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# The ARGOS New Zealand Farm Sustainability Survey

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# Chapter 1
# Introduction: Objectives, Method and Design

## 1.1 Background

The core of the ARGOS research design is a longitudinal panel study of New Zealand farms (including orchards in the case of the kiwifruit sector). The research aims to get a better understanding of farmer perspectives on sustainability to increase knowledge of current farming practices and opinions and assist policy development to improve the New Zealand farming sector and the wider economy. The information collected will help inform government and industry organisations such as Fonterra, ZESPRI and Beef + Lamb New Zealand.

The research involves gathering data in order to assess the environmental, economic and social aspects and effects of farming and its production. As part of the ARGOS programme this research has been supplemented and informed by a national survey of farmers. In the past, this survey was conducted in form of a mail survey. This study, however, for the first time, included a web-based survey which was sent to a large number of farmers' e-mail addresses in August 2012. The survey was comprised of a range of questions constructed to assess their perceptions and opinions about issues related to sustainability. This is particularly important with continuing changes to primary production in form of environmental issues, climate change, irrigation management and government policies. Farms in the panel were distributed by the main farm types (namely sheep/beef, dairy, horticulture and arable) and across New Zealand in order to achieve results that would be applicable to a broad range of farms.

## 1.2 Research aim and objectives

The questionnaire was developed in collaboration with the team of ARGOS researchers drawing from a number of issues in the literature and from previous surveys (e.g. Fairweather et al, 2008).

The specific research objective of ARGOS addressed in this report was to identify the management system that farmers currently use and their intentions to use different systems. In addition, the survey included questions on the importance of different indicators of economic, environmental and social performance of farms, farmers' readiness to adopt changes in farming practices based on consumer demand, emissions trading, and water and irrigation.

The intent of this report is to provide a descriptive analysis of the results. While the term *farmer* is used throughout this report, it is understood to mean farmers, growers and orchardists.

The report is structured as follows: After a brief outline of the research aims and objectives, Chapter 1 will further present the sample design, questionnaire development and methodology. In Chapter 2 results of the survey will be presented in detail, and finally, in Chapter 3 brief conclusions are made.

### 1.3 Sample design

A sample of farmers in New Zealand was purchased from AsureQuality. The sample size was 12,984 farms. The sample distribution by farm type and region is presented in Table 1.1. In order to compare the sample to the total population of farms in New Zealand, the distribution of farms by type and by region provided by Statistics New Zealand is shown in Table 1.2. It can be seen that overall the AsureQuality database covered 24 per cent of the total farms in New Zealand as recorded by Statistics New Zealand. With regards to the farm type the AsureQuality database provided the highest proportions/coverage for the sheep & beef sector accounting for 34 per cent of total sheep and beef farms in New Zealand. This is followed by a high coverage of sheep farms (28 per cent of the total number of sheep farms in New Zealand) and dairy farms (25 per cent of total dairy farms in New Zealand). In contrast, the AsureQuality database (AgriBase™) only included 15 per cent of the total arable farms nationally.

**Table 1.1: E-mail distribution by region and farm type**

| Region | Arable | Beef | Dairy | Fruit growing | Kiwifruit growing | Sheep | Sheep & Beef | Total |
|---|---|---|---|---|---|---|---|---|
| Northland Region | 1 | 279 | 363 | 86 | 28 | 8 | 69 | **834** |
| Auckland Region | 2 | 158 | 81 | 50 | 15 | 38 | 49 | **393** |
| Waikato Region | 24 | 206 | 889 | 55 | 50 | 26 | 193 | **1,443** |
| Bay of Plenty Region | 5 | 61 | 308 | 210 | 196 | 8 | 37 | **825** |
| Gisborne Region | 11 | 32 | 1 | 63 | 17 | 11 | 126 | **261** |
| Hawke's Bay Region | 17 | 151 | 36 | 278 | 21 | 73 | 433 | **1,009** |
| Taranaki Region | 5 | 87 | 788 | 19 | 3 | 17 | 68 | **987** |
| Manawatu-Wanganui | 11 | 214 | 352 | 21 | 8 | 114 | 421 | **1,141** |
| Wellington Region | 6 | 85 | 83 | 30 | 2 | 71 | 164 | **441** |
| Tasman Region | 4 | 145 | 93 | 148 | 33 | 47 | 76 | **546** |
| Nelson Region | 0 | 8 | 0 | 2 | 0 | 4 | 5 | **19** |
| Marlborough Region | 5 | 51 | 28 | 27 | 0 | 45 | 89 | **245** |
| West Coast Region | 1 | 48 | 117 | 7 | 0 | 10 | 17 | **200** |
| Canterbury Region | 296 | 516 | 391 | 58 | 0 | 445 | 574 | **2,280** |
| Otago Region | 23 | 132 | 150 | 68 | 0 | 442 | 382 | **1,197** |
| Southland Region | 14 | 58 | 380 | 2 | 0 | 435 | 274 | **1,163** |
| **TOTAL** | **425** | **2,231** | **4,060** | **1,124** | **373** | **1,794** | **2,977** | **12,984** |

Source: AsureQuality, 2012.

**Table 1.2: Total numbers of farms by farm type and region in New Zealand (YE June 2011)**

| Area/Farm type | Arable[(1)] | Fruit growing[(2)] | Kiwifruit growing[(3)] | Sheep[(4)] | Beef[(5)] | Sheep & Beef[(6)] | Dairy[(7)] | Total |
|---|---|---|---|---|---|---|---|---|
| Northland Region | 292 | 407 | 89 | 65 | 1,947 | 348 | 1,241 | **4,389** |
| Auckland Region | 915 | 349 | 75 | 137 | 1,241 | 311 | 512 | **3,540** |
| Waikato Region | 279 | 187 | 157 | 206 | 2,512 | 963 | 5,710 | **10,014** |
| Bay of Plenty Region | 216 | 726 | 1,834 | 70 | 794 | 260 | 993 | **4,893** |
| Gisborne Region | 47 | 300 | 26 | 64 | 145 | 392 | 23 | **997** |
| Hawke's Bay Region | 143 | 623 | 20 | 343 | 529 | 916 | 131 | **2,705** |
| Taranaki Region | 64 | 41 | 3 | 62 | 623 | 331 | 2,518 | **3,642** |
| Manawatu/Wanganui | 235 | 78 | 13 | 701 | 1,039 | 1,634 | 1,191 | **4,891** |
| Wellington Region | 88 | 194 | 2 | 264 | 310 | 451 | 265 | **1,574** |
| Tasman Region | 102 | 325 | 31 | 157 | 302 | 143 | 193 | **1,253** |
| Nelson Region | 21 | 25 | 0 | 7 | 21 | 6 | 8 | **88** |
| Marlborough Region | 52 | 825 | 0 | 132 | 145 | 170 | 81 | **1,405** |
| West Coast Region | 11 | 15 | 0 | 23 | 157 | 33 | 447 | **686** |
| Canterbury Region | 559 | 501 | 5 | 1,521 | 1405 | 1507 | 1472 | **6,970** |
| Otago Region | 126 | 329 | 0 | 1,120 | 322 | 697 | 586 | **3,180** |
| Southland Region | 50 | 14 | 1 | 1,461 | 292 | 554 | 1176 | **3,548** |
| **Total New Zealand** | **2,886** | **4,939** | **2,256** | **6,342** | **11,791** | **8,737** | **16,548** | **53,499** |

Note: Only selected ANZSIC06 categories are displayed in this table. These match the AsureQuality database categories.

(1) A011 Nursery and Floriculture Production and A012 Mushroom and Vegetable Growing
(2) A013 Fruit and Tree Nut Growing excluding Kiwifruit
(3) A013200 Kiwifruit Growing
(4) A014100 Sheep Farming (Specialised)
(5) A014200 Beef Cattle Farming (Specialised) and A014300 Beef Cattle Feedlots (Specialised)
(6) A014400 Sheep-Beef Cattle Farming and A014500 Grain-Sheep or Grain-Beef Cattle Farming
(7) A016 Dairy Cattle Farming

Source: Statistics New Zealand, 2011.

## 1.4 Questionnaire development and survey procedure

As stated earlier, the questionnaire was developed by the ARGOS research team based on literature and previous results from national farm surveys (e.g. Fairweather et al., 2008).

In constructing the survey, the questions aimed to be consistent, clear and concise. The questionnaire was designed and structured utilising predominantly Likert scales (Likert, 1932). A variety of 5 point Likert scales were used but the most frequent ones were level of importance and level of agreement. The questions were framed to present both extremes of the scale. For example, in asking about level of agreement, the question was worded: *How much do you agree or disagree with the subject.* Furthermore, options listed in questions were ordered carefully to avoid presenting any patterns, and, where possible, options were

worded in positive and negative terms in order to avoid any consistent patterns of agreement or disagreement. The majority of questions in the survey were closed – ended, however, two questions in the survey were open-ended, so respondents were asked to comment on a specific issue. Additionally, the survey included numerous skip and display logics. These functions present a large advantage of online surveys as some questions only apply to a portion of respondents, so not all respondents have to bother with all questions. Thus, some questions were made conditional based upon an answer to previous questions. These display logics are identified in the results section of this report. Furthermore, participants were screened out when they were not the primary decision makers on the farm. The researchers assumed that only primary decision makers would have the detailed information and knowledge of their farming activity required by the survey. The questionnaire is included in Appendix 1.

Pre-testing occurred during the period of questionnaire development using fellow AERU researchers to go through the questionnaires. This resulted in revisions to the way questions were asked.

The survey was administered through Qualtrics™, a web-based survey system. Respondents were given a link to the on-line survey and by clicking on the link the Qualtrics interface opened and questions were shown consecutively to the respondent. The online survey was active from 6-27 August 2012. A reminder was sent after the first week on 14 August 2012.

Quantitative results were analysed in Excel while qualitative results were analysed in Nvivo; a software that enables the analysis of qualitative information, usually in the form of text. It enables the ordering of ideas into themes and topics. Researcher can then see common ideas and patterns and also identify conflicting opinions within respondent comments.

### 1.5 Response rates and sample representativeness

A total of 12,984 e-mails were sent out using the Qualtrics™ server. Technically, it would have been difficult to send out this large amount of e-mails from the Lincoln University server, this is why the Qualtrics™ server was used to distribute the survey. However, sending the survey from the Qualtrics™ server had one disadvantage: it was not possible to monitor how many farmers actually received the mail to calculate the response rate accurately. Hence, the response rate calculations were based on 12,984 mail addresses provided by the AsureQuality database (AgriBase™).

The respondents numbered 1,081. Thus, the averaged response rate of the survey was 8 per cent. As mentioned earlier, it was the first time that an ARGOS survey was conducted online, previous surveys used mail out questionnaires. In addition, research has shown that response rates for web-based surveys are often lower than for paper surveys (e.g. Sax et al., 2003). Thus, it was expected that the survey would receive a lower response rate than usual when compared with the 16 per cent averaged response rate obtained in 2008 and 32 per cent averaged response rate received in 2005 (Fairweather et al, 2008). Another factor maybe explaining the response rate was the timing of the questionnaire mail out. August is a busy time for farmers and horticulturalists. It is likely that the increased workload of farmers at

that time meant that, even if they were willing to fill in the survey, they would not have time to do so.

Another factor contributing to the response rate was the web-based format of the questionnaire itself. In addition, the questionnaire asked some questions which were demanding and it was apparent that many farmers found them difficult as shown in more detail in Section 2.15 in this report. Some farmers partially completed the questionnaire and these are still included in the analysis. In the information sheet of the survey, it was explained to the farmers that also partially completed surveys will be taken into account unless they send an e-mail to withdraw their response.

Table 1.3 provides more detail on the sample distribution by farm type and its representativeness of the total population. Overall, the sample was representative of the total population of farms with an over-representation of sheep and sheep & beef farmers. In contrast, horticulture land was slightly under–represented and dairy was very under-represented. It can be seen that the majority of respondents were sheep and beef farmers (27 per cent), this is followed by beef and dairy farmers accounting for 20 per cent each. In addition, nearly 10 per cent of the total respondents were orchardists, of which 23 per cent were kiwifruit growers.

**Table 1.3: Representativeness of sample**

| Farm type | Completed Surveys | Fully and partially completed surveys | Sample distribution (%) | Distribution of total number of farms in NZ (%)[2] |
|---|---|---|---|---|
| Arable | 45 | 58 | 5 | 5% |
| Beef | 129 | 215 | 20 | 22% |
| Dairy | 192 | 215 | 20 | 31% |
| Fruit growing | 72 | 102[1] | 9 | 13% |
| Sheep | 141 | 204 | 19 | 12% |
| Sheep & Beef | 207 | 287 | 27 | 16% |
| **Total** | **786** | **1,081** | **100** | **100%** |

Note: (1) among those are 23 completed surveys by Kiwi orchardist.
(2) sourced from Statistics New Zealand, 2011.

The regional distribution of the sample and its representativeness of the total population is presented in Table 1.4. Overall, the sample is representative across regions, however, Canterbury farmers are over-represented whereas Waikato farmers are somewhat under-represented. It can be seen that most responses were received from farmers in Canterbury accounting for 20 per cent of respondents, this is followed by Otago farmers with 12 per cent and Southland and Waikato farmers with 10 per cent, each.

**Table 1.4: Regional distribution of respondents**

| Region | Number of Responses | Sample distribution (%) | Distribution of total no of farms in NZ (%)[(1)] |
|---|---|---|---|
| Northland | 46 | 6% | 8% |
| Auckland | 25 | 3% | 7% |
| Waikato | 79 | 10% | 19% |
| Bay of Plenty | 48 | 6% | 9% |
| Gisborne | 21 | 3% | 2% |
| Hawke's Bay | 61 | 8% | 5% |
| Taranaki | 31 | 4% | 7% |
| Manawatu/Whanganui | 45 | 6% | 9% |
| Wellington | 27 | 3% | 3% |
| Tasman | 32 | 4% | 2% |
| Nelson | 12 | 1% | 0% |
| Marlborough | 29 | 4% | 3% |
| West Coast | 13 | 2% | 1% |
| Canterbury | 161 | 20% | 13% |
| Otago | 95 | 12% | 6% |
| Southland | 81 | 10% | 7% |
| **Total** | **806** | **100%** | **100%** |

Note: (1) sourced from Statistics New Zealand, 2011.

# Chapter 2
# Results

## 2.1 Introduction

This chapter starts with a description of the farms and farmers. It then considers the management system used, and future intentions to use different management systems. Then results on economic, environmental and social performance of the farms, farmers' readiness to adopt changes in farming practices based on consumer demand, emissions trading, and water and irrigation are outlined.

The farm type distribution of the sample is presented in Table 2.1. This is based on the respondents' indication of their main farming activity and does not necessarily match the farm type distribution of the AsureQuality database presented in Table 1.1 in the previous section. The reason may be that farming activities changed and AsureQuality was not informed, and thus could not update their database. Additionally, different categories were used which made a comparison more difficult. However, by comparing the tables the proportions/trends are still the same with the majority of respondents being sheep and/or beef farmers (52 per cent), followed by dairy farmers (26 per cent), then horticulture accounting for 10 per cent. The smallest group of farmers represented in the sample were specialist livestock and deer famers with 2 and 1 per cent, respectively.

**Table 2.1: Farm type distribution indicated by respondents**

| Farm type | Responses | % |
|---|---|---|
| Dairy | 246 | 26% |
| Sheep/Beef | 498 | 52% |
| Deer | 10 | 1% |
| Specialist Livestock | 21 | 2% |
| Arable or Cropping | 52 | 5% |
| Horticulture | 94 | 10% |
| Other (please specify) | 37 | 4% |
| **Total** | **962** | **100%** |

Farmers that indicated they work predominantly in the horticulture sector were then asked to indicate which crop they are predominantly cultivating. This was used to identify the kiwi growers among the respondents. As shown in Table 2.2 a total of 32 per cent of respondents were kiwifruit orchardists, with the majority growing green kiwifruit. Again, this figure differs from Table 1.3 that identified only 23 per cent of the horticultural farmers in the AsureQuality database as being kiwifruit orchardists. However, the researchers argue that the information provided in Table 2.2 is more accurate as it represents the farmers'

indication at the time of the survey. Other predominant crops were apples and avocados with accounting for 12 per cent each, pipfruit (7 per cent) and berryfruit (6 per cent).

**Table 2.2: Kiwifruit growers and other orchardists in sample**

| Farm type | Responses | % |
|---|---|---|
| Green kiwifruit | 19 | 21% |
| Gold kiwifruit | 5 | 6% |
| 50/50 Green and Gold Kiwifruit | 3 | 3% |
| 50/50 Gold and Red Kiwi | 2 | 2% |
| Pipfruit | 6 | 7% |
| Berryfruit | 5 | 6% |
| Viticulture | 3 | 3% |
| Apples | 11 | 12% |
| Avocado | 11 | 12% |
| Cherries | 4 | 4% |
| Citrus | 4 | 4% |
| Olives | 3 | 3% |
| Walnuts | 4 | 4% |
| Other | 10 | 11% |
| **Total** | **90** | **100%** |

In Table 2.3 the farm information provided by respondents is shown. The average farm had 424 effective hectares (total hectares were 469). The financial information provided by the farmers showed a wide range, so the data were checked and an outlier of an annual gross revenue of $50 million for the financial year 2010-2011 was removed. Thus, the average annual gross revenue for the financial year 09-10 was $763,570 and for the financial year 2010-11 was $770,782.

**Table 2.3: Profile – farm information**

| Total hectares (avg) | Effective hectares (avg) | Average gross revenue 2009-10 ($) | Average gross revenue 2010-11 ($) |
|---|---|---|---|
| 469 | 424 | $763,570 | $770,782 |

Table 2.4 shows data relating to level of debt. The table shows that most farmers (28 per cent) were debt free. This is followed by more than a fifth of respondents with a debt of 20-39 per cent and 21 per cent with a debt level of 20-39 per cent, respectively.

**Table 2.4: Debt levels of sample repsondents**

| Answer | Response | % |
|---|---|---|
| My farm/orchard is debt free | 218 | 28% |
| Debt is between 0-19% of equity | 164 | 21% |
| Debt is between 20-39% of equity | 166 | 22% |
| Debt is between 40-59% of equity | 108 | 14% |
| Debt is between 60-80% of equity | 31 | 4% |
| Debt is over 80% of equity | 9 | 1% |
| Don't know | 19 | 2% |
| Prefer not to answer | 57 | 7% |
| **Total** | **772** | **100%** |

Table 2.5 shows data relating to farmers' levels of satisfaction with their current economic viability. The spread of responses was broad and all levels on the five-point scale were used. The highest proportion of respondents was satisfied (43 per cent). This is followed by a large grouping at the mid–point of the scale (22 per cent). In contrast, only 6 per cent were unsatisfied with their current level of economic viability.

**Table 2.5: Satisfaction with current level of economic activity**

| Answer | Response | % |
|---|---|---|
| Very satisfied | 65 | 8% |
| Satisfied | 335 | 43% |
| Neither satisfied or unsatisfied | 172 | 22% |
| Unsatisfied | 157 | 20% |
| Very unsatisfied | 44 | 6% |
| Prefer not to answer | 8 | 1% |
| **Total** | **781** | **100%** |

Table 2.6 shows the farmers' profile based on the respondents. The majority of respondents were men (78 per cent), on average between 56 years old, had been associated with their farm for an average of 23 years, had been farming for 29 years and expected to farm for another 14 years. Since the average age of the farmers was 56 this would mean that they intend to retire at the age of 70 years. Sixty six per cent of farmers expect to live in the same community in ten years' time. Most of the farmers (72 per cent) classified themselves as full-time farmers on a family farm (83 per cent).

**Table 2.6: Farmers' profile**

| % of male respondents | Average age | Years associated with farm | Years farming | Years expect to farm | % expect to live in community in 10 years | % full time |
|---|---|---|---|---|---|---|
| 78 | 56 | 23 | 29 | 14 | 66 | 72 |

Table 2.7 shows the educational attainment of the responding farmers. The majority of survey participants had completed secondary school education (33 per cent). A fifth of all respondents had an undergraduate diploma/certificate or university degree, respectively. In addition, eight per cent of the respondents had a post-graduate degree.

**Table 2.7: Level of education**

| Educational attainment | Response | % |
|---|---|---|
| Attended secondary school | 258 | 33% |
| Trade technical qualification or similar | 143 | 18% |
| Undergraduate diploma or certificate | 159 | 20% |
| University degree | 156 | 20% |
| Post graduate university degree | 60 | 8% |
| **Total** | **776** | **100%** |

## 2.2 Farm or orchard management system

The first questions in the survey were designed to establish what management system farmers used. In order to identify which specific system within the selected management system respondents are using, the questionnaire implemented numerous display logics depending on the management system the respondent selected in the first place. For example, if the participant selected organic management as his/her current system, the following question would then display numerous organic management systems in order to gain a greater specification of the system.

### Management system used

Management systems used by respondents at the time of survey are presented in Table 2.8. The majority of farmers, almost 70 per cent, used *conventional management systems.* This is followed by *modified conventional management systems* that are used by 15 per cent of respondents. Only 5 per cent of the respondents used *organic management systems* at the time of the survey. Respondents who indicated to use another management system mentioned *Biological farming* (n=10) and *holistic management approaches* (n=3).

**Table 2.8: Farm or orchard management systems in use**

| Management system | Response | % |
|---|---|---|
| Conventional Management | 560 | 70% |
| Modified Conventional Management (Integrated Management) | 120 | 15% |
| Conventional Management with other system | 53 | 7% |
| Organic Management (fully certified or in conversion) | 41 | 5% |
| Any other system | 27 | 3% |
| **Total** | 801 | 100% |

Respondents who selected horticulture as predominant farming activity were then shown specific management systems to specify further. As shown in Table 2.9, *GlobalGap* (31 per cent), *KiwiGreen* (18 per cent) and *NZGAP* (18 per cent) are the most commonly used systems by orchardists. The *Green Tick programme* was not used by any responding orchardist. *Tesco's Nature choice programme* and the *Team Avocado Foodsafety Program* were the most commonly mentioned systems by the majority of respondents who indicated their use of other systems.

**Table 2.9: Modified conventional management systems in use by horticulturists**

| Management system | Responses | % |
|---|---|---|
| AvoGreen | 14 | 12% |
| GlobalGap (kiwifruit) | 37 | 31% |
| Green Tick | 0 | 0% |
| NZGAP (fresh produce) | 21 | 18% |
| Pipfruit integrated fruit production | 15 | 13% |
| Sustainable Winegrowing NZ | 3 | 3% |
| KiwiGreen (kiwifruit) | 22 | 18% |
| Other system | 8 | 7% |
| **Total** | **120** | **100%** |

Table 2.10 shows the distribution of other conventional systems used by respondents. Survey participants could select more than one option. Results showed that almost two fifths of all respondents use *NZS8409:2004 Management of Agrichemicals (GROWSAFE)*. This is followed by the *Meat company assurance programme* accounting for 31 per cent of survey participants, then *the Code of Practice for Nutrient Use* which is used by more than a quarter of the respondents. *Merino NZ Ltd - Zque programme* was the least used system with only 2 per cent of the respondents indicating use of this system. Other most commonly used systems were *NZGAP* (16 per cent)*, BioGrow Standards/NOP Certification* (16 per cent) and *Fonterra Best Practice* (8 per cent).

**Table 2.10: Other conventional systems in use**

| Management system | Responses | % |
|---|---|---|
| Code of Practice for Nutrient Use | 278 | 26% |
| Meat company assurance programme | 342 | 31% |
| Merino NZ Ltd - Zque programme | 23 | 2% |
| NZS8409:2004 Management of Agrichemicals (GROWSAFE) | 409 | 38% |
| Other system | 38 | 3% |
| **Total** | **1,090** | **100%** |

Respondents who indicated use of an organic management system were further asked to specify the system. The distribution is shown in Table 2.11. Half of the respondents use BioGro as organic management system, this is followed by nearly two fifths of respondents using the *AsureQuality* certification scheme. There were no respondents who currently use the *Demeter* programme.

**Table 2.11: Organic management systems in use**

| Management system | Responses | % |
|---|---|---|
| AsureQuality | 13 | 38% |
| BioGro | 17 | 50% |
| Demeter | 0 | 0% |
| Organic Farm New Zealand | 3 | 9% |
| Not officially certified | 1 | 3% |
| Other system | 0 | 0% |
| **Total** | **34** | **100%** |

## 2.3 Intentions to use management systems

After the respondents indicated which management system they are currently using, they were then asked about the strength of their intention to use another management system if they were to change their current management system.

**Table 2.12: Intentions to change management system**

| Management system | Strong intent to use | Intend to use | Neutral | Intend not to use | Strong intent not to use | Total | N |
|---|---|---|---|---|---|---|---|
| Conventional management | 29% | 34% | 23% | 8% | 6% | 100% | 672 |
| Modified conventional management | 14% | 29% | 40% | 10% | 6% | 100% | 638 |
| Organic management (certified) | 4% | 2% | 17% | 38% | 38% | 100% | 615 |
| Organic management (not certified) | 7% | 11% | 19% | 33% | 31% | 100% | 642 |
| Other system | 6% | 2% | 40% | 33% | 19% | 100% | 172 |

As shown in Table 2.12, there were varying intentions to use any of these systems. Generally, there were positive intentions to use either conventional or modified conventional management systems, with higher proportions for the conventional management systems (61 per cent selecting *'strong intent to use'* or '*intend to use'*). Among the respondents, there was less enthusiasm for registered organic methods with 71 per cent of farmers selecting '*intend not to use'* or *'strong intent not to use'* in the future. However, there were 16 per cent of farmers who indicated a positive intention ('*strong intent to use'* and '*intend to use'*) for unregistered organic methods.

## 2.4 Intended changes in management systems

After identifying the current management systems that are used by farmers and their intentions to use other systems, the next question asked if respondents had actual plans to change their management system. Those respondents intent on making a change were then further asked to specify to which system they will change. Results are presented in Tables 2.13 and 2.14.

**Table 2.13: Plans to change farm management system**

| Answer | Response | % |
|---|---|---|
| Yes | 103 | 14% |
| No | 662 | 86% |
| **Total** | **765** | **100%** |

The majority of respondents (85 per cent) did not have any plans to change their farm management system at the time of the survey. This left about 14 per cent of respondents who have plans for changing their farm management system. Of those, more than two fifths said they have plans to change to a *modified conventional management system* and about one fifth had plans to change from their current system to *unregistered organic production*. The system that received the lowest proportion of responses was the *certified organic management*. Other management systems that were mentioned by respondents included

*soil carbon farming*, *approaches that go beyond organics*, *PSA control* and many more. Four respondents who claimed planning to change their management system did not give further indication to which management system they would convert to.

**Table 2.14: Plans to change to different management system**

| Management system | Response | % |
|---|---|---|
| Conventional management | 8 | 8% |
| Modified conventional management | 60 | 61% |
| Organic management (certified) | 2 | 2% |
| Organic management (not certified) | 20 | 20% |
| Other management system | 9 | 10% |
| **Total** | **99** | **100%** |

Within this set of questions, the kiwifruit growers that indicated plans of changing their management system were asked for further elucidations. Depending on the kiwifruit variety they are currently growing, they were asked if they have plans to grow another variety. Simply put, green kiwifruit growers were asked if they plan to change to grow gold kiwifruit and vice versa. The results are shown in Table 2.15. It can be seen that in both cases there are almost no intentions to change from the kiwifruit variety that is currently grown by the farmer.

**Table 2.15: Plans on changing growing kiwi fruit variety**

| Answer | Response | % |
|---|---|---|
| *Plans for growing predominantly new gold kiwifruit* | | |
| Yes | 3 | 17% |
| No | 15 | 83% |
| **Total** | **18** | **100%** |
| *Plans for growing predominantly green kiwifruit* | | |
| Yes | 0 | 0% |
| No | 6 | 75% |
| Don't know | 2 | 25% |
| **Total** | **8** | **100%** |

## 2.5 Reasons for changing management systems

After indicating that there is a willingness to change the current management system the respondents were asked for specific reasons for those plans. This was an open-ended questions and the data was analysed in Nvivo.

Just over one third of the comments made reference to organic, natural or environmental reasons for changing management systems. Changing to *organic* made up the majority of

these comments. This was followed by general comments about wanting to reduce chemicals, fertilisers, sprays, herbicides, modified seeds or for general environmental reasons

*"Would like to move towards organics or a more natural farming practice."*

*"Would like to go for a bit more of a biological approach."*

*"Less use of chemicals and fertilisers."*

*"Healthy soil = healthy plants = healthy animals = healthy humans."*

There were two comments made about organic being ideal but difficult to achieve – economic feasibility and hassles of certification.

About one quarter of the reasons for changing management related to economic, profit or productivity reasons although about half of these were conditional on improving sustainability or minimising environmental impacts at the same time.

*"we are constantly looking to improve our management to better utilize inputs and improve management out comes to get a better return on our capital and labour inputs and yet to minimise any adverse environmental effects as much as possible. It is of course not possible to farm without having some effects on the environment some being good and some adverse."*

***To improve profitability while farming sustainability***

Respondents also referred to following the market or what is deemed as best practice. These were often linked with economic benefits.

*Because there are always opportunities to improve how and what we do as new information comes forward, new methods developed and communicated. Commercial reward is another driver. From a strictly business financial perspective there is no point in changing the management system if there is no financial reward. We still have financial commitments and need to feed the family.*

A number of comments also cited sustainability without reference to profit or productivity. A few of these comments were made in relation to conventional methods not being sustainable or best practice and a few comments were linked with quality produce and more general environmental benefits.

Respondents also referred to a change in farm type or management such as children taking over, as a reason for changing the management system.

The remaining comments were a mix of general comments (i.e. "*see what works..*", "*just an upgrade…*", "*so I can use appropriate techniques*…") as well as specific comments on what practices will be used. There were two references to animals – better animal welfare and animal nutrition, as well as two comments on pest management.

## 2.6 Farm financial performance

The next part of the questionnaire assesses farmers' perceptions of environmental, economic and social indicators/measures for their farming activities. To examine financial performance indicators, participants were asked to rate the level of importance to them of particular financial measures based on a five point Likert scale ranging from *very important* to *important*.

As shown in Table 2.16, *working expenses* were seen to be of highest importance to participants accounting for 95 per cent of participants selecting *very important* or *important*. This is followed by the indicators '*Net profit/loss'* and '*gross income'* which were both seen as *very important* or *important* by 89 per cent of respondents.

The least important indicator of farm financial performance to survey participants was '*return on capital*', with only 56 per cent of respondents rating it as either *very important* or *important* and another 10 per cent valuing it as *unimportant*.

Overall, the majority of responses for this question showed that many of these indicators are either of high or medium importance to farm professionals. Other measures that were mentioned by numerous respondents were that of sustainability of the farm and the improvement of farm financial performance over time.

**Table 2.16: Importance of indicators for financial performance**

| Indicators | Very Important | Important | Neither | Unimportant | Very Unimportant | Total | N |
|---|---|---|---|---|---|---|---|
| Gross income | 41% | 48% | 9% | 2% | 0% | 100% | 828 |
| Working expenses | 48% | 47% | 4% | 1% | 0% | 100% | 832 |
| Change in bank balance over the year | 23% | 47% | 23% | 6% | 0% | 100% | 815 |
| Actual income versus budget income | 22% | 49% | 20% | 8% | 1% | 100% | 815 |
| Cash surplus/deficit | 47% | 41% | 9% | 3% | 0% | 100% | 826 |
| Net profit/loss | 51% | 38% | 9% | 2% | 0% | 100% | 826 |
| Equity | 30% | 49% | 17% | 4% | 0% | 100% | 820 |
| The ratio of working expenses to gross income | 27% | 49% | 18% | 5% | 1% | 100% | 824 |
| Return on capital | 18% | 38% | 32% | 11% | 1% | 100% | 819 |
| Money is available to cover cash needs | 37% | 52% | 9% | 2% | 0% | 100% | 827 |
| Monitoring financial performance | 35% | 48% | 13% | 4% | 1% | 100% | 822 |

## 2.7 Farm production performance

After identifying farmers' attitudes towards financial indicators of farm performance, participants were asked about the importance of several farm production performance indicators based on a five point Likert scale varying from *very important* to *very unimportant*. Results are presented in Table 2.17.

Highest proportions were received for '*health of livestock and/or plants'* with all respondents selecting it as either a *very important* or an *important* measure for farm production. Interestingly, there was no indication that this aspect was neither *important or unimportant, or very unimportant*. Participants also stated that maintaining that '*quality of production is at a maximum'* was of high importance for them, accounting for 91 per cent of the respondents (selecting either *very important* or *important*). Similarly, '*a tidy, well-maintained farm/orchard'* was considered to be an important farm production indicator with 89 per cent of respondents selecting either *very important* or *important*.

In contrast, the least important indicator of farm production performance was the '*reduction of greenhouse gas emissions'.* Only 29 per cent of respondents thought this was *very important* or *important* and 27 per cent thought this was *unimportant* or *very unimportant*.

As with results shown for farm financial performance indicators, the majority of respondents showed that most indicators of farm production performance are of either high or medium importance to farmers.

Suggestions for other production indicators included that of '*maintaining environmental properties'* and *'increase/optimise production'*.

**Table 2.17: Importance of indicators for farm production performance**

| Indicator | Very Important | Important | Neither | Unimportant | Very Unimportant | Total | N |
|---|---|---|---|---|---|---|---|
| The health of livestock and/or plants | 85% | 15% | 0% | 0% | 0% | 100% | 833 |
| Yields per hectare compared to other similar farmers/orchardists | 18% | 46% | 26% | 8% | 2% | 100% | 817 |
| A tidy, well-maintained farm/orchard | 28% | 60% | 9% | 2% | 0% | 100% | 833 |
| Minimum weeds | 26% | 58% | 13% | 2% | 1% | 100% | 837 |
| Volume of production is at a maximum | 20% | 45% | 27% | 7 % | 1% | 100% | 821 |
| Quality of production is at a maximum | 44% | 48% | 7% | 1% | 1% | 100% | 827 |
| The farm/orchard has a good mixture of productive uses/activities | 17% | 52% | 26% | 5% | 1% | 100% | 823 |
| No potentially productive land is going to waste | 18% | 56% | 18% | 6% | 1% | 100% | 827 |
| Reducing greenhouse gas emissions | 6% | 23% | 44% | 15% | 12% | 100% | 810 |

## 2.8 Farm environmental performance

To assess farmers perceptions of environmental indicators, participants were asked to rate the importance of several farm environmental performance indicators of their farming activities. As shown in Table 2.18, '*soil fertility levels'* and '*soil health'* were the most important measures with each exceeding 95 per cent of respondents selecting *very important* or *important*. Followed by this is the '*water quality in nearby streams and waterways'* accounting for 93 per cent of respondents considering this indicator to be *very important* or *important*.

The '*amount of carbon stored*' was rated lower than the other listed alternatives with more than a fifth of respondents finding it either *unimportant* or *very unimportant*.

Suggestions for other environmental indicators of importance included the '*reduction in erosion on the farm'* and *'the use of native/mixed vegetation'* which were mentioned by several survey respondents.

**Table 2.18: Importance of indicators of environmental farm performance**

| Indicator | Very Important | Important | Neither | Unimportant | Very Unimportant | Total | N |
|---|---|---|---|---|---|---|---|
| Soil fertility levels | 48% | 48% | 3% | 1% | 0% | 100% | 829 |
| Soil biological activity | 43% | 46% | 10% | 1% | 0% | 100% | 821 |
| Soil health | 50% | 45% | 4% | 0% | 0% | 100% | 831 |
| Water quality in nearby streams and waterways | 45% | 48% | 5% | 1% | 0% | 100% | 832 |
| Water budgeting | 13% | 31% | 40% | 13% | 4% | 100% | 798 |
| Nutrient budgeting | 21% | 50% | 24% | 4% | 1% | 100% | 807 |
| Pesticide use | 18% | 50% | 22% | 6% | 4% | 100% | 822 |
| Energy efficiency | 16% | 49% | 28% | 5% | 2% | 100% | 814 |
| The amount of carbon stored (sequestered) | 9% | 25% | 44% | 14% | 8% | 100% | 755 |

Then participants were further asked if they consider maintaining or increasing certain biodiversity aspects to improve the environmental performance of their farm (see Table 2.19). Results showed that for the majority of respondents maintaining and increasing the number of *'native bird species'* is the most important environmental performance factor for them, with 82 per cent selecting *very important* and *important*. This is followed by the importance of '*native plants and trees'* for the environmental performance of the farm, with 78 per cent of respondents stating it to be *very important* or *important*.

Conversely, *'introduced bird species'* were considered the least important of all listed alternatives with more than a fifth selecting it as *unimportant* or *very unimportant*.

**Table 2.19: Importance of maintaining or increasing certain biodiversity components on the farm**

| Component | Very Important | Important | Neither | Unimportant | Very Unimportant | Total | N |
|---|---|---|---|---|---|---|---|
| Native bird species | 36% | 46% | 15% | 2% | 1% | 100% | 832 |
| Introduced bird species | 5% | 25% | 47% | 17% | 6% | 100% | 823 |
| Native plant or tree species | 29% | 49% | 17% | 4% | 1% | 100% | 828 |
| Introduced plant or tree species | 8% | 40% | 40% | 9% | 3% | 100% | 830 |
| Biodiversity on my farm/orchard | 15% | 40% | 38% | 6% | 1% | 100% | 787 |

## 2.9 Farm social performance

In the next section of the survey, participants were confronted with numerous statements concerning the social performance of their farm and were asked to rank their importance. Results are shown in Table 2.20.

Highest proportions were received for the statements *"I have enough time to devote to family and friends"* and *"My farm/orchard workers are treated well"* with 93 per cent of respondents selecting *very important* and *important* for both statements. This is followed by "*My farming/orcharding helps to create an attractive place to live"* which was rated by 90 per cent of survey participants as *very important* or *unimportant*. In contrast, the least important statement to farmers was that their *"farming/orcharding is able to contribute to local festivals, shows or events"*, almost a quarter of all respondents considered this as either *unimportant* or *very unimportant*. Similarly, the approval of farming practices by neighbours was rated lower than other listed statements with 16 per cent selecting either *unimportant* or *very unimportant*.

Suggestions for other social farm performance indicators varied considerably, and included aspects relating to the community and government agencies receiving correct information about on-farm/orchard activities, the sustainability of social farm practices, and the personal satisfaction found in farming/orcharding activities.

## Table 2.20: Importance of social farm performance measures

| Statement | Very Important | Important | Neither | Unimportant | Very Un-important | Total | N |
|---|---|---|---|---|---|---|---|
| The children are involved in the farm or orchard. | 23% | 47% | 24% | 5% | 1% | 100% | 718 |
| I have enough time to participate in community activities | 13% | 57% | 23% | 5% | 1% | 100% | 804 |
| I have enough time to devote to family and friends. | 39% | 54% | 6% | 1% | 0% | 100% | 818 |
| I have enough time to participate in activities and recreation off-farm. | 22% | 60% | 14% | 4% | 0% | 100% | 813 |
| My farming/orcharding helps me to develop a connection to the place where it is located. | 15% | 52% | 27% | 5% | 1% | 100% | 801 |
| Members of my farm/orchard family will be able to find employment in this area. | 10% | 33% | 42% | 12% | 2% | 100% | 736 |
| My farming/orcharding is able to contribute to local festivals, shows or events. | 4% | 23% | 49% | 19% | 5% | 100% | 771 |
| My farm/orchard is contributing to the local community. | 9% | 46% | 35% | 8% | 2% | 100% | 781 |
| My neighbours approve of my farming/orcharding practices. | 8% | 43% | 35% | 12% | 4% | 100% | 797 |
| My farming/orcharding helps to create an attractive place to live. | 29% | 61% | 8% | 2% | 0% | 100% | 809 |
| My neighbours consider me to be a good farmer/orchardist. | 13% | 45% | 30% | 9% | 4% | 100% | 788 |
| My family has a good reputation in the local community. | 22% | 56% | 16% | 3% | 2% | 100% | 789 |
| My farm/orchard workers are treated well. | 45% | 49% | 5% | 1% | 0% | 100% | 684 |
| There is scope for farm succession. | 30% | 37% | 25% | 5% | 3% | 100% | 738 |

## 2.10 Farmers approach to management

In the next section of the survey, participants were asked to provide information relating to certain farm management approaches. They were presented with a list of strategic approaches and based on a five point Likert scale ranging from *always* to *never*, they were asked to indicate how often they would consider each of the presented approaches. As shown in Table 2.21, the majority of participants indicated that they *pay close attention to money in the bank and good financial returns from each part of their business*, with 49 per cent of participants indicating that they *always* do this, and a further 37 per cent indicating that they do this *most of the time*. Likewise, almost two fifths of respondents indicated that they *always pay close attention to what is going on in New Zealand and in the world*, with a further 48 per cent showing that they do this *most of the time*.

When it comes to farm plans, more than one third of farmers stick to existing plans, more than half of the respondents deviated from them *sometimes* and only 11 per cent deviate from them either *always* or *most of the time*.

**Table 2.21: Implementing farming strategies**

| Statement | Always | Most of the time | Sometimes | Rarely | Never | Total | N |
|---|---|---|---|---|---|---|---|
| I adopt proven practices rather than do my own experiments. | 6% | 66% | 25% | 3% | 0% | 100% | 814 |
| I pay close attention to changes in plants/animals/insects on my farm. | 37% | 46% | 14% | 2% | 0% | 100% | 815 |
| I pay close attention to money in the bank and good financial returns from each part of my business. | 49% | 37% | 12% | 2% | 0% | 100% | 818 |
| I pay close attention to what is going on in NZ and in the world. | 41% | 48% | 11% | 1% | 0% | 100% | 818 |
| I focus on a limited number of income sources. | 23% | 55% | 13% | 7% | 1% | 100% | 800 |
| I keep unused resources (e.g. buildings, machines) in case they are needed in the future. | 15% | 36% | 34% | 12% | 3% | 100% | 811 |
| I deviate from established farm plans. | 2% | 9% | 56% | 32% | 2% | 100% | 797 |
| I learn new things by talking with a wide variety of people. | 28% | 43% | 25% | 3% | 0% | 100% | 807 |

## 2.11 Community participation

Community life and participation can be important to many farmers. In order to find out in which community-based activities farmers are involved, participants were then asked to rate

their level of involvement in those activities based on a five point Likert scale varying from *heavy involvement* to *no involvement at all.*

As shown Table 2.22, community involvement was seen to be most prevalent in participation in political processes. Voting in national and local body elections received highest proportions with 63 per cent and 56 per cent of respondents being either *heavily* or *highly involved*, respectively.

In contrast, lowest involvement was recorded in emergency groups such as *fire services, ambulance and search & rescue* with 79 per cent of respondents indicating to have *little* or *no involvement*. Similarly, only 12 per cent of respondents reported of *heavy* or *high involvement* in *civic organisations* such as the Rotary or Lions Club.

Overall, very few community activities were shown to be engaged in heavily; the majority of participants stating *no involvement* in six out of 11 activities.

Other participation in community activities that was mentioned by farmers included rural and agricultural research and education; environmental and political awareness campaigns; involvement in community trusts, halls and domains, as well as other groups such as Young Farmers Clubs, RSA and surf lifesaving clubs.

**Table 2.22: Community participation**

| Activities | Heavy involve-ment | High involve-ment | Some involve-ment | Little involve-ment | No involve-ment | Total | N |
|---|---|---|---|---|---|---|---|
| Voting in national elections | 24% | 39% | 21% | 11% | 4% | 100% | 805 |
| Voting in local body elections | 21% | 35% | 24% | 14% | 6% | 100% | 802 |
| Submitting comments on local government plans and policy | 5% | 11% | 32% | 30% | 21% | 100% | 804 |
| School or educational groups | 12% | 16% | 23% | 16% | 33% | 100% | 798 |
| Church groups and/or care agencies | 6% | 8% | 19% | 21% | 46% | 100% | 794 |
| Sports/athletic/recreational groups | 10% | 18% | 32% | 18% | 21% | 100% | 802 |
| Civic organisations | 5% | 7% | 10% | 18% | 60% | 100% | 799 |
| Festivals, shows (e.g. A&P) | 4% | 9% | 25% | 25% | 37% | 100% | 800 |
| Fire service, ambulance, search & rescue | 5% | 4% | 12% | 22% | 57% | 100% | 801 |
| Providing cash financial support to community activities | 3% | 16% | 48% | 21% | 12% | 100% | 806 |

## 2.12 Future markets

There is a number of regulatory and private sector initiatives established to normalise and standardise the metrics used to monitor and describe sustainability impacts and trends. These are at a critical stage of development where a strategic understanding and input into the development of these sustainability metrics could have a significant impact on the viability of New Zealand's primary sector exports. Developing an understanding of these demands will enhance the responsiveness of the New Zealand primary industries and enable them to potentially extract greater value by servicing the demand for these extrinsic product attributes (ARGOS, 2011). Therefore, the next set of questions assessed farmer's current practices and readiness to adopt changes in farming practices in preparation for potential predicted changes in market activities and consumer demand. Firstly, participants were asked if they consider certain sustainability elements in their current farming practices and secondly, if they think those elements will gain importance in the future.

The sustainability elements included:

- Food safety,
- Farm Animal Welfare,
- Protection of indigenous flora and fauna,
- Water conservation, and
- Reduction of Greenhouse gas emissions.

As shown in Table 2.23, a majority of participants (98 per cent) indicated that they currently consider *animal welfare* in their day to day farming. This was closely followed by safe food production (97 per cent). A significant proportion of participants also indicated that they consider the protection of indigenous flora and fauna (81 per cent) and water conservation (78 per cent) in current production. In contrast, only 29 per cent of participants stated that they currently consider reducing Greenhouse gas emission, meaning that 71 per cent of respondents currently do not consider this element in farm production.

**Table 2.23: Sustainability elements in current farming practices**

| Sustainability element | Yes | No | Total | N |
|---|---|---|---|---|
| Safe food production | 97% | 3% | 100% | 794 |
| Farm animal welfare | 98% | 2% | 100% | 780 |
| Protection of indigenous flora and fauna | 81% | 19% | 100% | 742 |
| Water conservation | 78% | 22% | 100% | 784 |
| Greenhouse gas emissions reduction | 29% | 71% | 100% | 720 |

When asked if those elements will gain importance, results were similar to the above question with farm animal welfare, food safety and water conservation rated as becoming *a*

*lot more important* by nearly 80 per cent of respondents for each of the elements (see Table 2.24). With regards to the protection of indigenous flora and fauna, a third of respondents expect *no change in importance* compared to today. Again, the reduction in greenhouse gas emissions was rated lower than any of the other sustainability elements as growing in importance. However, a total of 58 per cent of respondents state that this will be either *a lot more important* or *more important* in the future.

**Table 2.24: Importance of sustainability elements in future farming practices**

| Sustainability element | A lot less important | Less important | No change | More important | A lot more important | Total | N |
|---|---|---|---|---|---|---|---|
| Safe food production | 1% | 0% | 18% | 40% | 40% | 100% | 781 |
| Farm animal welfare | 1% | 0% | 20% | 41% | 38% | 100% | 761 |
| Protection of indigenous flora and fauna | 1% | 1% | 33% | 44% | 21% | 100% | 755 |
| Water conservation | 1% | 1% | 19% | 37% | 42% | 100% | 773 |
| Greenhouse gas emissions reduction | 7% | 8% | 27% | 36% | 22% | 100% | 724 |

## 2.13 Water and irrigation

Some of the important political and industry issues in the future will most likely relate to water and its availability. The next set of questions reflected a variety of current and emerging issues relating to water use. Respondents were asked to indicate the likelihood of the occurrence of certain developments based on a five point Likert scale varying from *very likely* to *very unlikely*.

Results showed that the highest positive likelihood was received for the statement "*Increased demand for irrigation water will require water storage systems"* with 85 per cent of respondents selecting *very likely* or *likely* (see Table 2.25). This is followed by the statement *"Improved regulation of irrigation is needed to better manage water issues"* which almost three quarters of respondents think will be *very likely* or *likely* to happen in the future. In contrast, the least likely to happen, indicated by more than half of the respondents selecting either *unlikely* or *very unlikely*, is that their own farm will increase irrigation in the future to better meet production goals. Additionally, more than two fifths of farmers (41 per cent selecting *very likely* or *likely*) believe that irrigation use will be problematic for the environment, compared to 35 per cent of respondents (selecting *unlikely* or *very unlikely*) who believe the environment will not be affected by increased irrigation.

**Table 2.25: Likeliness of water and irrigation developments in New Zealand**

| Statement | Very likely | Likely | Neither | Unlikely | Very unlikely | Total | N |
|---|---|---|---|---|---|---|---|
| My farm will increasingly need to use irrigation to better meet production goals. | 14% | 15% | 15% | 23% | 34% | 100% | 793 |
| Improved regulation of irrigation is needed to better manage water issues. | 27% | 45% | 11% | 9% | 7% | 100% | 746 |
| Increased demand for irrigation water will require water storage systems. | 46% | 39% | 5% | 5% | 5% | 100% | 768 |
| Increased demand for irrigation water will inevitably negatively impact the environment. | 16% | 25% | 25% | 20% | 15% | 100% | 750 |

## 2.14 Emissions trading

New Zealand implemented an emissions trading scheme, the NZ ETS, to regulate the production of Greenhouse Gases. This ETS is the first of its kind to include the agricultural sector. This topic is of high interest to farmers. Thus, the next set of questions assessed farmers' views of who carries the responsibility for reducing greenhouse gas emissions. Respondents were shown six statements and were asked to indicate the level of agreement on a five-point Likert scale ranging from *strongly agree* to *strongly disagree*. Results are presented in Table 2.26.

The highest level of agreement was received for the statement that "*farmers are being asked to assume more than their fair share of responsibility for emissions*", for which 41 per of participants *strongly agreed*, and a further 40 per cent of participants *agreed*. This was followed by the statement that "*New Zealand farmers should take responsibility only to the same extent as farmers elsewhere*", to which 25 per cent of participants *strongly agreed*, and a further 42 per cent *agreed*.

In contrast, the lowest level of agreement was received for the statement that "*New Zealand has the opportunity to enhance its international reputation and to receive increased market returns by leading the world in emissions trading*" to which almost a third of respondents *strongly disagreed* and another 30 per cent *disagreed.* Similarly, there was low level of agreement that the costs of reduction efforts will be balanced out by market returns with 26 per cent indicating *strong disagreement* and another 35 per cent showing *disagreement*.

**Table 2.26: Views on responsibility for reducing greenhouse gas emissions**

| Statement | Strongly Agree | Agree | Neither | Disagree | Strongly disagree | Total | N |
|---|---|---|---|---|---|---|---|
| New Zealand farmers do not contribute to climate change and should not take responsibility for reducing emissions. | 22% | 20% | 31% | 22% | 6% | 100% | 770 |
| New Zealand farmers should take responsibility only to the same extent as farmers elsewhere. | 25% | 42% | 18% | 13% | 3% | 100% | 774 |
| Farmers are being asked to assume more than their fair share of responsibility for emissions. | 41% | 40% | 11% | 6% | 2% | 100% | 773 |
| Technological solutions are needed to decrease agricultural greenhouse gas emissions. | 23% | 41% | 25% | 6% | 4% | 100% | 750 |
| Market returns will balance the costs of reduction efforts. | 3% | 11% | 25% | 35% | 26% | 100% | 711 |
| By leading the world in emissions trading New Zealand has the opportunity to enhance its international reputation and to receive increased market returns. | 2% | 14% | 23% | 30% | 32% | 100% | 750 |

## 2.15 Further comments

The last question of the survey prompted the respondents to comment on the survey. The 135 comments received were analysed in Nvivo.

There were a number of comments that were generally positive in relation to a mixture of things: setup and presentation of the survey, the content of the survey, general best wishes for the research and interest in the results.

*"Very easy to understand and answer – a well presented survey"*

"*It's great to be asked questions that don't just ask about financial viability…environmental and social contributions are just as important*. "

*"Good idea. Questions struck a chord. Caught us at a point of major redevelopment and between management practice change. "*

There were a few comments that were generally negative, two relating to the time it took to complete the survey, one noting the survey is slow, one expressing concern about what is being asked and another that it is probably not relevant (asking us not to send them an account for the survey results).

***Specific comments relating to questions in survey***

About one third of the comments were made in relation to the survey questions, mostly about the wording of questions and the options for answering but also on the questions being difficult to answer as well as other more general and specific comments. These comments are further categorised and outlined in Table 2.27.

**Table 2.27: Comments made in relation to survey questions**

| | |
|---|---|
| **Comments relating to the wording of questions** | The management system questions at the beginning of the survey need more definition as to what you meant by modified management system vs. conventional. Most farmers would probably consider themselves conventional where as they probably have some sort of modification. I chose conventional as I was unsure what you meant by modified even though I do do certain things a little bit differently to others.<br>The question about gross income was unclear, is it sales less purchases, or before tax income?<br>Also, gross income totals may be misleading due to changes in sales date of stock, one year before 30 June and the next year after 30 June.<br>The farm management style questions early in the survey were not very clear as to exactly what you wanted.<br>Some of the earlier questions are poorly worded.<br>The question about greenhouse gases is not specific enough as while we are concerned about emissions from fossil fuels the emissions from natural closed cycles is not really having any effect on the climate and so doesn't need anything doing about it.<br>Some contradictory, unexplained terms. eg "effective area" - is forest, native or exotic ineffective, unvalued?<br>Some questions were a bit vague and tended to lean toward a predictable outcome |
| **Comments relating to the options for answering survey questions** | Some questions do not have suitably appropriate responses available as an option to select.<br>In the 30th June stock numbers there was no box for grazing stock. Dairy grazing is playing a bigger role on many farms now which will make your stock number calculations too low as you only asked for sheep and beef numbers<br>good but need a bit more choice eg good very good excellent etc could have boxes after each section to explain why some ? weren't answered. ie not organic farmers<br>milksolids produced 76876 kg [box too small]<br>Could do with less 'choose answer that most suits you' type of questions<br>could perhaps do with a comments box on each page to explain things for me that would be the Emissions trading page where my |

| | |
|---|---|
| | answers are a combination of what I believe which is at odds with what will happen<br>At least one question required a N/A, which was not provided.<br>Needed more testing before sent out. |
| **Comments relating to the questions being difficult to answer** | Farm size question did not allow for other stock on farm e.g young stock grazed as part of the 120 grazing hectares. Therefore you can not accurately calculate stocking rate.<br>Cannot provide details of farms in more than one district or shareholding in other rural properties<br>It is difficult to ask questions which have simple answers. I am lucky to have private income so am able to spend money improving the farm that people supporting families would not be able to afford. I am an immigrant from Africa following a broken marriage, and am grateful for the opportunity to contribute to NZ.<br>I had no stock at the date specified as I had temporarily de-stocked due to absence overseas.<br>The irrigation question is not really applicable to my area, however in places around the South Island it is incredibly sensitive and applicable, therefore I would hate to see (yet again), where everyone is penalised by legislation when it is not really relevant.<br>Difficult to answer especially financial questions when land use and acreage have changed in the intervening years.<br>It would be impossible to work out the dairy stocking rate from the questions asked as you did not ask how much land was solely for dairy, the main income earner, and how much was for our other operations. We operate a mixed farming business, dairy, store lamb fattening, arable and dairy grazing. Very difficult to answer if we are happy or not with current economic conditions when cropping has been and is at present very poor and store lamb fattening and dairy have been good but are diminishing rapidly at present. |
| **Other comments:** | Couldn't get info on various management systems on iPhone<br>We farm in the Wairarapa not part of Wellington!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!<br>There is 2 hr of fruit trees which the cattle graze under in 2010 there was $4500 income off them of the $11780 plumbs<br>This survey appears to be leaning towards South Island farming situation. Generally we have a problem with too much water.<br>Meat and Wool New Zealand no longer exists, hasn't done for years.<br>I'm very much in partnership with my wife who carries out various light duties but is generally involved in big decisions.<br>answer question based on total farming operation, which includes kiwifruit orchard |

***Survey not relevant***

There were a number of comments relating to the survey not being relevant or applicable to them – people who do not live on their farms, lifestyle block owners, too small, in early stages, owning multiple farms and one respondent requesting not to be included in future surveys as no longer in operation.

***Suggestions for future research***

There were a few suggestions and comments around what other things could be looked at: how cows are wintered, horticulture and kiwifruit industry, attitudes towards GE crops, more science around carbon sequestration by sheep wool, gathering new ideas such as what has nature taught you, lignite mining and fracking, game species and A2 milk versus organic milk.

***Other comments***

There were a number of other comments relating to the ETS and carbon trading, environment and sustainability, politics/bureaucracy as well as a few more general comments.

# Chapter 3
# Summary

This study surveyed New Zealand farmers in order to identify the management system that farmers currently use, their intentions to use different systems and how farmers perceive environmental, economic and social aspects and effects of farming and its production. The study included a web-based survey which was sent to a large number of farmers' e-mail addresses in August 2012. Farms in the panel represented the main farm types and were distributed across New Zealand. A total of 1,081 completed questionnaires were received.

***Farmers and farm profile***

The majority of respondents were male sheep & beef farmers. On average the survey respondents were 56 years old with almost 30 years of farming experience. Farms had an average size of 469 hectares, with a gross revenue over $770,782 and low levels of debt.

***Management systems***

The majority of farmers used conventional management systems and had no plans to change their farm management system in the future. Although the current use of modified conventional management was low, it appeared to be more attractive than organic management systems. Organic management systems had some appeal but predominantly in their unregistered form.

***Environmental, economic and social indicators of farm performance***

Overall, farmers found environmental, economic and social performance indicators for their farming activities important. With regards to the implementation of sustainability elements in current and future farming practices the majority of farmers currently consider animal welfare and safe food production important in their farming practices whereas the reduction of greenhouse gas emission was not considered as important in current farming practice. In the future, farmers believe that farm animal welfare, food safety and water conservation will gain in importance but they do not believe that reducing greenhouse gas emissions will become more important in coming years.

**Water and irrigation**

Farmers were aware of the potential problems increased irrigation may cause and the need for storage systems and improved regulations. Also, farmers believed that the environment will be affected by increased irrigation.

**Emissions trading scheme**

The majority of farmers agreed that they are asked to assume more than their share of responsibility for greenhouse gas emissions and that they should only take as much responsibility as farmers elsewhere. Furthermore, they did not agree that New Zealand as a country has the opportunity to enhance its reputation overseas and to receive increased market returns by leading the world in emissions trading.

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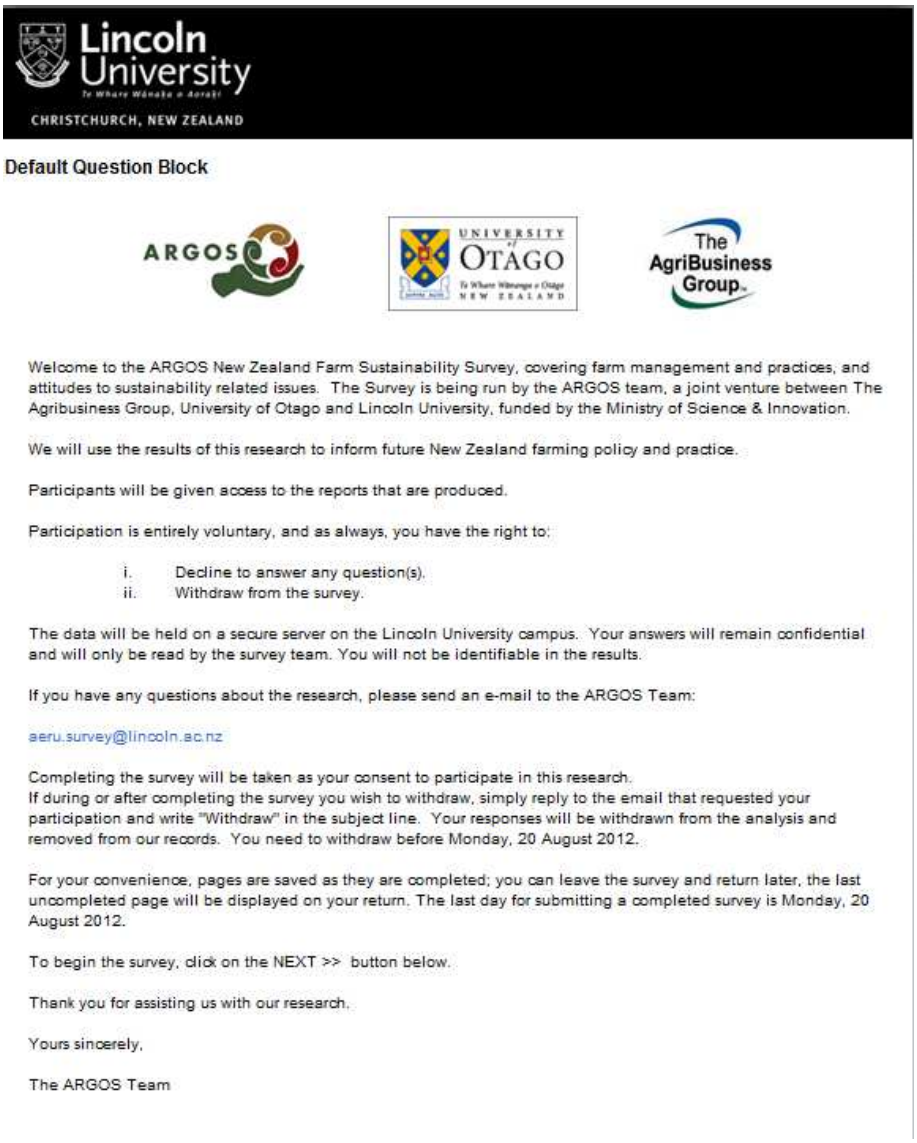
# Appendix 1: Questionnaire



Lincoln University
Te Whare Wānaka o Aoraki
CHRISTCHURCH, NEW ZEALAND

**Default Question Block**

ARGOS

UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND

The AgriBusiness Group

Welcome to the ARGOS New Zealand Farm Sustainability Survey, covering farm management and practices, and attitudes to sustainability related issues. The Survey is being run by the ARGOS team, a joint venture between The Agribusiness Group, University of Otago and Lincoln University, funded by the Ministry of Science & Innovation.

We will use the results of this research to inform future New Zealand farming policy and practice.

Participants will be given access to the reports that are produced.

Participation is entirely voluntary, and as always, you have the right to:

i. Decline to answer any question(s).
ii. Withdraw from the survey.

The data will be held on a secure server on the Lincoln University campus. Your answers will remain confidential and will only be read by the survey team. You will not be identifiable in the results.

If you have any questions about the research, please send an e-mail to the ARGOS Team:

aeru.survey@lincoln.ac.nz

Completing the survey will be taken as your consent to participate in this research.
If during or after completing the survey you wish to withdraw, simply reply to the email that requested your participation and write "Withdraw" in the subject line. Your responses will be withdrawn from the analysis and removed from our records. You need to withdraw before Monday, 20 August 2012.

For your convenience, pages are saved as they are completed; you can leave the survey and return later, the last uncompleted page will be displayed on your return. The last day for submitting a completed survey is Monday, 20 August 2012.

To begin the survey, click on the NEXT >> button below.

Thank you for assisting us with our research.

Yours sincerely,

The ARGOS Team

Are you one of the primary decision makers on the farm/orchard?

- ○ Yes
- ○ No

Do you wish to be given access to the reports that are produced from this research?

- ○ Yes
- ○ No

## Farming activity

What is your main farming activity?

- ○ Dairy
- ○ Sheep/beef
- ○ Deer
- ◉ Specialist livestock
- ○ Arable or cropping
- ○ Horticulture
- ○ Other (please specify)

Please specify the main activity that you are involved in within the horticulture sector:

- ○ Green kiwifruit
- ○ Gold kiwifruit
- ○ 50/50 green and gold kiwifruit
- ○ Other (please specify)

## Farm or Orchard Management System

Do you currently use any of the following management systems? (please tick the appropriate box)

Additional information can be viewed by hovering over the relevant management system.

- ○ Conventional Management
- ○ Modified Conventional Management (Integrated Management)
- ○ Conventional Management with other system
- ○ Organic Management (fully certified or in conversion)
- ○ Any other system (please specify):
- ○ None of the above

Which modified conventional management system(s) (integrated management) do you use? (you can select multiple options)

- ☐ AvoGreen
- ☐ GlobalGap
- ☐ Green Tick
- ☐ NZGAP (fresh produce)
- ☐ Pipfruit integrated fruit production
- ☐ Sustainable Winegrowing NZ
- ☐ KiwiGreen
- ☐ Other system (please specify):
- ☐ None of the above

Which of the following do you use? (you can select multiple options)

- [ ] Code of Practice for Nutrient Use
- [ ] Meat company assurance programme
- [ ] Merino NZ Ltd - Zque programme
- [ ] NZS8409:2004 Management of Agrichemicals (GROWSAFE)
- [ ] Other system (please specify):
- [ ] None of the above

Which organic management system - (fully certified or in conversion) do you use? (please tick the appropriate box)

- ( ) AsureQuality
- ( ) BioGro
- ( ) Demeter
- ( ) Organic Farm New Zealand
- ( ) Not officially certified
- ( ) Other system (please specify):

If you were to change your management system, how strong would your intention be to use each of the following? (please answer for each option)

| | Strong intent to use | Intend to use | Neutral | Intend not to use | Strong intent not to use | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| Conventional management | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Modified conventional management | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Organic management (certified) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Organic management (not certified) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other system (please specify) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Are you planning to change your management system? (please tick the appropriate box)

- ○ Yes
- ○ No
- ○ Don't know
- ○ Prefer not to answer

What management system would you be most likely to change to?

- ○ Conventional management
- ○ Modified conventional management
- ○ Organic management (certified)
- ○ Organic management (not certified)
- ○ Other management system (please state):

Why are you planning to change to this management system? (please write your response below)

**Are you planning on changing to grow predominantly a new gold kiwifruit variety?**

- Yes
- No
- Don't know
- Prefer not to answer

**Are you planning on changing to grow predominantly green kiwifruit?**

- Yes
- No
- Don't know
- Prefer not to answer

If you change to green kiwifruit, what will you change to?

- Hayward Green
- A new green variety
- Other
- Don't know

## Farm financial performance

What is the importance to you of each of the following measures when you are considering the annual financial performance of your farm/orchard? (please rate each item using the displayed range)

| | Very Important | Important | Neither Important or Unimportant | Unimportant | Very Unimportant | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| Gross income | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Working expenses | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Change in bank balance over the year | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Actual income versus budget income | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cash surplus/deficit | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Net profit/loss | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Equity | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The ratio of working expenses to gross income | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Return on capital | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Money is available to cover cash needs | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Monitoring financial performance | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other (please specify): | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Farm production performance

What is the importance to you of each of the following measures when you are considering the production performance of your farm/orchard? (please rate each item using the displayed range)

| | Very Important | Important | Neither Important or Unimportant | Unimportant | Very Unimportant | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| The health of livestock and/or plants | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Yields per hectare compared to other similar farmers/orchardists | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| A tidy, well-maintained farm/orchard | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Minimum weeds | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Volume of production is at a maximum | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Quality of production is at a maximum | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The farm/orchard has a good mixture of productive uses/activities | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| No potentially productive land is going to waste | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reducing greenhouse gas emissions | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other (please specify): | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Farm environmental performance

What is the importance to you of each of the following measures when you are considering the environmental performance of your farm/orchard? (please rate each item using the displayed range)

| | Very Important | Important | Neither Important or Unimportant | Unimportant | Very Unimportant | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| Soil fertility levels | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Soil biological activity | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Soil health | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Water quality in nearby streams and waterways | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Water budgeting | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nutrient budgeting | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Pesticide use | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Energy efficiency | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The amount of carbon stored (sequestered) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other (please specify): | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Farm environmental performance

What is the importance to you of maintaining or increasing the following when you are considering the environmental performance of your farm/orchard? (please rate each item using the displayed range)

**Maintaining or increasing the abundance and variety of...**

| | Very Important | Important | Neither Important or Unimportant | Unimportant | Very Unimportant | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| Native bird species | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Introduced bird species | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Native plant or tree species | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Introduced plant or tree species | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Biodiversity (the number and variety of productive and unproductive species) on my farm/orchard. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Farm social performance

What is the importance to you of each of the following measures when you are considering the social performance of your farm/orchard? (please rate each item using the displayed range)

| | Very Important | Important | Neither Important or Unimportant | Unimportant | Very Unimportant | Don't know | Not applicable | Prefer not to answer |
|---|---|---|---|---|---|---|---|---|
| The children are involved in the farm or orchard. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have enough time to participate in community activities | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have enough time to devote to family and friends. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have enough time to participate in activities and recreation off-farm. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My farming/orcharding helps me to develop a connection to the place where it is located. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Members of my farm/orchard family will be able to find employment in this area. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My farming/orcharding is able to contribute to local festivals, shows or events. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My farm/orchard is contributing to the local community. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My neighbours approve of my farming/orcharding practices. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My farming/orcharding helps to create an attractive place to live. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My neighbours consider me to be a good farmer/orchardist. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My family has a good reputation in the local community. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My farm/orchard workers are treated well. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| There is scope for farm succession. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other (please specify): | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Your approach to management

How often do you consider or implement each of the following strategies:
(please rate each item using the displayed range)

| | Always | Most of the time | Sometimes | Rarely | Never | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| I adopt proven practices rather than do my own experiments. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I pay close attention to changes in plants/animals/insects on my farm. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I pay close attention to money in the bank and good financial returns from each part of my business. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I pay close attention to what is going on in NZ and in the world. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I focus on a limited number of income sources. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I keep unused resources (e.g. buildings, machines) in case they are needed in the future. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I deviate from established farm plans. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I learn new things by talking with a wide variety of people. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Community participation

How involved are you and/or your family in each of the following:
(please rate each item using the displayed range)

| | Heavy involvement | High involvement | Some involvement | Little involvement | No involvement | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| Voting in national elections | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Voting in local body elections | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Submitting comments on local government plans and policy | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| School or educational groups (e.g. PTA, school committees) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Church groups and/or care agencies | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sports/athletic/recreational groups | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Civic organisations (e.g. Rotary, Lions) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Festivals, shows (e.g. A&P) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Fire service, ambulance, search & rescue | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Providing cash financial support to community activities | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Other (please specify): | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Future markets

Over the last few years we have been investigating markets, and what consumers are prepared to pay for premium farm agricultural produce in terms of food safety, farm animal welfare and environmental sustainability.

| | Do you currently consider these elements in your day to day farming? | | | In the next five years, how important do you think each of these elements will be in your farming practice? | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Yes | No | Don't know | A lot less important | Less imporant | No change | More important | A lot more important | Don't know |
| Safe food production | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Farm animal welfare | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Protection of indigenous flora and fauna | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Water conservation | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Greenhouse gas emissions reduction | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Water and irrigation

In your opinion, how likely or unlikely is each of the following developments in New Zealand? (please rate each item using the displayed range)

| | Very likely | Likely | Neither likely or unlikely | Unlikely | Very unlikely | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| My farm will increasingly need to use irrigation to better meet production goals. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Improved regulation of irrigation is needed to better manage water issues. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Increased demand for irrigation water will require water storage systems. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Increased demand for irrigation water will inevitably negatively impact the environment. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Emissions trading

How much do you agree or disagree with each of the following views about responsibility for reducing greenhouse gas emissions from agriculture? (please rate each item using the displayed range)

| | Strongly Agree | Agree | Neither agree or disagree | Disgree | Strongly disagree | Don't know | Prefer not to answer |
|---|---|---|---|---|---|---|---|
| New Zealand farmers do not contribute to climate change and should not take responsibility for reducing emissions. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| New Zealand farmers should take responsibility only to the same extent as farmers elsewhere. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Farmers are being asked to assume more than their fair share of responsibility for emissions. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Technological solutions are needed to decrease agricultural greenhouse gas emissions. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Market returns will balance the costs of reduction efforts. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| By leading the world in emissions trading New Zealand has the opportunity to enhance its international reputation and to receive increased market returns. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## Background information

The following questions will help us to compare our survey with the general population. Please remember that this is an anonymous survey, and that you cannot be identified from any information you provide.

What is the size of your farm?

Total Hectares:

Effective Hectares:

How much of this land is irrigated?

| 0-10% | 11-20% | 21-30% | 31-40% | 41-50% | 51-60% | 61-70% | 71-80% | 81-90% | 91-100% |
|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

How is the total land area of your farm/orchard made up?

| | Number of hectares |
|---|---|
| Grassland | |
| Tussock and danthonia used for grazing (whether over-sown or not) | |
| Grain, seed, fodder crop and winter feed land, and land prepared for these crops | |
| Horticultural land and land prepared for horticulture (include covered production areas and vegetable land) | |
| Plantations of exotic trees intended for harvest | |
| Harvested exotic forest area awaiting restocking | |
| Mature native bush | |
| Native scrub and regenerating native bush | |
| All other land (for example houses, domestic gardens, farm buildings, conservation plantings, shelter belts, river beds, wetlands, tracks, gorse) | |

## Farm location

In which region is your farm/ orchard located:

## Type of farm

What type of farm do you have?

- ○ Full-time farm
- ○ Part-time farm
- ○ Lifestyle or hobby farm
- ○ Other (please state)

What is the ownership arrangement on your farm/orchard?

- ○ Corporate farm
- ○ Family farm
- ○ Other (please state)

We want to calculate your total number of stock units as at June 2012. Please fill out the following table:

| | Cows |
|---|---|
| Max. cows milked | |
| Total milk solids in kg | |

We want to calculate your total number of stock units as at June 2012. Please fill out the following table:

| | **Number of sheep** |
|---|---|
| Ewes | |
| Hogget (ewe or wether) | |
| Other | |

| | Number of beef |
|---|---|
| Rising 1 year heifers | |
| Rising 2 year heifers | |
| M/A cows | |
| Rising 1 year steers/ bulls | |
| Rising 2 year steers and older | |
| Rising 2 year and older bulls | |

| | Number of deer |
|---|---|
| Rising 1 year hinds | |
| Rising 2 year hinds | |
| M/A hinds | |
| Rising 1 year stags | |
| Rising 2 year stags | |

## Financial information

We would like to gauge the size of your farming operation, what was the annual gross revenue (approximate figures) from your farm/ orchard for the:

2009 - 2010 financial year? Approximate figures only:

2010 - 2011 financial year? Approximate figures only:

What is your level of debt at present (approximate)? Please tick the appropriate box.

- My farm/orchard is debt free
- Debt is between 0-19% of equity
- Debt is between 20-39% of equity
- Debt is between 40-59% of equity
- Debt is between 60-80% of equity
- Debt is over 80% of equity
- Don't know
- Prefer not to answer

## Financial information

How satisfied or unsatisfied are you with the current level of economic viability of your farm/orchard?

- Very satisfied
- Satisfied
- Neither satisfied or unsatisfied
- Unsatisfied
- Very unsatisfied
- Don't know
- Prefer not to answer

## Years of Management

For how many years have you managed, owned or been associated with your current farm or orchard?

For how many years have you been farming or orcharding on any farm?

For how many more years do you expect to be farming or orcharding?

In ten years time do you think you will still be living in your present community?

- Yes
- No
- Unsure

## Demographics

Gender

- Male
- Female

What statement best describes you?

- Farm/orchard owner and manager
- Farm/orchard owner
- Farm/orchard manager (includes lessees, share farmers, sharemilkers and contract milkers etc.)
- Spouse or partner of the farmer/orchardist
- Other (please state):

Do you have children living with you on the farm/orchard?

- Yes
- No
- Prefer not to answer

If you have children living with you, please state the number in each age group?

| | |
|---|---|
| Under 5 years of age | |
| 5-12 years of age | |
| 13-17 years of age | |
| 18 years of age or older | |

Please provide the year you were born:

What is your highest level of education completed?

- Attended secondary school
- Trade technical qualification or similar
- Undergraduate diploma or certificate
- University degree
- Post graduate university degree

If you wish to make a comment about this survey, please do so here:

Please click the NEXT>> button to submit the survey.

Thank you for your participation in the survey!

ARGOS

AGRICULTURE RESEARCH GROUP ON SUSTAINABILITY

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