "... I find it fascinating".

Orchardists took on this risk for many reasons. One was, it provided a great lifestyle for themselves and their families associated with being near the beach, having boats, and living in a good climate in an attractive landscape. One KiwiGreen Hort 16A orchardist explained this as:

"It's a kind of means to an end. We want lifestyle. We want to be able to ... do things. We want, you know, good fun with our kids. And the orchard is part of the pathway on that journey, to actually achieving those things ..."

Another reason was the financial return from the orchard, and if this return did not meet their expectations then they would sell up and move on: "The day they take Hicane away from us I'll be chopping up my property real early" (KiwiGreen Hort 16A).

Orchardists received a 'buzz' from taking on a challenge. One told the story (related earlier in this report) of how he responded to a frost by grieving, then taking on the challenge of getting the orchard up and running again. There is also the 'buzz' received from seeing the orchard as a 'happening' place. Orchards are a hive of activity, as this person describes it:

"During the pollination time ... the place is just awash. Bees everywhere, things happening, insects, the hum, the scent of flowers ... and to see it happening. You know, this is the moment ... it's all happening" (KiwiGreen Hort 16A orchardist).

13.3.3 The needy orchard

Some participants saw their orchards as needy, suffering, starved, hungry, dead, stressed and invaded or threatened:

"... When I first got here ... [the vines] were yellow, completely yellow There was no grass there at all... They were suffering. You'd dig a hole. You wouldn't find a worm ... First year, I think we put on about six ton of chicken manure ... per hectare ... to stimulate the life back into the property ..." (KiwiGreen Hayward orchardist).

“You can walk into an orchard and see if it looks stressed ... colour ... size of leaves ... you can soon tell whether it’s lacking something or hungry. You might not know ... what it is exactly ... just looks drab” (KiwiGreen Hayward orchardist).

“We have everything from wild dogs, wild cats, pigs, deer ... obviously rabbits and possums are just a nightmare ... I think one night we shot 50 possums ... that’s just on that boundary ...” (KiwiGreen Hayward orchardist).

The response of those who saw their orchard in this way was to care for it, love it, feed it, protect it, as one Organic Hayward orchardist expressed it: “Under the organic regime we try and nurse the soil”. In another interchange between husband and wife, Organic Hayward orchardists, this was said:

“We do know that the high producing orchards are the ones that are run by the owners ...”
(male partner)
“ ... and they’re out there every day, pruning and titivating.” (female partner)
“Doing it for love.” (male partner)

Such orchardists are likely to compare their response to their orchard with that of others. The following two quotes are examples of such comparisons which accentuate the importance of caring.

“An orchard that’s really well mown and the wee spray strips .. They all look like lined up little soldiers ... but you can spend a lot of time on those things when you probably should spend more time thinking about your plants” (KiwiGreen Hort 16A orchardist).

“I might mow here three times a year. I give the neighbour this side [a hard time]. He’s just got a new mower and it’s like a bowling green you know ... got an hour to spare and he’s out killing the place. But to me, the longer grass - there’s creatures in it as well, you know. Bugs and birds and bits and pieces running round out there ...” (Organic Hayward orchardist).

The latter quote also serves the purpose of introducing one of the rewards of responding to the orchard in this way. It provides a haven for animals and insects, themselves, other people and their domestic animals:

“But we could see there are advantages to the neighbours in that ... we don’t have to worry about using aggressive chemicals near to where people live, and worry about what the wind is doing – that kind of thing ... It’s an organic orchard alongside them ... I actually feel happier walking around this place than I do some other orchards ... [in the] Hicane season the neighbours bring over their dog for walks ... the neighbour on the other side quite often brings her horse for a walk and a bit of a chomp on the grass too ... and the chooks, ah, the neighbours have got sixty five chooks ... which spend most of their time on our orchard” (Organic Hayward orchardist).

An orchard is seen to be a haven for ‘life’. It is teeming with insects, birds, soil micro-organisms: “We’ve got spider webs galore which I love getting smacked in the face with” (Organic Hayward orchardist). It also creates a micro-climate due to greater soil activity: “It breathes ... it’s got its own micro-climate in there” (Organic Hayward orchardist).

The greater reward is the higher good that is achieved by caring for the orchard in this way, epitomised in this quote: “It [growing organic kiwifruit] is for the good of the planet as well as the environment as well as myself – it’s not just for the good of my ego” (Organic Hayward orchardist).

13.3.4 Association of these 'orchard types' with 'orchardist types'

As is apparent from the sources of the quotes included in the above sections, the concepts of the wild, challenging and needy orchards have been developed from expressions taken from the transcriptions of the interviews with participants from any of the panels. As such all of these orchard qualities could be seen as present to a greater or lesser extent in all orchardists. However, many orchardists from the KiwiGreen Hayward panel and the KiwiGreen Hort 16A panel who also worked with the KiwiGreen Hayward variety, expressed thoughts that could be associated with the wild orchard concept. The challenging orchard would mainly be associated with those who grew KiwiGreen Hort 16A only and some of the Organic Hayward panel who found growing organically a stimulating challenge. Finally the needy orchard was most associated with those from the Organic Hayward panel, but one or two others from other panels also sometimes presented this view of their orchard.

13.4 Conclusion

This report demonstrates both the richness of the qualitative approach to data gathering and analysis and its limitations. The semi-structured nature of the interview questions 'gave voice' to those who participated and allowed them a fuller expression of their thoughts in a way that would not be possible if a questionnaire or survey with closed questions was used exclusively. Since these were preliminary interviews the interviewer was not expected to probe behind the questions asked. As a result, we have only been able to provide limited explanations for people's responses.

13.6.1 Questions arising

In the process of conducting and analysing these interviews certain issues have arisen which we may pursue in later interviews. Some of these issues are listed below:

1. What makes a 'good' orchard and a good orchardist? A 'tidy' and 'clean' environment was used by some participants as an indication that an environment is well cared for. Five KiwiGreen participants (2 Green, 3 Gold) mentioned tidiness and cleanliness as indicators of environmental care, but no organic participants made this connection.
2. Animals, birds and insects: this first interview gathered a list of the animal life that participants notice on their orchard, but did not explore how they feel about these animals, birds and insects, in any depth. While we have some idea about which animal species are viewed as pests, and which are seen more positively, it would be worthwhile investigating participants' understandings in more detail. The ethical dimensions of these understandings could be particularly relevant as they will impact upon what participants conceive of as appropriate or inappropriate changes to the environment and animal habitat.
3. Industry constraints: what are the participants' responses to the many audit procedures they are subject to and how do they impact on their management practices?
4. How do participants learn and/or change their management practices?
5. Financial aspects of vision: to what extent does a possible greater entrepreneurial drive among organic and gold growers contribute to their adoption of more 'risky' practices? Do Gold and Green growers also recognise environmental limits to the pursuit of productivity?
6. Social aspects of vision: to what extent are differences between panels' association with place important to their management practice? Is it merely a matter of more emphasis on nature in the organic panel? Is the apparent lack of emphasis on succession real, or a matter of the panel selection process?
7. Ecological aspects of vision: to what extent are the apparent differences in the Organic panel's approach to nature incorporated within management practice and response to industry and market?

8. Personal aspects of vision: do differences in motivation associate more directly with choice of management system? Do these perspectives influence Orchardists' understandings of what is possible/impossible?
9. Ecological constraints: is there any variation among panels in the perceived impact (and ability to mitigate it) of ecological factors on production? Or, by contrast, is there any variation among panels in the perceived impact of their management on the environment?
10. Financial constraints: how are labour relations (already recognised as a constraint) developing as the industry is exposed to EUREP-GAP standards? Are Gold growers truly more aware of financial constraints?
11. Local and national governmental constraints: how do the State and local bodies influence management practice, economic activity, etc.?
12. Measures of sustainability: what is the extent to which the differences in response are also reflected in practice - or at least the structure of the farm/orchard? (This is a question that requires some form of participant observation, beginning with – but not necessarily limited to – a farm tour.)
13. Financial wellbeing and productivity: to what extent does awareness of costs (and, thus, more likely the Gold growers) influence management practice?
14. Is the difference in attention to quality (Gold, Green) versus quantity (Organic) predominantly an economic response, or does it involve other aspects of production as well?
15. Identity: why do these people call themselves orchardists when their single desk marketing company Zespri, calls them growers? What do they mean when they say 'orchardist'? How does self-identity relate to their management practice?
16. Age structure of orcharding communities: how does the life cycle stage of practitioners impact on them and their orchard practices?
17. Some growers referred to specific management systems as a means for knowing they were caring for the environment. What do participants think about specific management systems in connection to the impact these systems have on the environment? What differences are there between the panels?
18. Although only mentioned by a small number of growers, there seems to be a negative connotation associated with the idea of being a 'greenie'. This should be explored further. If there is a widespread antipathy towards this notion of being a 'greenie', it may need to be taken into consideration in terms of how information about management practices on the orchard environments is delivered to growers.
19. It appears from this first interview that Organic growers generally tend to feel a deeper commitment to broader philosophies of sustainability and 'stewardship', in comparison to the Green and Gold growers. This is an area that needs to be explored further to discover whether ideas about stewardship and being a 'caretaker' of the land are mostly part of an Organic management system.

13.6.2 The wider social research design

The Social Objective of the ARGOS programme's rationale document, 'Social Dimensions of Sustainable Agriculture' (p.73) suggests that the social research done in ARGOS will mainly describe, then may go on to interpret and provide explanations for what is thought to be happening, and finally it will go into a more theoretical mode to consider issues of power. That latter process will address such questions as: Who has the power and capacity to act in a given situation? What are the constraints to this action? What will enable action? This report describes how the participants in ARGOS have answered the questions in the first

interview and goes further to interpret through the technique of ideal types how these might be explained in terms of 'the typical orchardist' and types relating to each management system under study.

Given the panel design under a BACI study, this interview starts to tell us something about the three panels. The method of this study rests on the assumption (made, nevertheless, after some acquaintance with the industry and growers) that organic, green and gold growers are different in important ways. The panels and clusters were selected on tight environmental and broad economic criteria. To ensure the robustness of the panel design, however, the selection has needed some testing for social characteristics of growers. Consequently, a key finding for the wider method is that an ideal type analysis does find differences. If the ideal type analysis had not found differences, then there would be little point in continuing a social analysis focusing on panel differences, and the task would then have been the simpler one of characterising the orchardists as one group.

The first preliminary interview raises many questions about the practice of sustainable agriculture and horticulture. In this sense it serves the purposes of what was, after all, only a preliminary interview. It revealed to us a broad range of interesting responses to the questions asked. How does what we have found relate to sustainable farming/horticultural practice? Does an orchardist whose vision for their orchard is dominated by financial returns, producing more or better quality fruit, or doing better than other orchards, mean that their orchard practice is likely to be more sustainable or resilient than the orchardist whose vision is of creating a safe and healthy haven for themselves, their family and those around them? Are these visions mutually exclusive? Is an orchardist whose wellbeing is associated with living on the orchard, working on the orchard and/or enjoying its environment more likely to engage in sustainable practices than one who does not live on the orchard and/or enjoys living in the Bay of Plenty for its climate and beaches? Is someone who is immersed in the environment of the orchard, who mows it, does their own vineyard and so on, more likely to achieve sustainability than someone who employs contractors to do the work? Does working on the orchard you own make a difference to the way it is managed?

The development of the typical orchardist through the use of ideal types goes some way to demonstrate that the answer to the preceding questions may be given in part by characteristics of the management system to which an orchardist is attracted. The strength of the ARGOS programme lies in its transdisciplinarity. As a result, the questions raised in the preliminary interview can be addressed from the perspectives of the Environmental, Economic and Management objectives allowing for fuller descriptions and explanations of sustainable practice, its practitioners and their rationales. The responses of the kiwifruit orchardists can also be compared with those of participants in the other sectors in the ARGOS programme to produce more robust and valid theories about sustainable and resilient agricultural practices. Addressing further these important questions is what we can look forward to.

References and bibliography

- Abercrombie, Nicholas, Hill, Stephen and Turner, Bryan S. (1984). *The penguin dictionary of sociology*. London: Penguin Books.
- Berardi, Gigi. (1998). Application of Participatory Rural Appraisal in Alaska. In *Human Organization*, Vol 57, No 4, pp 438 – 446.
- Blaikie, Norman. (1993). *Approaches to Social Enquiry*. Cambridge (U.K.): Polity Press.
- Blumer, H. (1969). *Symbolic interactionism: perspective and method*. Berkeley: University of California Press.
- Bryman, Alan (2004). Quantitative and qualitative research, debate about. In, *The Sage encyclopedia of social science research methods* by Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao (Eds). Thousand Oaks: Sage Publications.
- Fook, Jan (Ed.). (1996). *The reflective researcher: social workers theories of practice research*. St Leonards, Australia: Allen & Unwin.
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- Gerhardt, U. (2004). Ideal type. In, *The Sage encyclopedia of social science research methods* by Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao (Eds). Thousand Oaks: Sage Publications.
- Glaser, Barney G.; Strauss, Anselm L. (1967). The discovery of grounded theory: strategies for qualitative research. London: Weidenfeld and Nicolson.
- Hammersley, Martyn. (2004). Reflexivity. In, *The Sage encyclopedia of social science research methods* by Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao (Eds). Thousand Oaks: Sage Publications.
- Hill, Roberta. (1984). Establishing validity in the social sciences: an empirical illustration. *N.Z. Science Review* 41(4): 59-62.
- Jones, Michael Owen. (1988). In search of meaning: using qualitative methods in research and application. In, *Inside organizations: understanding the human dimension* by M.O. Jones; M.D. Moore; R.C. Snyder (Eds). Newbury Park: Sage Publications.
- Jones, Owain and Cloke, Paul. (2002). *Tree cultures: the place of trees and trees in their place*. Oxford: Berg.
- Marsden, T., Murdoch, J. and Abram, S. (1997). Rural sustainability in Britain: the social bases of sustainability. In, *The international handbook of environmental sociology* by Michael Redcliff and Graham Woodgate (Eds). Cheltenham, U.K.: Edward Elgar Publishing Ltd.
- Massé, Raymond. (2000). Qualitative and quantitative analyses of psychological distress: methodological complementarity and ontological incommensurability. *Qualitative Health Research* 10(3); 411-423.
- Nord, W.R. and Jermier, J.M. (1994). Overcoming resistance to resistance: insights from a study of the shadows. *Public Administration Quarterly*, 17(4).
- Perkins, Harvey C. (1988). Bulldozers in the southern part of heaven: defending place against rapid growth. Part 1: local residents' interpretations of rapid urban growth in a free-standing service-class town. *Environment and Planning A* 20: 285-308.
- Rose, Gillian. (2001). *Visual Methodologies*. Sage Publications: London.
- Rose, Michael. (1978). *Industrial behaviour: theoretical development since Taylor*. Middlesex, England: Penguin Books.
- Sandelowski, Margarete. (2004). Qualitative research. In, *The Sage encyclopedia of social science research methods* by Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao (Eds). Thousand Oaks: Sage Publications.
- Sarantakos, S. (1993). *Social research*. Melbourne: Macmillan Education.
- Shucksmith, M. (1999). Structural changes in British agriculture beyond 2000. *Roots 99: The proceedings of the RICS Rural Research Conference*, held at Harper-Adams University College 20-21 April, 1999.
- Tolich, Martin and Davidson, Carl. (1999). *Starting fieldwork: an introduction to qualitative research in New Zealand*. Oxford: Oxford University Press.

Appendix 1: Interview schedule

Guiding Questions for First Social Science Visit to Orchards and Farms

Check out that person is OK with taping this interview. Say that the interview tape and transcription will be kept confidential to the ARGOS team.

First of all I am interested in what you call yourself. When you are out and someone says, "What do you do?" what do you say?

Could you tell me about what your work involves?

What is your vision for your future? (What do you want to be doing in 5 years time?)

How could this be achieved?

What do you think are the most important constraints or problems that might prevent you achieving this vision?

What do you think could be done to address these constraints or problems?

What is your vision for the future of your orchard/farm?

What ideas have driven this vision? (Where have they come from?)

How could this vision be achieved?

What are the main constraints to achieving this vision?

What do you think could be done to address these constraints or problems?

Could you draw me a mind map/diagram/sketch of your orchard/farm? It doesn't need to be geographically exact. It should contain all the things/features/elements/parts that are important to you and the orchard/farm, and impact on your management of the orchard/farm.

Answers to the following questions may also be indicated on the map in some way.

The ARGOS team consists of many researchers who have ideas about what needs to be measured on your orchard/farm. But first we want to hear from you about what you think is important and what should be measured.

Thinking about your orchard/farm, what things are important to you and to the management of your orchard/farm, now and in the future?

(For each thing)

Why?

What could be measured to record that?

1. What tells you how productive your orchard/farm is?
How do you know that financially all is going well?
2. What tells you that you are looking after the environment on your orchard/farm?
(Is there anything in particular that you notice – see, hear, smell, taste, feel – that tells you everything's OK?)

Can you tell me about the animals – including insects and apart from the orchard/farm animals – that you notice on your orchard/farm?

(Prompt for a full list of animals present at any time of year.)

Can you tell me about the birds on your orchard/farm?

What tells you that your soil is healthy?
Do you do any soil monitoring?

3. How does your orchard/farm contribute to your own wellbeing? What is it about orcharding/farming that makes you happy?
How does your orchard/farm contribute to the wellbeing of your family?
How does your orchard/farm contribute to the wellbeing of your community?

What are you managing well?
What is hard to manage?

What do you most hope to get out of your involvement in ARGOS?
Do you have any concerns about being involved in ARGOS?
(If concerns are raised) How can we best manage these concerns?

Now I would like to ask you some operational questions to help Jayson/Dave and others in the ARGOS team.

- a. From time to time the ARGOS team would like to visit your orchard/farm for monitoring. How much access to your orchard/farm by the ARGOS team seems reasonable?
What process would you like them to follow when visiting your orchard/farm?
- b. How much time might ARGOS reasonably take of you?
- c. How would you feel about having Artificial Cover Objects placed in your orchard/farm?
(*Show picture.*)
- d. How would you feel about researchers driving around your orchard/farm at night to sweep out air to catch flying insects?
- e. How would you feel about researchers walking around at night for surveys?
- f. Do you do an annual soil test? If so, and if we were to institute a regular soil sampling programme on your orchard/farm as part of ARGOS, would you keep doing your own one?

Appendix 2: Catalogue of categories

This appendix provides a catalogue of the categories used by the members of the ARGOS social research objective in their analysis of the initial kiwifruit interviews. The intent of the catalogue is to provide access to elements within the interviews which may be of interest to other researchers. It is the desire of the social research team to provide access to the wealth of data that is the first qualitative interview of the ARGOS programme. We will be able to provide a report listing only those sections of individual interviews which have text included in any code of interest, thus eliminating the need to peruse several hundred pages of interview transcripts.

Codes are listed in the form of a hierarchical index. As in the descriptive portion of the report, the number of interviews with excerpts in a particular category will be indicated by three numbers in parentheses (KiwiGreen Hayward, Organic, and KiwiGreen Hort 16A). While such numbers give an indication of the frequency with which a specific theme appears in interviews, they should not be interpreted as an indication of the relative importance of that code. It is very likely that a seldom used code may be of great influence to issues of sustainability for the relatively few orchardists who recognize that theme. At the same time, more numerous responses may be a reflection of the interview structure in which specific topics were included in each interview. If a category of interest is not included in the index, we would be to respond to enquiries about other categories. It is possible that the missing category is included within the coding under an existing heading, that the category did not appear in the interviews, or that we simply did not recognize it as a category in our analysis.

Categories for coding the preliminary ARGOS kiwifruit interviews

Management

- ❖ well [11, 12, 12]
- ❖ difficult [11, 12, 12]
- ❖ basic [11, 12, 11]
- ❖ business operation (extent of) [10,10, 8]
- ❖ landscape [9, 8, 10]
- ❖ motivations [11, 12, 12]
- ❖ risk – timing (importance of) [8, 7, 8]

Vision

- ❖ Financial Aspects
 - Money [5,10, 8]
 - *Economic growth* [0, 2, 2]
 - *Profitability* [1, 2, 2]
 - *Securing return* [2, 2, 3]
 - *Other* [2, 4, 1]
 - Productivity [6, 7, 8]
 - *Yield and viability* [2, 3, 3]
 - *Benchmarking* [1, 2, 3]
 - *Indicator of good management* [2, 1, 2]
 - *Consistency* [1, 1, 0]
 - Active retirement [6, 3, 4]

- Investment in Farm [0, 0, 4]
- Alternatives [3, 4, 4]
- Good fruit
 - *Size* [2, 2, 1]
 - *Consumer demands* [3, 3, 4]
 - *Other* [2, 0, 1]
- Maintaining position [1, 3, 1]
- Self-subsistence [0, 2, 1]
- Efficiency [1, 2, 0]

❖ **Social Aspects**

- Lifestyle [9, 10, 8]
- Family [5, 7, 6]
- Succession [1, 4, 1]

❖ **Ecological Aspects**

- Farm as part of landscape [3, 7, 6]
- Stewardship [2, 7, 3]
- Improving soil [1, 4, 4]
- Wise input use [3, 0, 2]
- Organic, as goal [0, 9, 0]

❖ **Personal Aspects**

- Being in Control [2, 3, 6]
- Challenge Driven [2, 4, 4]
- Experience [3, 2, 1]
- Chance to dream [0, 1, 1]

Constraints

❖ **Physical Environment**

- Climate [9, 11, 10]
- Topography [5, 5, 4]
- Soil [2, 2, 1]
- Pests
 - *Animals* [7, 7, 6]
 - *Pollination* [2, 2, 0]
 - *Plants* [0, 2, 0]
 - *Others* [2, 6, 4]
- Vines [0, 10, 6]
- Orchard Structure [8, 2, 3]

❖ **Financial**

- Labour [8, 6, 7]
- Reliability of Inputs [0, 8, 0]
- Money [2, 2, 4]
- Costs [0, 1, 3]
- Land [1, 0, 2]
- Viability [0, 2, 0]
- Outside interests [3, 2, 2]

❖ **Industry**

- Audit

- *Consumer demands* [2, 5, 5]
 - *Documentation* [2, 5, 5]
 - *Labour issues* [0, 0, 2]
 - Relations [2, 2, 1]
 - Poor Marketing [1, 7, 2]
- ❖ **Social**
- State
 - *Land use* [1, 2, 3]
 - *Macroeconomy* [3, 2, 1]
 - Outside Knowledge [6, 5, 4]
 - Neighbours [5, 5, 4]
 - Uncertainty [0, 2, 1]
- ❖ **Personal**
- Health/Age [3, 3, 2]
 - Lack Knowledge [4, 3, 7]
 - Limitations [1, 1, 0]
 - Time [4, 0, 0]
- ❖ **None [3, 3, 5]**

Indicators of sustainability

Economic Wellbeing/Productivity (Financial Indicators)

- ❖ **Wellbeing**
- Return [5, 6, 5]
 - Cost-Return [3, 8, 8]
 - Benchmarking [0, 4, 2]
 - Development vs. Production [0, 0, 2]
 - Financial Independence [0, 0, 2]
 - Lifestyle, other [1, 3, 1]
- ❖ **Productivity**
- Fruit Quality [3, 1, 4]
 - Fruit Quantity [6, 7, 8]
 - Vine Health [2, 5, 2]

Environment

- ❖ **Issues related to Soil**
- Worms, Nematodes [2, 4, 3]
 - Soil [2, 7, 4]
- ❖ **Ideas about Spraying**
- Appropriate Spray Use [1, 0, 0]
 - Previous spray programmes [2, 1, 4]
 - Spray Damaging Environment [2, 2, 4]
 - Spray NOT affecting Environment [2, 0, 0]
 - Spray Use to increase profit [0, 0, 1]
 - Pesticides [1, 0, 0]

- ❖ **Ideas Around Organics**
 - Organic Growing – Advantages [1, 3, 0]
 - Organic Growing – Challenges [0, 1, 1]
 - Organic/Conventional Comparison [0, 1, 1]
- ❖ **Insects, Spiders etc.**
 - Insect Pests [2, 0, 1]
 - Insects – not as pests [1, 2, 0]
 - Spiders [0, 1, 1]
- ❖ **Mammals**
 - Controlling Animal Pests [0, 3, 1]
 - Mammals [2, 2, 1]
- ❖ **Aesthetic appreciation of environment [0, 2, 1]**
- ❖ **Alternative Weed Control [0, 1, 0]**
- ❖ **Animals [1, 0, 0]**
- ❖ **Animals, plants show environmental health [4, 4, 4]**
- ❖ **Awareness of the Environment [2, 2, 0]**
- ❖ **Beneficial fungi, bacteria [0, 0, 1]**
- ❖ **Beneficial Science [1, 1, 0]**
- ❖ **Birds [1, 2, 2]**
- ❖ **Birds as Pests [0, 0, 1]**
- ❖ **Caring for the Environment [3, 6, 0]**
- ❖ **City-Urban versus Rural values [1, 1, 0]**
- ❖ **Compost [0, 1, 0]**
- ❖ **Controlling Weeds [1, 1, 0]**
- ❖ **Environmental quality measured through tests [0, 0, 1]**
- ❖ **Environment for Future Generations [0, 1, 0]**
- ❖ **Fertilizer [2, 0, 1]**
- ❖ **Fish, Frogs, Eels [0, 1, 0]**
- ❖ **Good product = Healthy environment [2, 0, 3]**
- ❖ **Grass [0, 0, 1]**
- ❖ **Greenie [2, 1, 1]**
- ❖ **Increase in Biodiversity [0, 3, 1]**
- ❖ **Industry and the Environment [1, 0, 1]**
- ❖ **KiwiGold and the Environment [0, 0, 1]**
- ❖ **KiwiGreen and the Environment [2, 0, 2]**
- ❖ **Lizards [1, 0, 0]**
- ❖ **Native Animals/Birds Value [0, 1, 0]**
- ❖ **Paramagnetic [0, 1, 0]**
- ❖ **'Tidy' Environment [3, 1, 4]**
- ❖ **Trees – importance of [1, 1, 0]**
- ❖ **Understandings of 'Nature' [1, 1, 0]**
- ❖ **Wetlands and waterways [1, 2, 1]**

Wellbeing of Self, Family and Community (social indicators)

- ❖ **Family** [11, 12, 12]
- ❖ **Community** [11, 12, 12] (networks)
- ❖ **Labour** [11, 12, 11] (who does what, contractors etc.)
- ❖ **Land value** [2, 5, 4] (encroachment by urban, overlaps with local authority etc.)

ARGOS [11, 12, 12]

Appendix 3: Summary of Attributes

Unless mentioned otherwise none of these relationships are statistically significant simply because the numbers in each crosstabulation are insufficient for the statistical tests to be valid. They are placed in this report to show some of the attributes that may contribute to the qualitative analysis of the first interviews and to demonstrate some possible relationships. The data to set up these tables was supplied by Dr Jayson Bengé.

Table 1: Crosstabulation of ‘Orchard system’ by ‘Number of people interviewed’

			No. interviewed		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	6	5	11
		%	55	46	101
	Organic Hayward	Count	8	4	12
		%	67	33	100
	KiwiGreen Hort 16A	Count	9	3	12
		%	75	25	100
Total		Count	23	12	35
		%	66	34	100

Table 2: Crosstabulation of ‘Orchard system’ by ‘Position of person interviewed’

			Position of person interviewed			Total
			Owner	Manager	Lessee	
Orchard system	KiwiGreen Hayward	Count	11	0	0	11
		%	100	0	0	100
	Organic Hayward	Count	10	1	1	12
		%	83	8	8	99
	KiwiGreen Hort 16A	Count	9	2	1	12
		%	75	17	8	100
Total		Count	30	3	2	35
		%	86	9	6	101

Table 3: Crosstabulation of 'Orchard system' by 'Number of kiwifruit varieties grown on orchard'

			No. of kiwifruit varieties grown on orchard		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	10	1	11
		%	91	9	100
	Organic Hayward	Count	11	1	12
		%	92	8	100
	KiwiGreen Hort 16A	Count	4	8	12
		%	33	67	100
Total		Count	25	10	35
		%	71	29	100

Table 4: Crosstabulation of 'Orchard system' by 'Growing other fruit as well as kiwifruit'

			Grow 'other' fruit on orchard as well as kiwifruit		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	6	5	11
		%	55	46	100
	Organic Hayward	Count	8	4	12
		%	67	33	100
	KiwiGreen Hort 16A	Count	8	4	12
		%	67	33	100
Total		Count	22	13	35
		%	63	37	100

Table 5: Crosstabulation of 'Orchard system' by 'Mows own orchard'

			Mow own orchard		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	2	9	11
		%	18	82	100
	Organic Hayward	Count	1	11	12
		%	8	92	100
	KiwiGreen Hort 16A	Count	5	7	12
		%	42	58	100
Total		Count	8	27	35
		%	23	77	100

Table 6: Crosstabulation of 'Orchard system by 'Does own vine work'

			Do own vine work		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	6	4	10
		%	60	40	100
	Organic Hayward	Count	7	4	11
		%	64	36	100
	KiwiGreen Hort 16A	Count	8	4	12
		%	67	33	100
Total		Count	21	12	33
		%	64	36	100

Table 7: Crosstabulation of 'Orchard system by 'Does own spraying'

			Do own spraying		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	7	4	11
		%	64	36	100
	Organic Hayward	Count	2	10	12
		%	17	83	100
	KiwiGreen Hort 16A	Count	7	5	12
		%	58	42	100
Total		Count	16	19	35
		%	46	54	100

Note: There is a statistically significant relationship between 'Orchard System' and 'Does Own Spraying' ($p = 0.043$). This indicates that more Organic participants are likely to do their own spraying when compared with the participants in the other two systems.

Table 8: Crosstabulation of 'Orchard system' by 'Does own basic fertilising'

			Do own basic fertilising		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	6	3	9
		%	67	33	100
	Organic Hayward	Count	2	9	11
		%	18	82	100
	KiwiGreen Hort 16A	Count	9	2	11
		%	82	18	100
Total		Count	17	14	31
		%	55	45	100

Table 9: Crosstabulation of 'Orchard system' by 'Does own side dressings of fertiliser'

			Do own side of dressings of fertiliser		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	4	5	9
		%	44	56	100
	Organic Hayward	Count	2	8	10
		%	20	80	100
	KiwiGreen Hort 16A	Count	7	4	11
		%	64	36	100
Total		Count	13	17	30
		%	43	57	100

Table 10: Crosstabulation of 'Orchard system' by 'Lives on orchard'

			Live on orchard		Total
			1	2	
Orchard system	KiwiGreen Hayward	Count	1	10	11
		%	9	91	101
	Organic Hayward	Count	4	8	12
		%	33	67	100
	KiwiGreen Hort 16A	Count	6	6	12
		%	50	50	100
Total		Count	11	24	35
		%	31	69	100