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Small Dairy Farms, North Island, Prospects, Challenges and Change

A Survey and Analysis

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Small Dairy Farms, North Island, New Zealand - Prospects, Challenges and Change : A Survey and Analysis

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Introduction

Worldwide, over the decades farm sizes have tended to increase (Burton & Walford, 2005; Santelmann et al 2004). This is often from necessity as the cost/price squeeze requires farmers to constantly increase production to maintain reasonable profit levels (Lawrence, 1992; Moss, 1992).

Consequently, there will always be some farms at the lower end of the size spectrum facing decisions over their best strategy to improve their situation (McKay, 1967). If anything this small farm 'problem' is increasing with the opening of markets worldwide and the consequent lowering of farm supports together with the increasing price volatility from the cold winds of open markets.

The overall size problem is no less important in NZ than in many other countries. Consequently, this study looks at the small dairy farm problem in response to industry pressure and associated research funding (from DairyNZ through a small dairy farmer organization ... Smaller Milk and Supply Herds Association...SMASH). The objective was to explore the problems, or challenges, resulting from being 'small' as seen by the dairy farmers themselves. The objective was also to relate these farmer defined 'challenges' to the farmers' personal situation and attributes. It was believed this farmer data may well inform the final phase of the study in which data was collected to discover the information the farmers' believed would be helpful to them in meeting the challenges. Conclusions should guide the actions which SMASH, and other extension groups, can take.

The following sections present the information collected together with analyses leading to conclusions. Also presented is information which is common between this survey and two others conducted earlier.... the first was gathered in 2006 (Nuthall, 2009) and the second in 2013 (Nuthall and Old, 2014). These surveys covered all farm types including all sizes of dairy farms consequently providing comparative data. This is presented where appropriate. When presented the data is labelled Survey 2006 and Survey 2013. The data from the current survey is labelled '2014' where confusion might arise.

With the changing farm sizes a definition of a small farm is forever changing. In NZ in 1998, farms less than 40 hectares was considered small (Allen, 1998), and Parker et al (2000) defined a small farm as one being less than 60 hectares supporting fewer than 180 cows. Whereas in 2013, less than 250 cows was used as the definition (Westbrooke, 2013). For the purpose of this research a farm with less than 400 cows was regarded as 'small'. In the 2006 and 2013 surveys, farms with less than two worker units (including the manager) was used as a definition as data on cow numbers was not available. As it turned out, the average number of worker units in this current survey was 1.83 (thus the use of 2.0 as the cut off for the other surveys).

Comparisons are also provided between this survey data and data from the larger dairy farms in the 2006 and 2013 surveys. These are defined as farms with more two or more labour units including the manager.

Survey Details

A telephone survey using the questionnaire given in the appendix was conducted between the 15th of October and the 21st of November 2014. Only respondents who were the farm owner or a 50/50 share milker were included. The sample was drawn solely from North Island dairy farmers (Northland, Waikato and Taranaki being the area's most populace in dairying) as in the South Island, with its relatively new dairy industry, the farm and herd sizes tend to be much larger.

The survey was compiled in conjunction with SMASH to cover five key areas:

- Farm and family statistics, including farmers managerial style, goals and aims, and locus of control (Nuthall, 2010),
- The longer term objectives of the farm owner(s),
- Resources available, and barriers to the next steps,
- Farmers' preferences in terms of how they would like to see knowledge and support provided.

A telephone survey was used due to both time and funding restrictions. This clearly place limitations on the information that could be collected.

Questions relating to farmers' managerial style, aims, goals and locus of control were selected from the National Survey on Farm Succession and Governance (Nuthall & Old, 2014). This was to allow comparisons of results from this research with recent findings for New Zealand farmers. The limited number of questions possible meant those selected were regarded as likely to be correlated with the discarded questions (for the full list used in the other surveys see Nuthall & Old, *ibid*). As it turned out the question selected were highly correlated with those used in the 2006 and 2013 surveys as shown later in regression equations)

The questions were either short answer replies or statements for which the respondent was asked to rate the degree of truth of the statement for their situation. A Likert style 1 (not true) to 5 (true) scale was used for the farmer's scale rating preferences. The questionnaire was designed to take between 12- 14 minutes. It was trialled with both colleagues and farmers (n=13) and refinements made based on their feedback. The questionnaire was also adapted for farmers to complete at field days. To encourage participation farmers were entered into a draw for three \$200 Farmers gift cards. The survey was conducted by a trained telephone team, experienced in working within the agricultural sector. The questionnaire was approved by the Lincoln University Human Ethics committee, approval Number 2014-33.

The basic sample was taken from a randomised selection of farmers from the SMASH membership database together with additional respondents randomly selected from electoral rolls of the selected areas. The number of these additional respondents was based on the short fall in each area after the random SMASH list was exhausted. During the survey period a SMASH field day was conducted in Taranaki so the opportunity was used to obtain further written responses (n=21).

An analysis of farm sizes countrywide made it clear most small dairy farmers were located in Northland, Waikato, and Taranaki. Consequently these areas were targeted to obtain the sample. A total of 346 surveys were completed (see Table 2.1). The target of 100 completed

surveys was successfully reached for Taranaki (n=103) and Waikato (n=144), with Northland almost reaching this target (n=99). The telephone response rate varied from 51 per cent in Taranaki, which was supplemented by 21 surveys completed at a field day, to 44 per cent and 30 per cent in the Waikato and Northland, respectively.

Table 2.1: Number of completed surveys by region, and collection method.

Region	Telephone			Written	Total surveys completed
	Farmers Telephoned	Number Completed	Response rate (%)		
Taranaki	160	82	51	21	103
Waikato	474	144	30	0	144
Northland	224	99	44	0	99
Total		325		21	346

Descriptive Farm Data

As shown in Table 3.1, the surveyed farmers milked on average 240 cows at peak, on 97 ha employing nearly a fulltime staff member in addition to the manager. Over all regions, the mean total milk production level was 86789 kgMS, 355kgMS/cow and 971kgMS/ha.

Table 3.2: Data for the farms surveyed in the three regions.

Overall means OR Regional means	Overall mean	F Significance probability	Taranaki	Waikato	Northland
Peak cows milked (cows)	240	0.335	242	233	249
Effective farm area (ha)	97	0.000	93 ¹	84 ²	121 ^{1,2}
Production (total kgMS)	86,789	0.005	94,457 ^a	86,306	79,363 ^a
Production (kgMS/cow)	355	0.000	377 ^a	365 ^b	316 ^{ab}
Production (kgMS/ha)	971	0.000	1070 ^a	1080 ^b	696 ^{ab}
Staff employed (FTE)	0.83	0.073	0.75	0.77	0.99

Regional means within rows with different subscript letters are significantly different at $P < .001$, and with different subscript numbers are different at $P < .05$

To assess the sample relative to other areas and situations, data was collected from national statistics as well as the Survey 2006 and Survey 2013 data. This is presented in Table 3.2. The blank cells are due to the unavailability of that data. Statistical tests (mean comparisons (t)

and treatment tests (F)) showed there were significant differences. However, the data shows that the differences were not great. As the farms were selected to be 'small' there is no direct comparative data available other than the previous surveys and even these are not totally comparable as they cover the whole country. What can be concluded is the selection of farms are not obviously very different from their parent populations.

Table 3.3: Summary of farm statistics for both the survey and national statistics (labelled ALL, source LIC/DairyNZ, 2015). Note The age and education data are codes representing age and education level ranges. Refer to the questionnaire in the appendix for details.

Data source	Number of herds	Area (Ha)	Herd size (cows)	Milk solids Per ha (kgs)	Milk solids Per cow (kgs)	Labour units	Age Yrs. (score) 1 to 5*	Education (score) 1 to 5*
Northland ALL	929	134	307	713	313			
Northland surv.	99	121	249	696	316	1.98	2.97	3.2
Waikato ALL	3536	112	329	1051	356			
Waikato survey	144	84	233	1080	365	1.77	2.90	3.4
Taranaki ALL	1719	101	287	1068	375			
Taranaki surv.	103	93	242	1070	377	1.75	2.73	3.2
All NZ	11,927	144	413	1063	371			
All Survey 2014	346	97	240	971	355	1.83	3.79	3.21
Survey 2006	97	109		934	347	1.63	3.47	3.0
Survey 2013	97	110		984	371	1.60	3.42	3.1

* See questionnaire in the appendix

In terms of herd size, the majority (60 per cent) of farmers in the survey milked between 151 and 300 cows at peak. Few farmers (10.5 per cent) milked relatively large herds of more than 350 cows and very few (2.6 per cent) milked relatively small scale herds of less than 100 cows, as shown in Table 3.3

Table 3.4: Distribution of cows milked (data for Surveys 2006/2013 not available)

Region	% of respondents'								
	Mean	0-50	51-100	101-150	151-200	201-250	251-300	301-350	351-400
Overall	240.4	0.3	2.3	11.1	23.9	21.0	12.8	18.1	10.5
Northland	249.1	0	5.1	9.2	24.5	14.3	16.3	13.3	17.3
Waikato	233.4	0	1.4	9.8	28.0	25.1	15.4	12.6	7.7
Taranaki	241.9	1.0	1.9	13.8	20.5	21.6	14.7	22.3	7.1

As shown in Table 3.4, the majority (46 per cent) employed one full time staff member, with a few (15 per cent) of farmers employed two or more. Approximately 30 per cent of smaller farmers employed no staff. Farmers in Northland employed a higher proportion of a staff member (0.99FTE), compared to farmers in the Waikato (0.77FTE) or Taranaki (0.75 FTE).

Table 3.5: Distribution of number of staff (FTE) employed on respondents' farm. Row percentages

	Number of staff (FTE) employed*						
	0	0.5	1	1.5	2	2.5	3+
Overall 2014	33.9	3.5	45.5	2.0	13.0	0.6	1.5
Northland	32.3	4.0	32.3	4.0	23.2	1.0	3.0
Waikato	34.0	2.1	52.1	1.4	9.7	0	0.7
Taranaki	35.3	4.9	49.0	1.0	7.8	1.0	1.0
Survey 2006	16.5	33.0	46.4	0	1	0	0
Survey 2013	15.5	38.1	46.4	0	0	0	0

* Rounded to the nearest half FTE

Relative to the previous surveys the farmers tend to employ more staff, but it must be noted the farms in the earlier surveys were based on those with less than 1 employee in total as data on cow numbers was not available.

There were significant variation between farms in the three regions with regards to farm size (reflecting the poorer soil types and different climate) and milk production levels. Northland farms produced significantly less milk on both a per cow and per hectare basis than farms in the Waikato and Taranaki. Total production in Northland (79,363kgMS) was significantly lower than compared to the Waikato (86306 kgMS) and Taranaki (94457 kgMS). The data is presented in Tables 3.5, 3.6, 3.7.

Table 3.6: Distribution of farm sizes

	% of respondents' farm size (ha)				
Region/type	0-50	51-100	101-150	151-200	201+
Overall 2014	8.2	56.4	24.9	7.9	2.6
Northland	5.3	38.9	29.5	20.0	6.3
Waikato	9.7	68.8	16.6	3.5	1.4
Taranaki	8.7	55.4	32.0	2.9	1.0
Survey 2006	8.3	51.1	21.9	9.3	9.4
Survey 2013	5.2	53.1	26.1	9.4	6.2

Table 3.7: Distribution milksolids per cow (kgs)

		% of respondents' milk solids per cow (kgs)								
Region/type	Mean	<251	251-300	301-350	351-400	401-450	451-500	501-550	551-600	>600
Overall 2014	355	5.7	18.6	27.2	23.6	13.5	7.2	2.4	1.5	0.3
Northland	313	15.1	33.3	23.6	20.5	2.1	2.2	1.0	1.1	1.1
Waikato	365	2.8	15.5	28.2	25.3	14.1	10.6	2.8	0.7	0.0
Taranaki	377	2.0	9.1	29.3	23.2	24.3	6.0	4.1	2.0	0.0
Survey 2006	347	2.2	15.8	42.7	25.8	12.4	0.0	0.0	0.0	1.1
Survey 2013	371	2.5	9.8	24.7	35.8	22.3	4.9	0.0	0.0	0.0

Table 3.8: Distribution of milksolids per hectare (kgs)

		% of respondents' milk solids per hectare (kgs)							
Region/type	Mean	<500	501-700	701-900	901-1100	1101-1300	1301-1500	1501-1700	>1700
Overall 2014	971	10.2	12.6	21.5	21.6	16.4	12.0	3.3	2.4
Northland	695	26.1	29.3	15.3	4.3	1.1	0.0	0.0	0.0
Waikato	1080	4.2	8.5	19.0	21.8	21.9	16.1	3.6	4.9

Taranaki	1070	4.0	3.0	24.0	27.0	20.0	15.0	6.0	1.0
Survey 2006	934	7.1	6.0	30.9	34.6	17.8	3.6	0.0	0.0
Survey 2013	984	9.2	10.5	15.8	32.9	19.8	5.2	5.3	1.3

Table 3.9: Productivity and labour employment. Average yields for whether labour is employed.

Region/type	Milk solids/ha		t test prob*	Milk solids/cow		t test prob*
Labour employed?	Yes	No		Yes	No	
Overall 2014	1003	1043	.018	361	346	.100
Northland	742	585	.005	329	288	.016
Waikato	1127	988	.024	370	358	.389
Taranaki	1141	1043	.318	409	374	.177
Survey 2006	937	918	.812	351	327	.238
Survey 2013	1000	869	.239	374	341	.091

* the significance probability relates to the difference between either employing labour or not employing labour

Overall, the tendency is for production to be higher if labour is employed (Table 3.8), though in some cases the probability of a difference is less than generally accepted significance levels, particularly for Survey 2006. However, the trend is very clear which would suggest farmers working by themselves are less efficient.

When production is related to the total labour units on a farm some interesting figures emerge. For farms employing labour the cows milked is 267 in contrast to 190 cows. This translates into, however, 122 cows per person where labour is employed, and 190 when no labour is employed. This means productivity is higher without labour though the production per cow and per hectare is lower. Hectares used per person working is 47 where staff are employed in contrast to 83 hectares. And for kgs milk solids per person working on the farm it is 44,091 where staff is employed, and 65,883 kgs for one person farms. The productivity differential is clear. All these differences are highly significant. However, it is possible the single person farms obtain some non paid, nor accounted for, family assistance. It is also relevant to note farmers employing staff are older (score 2.993 which is nearly 40 years) relative to the sole farmers (score 2.645 which is around 36 years or so). This difference is also highly significant.

Table 3.10: Percentage of farms that have increased their herd size by at least a third since their first season.

Region	% of respondents'	
	Yes	No
Overall	30.4	69.6
Northland	30.3	69.7
Waikato	31.9	68.1
Taranaki	28.4	71.6

From Table 3.9 it is clear around a third of the farms have grown their herds quite significantly in their efforts to improve their financial situation. However, the data available does not permit relating this increase to how long they have been on their farm. In that this could be related to age, this is included in the analysis shown in Table 3.10. It is of interest that of the farms increasing their herd 66.1 per cent employ labour. This herd increase data was not collected in Surveys 2006 and 2013 which is why they do not appear in Table 3.10.

Table 3.11: Details of the farms increasing herd size (by at least a third) relative to those increasing less than third (the 'increase' can be zero or even negative). The probability is the t test mean difference significance

Region and whether inc. Or not inc. herd	Age*	Cows milked	Kgs MS per person	Cows per person	Kgs MS per ha	Kgs MS per cow	Rural base*	Education*
Overall 2014... inc	3.3	275	48,503	137	1007	356	1.15	3.08
Overall 2014... not	2.07	226	52,539	148	955	355	1.23	3.39
Probability	.000	.000	.118	.102	.200	.902	.076	.046
Northland inc	3.31	303	44,228	140	747	331	1.23	2.90
Northland not	2.91	226	41,205	141	672	310	1.23	3.29
Probability	.351	.000	.454	.934	.171	.218	.988	.167
Waikato inc	3.30	268	48,039	133	1116	363	1.20	3.06

Waikato not	2.7	217	54,441	148	1063	367	1.26	3.64
Probability	.002	.000	.089	.085	.399	.727	.367	.018
Taranaki inc	3.46	257	53,513	142	1096	371	1.00	3.38
Taranaki not	2.44	238	60,345	156	1059	380	1.21	2.44
Probability	.000	.277	.191	.322	.570	.558	.008	.605

* Refer to the questionnaire for the grading scale.

For the overall survey it is clear farmers increasing their herd are older than the counterparts. This will in part reflect that these farmers have been farming longer and have had the chance to increase stock numbers. The same applies to the regional information.

Cows milked in total are clearly higher for those increasing their herds and mainly significantly so. Kilograms of milk solids produced per person is lower except in Northland for those increasing cow numbers, and mainly relatively significant. Yet despite this cows run per person tend to be slightly lower where increased cow numbers have occurred. However, the differences are relatively small. This is reversed when it comes to the all-important production per hectare. This would tie in with greater efficiency.

For production per cow the situation is mixed. Overall, there is virtually no difference between the farmers that have increased relative to the others. The same applies to the other regions except Northland where the progressive increasers get more out of their cows.

It is also interesting to note the tendency for the 'increasers' to be born and bred in other than rural areas and might well be new to farming in a traditional family sense. And other than for Taranaki, the 'increasers' tend to have a slightly lower level of education.

Despite the higher age of the farmers increasing cow numbers the most, it is clear they tend to be more efficient and probably newer to farming with a more analytical approach despite the slightly lower education levels. This situation might well influence their success as small dairy farmers.

Business and Financial Data

Owner/operators dominate the respondents though a fifth are 50/50 share milkers. Leasehold situations and equity partners are well in the minority. When comparing share milkers with owner/operators, it is clear they are much younger (as you would expect), less are 'born and bred' in the country, and more have increased their herd by at least a third. The critical production per hectare is also significantly higher, though by just 19 kgs per hectare. This information is just a snap shot from 2014/15. Share milkers tend to be mobile and have greater opportunities to increase output and improve their longer term prospects provided they are efficient. Table 4.1 contains a breakdown of the farm ownership situation found in the regions surveyed.

Table 4.12: Farm ownership arrangements. Percentage of farmers under each structure.

	% of respondents'			
	Owner	Share milker	Equity partner	Leaseholder
Overall	74.5	23.2	0.9	1.5
Northland	76.8	20.2	2.0	1.0
Waikato	72.9	24.3	0	2.8
Taranaki	71.6	23.5	1.0	0

By far the majority of the farmers have a high level of equity in their farms as shown in Table 4.2. However, in Northland a significant number could be in a difficult position (20.3 per cent with equity less than 41 per cent) given adverse events impinging on their financial outcomes. Taranaki farmers are not far behind.

Table 4.13: Equity levels as reported by the farmers. Percentage of farmers in bands of equity

	% of respondents'				
	0-20% equity	21-40% equity	41-60% equity	61-80% equity	81-100% equity
Overall	6.0	10.7	28.1	25.4	29.8
Northland	8.7	11.6	26.1	23.2	30.4
Waikato	5.4	7.1	32.1	26.8	28.6
Taranaki	4.2	15.5	24.0	25.3	31.0

It might be expected that differences would exist between the equity levels and a range of key variables as efficiency will speed up debt repayment. But equally, high debt might reflect recent farm acquisition, or perhaps expensive farm development. Debt levels can also relate

to a farmer's objectives particularly their risk attitude and consumption requirements. Some of these latter factors are considered in more detail later. Table 4.3 provides averages for the significant variables and Table 4.4 the t test values when comparing the means.

Table 4.14: Average values for some important variables relative to financial equity levels

Equity ranges %	Age	Educ	FTE	Ha/person	Cows	Herd increase > third	Kgs MS/person	MS per cow	MS per ha.	Own'ship
0 – 25	1.9	4.2	.56	73	244	1.75	63,001	361	926	1.75
26 – 50	2.1	3.8	.71	65	239	1.83	57,198	376	1027	1.29
51 – 75	2.6	3.2	.91	59	255	1.67	52,461	363	1007	1.27
76 - 100	3.4	3.2	.71	54	221	1.62	47,606	343	965	1.27

Note -- For the age, educ (education), FTE (labour employed), Herd increase and ownership codes refer to the questionnaire for details.

Table 4.15: Student's t test values for the averages in Table 4.3 Paired comparisons

Equity range s % pairs	Age	Edu c	FTE	Has /person	Cow s	Herd increase > third	Kgs MS/person	MS per co w	MS per ha.	Own'si p
1 & 2	.577	.309	.497	.508	.808	.544	.440	.390	.705	.024
1 & 3	.014	.006	.088	.133	.613	.515	.083	.950	.404	.001
1 & 4	.000	.004	.405	.034	.276	.325	.012	.397	.682	.996
2 & 3	.013	.038	.200	.442	.313	.099	.297	.416	.786	.923
2 & 4	.000	.023	.979	.077	.278	.037	.038	.044	.412	.930
3 & 4	.000	.753	.043	.207	.002	.515	.110	.073	.407	.996

Note – For the ranges 1 = 0-5%, 2 = 25-51%, 3 = 51-75%, & 4=75-100%. For the age, educ (education), FTE (labour employed), Herd increase and ownership codes refer to the questionnaire for details.

The lower equity levels do not have any significant differences other than the ownership situation (Owner/operator, share farmer, equity partnership, and leasehold). When comparing the lowest equity level with the mid range equity it is clear age, education, employed labour, kgs. milk solids produced per person, and again ownership have significant differences. Age is higher, education less, more labour is employed and perhaps it is because of this production per person is lower. It is likely these farmers have had more time to consolidate and this has had allowed them to be more relaxed.

When comparing the lowest equity with the highest it is clear production per person is even lower with also smaller farm sizes. Perhaps the trend to relax is even greater for age is very different, though education less. When comparing the middle two equity levels the herd increase is lower with increasing equity. Again, this suggests a lower push to increase production with production per person lower. Age and education differences also stand out.

Similar comparisons with the remaining groups provide intermediate conclusions. At the higher equity level production per cow is down as is production per hectare and the number of cows. Education is not significantly different despite the increasing age. Overall, it does seem low equity farmers strive to be productive and efficient, but even for these small dairy farms, the manager eases off as equity builds up. The ability to do this must, however, depend on the sequence of good seasons and good prices.

Table 4.5 gives the percentages of farms with non farm investments as well as farmers with financial interests in other farms some of which could well be another complete farm but is more likely to be, say, an offspring’s farm. Further details of the relationships between these factors and variables likely to be related to, or even directly impacting on, are given in Table 4.6.

Table 4.16: Degree of activity in non-farm asset investment and financial interests in other farms

Region	% of respondents with non farm financial interests		% of respondents with financial interests in other farms	
	Yes	No	Yes	No
Overall	35.1	64.9	22.9	77.1
Northland	33.3	63.6	31.3	68.7
Waikato	35.4	64.6	13.9	86.1
Taranaki	36.4	66.7	27.6	72.4

Around a third of the farmers have financial interests off the farm, though there is no information on the size of these and their nature. A somewhat lower percentage have a pecuniary interest in other farms, but again the extent of this is not known ... overall about a fifth of the farmers fall into this category. Interestingly, farmers with no interests in other farms have tended to increased their herds by over a third (Score for increasing herd by at least a third and having other farm interests is 1.59 (scoring 1=incr by 1/3, 2=not incr by 1/3), whereas without other farm interests it is 1.73 (difference significance prob .021).

Table 4.17: Variables related to using non-farm investments and a financial interest in other farms

Variable*	Whether have non farm financial interests		Signif prob	Whether have interests in other farms		Signif prob
	Yes	No		Yes	No	
Age	3.14	2.73	.001	3.03	2.83	.152
Equity	72.2	63.94	.013	72.2	65.3	.064
Ownership	1.23	1.33	.129	1.29	1.29	.940
Reduce debt	1.33	1.29	.074	3.74	3.79	.801
Sell farm	2.32	2.65	.087	2.52	2.53	.990
Sell to enlarge	1.83	1.78	.767	1.98	1.74	.194
Increase size	2.46	2.34	.499	2.72	2.29	.039
Mgmt ability staffing	2.61	2.83	.136	2.52	2.82	.065
No rest till done	3.42	3.46	.773	3.69	3.38	.056
Max sustainable cash	4.34	4.54	.028	4.38	4.49	.316

* See the questionnaire for the codes and scales. Equity refers to the %, Ownership is 1=owner/operator, 2=share milker, 3=equity partner, 4=leasehold. 'Sell farm' refers to selling sometime in the next 10 years, 'Inc size' refers to buying land to increase the size of the current farm in the next ten years. 'Mgmt. ability staff' refers to the farmer's belief in her/his ability to select and manage staff. 'No rest till done' refers to the belief it is necessary to achieve job completion before rest. 'Max sust'n cash' refers to the objective of striving for greatest cash surplus provided it is sustainable.

Having off farm investments and an interest in other farms is clearly age related. In part this will mean time does enable building up sufficient assets to allow these investments. Equity levels have a similar effect. Ownership type does impact on off farm investments (closeness

to owner\operator), but not interests in other farms. Similarly, a desire to reduce debt impacts slightly on off farm investing, but not other farm interests.

Where the farmer does not have off farm investments there is a slightly greater chance they will sell the farm over the next 10 years. This is a logical response. On the other hand, having interests in other farms has little impact on this attitude. In contrast farmers with interests in other farms are slightly more likely to sell their current farm to purchase a larger one over the next ten years, and the same applies to farmers with non farm assets. No doubt these would be used to facilitate obtaining a larger farm. Gathering non farm assets can be a strategy to allow eventual expansion.

Farmers planning on buying land to increase the size of their existing farm over the next ten years are more likely to already have an interest in other farms, but this certainly is not the case for farmers with off farm financial interests. However, note that some farms will have both non farm assets and interests in other farms (8.1 per cent).

Farmers who do not find managing staff as much of a challenge as the others are more likely to have off farm investments and interests in other farms. These farmers are likely to be more financially aggressive and capable. Finally, farmers with off farm and other farm interests tend to agree that ‘they don’t rest until the job is done’, and farmers without off farm investments tend to seek maximum sustainable cash as an objective relative to their counterparts. Again, some of these farmers are likely to be determined and very interested in maximising profit within reason.

Farmer Information

It is important to have core information on the farmers to enable discovering how attitudes change as the core values change. This aids targeting groups of farmers according to their needs. The following tables contain this information.

Table 5.18: Farmers’ age (years)

Age band (years)	% of respondents’					Score (ave)*
	20-30	30-40	40-50	50-60	60+	
Overall’14	4.1	19.9	29.5	27.5	19.0	3.37
Northland	2.0	18.2	34.3	21.2	24.2	3.48
Waikato	3.5	20.1	26.4	32.6	17.4	3.40
Taranaki	7.1	21.2	29.3	26.3	16.2	3.23
Survey’06	2.1	16.8	33.7	26.3	21.1	3.47+
Survey’13	4.1	7.2	49.5	20.0	18.9	3.42+

Regional differences not significant in a traditional sense. * Codes used (1= 20-30 yrs..... 5= 60+ yrs)

+ The codes used were slightly different with the ranges being x6 to (x+1)5. The average was adjusted to suit.

Table 5.19: Farmers' education. Highest level attained

Level attained	% of respondents						Ave Score*
	Pre-Sec	Secondary	Cadet	Diploma	Degree	Other	
Overall'14	0.3	43.4	12.1	18.6	22.1	3.5	2.29
Northland	0	48.5	9.1	22.2	17.2	3	2.17
Waikato	0	38.5	12.6	19.6	23.8	5.6	2.45
Taranaki	1	45.4	14.4	13.4	24.7	1.0	2.19
Survey '06	2.1	31.9	40.4	13.8	11.7	0	3.01+
Survey '13	0	43.6	23.4	13.8	19.1	0	3.08+

* Each column is incremented by one with pre-sec=1 through to 6=other. No significant differences exist between the regions in a traditional significance sense. + Note the scoring system was slightly different as can be seen from the averages with cadet being interpreted as advanced secondary schooling.

Table 5.20: Information on whether the farmer was born and bred in a rural area.

	% of respondents'		Average Score
	Yes	No	1=yes, 2=no
Overall	78.7	21.3	1.21
Northland	76.8	23.2	1.23
Waikato	75.7	24.3	1.24
Taranaki	84.8	15.2	1.15

The differences between regions were non significant in a traditional significance sense.

Overall, the farmers tend to be older than younger, have a lower education than many, though a significant number have tertiary education, and three quarters were country born and bred.

Farmer Goals

Farmer goals drive most action. This chapter examines the survey information available on goals. Table 6.1 presents information on the importance of cash returns to the farmers, and subsequent tables provide information on other goals.

Table 6.21: The Importance of maximum sustainable net cash returns to the farmers as a goal. Score distributions

Score*	% of respondents					Ave score
	1	2	3	4	5	
Overall'14	0.3	2.9	9.3	25.6	61.9	4.46
Northland	1	2.0	8.1	31.3	57.6	4.42
Waikato	0	3.5	11.2	22.4	62.9	4.45
Taranaki	0	2.9	7.8	25.4	64.7	4.51
Survey '06	4.3	4.3	12.9	30.1	48.4	4.14
Survey '13	5.2	8.3	22.9	28.1	35.4	3.80

* Degree of agreement with the goal. 1=no agreement, ... 5=total agreement. There were no significant differences between the regions in the traditional significance sense.

The farmers' age had a significant impact (F prob= .006) on this goal as you might expect. Gender also related to the goal. Similarly, education influenced the goal (F prob=.015) with the higher the education the more likely the goal was held in high esteem.

Table 6.22: The importance of having 'reasonable holidays and leisure time' as a goal. Score distributions.

Score*	% of respondents					Ave score
	1	2	3	4	5	
Overall'14	3.2	4.7	10.8	26.8	54.5	4.23
Northland	3.0	8.1	9.1	27.3	52.5	4.18
Waikato	4.2	2.1	13.4	26.1	54.2	4.24
Taranaki	2.0	4.9	8.8	27.5	56.9	4.32
Survey '06	5.4	10.8	21.5	29.0	33.3	3.74
Survey '13	4.3	7.5	20.2	26.6	41.5	3.94

* Degree of agreement with the goal. 1=no agreement, 5=total agreement. There were no significant differences between the regions in the traditional significance sense.

Age and education only had a small influence on this goal with the respective F probability of differences being 0.221 for age and 0.498 for education.

Table 6.23: The importance of ‘passing the property onto family members’ as a goal. Score distributions.

Region	% of respondents*					Ave score
	1	2	3	4	5	
Overall'14	22.4	14.2	30.2	14.2	18.9	2.93
Northland	22.4	16.2	25.3	14.1	22.2	2.98
Waikato	22.4	11.9	32.2	16.1	17.5	2.94
Taranaki	22.5	15.7	32.4	11.8	17.6	2.86
Survey '06	19.4	18.3	26.9	15.1	20.4	2.99
Survey '13	25.0	10.4	25.0	15.6	24.0	3.03

* Degree of agreement with the goal. 1=no agreement, 5=total agreement. There were no significant differences between the regions in the traditional significance sense.

It was interesting that the greater the level of education the higher was the tendency to aim for passing the farm onto heirs, but age had little impact in this respect.

In the surveys conducted in 2006 and 2013 information was obtained on twenty possible goals and aims of the farmers. When these 20 items were factorised to reduce the volume of information base on the correlations between the variables, six summary factors emerged (Eigenvalues of 1.0 or greater) in both surveys. Based on their constituents, each was given a name. These were (Nuthall and Old, 2014; Nuthall, 2009) ‘balanced’ (Obj 1) which, as the name implies, was a mixture of the basic goals, ‘risk remover’ (Obj 2), ‘way of life’ (Obj 3), ‘reluctant farmer’ (Obj 4), ‘community supporter’ (Obj 5) and ‘family supporter’ (Obj 6). The names are largely self explanatory.

Using the details from Survey 2013, which used many of the same variables used in this survey, regression equations were developed to predict the score on each of the six objective factors. The results then enabled estimating the scores on each, using the cross over variables, for the farmers in the current survey.

These equations were... (using the variable numbers as given in the questionnaire in the appendix)

Objective 1 ($R^2=.326$, Sign prob= .000) = $-1.788-(-.051*(6-5b))+(.136*(6-5c))+(.092*(6-5d))+(.062*7c)+(.432*3f)+(.25*(6-3d))$

Objective 2 ($R^2=.467$, Sign prob= .000) = $-.87+(.049*(6-5b))+(.049*(6-5c))+(.047*(6-5d))- (.084*(6-3d))- (.102*(6-2l))- (.125*(6-5g))+(.605*(6-5i))$

Objective 3 ($R^2=.326$, Sign prob=.000) = $-1.332+(.081*(6-5c))+(.10144*(6-3d))- (.091*(6-2l))+(.277*(6-5g))+(.097*(6-5i))+(.182*(6-5e))- (.236*3f)$

Objective 4 (R²=.484, Sign prob=.000) =-1.468+(.103*(6-5c))-(.062*(6-2l))+(.433*(6-5g))+(.391*3f)-(.073*7c)

Objective 5 (R²=.672, Sign prob=.000) =-1.714-(.139*(6-5c))+(.443*(6-2l))+(.098*(6-5g))+(.041*7c)+(.042*(6-5b))-(.035*(6-5d))-(.051*(6-5e))-(.047*(6-5f))+(.173*(6-5i))+(.246*(6-3d))+(.179*(Gender-1))

Objective 6 (R²=.725, Sign prob=.000) =-1.271+(.032*(6-2l))+(.565*(6-5f))-(.086*(6-5i))- (.035*7a)

These relationships were used to predict the full six objective factors in the current survey. These were then available to relate the farmers' full objective set to their views on their challenges and information requirements enabling determining the best way of providing information.

It will be noted all these equations were highly significant with their R² values ranging from 0.326 to 0.725. That is, the equations explain from a third to three quarters of the variability in the raw data.

It will also be noted the equations have bracketed terms with (6-x). These reverse the ranking ordering as Survey 2006 and Survey 2013 used the opposite scale (1=full agreement).

Managerial Style

Managerial style helps define a manager and is, correspondingly, important when considering the assistance that might be provided small farmers. This data on style is presented in the following tables.

Table 7.24: The importance of the attitude ‘tend to tolerate employees’ and contractors’ mistakes and accidents’ as a factor in managerial style. Distribution of scores.

Region	% of respondents*					Ave
	1	2	3	4	5	score
Overall’14	7.9	10.6	36.4	33.9	11.2	3.30
Northland	9.2	9.2	34.7	36.7	10.2	3.30
Waikato	6.7	8.1	40.0	34.1	11.1	3.35
Taranaki	8.2	15.5	33.0	30.9	12.4	3.24
Survey ‘06	8.6	16.1	25.8	38.6	12.9	3.71
Survey ‘13	23.7	15.1	15.1	30.1	16.1	3.00

* Degree of agreement with the attitude. 1=no agreement, 5=total agreement. There were no significant differences between the regions in the traditional significance sense.

Table 7.25: The importance of the factor ‘don’t tend to sleep at night worrying about decisions’ as a factor in managerial style. Distribution of scores.

Region	% of respondents*					Ave
	1	2	3	4	5	Score
Overall’14	44.9	25.4	14.6	8.7	6.4	2.06
Northland	52.0	29.4	4.9	6.9	6.9	2.57
Waikato	51.0	27.3	11.2	6.3	4.2	1.85
Taranaki	28.6	18.4	29.6	14.3	9.2	1.87
Survey ‘06	30.1	25.8	11.8	15.1	17.2	2.37
Survey ‘13	34.4	24.7	19.4	12.9	8.6	2.26

* Degree of agreement with the attitude. 1=no agreement, 5=total agreement. There were significant differences between the regions in the traditional significance sense(F prob=.000).

Table 7.26: The importance of the attitude ‘investigating new farming methods is exhilarating and challenging’ as a factor in managerial style. Distribution of scores

Region	% of respondents*					Ave
	1	2	3	4	5	score
Overall ‘14	5.2	6.7	25.6	35.2	27.3	3.73
Northland	3.0	10.1	26.3	35.4	25.3	3.70
Waikato	7.0	3.5	27.3	29.4	32.9	3.78
Taranaki	4.9	7.8	22.5	43.1	21.6	3.69
Survey ‘06	2.2	7.5	17.2	47.3	25.8	3.87
Suevey ‘13	6.5	11.8	23.7	34.4	23.7	3.57

* Degree of agreement with the attitude. 1=no agreement, 5=total agreement. There were no significant difference between the regions in the traditional significance sense.

Table 7.27: The importance of the attitude ‘don’t rest until the job is fully completed’ as a factor in managerial style. Distribution of scores

Region	% of respondents*					Ave
	1	2	3	4	5	score
Overall‘14	7.9	16.3	25.9	23.6	26.2	3.44
Northland	3.1	12.2	21.4	34.7	28.6	3.74
Waikato	6.3	21.7	23.1	19.6	29.4	3.44
Taranaki	14.7	12.7	34.3	18.6	19.6	3.16
Survey ‘06	4.3	15.1	22.6	26.9	31.2	3.66
Survey ‘13	10.6	17.0	17.0	29.8	26.5	3.47

* Degree of agreement with the attitude. 1=no agreement, 5=total agreement. There were significant differences between the regions in the traditional significance sense(F prob=.005).

Table 7.28: The importance of the attitude ‘speak your mind and ask questions at meetings’ as a factor in managerial style. Distribution of scores

Region	% of respondents*					Ave
	1	2	3	4	5	score
Overall ‘14	9.2	11.5	21.0	26.9	31.3	3.60
Northland	10.1	12.1	16.2	33.3	28.3	3.58
Waikato	9.2	12.0	23.9	26.1	28.9	3.53
Taranaki	8.2	10.3	21.6	21.6	38.1	3.71
Survey ‘06	11.8	19.4	22.6	23.7	22.6	3.26
Survey ‘13	26.1	25.0	15.2	18.5	15.2	2.56

* Degree of agreement with the attitude. 1=no agreement, 5=total agreement. There were no significant differences between the regions in the traditional significance sense.

The five attitude statements presented in the last five tables are representative questions from a 25 attitude statement set designed to assess a farmers management style which is highly correlated with their personality. Personality is based on five key traits and the 25 question set has 5 questions related to each trait (Nuthall, 2009a). Accordingly some of the questions are correlated enabling the use of factor analysis to create the underlying core variables. The two studies reported in Old and Nuthall (2014) and Nuthall (2009) used this 25 question set to conclude farmers had six factors making their managerial style. These were named (based on their constituent attitudes) ‘consultative logician community’ (Style 1), ‘correctness seeker’ (Style 2), ‘consultative logician family and friends’ (Style 3), ‘conscientious planner’ (Style 4), ‘thoughtful creator’ (Style 5), and ‘benign manager’ (Style 6).

The five representative attitude statements in this survey were also in Survey 2013. They were used to develop regression equations using the full set and associate data from the 2013 survey. These equations then allow estimating the six style variables for each farmer in the 2014 survey. The six equations are listed below. The variables codes can be assessed from the questionnaire in the appendix.

$$\text{Style 1 (R}^2\text{=.733, Sign prob=.000) = -2.246+ (.398*(6-5c))+ (.426*(6-5e))+ (.035*(6-5g))}$$

$$\text{Style 2 (R}^2\text{=.505, Sign prob=.000) = -2.004+ (.499*(6-5b))+ (.036*(6-5f))+ (.074*7a)- (.057*7c)}$$

$$\text{Style 3 (R}^2\text{=.109, Sign prob=.000) = -.85+ (.094*7a)- (.047*7c)+ (.081*(6-5a))+ (.125*(6-5c))+ (.099*(6-5d))+ (.052*(6-5G))}$$

Style 4 ($R^2=.185$, Sign prob=.000) = $-.150-(.171*7a)+(.232*(6-5c))+(.111*(6-5d))+(.066*(6-5b))-(.157*(6-5e))+(.053*(6-5g))+(.146*(6-5i))$

Style 5 ($R^2=.432$, Sign prob=.000) = $-1.712-(.288*(6-5c))+(.446*(6-5d))+(.169*(6-5e))+(.042*(6-5g))+(.051*(6-5i))+(.056*(6-5a))+(.107*7c)$

Style 6 ($R^2=.531$, Sign prob=.000) = $-.860-(.077*(6-5c))-(.182*(6-5d))+(.471*(6-5a))-(.063*(6-5g))-(.002*7c)+(.173*(Gender-1))$

While two of the equations explain less than 20 per cent of the variance, the others explain much more. And all equations are highly significant. Many of the terms have a term (x-6y), this is to reverse the importance ordering as the 2013 survey had 1 as total agreement with the statement.

The equations were used to estimate each of the style variables for each farmer in the 2014 survey. As shown later, this data is used in helping to explain the farmers' approaches to their situations.

Table 7.29: Responses to the view 'when things go wrong it is due to factors beyond my control' as a pointer to the farmers' Locus of Control. Distribution of scores

Region	% of respondents*					Ave
	1	2	3	4	5	Score
Overall '14	2.3	8.4	29.1	26.7	32.6	3.80
Northland	2.0	9.1	29.3	27.3	32.3	3.79
Waikato	3.5	10.5	28.7	28.0	29.4	3.69
Taranaki	1.0	4.9	29.4	27.5	37.3	3.95
Survey'06+	12.9	18.3	23.7	25.8	19.4	3.21

* Degree of agreement with the statement. 1=no agreement, 5=total agreement. + Data not available in Survey 2013. There were no significant differences between the regions in the traditional significance sense.

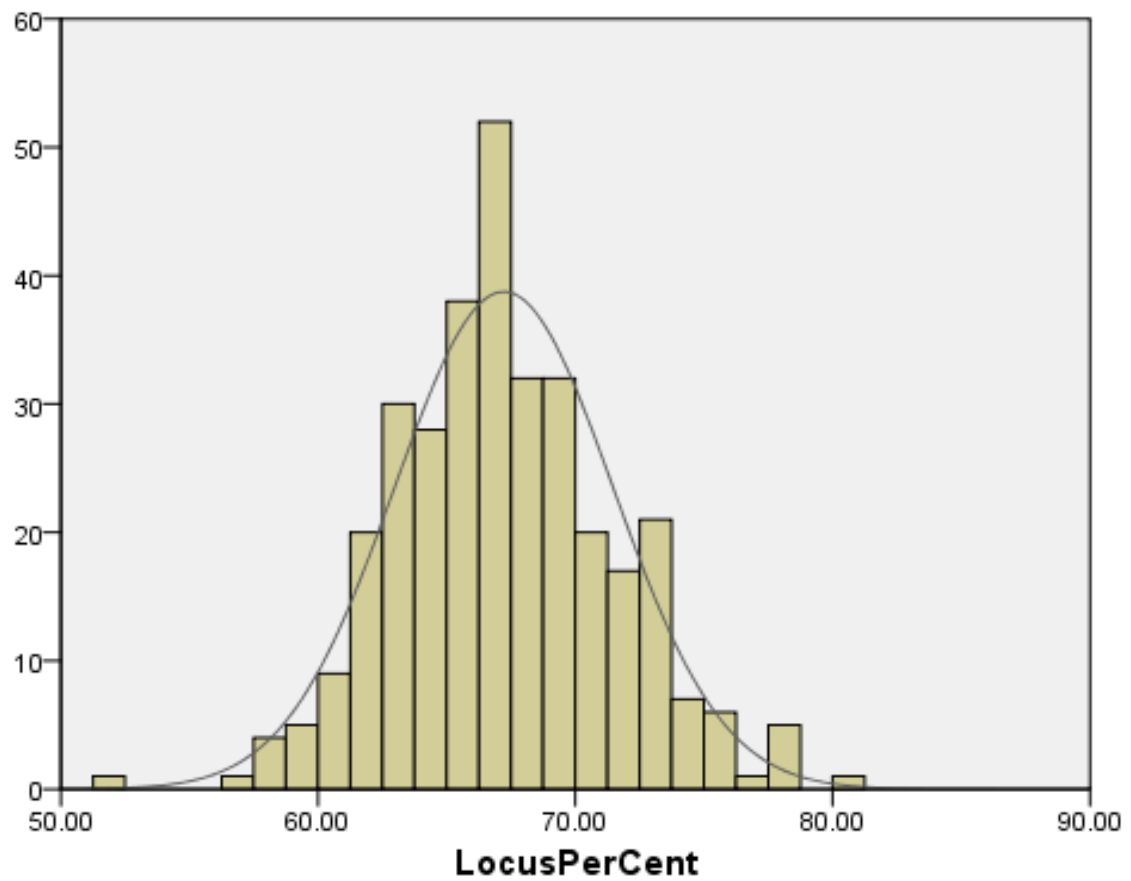
The data from the 2006 survey in which a set of 19 questions was used to assess a farmer's belief in their ability to control their farming destiny (Locus of Control, Nuthall, 2010) enabled giving each farmer a percentage score expressing their belief in their own control. There were a number of questions, including this one on 'beyond my control', common to this current survey and the 2006 survey. They were used to estimate a regression equation expressing this percentage LOC. The estimated predictor was:

LOC % ($R^2=.339$, Sign prob .000) = $64.139+(2.511*(6-5h))+(.584*7c)+(.846*(6-5b))-(1.844*(6-5c))+(.448*(6-5d))-(1.068*(6-5e))-(.893*(6-5g))$

This equation was used to predict the farmers' LOC for use in analyses presented later.

These estimates produced a distribution of LOC values as shown in Figure 7.1. The distribution approaches normality.

Figure 7.1: Distribution of the farmers' estimated Locus of Control



Future Goals

The farmers were asked to rate twelve possible actions that they planned to be involved in over the next ten years. The idea was to find out the topics where they might value assistance and advice. The actions included a range of possibilities from selling the current farm, to passing it to heirs, through to seeking off farm income and to reducing debt to low levels. Their views are expressed in the next twelve tables which give the farmers' average score out of a five point range as well as the percentage of the farmers giving each score on the five point range. The data was tested for regional differences as noted under each table. In general regional differences were not particularly significant meaning assistance programmes can be common across the regions. Three tables following the twelve (41 to 43) relate the farmers' views to a range of key variables (such as the farmers' age and education, their Locus of Control and the like).

Table 8.1 contains the farmers' views on selling their farm. In contrast, table 8.2 has the data on the option to sell and use the proceeds to buy a larger farm, and table 8.3 provides the farmers' views on enlarging the current farm through land acquisition, or perhaps leasing.

Table 8.30: Likelihood of selling the farm over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	41.5	11.3	18.9	10.6	17.7	2.52
Northland	33.8	13.0	19.5	11.7	22.1	2.75
Waikato	40.7	11.1	18.5	12.0	17.6	2.55
Taranaki	50.0	10.0	18.8	7.5	13.8	2.25

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action. 1=unlikely, 5=Very likely

Table 8.31: Table 30 Likelihood of selling the farm to buy larger over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	64.2	12.1	9.8	7.5	6.4	1.80
Northland	57.1	11.7	13.0	7.8	10.4	2.03
Waikato	62.6	15.0	8.4	9.3	4.7	1.78
Taranaki	72.5	8.8	8.8	5.0	5.0	1.61

* The regions were nearly significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.32: Likelihood of increasing the size of the current farm over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	40.4	14.7	21.1	12.5	11.3	2.40
Northland	37.7	16.6	19.5	13.0	14.3	2.51
Waikato	41.1	17.8	17.8	12.1	11.2	2.35
Taranaki	42.0	9.9	27.2	12.3	8.6	2.36

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

The chance of the farmers either selling outright or buying to enlarge their current farm is higher than the option of selling and rebuying. Overall, however, a large proportion of the farmers believed they would not follow any of these courses of action as shown by the large percentage answering 'one' to each option.

Related to changing the current farm is passing the farm onto heirs. Table 8.4 presents the farmers' views on this likelihood over the next ten years. On average there is a slightly less than an even chance of this happening, and nearly half say it is most unlikely (score of 1). The information available did not provide information on the number and age of any children. However, in the 2013 survey small dairy farms had families ranging from 0 to 7 children with 28.9 per cent having no children at that time, 3.1 per cent with 1 child, 21.6 per cent with 2 children, 32.0 per cent with 3, 11.3 per cent with 4, and 3.1 per cent with greater than 4 children. If the same numbers hold in 2014, some 18 per cent with children are not planning on passing the farm on to the heirs. In contrast, 24 per cent are very likely to be passing the farm to their children. Overall, around 53 per cent do not plan on passing the farm to heirs. This is surprisingly high.

Table 8.33: Likelihood of transferring the farm to one or more children over the next ten years. Distribution of scores.

Region	Likelihood levels + ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	45.9	12.4	17.3	11.7	12.8	2.33
Northland	48.1	15.6	10.4	11.7	14.3	2.29
Waikato	48.6	7.5	22.4	13.1	8.4	2.25
Taranaki	40.2	15.9	17.1	9.8	17.1	2.48

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

One strategy to overcome the problems of 'smallness' is, obviously, to expand, or alternatively, cut costs. Equally, the farmer might accept smallness but improve her/his lot by taking more time off. The next four tables (8.5, 8.6, 8.7, and 8.8) contain the farmers' views on four aspects of profit and/or satisfaction increase. The first is employing labour or a share milker (which could also simply be used to reduce the farmer's work load), the second is whether the farmer plans on continuing to do the all the work her/himself, the third whether to use labour saving technology, and the fourth the likelihood of increasing production by at least 10 per cent. Of course, employing more labour might also relate to increasing production as would working harder her/himself.

Table 8.34: Likelihood of employing a non family worker or share milker over the next ten years. Distribution of scores.

Region	Likelihood levels + ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	23.1	5.7	15.9	16.5	38.7	3.42
Northland	22.4	4.1	11.2	13.3	49.0	3.62
Waikato	24.6	6.5	16.7	18.8	33.3	3.30
Taranaki	21.6	6.2	19.6	16.5	36.1	3.39

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.35: Likelihood of the farmer doing all the work themselves over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	28.1	14.0	26.0	14.9	17.0	2.79
Northland	32.3	15.2	22.2	13.1	17.2	2.68
Waikato	32.1	14.3	24.3	13.6	15.7	2.66
Taranaki	17.7	12.5	32.3	18.8	18.8	3.08

* The regions were virtually significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.36: Likelihood of the farmer investing in on farm labour saving technology over the next ten years. Distribution of scores.

	Likelihood levels + ...% of respondents					Ave
	1	2	3	4	5	Score*
Overall	26.7	16.0	22.1	21.1	14.0	2.80
Northland	28.3	12.1	21.2	25.3	13.1	2.83
Waikato	23.6	16.7	25.0	20.8	13.9	2.85
Taranaki	29.7	18.8	18.8	17.8	14.9	2.69

* The regions were not significantly different.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.37: Likelihood of the farmer increasing production by more than 10% over the next ten years. Distribution of scores.

Region	Likelihood levels + ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	9.3	10.2	23.0	26.5	31.1	3.60
Northland	8.1	10.1	22.2	24.2	35.4	3.69
Waikato	7.6	8.3	23.6	31.9	28.5	3.65
Taranaki	12.9	12.9	22.8	20.8	30.7	3.44

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

As might be expected, farmers are keen on the idea of increasing production and also on employing labour. Who would not be? and clearly the farmers think it would be economic as this data reflects their intentions. But the price for milk solids as the years unfold will impact on actions in this regard. The farmers are somewhat ambivalent over investing in labour saving technology with the middle of the road scores and similarly over doing all the work themselves, though in Taranaki there seems to be a larger belief that this will happen.

To increase income diversification into other enterprises can be an option. Activities such as home stays, or an intensive patch of flower growing are all possibilities. Another opportunity, depending on location, is off farm work of some kind, and yet another is using any surplus funds, or perhaps funds through borrowing, to invest off site into another farm which may or may not be a dairy farm and so diversify and possibly cover dairy downturns. The next three tables (8.9, 8.10, and 8.11) present the farmers' views on these options.

Table 8.38: Likelihood of the farmer diversifying the current business over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	50.0	14.0	15.4	11.9	8.7	2.15
Northland	28.3	20.2	23.2	15.2	13.1	2.65
Waikato	62.5	11.1	11.1	8.3	6.9	1.86
Taranaki	53.5	11.9	13.9	13.9	6.9	2.09

* The regions were highly significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.39: Likelihood of the farmer investing in another farm as well as the current farm over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	31.1	12.5	21.8	15.7	18.9	2.79
Northland	38.4	6.1	14.1	16.2	25.3	2.84
Waikato	26.4	12.5	27.1	18.1	16.0	2.85
Taranaki	30.7	18.8	21.8	11.9	16.8	2.65

* The regions were not significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

Table 8.40: Likelihood of at least 20% of the farmer's income coming from non-farm investment and/or off farm wages over the next ten years. Distribution of scores.

Region	Likelihood levels + ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	41.9	21.5	15.1	8.4	13.1	2.29
Northland	44.4	18.2	15.2	8.1	14.1	2.29
Waikato	34.7	20.1	18.8	9.7	16.7	2.54
Taranaki	49.5	26.7	9.9	6.9	6.9	1.95

* The regions were highly significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

The farmers are not overly keen on any of these strategies. Perhaps they see diversification as not really being practical, particularly in the Waikato. No doubt the farmers would like to obtain off farm income, but again a significant proportion would not opt for this, or alternatively they do not see the opportunities as being practical. They are a little keener on investing in other farms where, no doubt, possible. Perhaps this is a matter of sticking to a business they are currently familiar with.

To expand taking on debt is likely to be necessary. Table 8.12 provides the farmers' views on whether they plan on reducing debt and, therefore, not expanding. In its own right, debt reduction can be a strategy to provide resilience. So often, reducing debt is a better investment with the interest saving being greater than the return on using the money to invest in expansion.

Table 8.41: Likelihood of the farm debt being reduced to very low levels over the next ten years. Distribution of scores.

Region	Likelihood levels+ ... % of respondents					Ave
	1	2	3	4	5	Score*
Overall	9.9	7.3	17.7	25.9	39.2	3.77
Northland	11.1	9.1	24.2	18.2	37.4	3.62
Waikato	7.6	6.9	13.9	25.7	45.8	3.95
Taranaki	11.9	5.9	16.8	33.7	31.7	3.67

* The regions were nearly significantly different at conventional levels.

+ Degree of agreement with the action 1=unlikely, 5=Very likely

It is very clear the farmers like the debt reduction strategy with large numbers answering with a 4 or 5. In considering these figures the farmer's current debt level is a factor. This data is considered later. To further understand this 10 year plan information the data was divided and compared for a number of key variables. Table 8.13 contains the average scores for each option where the farmers are divided into age, education, and Locus of Control groups. The t test significance probabilities are also presented for the average comparisons. In Table 8.14 the information where the same approach is used in comparing farmers employing staff in contrast to having no staff, equity levels, and whether the farmer was born and bred in a rural area.

As might be expected, age has a major impact on most of the variables. Effectively, stage of life is important in a farmers' attitude so, for example, older farmers are keen on selling the farm, but younger farmers keen on increasing production. All this data confirms the logic of the situation. In contrast, education seems to have little impact on the attitudes so all farmers can be treated equally in programmes. For the Locus of Control, farmers with a belief in their own control of the situation are keener on selling the farm, diversifying, investing in another

farm, and increasing production. If they are right in their belief, there would be benefit in helping the remaining farmers realise they have greater control than they imagine.

Table 8.42: The relationship of the farmers' prediction of their ten year changes relative to age, education and their locus of control (LOC). Average scores+ and the significance probability (Sign prob) of the differences

Change item	Age < 45 yrs	Age 45+ yrs	Sign prob	Edn < dip*	Edn dip +	Sign prob	LOC <67.5%	LOC 67.5%+	Sign prob
Sell farm	2.06	2.84	.000	2.42	2.65	.230	2.70	2.34	.066
Sell and move to larger farm	2.07	1.60	.003	1.74	1.87	.395	1.77	1.89	.429
Enlarge current farm	2.64	2.22	.018	2.36	2.43	.685	2.38	2.44	.749
Transfer farm to children	1.93	2.59	.000	2.59	2.05	.003	2.40	2.22	.331
Employ worker/share milker	3.39	3.44	.776	3.39	3.44	.741	3.42	3.42	.984
Largely do work myself	3.24	2.24	.000	2.68	2.85	.268	2.87	2.66	.185
Invest in labour saving device/s	2.93	2.66	.082	2.75	2.86	.473	2.83	2.86	.846
Increase prodn by 10% plus	3.92	3.22	.000	3.35	3.81	.001	3.48	3.77	.042
Diversify prodn	2.25	2.04	.149	2.09	2.20	.492	2.24	2.01	.124
Invest in additional farm	3.03	2.51	.001	2.62	2.93	.061	2.68	2.99	.063
20%+ of income from off farm	2.28	2.32	.802	2.13	2.43	.049	2.26	2.38	.435
Reduce debt to low level	3.58	4.01	.002	3.80	3.77	.869	3.78	3.72	.697

+ Scoring 1=very unlikely 5= very likely * dip = diploma

The data in table 8.14 shows employing staff is not correlated with the various ten year plans (other than staff questions themselves), but high equity is related to various factors. With higher equity a farmer is less likely to move to a larger farm (presume as no need to), and more likely to pass the farm to the children (as more financial room to move), less likely to do

the work her/himself, less likely to increase production (again, no need to), and very likely to focus on further debt reduction. And it will be noted being born and bred rurally is correlated with a number of ten year moves. The farmer is less likely to transfer the farm to the children (perhaps s/he has so much experience of rural areas that believes the children should move on), more likely to do all the work her/himself, less likely to diversify (less ideas perhaps), and similarly, less likely to work off farm and to reduce debt (perhaps faith in agriculture). All these relationships are logical and what would be expected.

Table 8.43: The relationship of the farmers' prediction of their ten year changes relative to whether staff are employed, farm equity, and whether the farmer was born and bred in a rural area. Average scores+ and the significance probability (Sign prob) of the differences

Change item	Staff	No staff	Sign prob	Equity > 60%	Equity < 61%	Sign prob	Born & bred	Not born & bred	Sign prob
Sell farm	2.54	2.47	.737	2.67	2.42	.289	2.49	2.65	.507
Sell and move to larger farm	1.82	1.77	.797	1.78	2.15	.072	1.79	1.83	.847
Enlarge current farm	2.44	2.30	.438	2.34	2.64	.165	2.38	2.44	.762
Transfer farm to children	2.37	2.25	.542	2.51	2.11	.086	2.45	1.83	.006
Employ worker/share milker	3.84	2.53	.000	3.41	3.43	.927	3.46	3.24	.303
Largely do work myself	2.47	3.42	.000	2.43	3.08	.001	2.84	2.51	.081
Invest in labour saving device/s	2.92	2.54	.017	2.70	2.86	.388	2.80	2.82	.915
Increase prodn by 10% plus	3.58	3.63	.753	3.48	3.98	.003	3.57	3.68	.514
Diversify prodn	2.18	2.11	.679	2.25	2.03	.249	2.06	2.49	.016
Invest in additional farm	2.82	2.72	.575	2.86	2.87	.945	2.76	2.89	.525
20%+ of income from off farm	2.32	2.25	.684	2.26	2.40	.448	2.23	2.57	.063
Reduce debt to low level	3.82	3.67	.318	4.16	3.28	.000	3.71	4.03	.064

+ Scoring 1=very unlikely 5= very likely

It would be expected farmers who have increased production significantly (by at least a third) would have different attitudes to development. As shown by the data in table 8.15 this is the case for transferring the farm to the children, employing others and doing less themselves, investing in labour saving devices as well as diversification, off farm income and reducing debt. It might be expected farmers who have worked hard to increase production would continue with this approach through the items highlighted.

Table 8.44: The relationship of the farmers' prediction of their ten year changes relative to herd increasing by at least a third, herd size, and ownership (owner/operator OR share milker). Average scores+ and the significance probability (Sign prob) of the differences

Change item	Inc by 1/3 +	Not inc by 1/3	Sign prob	> 200 cows	200 or less cows	Sign prob	Owner Operator	Share milker	Sign prob
Sell farm	2.47	2.54	.702	2.48	2.61	.502	2.52	2.00	.502
Sell and move to larger farm	1.71	1.85	.364	2.00	1.48	.001	1.79	2.00	.736
Enlarge current farm	2.37	2.41	.795	2.66	1.94	.000	2.39	2.25	.848
Transfer farm to children	2.62	2.17	.017	2.35	2.31	.793	2.33	2.20	.838
Employ worker/share milker	3.87	3.22	.001	3.72	2.77	.000	3.48	3.22	.204
Largely do work myself	2.39	2.96	.001	2.67	3.02	.038	2.62	3.23	.001
Invest in labour saving device/s	3.02	2.70	.052	3.08	2.26	.000	2.75	2.97	.210
Increase prodn by 10% plus	3.54	3.62	.590	3.72	3.36	.013	3.45	4.05	.000
Diversify prodn	1.98	2.23	.123	2.06	2.34	.072	2.09	2.33	.180
Invest in additional farm	2.61	2.87	.138	2.94	2.48	.007	2.58	3.44	.000
20%+ of income from off farm	2.12	2.37	.105	2.28	2.32	.835	2.22	2.58	.049

Reduce debt to low level	3.93	3.70	.132	3.71	3.88	.256	3.74	3.99	.140
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+ Scoring 1=very unlikely 5= very likely

Somewhat similarly, farmers with larger herds are keener to move to a larger farm and/or enlarge their existing farm, employ labour, invest in labour saving devices, increase production, diversify and invest in additional farms. All in all, these farmers seem to be more entrepreneurial than the smaller farms. Perhaps that is why they have larger herds.

When it comes to share milkers relative to owner operators, they are more likely to do the work themselves, increase production, invest in another farm and work towards getting off farm income. There is nothing unexpected here.

Overall, it does seem some farmers have, and are keen to, work hard at improving their income through expansion. This has shown in the past through their increased herd size. It might be concluded that, as a generalisation, there is a distinct body of farmers content with their current situation, and another group keen to progress into larger operations, at least in a financial sense, through various strategies. Many share milkers would be classed in this latter group.

Challenges to Future Plans

To obtain information on the problems and challenges the farmers believe they would face in carrying out their future plans, and consequently discover the information and/or help they might find beneficial, the farmers were given a list of challenges/problems they could face and were asked to rate them as to their degree of challenge on a 1 to 5 scale. The next ten tables give the distribution of the scores the farmers provided as well as their average scores for each challenge.

Dealing with environmental regulations and issues was clearly considered a challenge by the farmers. Table 9.1 shows an average rating of 3.44 in the five point scale, and a distribution of answers with the higher scores dominating. And the scores are similar in all regions.

Table 9.45: The importance of environmental regulations and issues in challenging future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge. % of respondents+					Ave
	1	2	3	4	5	score
Overall	8.8	14.0	24.6	29.5	23.1	3.44
Northland	7.1	14.1	23.2	35.4	20.2	3.47
Waikato	7.7	12.7	26.1	26.1	27.5	3.53
Taranaki	11.9	15.8	23.8	28.7	19.8	3.29

+ Scoring 1= no challenge 5=very challenging * no significant differences between regions in the traditional significance levels.

As shown in Table 9.2, finding suitable staff is not such a challenge as dealing with environmental issues, but never the less still an important challenge which, it will be noted, transcends all the regions in much the same way.

Table 9.46: The importance of finding suitably experienced staff in challenging future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge + ... % of respondents					Ave
	1	2	3	4	5	score
Overall	15.5	16.5	22.8	22.5	22.7	3.21
Northland	15.2	30.3	35.4	17.2	2.0	3.29
Waikato	17.5	30.7	30.7	15.3	5.8	3.13
Taranaki	17.2	30.3	39.4	10.1	3.0	3.16

+ Scoring 1= no challenge 5=very challenging * no significant differences between regions in the traditional significance levels.

However, as shown in table 9.3, the farmers do not believe actually managing staff is such a problem as finding the staff in the first place. This does, however, vary in that some farmers still rated the problem as challenging to very challenging.

Table 9.47: The willingness and ability to manage staff as a challenge in future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge + ... % of respondents					Ave
	1	2	3	4	5	score
Overall	21.5	21.5	24.8	24.2	7.9	2.76
Northland	24.2	29.3	28.3	12.1	6.1	2.47
Waikato	19.4	22.4	23.9	26.1	8.2	2.81
Taranaki	21.6	12.4	22.7	34.0	9.3	2.97

+ Scoring 1= no challenge 5=very challenging * there are significant differences between regions in the traditional significance levels ($p=.015$).

The amount of capital/debt required for the farmers' plans is on average quite challenging to them (Table 9.4) as is the expected cash returns from the future plans which is slightly different across the regions (table 9.5). It would be surprising if this was not the case.

Table 9.48: The challenge of the amount of capital and/or debt required for the future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	10.3	21.5	27.6	27.6	12.9	3.11
Northland	11.1	16.2	28.3	29.3	15.2	3.21
Waikato	9.9	24.8	21.3	31.2	12.8	3.12
Taranaki	10.1	22.0	36.0	21.0	11.0	3.01

+ Scoring 1= no challenge 5=very challenging * no significant differences between regions in the traditional significance levels.

The cash returns resulting from any changes would be expected to be an important challenge to the ten year proposals as the cash surplus can mean less borrowing is required. This certainly turns out to be the case as shown in table 9.5. And there does seem to be a slight difference between the regions in attitudes. Northland farmers in particular seem to think

their future returns will be important to their plans. Upturns in the price of milk solids can clearly help enormously.

Table 9.49: The importance of the level of cash return from farmers' potential future plan in challenging future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave score
	1	2	3	4	5	
Overall	6.5	23.0	39.2	22.7	8.6	3.04
Northland	7.1	16.2	41.4	22.2	13.1	3.18
Waikato	5.0	24.1	41.8	21.3	7.8	3.03
Taranaki	8.1	28.3	33.3	25.3	5.1	2.91

+ Scoring 1= no challenge 5=very challenging * not far from ($p=.175$) significant differences between regions in the traditional significance levels.

Similarly, recent farm returns can have a major influence on the farmers' ability to carry out farm system changes as shown in Table 9.6.

Table 9.50: The importance of the level of cash returns over the last four years in challenging future farming plans. Distribution of farmers' scores on the degree of challenge.

Region	Degree of challenge+ ... % of respondents					Ave score
	1	2	3	4	5	
Overall	14.4	18.2	38.4	18.5	10.6	2.93
Northland	11.1	12.1	42.4	22.2	12.1	3.12
Waikato	13.5	19.1	36.2	17.7	13.5	2.99
Taranaki	18.8	22.8	37.6	15.8	5.0	2.65

+ Scoring 1= no challenge 5=very challenging * there are significant differences between regions in the traditional significance levels ($p=.013$).

Again, the Northland farmers believe the returns from the recent past is a 'challenge' to their future activities.

Risk is always a concern to most farmers, and certainly many of the small dairy farmers face this problem. While the average scores (Table 9.7) are not at the very high end of the scale, there is around 25 per cent of the farmers rating risk problems as a major challenge.

Table 9.51: The level of risk in farming plans as a challenge to future operations. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	14.1	25.0	38.5	17.6	4.7	2.74
Northland	15.2	19.2	37.4	21.2	7.1	2.86
Waikato	14.2	29.1	34.0	19.9	2.8	2.68
Taranaki	13.0	25.0	46.0	11.0	5.0	2.70

+ Scoring 1= no challenge 5=very challenging * there are no significant differences between regions in the traditional significance levels.

With the undoubted problems of finding valuable staff, some farmers will invest in labour saving devices. Table 9.8 contains data showing the farmers, on average, do not believe any lack of technology is a major challenge with them mainly scoring 2's and 3's though also moving into the 4's. However, it is likely they would be very interested in very low cost robotic milking machines. While readily available, the currently available models are probably too costly for most farmers to find them economic.

Table 9.52: The lack of suitable cost effective technology as a challenge to future farming plans. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	16.7	30.4	34.6	14.3	3.9	2.58
Northland	15.2	30.3	35.4	17.2	2.0	2.61
Waikato	17.5	30.7	30.7	15.3	5.8	2.61
Taranaki	17.2	30.3	39.4	10.1	3.0	2.51

+ Scoring 1= no challenge 5=very challenging * there are no significant differences between regions in the traditional significance levels.

Surprisingly, farmers largely believe their knowledge situation is relatively adequate as the data in Table 9.9 shows. Perhaps reality is different in that what the farmers do not know generally cannot be judged by themselves.

Table 9.53: The lack of knowledge and/or detail of your future plan as a challenge to future operations. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	18.8	31.0	37.0	10.1	3.0	2.48
Northland	17.2	29.3	41.4	7.1	5.1	2.53
Waikato	21.4	30.0	33.6	12.1	2.9	2.45
Taranaki	16.7	31.4	37.5	10.4	1.0	2.45

+ Scoring 1= no challenge 5=very challenging * there are no significant differences between regions in the traditional significance levels.

Part of planning is setting up succession systems. While other data suggests many farmers are tardy in making such plans (Nuthall and Old, 2014), it would appear from table 9.10 that this sample of farmers do not see many difficulties in discussing such issues with potential heirs.

Table 9.54: Difficulties of discussing potential plans with the next generation as a challenge to future operations. Distribution of farmers' scores on the degree of challenge.

Region*	Degree of challenge+ ... % of respondents					Ave
	1	2	3	4	5	score
Overall	43.3	25.7	21.0	5.5	4.4	2.02
Northland	43.4	23.2	23.2	9.1	1.0	2.01
Waikato	48.6	27.5	15.5	3.5	4.9	1.89
Taranaki	36.3	25.5	26.5	4.9	6.9	2.21

+ Scoring 1= no challenge 5=very challenging * there are nearly significant differences between regions in the traditional significance levels sense(p=.092).

In the interests of possibly targeting certain groups of farmers in extension and information campaigns, the ten challenges listed above were assessed relative to a range of other variables such as the age and education of the farmers, and many other groupings as well included some of the objectives held by the farmers. The next four tables contains this information comparing the mean scores of the various challenges between two groupings of farmers in each case and the significance probability of the differences in the means.

Table 9.55: The relationship of the farmers' beliefs in the challenges they face over the next ten years relative to age, education and their locus of control (LOC). Average scores+ and the significance probability (Sign prob) of the differences

Challenge+	Age < 45 yrs	Age 45+ yrs	Sign prob	Edn < dip*	Edn dip & >	Sign prob	LOC <67.5%	LOC 67.5%+	Sign prob
Cash over last 4 years	3.05	2.78	.035	2.84	3.00	.204	3.01	2.84	.179
Cash from 10 year plans	3.07	3.00	.528	3.01	3.07	.586	3.02	3.09	.575
Capital/debt reqd by plans	3.38	2.80	.000	2.93	3.26	.013	3.10	3.16	.640
Risk in plans	3.02	2.41	.000	2.63	2.84	.085	2.75	2.76	.885
Lack of plan knowledge	2.48	2.48	.976	2.40	2.54	.199	2.59	2.34	.025
Environmental regs/issues	3.30	3.59	.028	3.40	3.46	.656	3.59	3.28	.021
Lack of suitable technology	2.62	2.54	.506	2.65	2.54	.337	2.64	2.54	.416
Poor next gen communications	2.14	1.88	.032	2.14	1.93	.088	2.18	1.85	.010
Finding staff	3.29	3.12	.289	3.08	3.32	.119	3.21	3.21	.994
Willingness to manage staff	2.87	2.61	.063	2.58	2.90	.021	2.68	2.81	.374

+ Scoring 1=not challenging 5= very challenging * dip = diploma

Farmers above and below 45 years of age have quite distinct differences for some of the challenges (Table 9.11). Of course, selecting a cutoff of 45 is somewhat arbitrary, but it does cut the numbers somewhat equally. Age impacts on the attitude of the importance of cash from recent years with the younger farmers seeing it as being quite significant. Similarly for debt and risk. On the other hand the older farmers believe environmental issues are more important ... perhaps they are just not used to the emphasis on the environment. And they are not so concerned about succession communications and their ability to manage staff.

Education does not relate to many of the challenges willingness to manage staff, and the capital requirements of plans. In both cases it seems a longer education allows the farmers to understand and appreciate these challenges. In the case of the Locus of Control, farmers with a high control belief do not find environmental and succession communication challenges as

much of a challenge as the other farmers. They clearly believe they can manage these situations.

Table 9.56: The relationship of the farmers' beliefs in the challenges they face over the next ten years relative to whether staff are employed, farm equity, and whether the farmer was born and bred in a rural area. Average scores+ and the significance probability (Sign prob) of the differences

Challenge+	Staff	No staff	Sign prob	Equity > 60%	Equity < 61%	Sign prob	Born & bred	Not born & bred	Sign prob
Cash over last 4 years	2.91	2.97	.660	2.81	3.08	.084	2.89	3.04	.344
Cash from 10 year plans	2.96	3.20	.037	2.97	3.06	.549	3.03	3.08	.674
Capital/debt reqd by plans	3.07	3.19	.389	2.86	3.42	.000	3.12	3.08	.814
Risk in plans	2.76	2.70	.651	2.51	3.08	.000	2.77	2.64	.352
Lack of plan knowledge	2.47	2.49	.836	2.35	2.59	.063	2.52	2.34	.184
Environmental regs/issues	3.46	3.40	.697	3.40	3.38	.918	3.52	3.12	.017
Lack of suitable technology	2.57	2.60	.857	2.56	2.57	.909	2.58	2.58	.985
Poor next gen communications	2.02	2.02	.998	1.87	2.24	.013	2.07	1.85	.142
Finding staff	3.23	3.15	.598	3.15	3.26	.553	3.29	2.93	.052
Willingness to manage staff	2.69	2.90	.149	2.68	3.00	.065	2.79	2.61	.302

+ Scoring 1=not challenging 5= very challenging

Whether staff are employed does not seem to have much impact on the challenges other than over the cash from the planned changes as shown by the data in table 9.12. People with no staff see this as more of a challenge. Equity levels are, however, related to more of the challenges.

Cash from the last four years is more of a challenge for low equity farmers as is the debt and risk situations. On the other hand, low equity farmers see succession and managing staff more of a challenge. The two are likely to go hand in hand and relate to communication abilities. Finally in table 9.12, whether a farmer was born and bred in the country does not seem to

really influence their attitude to the challenges except for the environmental and finding staff challenges. The rural background seems to relate to some fears here, or some might say a better understanding of the realities of the problems.

Table 9.57: The relationship of the farmers' beliefs in the challenges they face over the next ten years relative to farmers increasing their herd by at least a third, herd size, and ownership (owner/operator OR share milker). Average scores+ and the significance probability (Sign prob) of the differences

Challenge+	Inc by 1/3 plus	Not inc by 1/3	Sign prob	> 200 cows	200 or less cows	Sign prob	Owner Operator	Share milker	Sign prob
Cash over last 4 years	2.81	2.98	.217	2.99	2.81	.181	2.92	2.88	.793
Cash from 10 year plans	2.97	3.07	.425	3.02	3.05	.789	3.04	3.01	.815
Capital/debt reqd by plans	2.96	3.18	.115	3.19	2.93	.053	2.97	3.61	.000
Risk in plans	2.61	2.80	.125	2.84	2.45	.003	2.64	3.04	.003
Lack of plan knowledge	2.39	2.51	.327	2.48	2.46	.858	2.49	2.38	.389
Environmental regs/issues	3.59	3.39	.137	3.52	3.29	.111	3.55	3.11	.007
Lack of suitable technology	2.59	2.58	.944	2.59	2.59	.995	2.58	2.58	.998
Poor next gen communications	1.97	2.04	.615	2.03	2.00	.811	2.00	2.00	.978
Finding staff	3.30	3.16	.390	3.31	2.96	.032	3.10	3.53	.018
Willingness to manage staff	2.67	2.79	.396	2.85	2.54	.038	2.65	3.08	.009

+ Scoring 1=not challenging 5= very challenging

The data in Table 9.13 makes it clear whether farmers have increased their herd significantly does not seem to relate to their attitude to the challenges. This is surprising. On the other hand herd size is related to the challenges. As you might expect the larger herd managers think the debt requirement is quite a challenge and similarly the riskiness of plans. Labour issues also, as you would predict, are seen as more of a challenge by the larger herd managers.

Virtually the same can be said when comparing owner/operators with share milkers. The only difference lies in the environmental challenges with the owners seeing this as more of a challenge with the share milkers having less responsibility for environmental issues.

When looking at the impact of the farmers' objectives and their level of anxiety, there are clear differences as shown by the information in table 9.14. Farmers with an interest in maximising cash returns see cash, debt and risk factors as more of a challenge than farmers with other objectives. This is to be expected. In contrast, the farmers' attitude to holidays and leisure does not relate to any of the challenges.

A farmers' worry tendencies provides quite a different picture with strong differences in all challenges except in the debt and staff management areas. It does seem the anxiety personality trait is quite powerful in influencing a farmers' management.

Table 9.58: The relationship of the farmers' attitudes to the challenges they face over the next ten years relative to two important objectives and concern/worry levels. Average scores+ and the significance probability (Sign prob) of the differences

Challenge+	Cash return not priority	Cash return is priority	Sign prob	Hols & leisure not priority	Hols and leisure a priority	Sign prob	Do not worry	Worry about plans	Sign prob
Cash over last 4 years	2.52	2.98	.017	3.05	2.90	.361	2.82	3.52	.000
Cash from 10 year plans	2.62	3.10	.005	3.03	3.04	.954	2.98	3.33	.024
Capital/debt reqd by plans	2.5	3.20	.000	3.16	3.11	.763	3.08	3.31	.205
Risk in plans	2.17	2.82	.000	2.81	2.72	.532	2.70	2.98	.075
Lack of plan knowledge	2.31	2.50	.256	2.56	2.44	.395	2.44	2.70	.088
Environmental regs/issues	3.21	3.47	.203	3.42	3.44	.897	3.38	3.81	.022
Lack of suitable technology	2.37	2.61	.159	2.63	2.57	.697	2.53	2.84	.049
Poor next gen communications	1.98	2.02	.800	2.03	2.02	.932	1.95	2.36	.015
Finding staff	3.03	3.23	.356	3.22	3.20	.906	3.13	3.67	.008

Willingness to manage staff	2.52	2.79	.203	2.66	2.77	.545	2.71	2.94	.231
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+ Scoring 1=not challenging 5= very challenging

Farmers' Extension Preferences

The farmers were asked to give their views on a range of systems which could provide them with decision information and management help tools. This information is clearly of some importance in guiding extension personnel on the preferred methods of providing assistance.

Tables 10.1 to 10.7 provide the distribution of the farmer's preferences for each method offered as a possibility (see the questionnaire in the appendix for the exact questions (series 6a to 6h). The tables also provide the average score for each possibility and note any statistically different categories.

The tables following table 10.7 analyse the data in greater depth to explore the relationship between the information choices and key variables such as farm sizes, herd increases, farmer's age and education and such like variables. These comparisons lead to conclusions on the reasons for any differences in attitude and, consequently, whether farmers need grouping when providing information and considering different ways to provide assistance.

Table 10.59: Farmers' rating on their preference to have expert speakers provide them with management information and tools. Distribution of farmers' scores on their preferences.

Region+	Preference scores ... % of respondents on each score*					Ave score
	1	2	3	4	5	
Overall	1.5	4.2	13.1	41.5	39.8	4.14
Northland	1.0	1.0	17.2	41.4	39.4	4.17
Waikato	1.4	5.3	13.3	41.3	38.5	4.10
Taranaki	2.1	5.3	8.4	42.1	42.1	4.17

* 1=do not prefer, through to 5=strongly prefer + the regional differences were not significantly different

Table 10.60: Farmers' rating on their preference to have one day workshops to provide them with management information and tools. Distribution of farmers' scores on their preferences.

Region+	Preference scores ... % of respondents on each score*					Ave score
	1	2	3	4	5	
Overall	4.5	5.1	15.6	33.2	41.6	4.02
Northland	4.0	2.0	17.2	31.3	45.5	4.12
Waikato	4.2	6.3	14.1	32.4	43.0	4.03
Taranaki	5.4	6.5	16.1	36.6	35.5	3.90

*1=don't prefer, through to 5=strongly prefer + the regional differences were not significantly different (p=.378)

Tables 10.1 and 10.2 show the farmers are all relatively keen to listen to expert speakers and attend workshops. There are virtually no differences between regions.

Table 10.61: Farmers' rating on their preference to have farmer case studies to provide them with management information and tools. Distribution of farmers' scores on their preferences.

Region+	Preference scores ... % of respondents on each score*					Ave score
	1	2	3	4	5	
Overall	2.1	5.7	22.2	39.2	30.8	3.91
Northland	3.0	2.0	20.2	40.4	34.3	4.01
Waikato	2.1	7.7	21.7	39.9	28.7	3.85
Taranaki	1.1	6.5	25.0	37.0	30.4	3.89

*1=don't prefer, through to 5=strongly prefer + the regional differences were not significantly different

The information in Table 10.3 shows the farmers are slightly less keen on relying on farmer case studies for their information. This is surprising as many studies show farmers are keen to see what approaches their colleagues use. While still relatively positive about using discussion groups, it must be said other methods are preferred having higher average scores.

Table 10.62: Farmers' rating on their preference to have farmer discussion groups to provide them with management information and tools. Distribution of farmers' scores on their preferences. And note that the Northland results provide a slightly flatter distribution of scores.

Region+	Preference scores ... % of respondents on each score*					Ave
	1	2	3	4	5	score
Overall	7.7	9.5	24.4	33.3	25.0	3.58
Northland	11.1	15.2	22.2	27.3	24.2	3.38
Waikato	6.3	6.3	27.5	35.9	23.9	3.65
Taranaki	6.3	8.4	22.1	35.8	27.4	3.69

*1=don't prefer, through to 5=strongly prefer + the regional differences were approaching significant differences (p=.130)

On average farmers are slightly less enthusiastic over using booklets for their information as shown in Table 10.5, and the enthusiasm drops even further when considering information over the internet (Table 10.6), and through computer simulations (Table 10.7).

Overall, it is clear farmers prefer face to face type extension systems in contrast to booklets, the internet and computer based systems. However, the ranking scores do not markedly decline between each.

Table 10.63: Farmers' rating on their preference to have written booklets to provide them with management information and tools. Distribution of farmers' scores on their preferences.

Region+	Preference scores ... % of respondents on each score*					Ave
	1	2	3	4	5	score
Overall	5.7	15.2	34.0	26.6	18.5	3.37
Northland	4.0	13.1	33.3	26.3	23.2	3.51
Waikato	5.6	19.6	29.4	26.6	18.9	3.34
Taranaki	7.5	10.8	41.9	26.9	12.9	3.27

*1=don't prefer, through to 5=strongly prefer + the regional differences were slightly tending towards significant differences (p=.279)

Table 10.64: Farmers' rating on their preference to have information on the internet (WWW) to provide them with management information and tools. Distribution of farmers' scores on their preferences.

Region+	Preference scores ... % of respondents on each score*					Ave
	1	2	3	4	5	score
Overall	11.0	17.0	29.0	29.9	13.1	3.17
Northland	9.1	21.2	27.3	32.3	10.1	3.13
Waikato	12.6	14.0	28.0	32.2	13.3	3.20
Taranaki	10.8	17.8	32.3	23.7	16.1	3.17

*1=don't prefer, through to 5=strongly prefer + the regional differences were not at all significantly different

Table 10.65: Farmers' rating on their preference to have computer based 'what if' scenario simulations as a source of management information and tools. Distribution of farmers' scores on their preferences

Region+	Preference scores ... % of respondents on each score*					Ave
	1	2	3	4	5	score
Overall	19.6	18.2	28.0	23.2	11.0	2.88
Northland	15.2	25.3	28.3	20.2	11.1	2.87
Waikato	24.5	17.5	28.0	21.7	8.4	2.72
Taranaki	17.0	11.7	27.2	28.7	14.9	3.13

*1=don't prefer, through to 5=strongly prefer + the regional differences were significantly different (p=.055)

Given the slight preferences shown above, it is also important to see if there are preference differences between subgroupings of the farmers. To start with, Table 10.8 contains the average ratings of farmers less than 45 years relative to their older colleagues, for farmers with higher formal education relative to farmers who did not proceed as far in formal education, and also farmers with a low Locus of Control compared with the remainder.

Table 10.66: The relationship of the farmers' beliefs in the form of the information and tools that they would find useful relative to age, education and their locus of control (LOC). Average scores+ and the significance probability (t test sign prob) of the differences

Form of information+	Age < 45 yrs	Age 45+ yrs	Sign prob	Edn < dip*	Edn dip & >	Sign prob	LOC <67.5%	LOC 67.5%+	Sign prob
One day workshop	3.99	4.04	.730	3.94	4.08	.263	3.92	4.23	.010
Discussion group	3.60	3.58	.901	3.53	3.62	.502	3.44	3.79	.006
Expert speakers	4.30	4.09	.056	4.00	4.26	.008	4.05	4.28	.019
Farmer case studies	4.02	3.87	.223	3.86	3.97	.311	3.85	4.05	.063
Information in a booklet	3.41	3.36	.679	3.35	3.39	.749	3.31	3.46	.233
Information on the internet	3.49	3.07	.005	3.06	3.26	.137	3.02	3.35	.013
Discussions with other farmers	3.99	3.07	.530	3.94	3.94	.941	3.91	3.99	.459
Computer simulations of 'what if' scenarios	3.15	2.79	.028	2.68	3.03	.012	2.78	3.06	.036

+ Scoring 1=don't prefer 5= strongly prefer * dip = diploma

As might be expected the younger farmers show a higher preference for information over the internet and computer systems, and also for expert speakers. The other categories show little real differences. The same situation exists when looking at farmers with greater formal education. And it is quite clear that farmers with a greater LOC rate more highly all the methods other than discussions with other farmers. Presumably, they believe their colleagues have an inaccurate view of controlling changes and possible action. These results are quite significant and stress the need to assist farmers in believing they can make a difference.

Table 10.67: The relationship of the farmers' beliefs in the form of the information and tools that they would find useful relative to whether staff is/are employed, equity %, and whether the farmers was born and bred in the country. Average scores+ and the significance probability (t test sign prob) of the differences

Form of information+	Staff	No staff	Sign prob	Equity <60%	Equity >= 60%	Sign prob	Born & bred	Not born & bred	Sign prob
One day workshop	4.13	3.81	.011	4.00	4.02	.900	4.01	4.08	.602
Discussion group	3.59	3.57	.884	3.69	3.49	.196	3.54	3.75	.166
Expert speakers	4.21	4.00	.042	4.18	4.12	.621	4.12	4.22	.394
Farmer case studies	3.92	3.88	.735	3.97	3.82	.273	3.89	3.97	.541
Information in a booklet	3.32	3.46	.294	3.19	3.47	.062	3.31	3.59	.059
Information on the internet	3.12	3.27	.253	3.27	3.09	.282	3.07	3.52	.004
Discussions with other farmers	3.92	3.96	.657	3.88	3.92	.774	3.89	4.10	.077
Computer simulations of 'what if' scenarios	2.94	2.75	.199	3.05	2.73	.073	2.82	3.10	.099

+ Scoring 1=don't prefer 5= strongly prefer * dip = diploma

For considering the effect of herd size and increases, as well as ownership, on preferred extension systems, Table 10.10 contains the relevant data. It is clear whether or not the herd has been increased significantly in the past has little bearing on the preferred method of obtaining information. And it is only the attitude to expert speakers and computer use is there a relationship of preferences to herd size. Share milkers, probably being younger, have a preference for internet and computer systems as well as booklets and farmer discussions relative to owner operators. Age does seem critical in many factors.

Table 10.68: The relationship of the farmers' beliefs in the form of the information and tools that they would find useful relative to whether the herd has increased by at least a third, peak herd greater than 200 cows, and ownership form (owner or sharemilker). Average scores+ and the significance probability (t test sign prob) of the differences

Form of information+	Up a third or more	Not inc. by a third	Sign prob	Herd <200 cows	Herd => 200 cows	Sign prob	Owner operator	Share milker	Sign prob
One day workshop	4.14	3.97	.207	3.94	4.08	.279	4.03	3.99	.746
Discussion group	3.53	3.60	.612	3.52	3.61	.536	3.61	3.50	.474
Expert speakers	4.17	4.12	.634	4.00	4.21	.036	4.13	4.18	.686
Farmer case studies	3.81	3.95	.229	3.93	3.91	.872	3.86	4.04	.172
Information in a booklet	3.38	3.36	.895	3.36	3.38	.845	3.30	3.56	.080
Information on the internet	3.11	3.20	.516	3.16	3.16	.999	3.04	3.57	.001
Discussions with other farmers	3.90	3.95	.663	4.00	3.89	.276	3.89	4.13	.034
Computer simulations of 'what if' scenarios	2.91	2.86	.741	2.72	2.98	.081	2.80	3.13	.047

+ Scoring 1=don't prefer 5= strongly prefer * dip = diploma

Table 10.11 contains further information on the comparisons. In this case objectives and attitudes are considered. Strangely, farmers with a strong wish to increase cash returns are less keen on listening to experts, having discussions with fellow farmers, and using computer simulations than others with are less keen on maximising cash returns. This seems counterintuitive. But more intuitive is the response of farmers with less concern over leisure in preferring workshops, case studies and computer simulations. When it comes to anxious farmers there are few differences with their colleagues other than being less keen on computer simulations.

Table 10.69: The relationship of the farmers' beliefs in the form of the information and tools that they would find useful relative to cash return is a priority, holidays and leisure are priorities, and whether the farm worries. Average scores+ and the significance probability (t test sign prob) of the differences

Form of information+	Cash return not priority	Cash return a priority	Sign prob	Hols & leisure not priority	Hols & leisure is priority	Sign prob	Do not worry	Worry about plans	Sign prob
One day workshop	4.03	3.98	.762	4.07	3.81	.081	4.04	3.92	.479
Discussion group	3.61	3.38	.237	3.62	3.47	.362	3.55	3.72	.338
Expert speakers	4.18	3.83	.018	4.17	4.03	.269	4.13	4.18	.734
Farmer case studies	3.94	3.71	.162	3.96	3.75	.064	3.88	4.06	.225
Information in a booklet	3.40	3.19	.266	3.40	3.21	.232	3.37	3.37	.993
Information on the internet	3.19	3.02	.394	3.18	3.10	.615	3.22	2.88	.065
Discussions with other farmers	3.99	3.57	.004	3.95	3.87	.503	3.95	3.84	.438
Computer simulations of 'what if' scenarios	2.95	2.40	.010	2.94	2.59	.052	2.86	3.00	.479

+ Scoring 1=don't prefer 5= strongly prefer * dip = diploma

Table 10.12 contains data continuing this theme of comparing personal attributes. Quite noticeably, farmers finding new things excites them (adventuresome) are keener on most of the extension methods than the others. Somewhat similarly, farmers who are determined (to finish what they start) are interested in information provided through most of the methods listed other than computer simulations, booklets and case studies.

Table 10.70: The relationship of the farmers' beliefs in the form of the information and tools that they would find useful relative to 'finding new things exciting' and 'not giving up until the job is done'. Average scores+ and the significance probability (t test sign prob) of the differences

Form of information+	New things exciting	New things not so exciting	Sign prob	Determined to finish	Not so determined to finish	Sign prob
One day workshop	4.14	3.87	.048	4.10	3.94	.177
Discussion group	3.68	3.41	.037	3.48	3.68	.139
Expert speakers	4.24	3.96	.005	4.23	4.04	.059
Farmer case studies	4.05	3.66	.000	3.88	3.94	.552
Information in a booklet	3.34	3.42	.513	3.36	3.38	.865
Information on the internet	3.24	3.04	.129	3.08	3.25	.202
Discussions with other farmers	4.01	3.80	.029	3.85	4.02	.076
Computer simulations of 'what if' scenarios	3.05	2.58	.001	2.85	2.91	.656

+ Scoring 1=don't prefer 5= strongly prefer * dip = diploma

Overall, personal attributes do seem to impact on information source preferences. This is as you would expect. Other differences are also important, such as age. However, the data does not reveal any fully overriding differences such that you would conclude specific methods are preferable to the others, and only for specific sub groups of the farmers. However, computer simulations and booklets might be relegated where extension funds are limited. Generally farmers are keener on fact to face systems of extension.

Farmers' Comments

The farmers were asked to provide comments on the issues they felt were impacting on their future plans. Table 11.1 contains summaries of the comments provided and the percentage of the farmers noting each factor was important. The farmers gave up to three factors to their answers. Where more than one answer was provided the percentage of farmers noting the factor is given in the second and third columns in the table.

Table 11.71: Farmers' comments on the factors that concerns them over their future plans. Percentage of farmers selecting each comment (precis given) out of those answering.

SUMMARY OF COMMENT	First comment	Second comment	Third comment
Answered 'No comment'	4.8	0	0
Staffing factors/problems	19.5	23.5	56.3
Limitations due to age	1.8	4.4	0
Environmental/effluent problems	19.2	17.6	18.8
Debt/equity considerations	13.2	19.1	6.3
Problem of generating sufficient cash	12.0	16.2	0
No family to take over farm	1.8	1.5	6.3
Getting out of the industry	2.1	0	0
Low milk solids price and volatility	6.0	8.8	0
Land prices too high and local supply poor	2.7	1.5	0
Children too young now	5.1	4.4	6.3
Droughts and weather	1.5	2.9	6.3
Miscellaneous risk/stress/indecision...	10.2	0	0
Number of farmers answering	333	68	16

The comments were analysed by seeing if, when divided by various variables, there were significant differences between the groupings. Considered were age, education, Locus of Control, whether or not staff are employed, equity, whether born and bred rurally, whether their herd has increased by at least a third since starting, and whether they were an owner operator or sharemilker. Of these it was only education, and whether staff were employed or not, where significant differences between the comments made existed. It is reasonable to expect the larger units to have differences, and similarly older farmers. Overall, the old

familiar challenges occur... namely staffing, environmental/effluent, debt and finance factors, and profitability levels.

The farmers were also asked to note the topics they would like information on, and their preferred methods of delivery, over and above the formal list of information delivery methods selected as shown in Tables 10.1 to 10.12. Table 11.2 contains this information for both the farmers' primary comment, and their second one where they had an additional suggestion.

Table 11.72: Farmers' comments on the topics or tools they would like provided. Percentage of farmers making each listed comment (precis given) out of those answering.

SUMMARY OF COMMENT... INFORMATION ON	Primary comment	Secondary comment
Succession	10.7	4.6
Animal nutrition	3.3	0
Effluent disposal	7.8	14.9
Pasture management	3.7	3.4
Stock replacement	1.2	2.3
Labour management	8.6	14.9
Financial management	14.0	13.8
Technology/robotics	3.7	6.9
General information	3.7	0
Herd homes/housing	9.9	2.3
Networks and discussion groups	9.1	8.0
Off farm investments	2.1	1.1
Ownership systems	3.7	2.3
Farmer organisations	4.9	1.1
Skill development	9.1	4.6
Mental health/depression	1.2	1.1
No suggestion/no idea	3.3	0
No. of farmers answering	243	87

Again, the comments were analysed by seeing if, when divided by various variables, there were significant differences between the groupings. Considered were age, education, Locus

of Control, whether or not staff are employed, equity, whether born and bred rurally, whether their herd has increased by at least a third since starting, and whether they were an owner operator or sharemilker. Of these it was only whether staff were employed or not, farm equity, ownership and whether the herd had increased by a third were there significant differences between the comments. These factors are probably related making the larger more entrepreneurial farmers interested in development like factors.

It is clear, overall, that succession, effluent management and financial management factors dominate in the interests. As might be expected, the farmers are keen in learning about 'skill development'.

At the end of the survey (question 8), the farmers were also asked to make any comments they liked about how others might help. The common comments are covered by the following statements and requests..... (where relevant, the number in brackets gives the number of farmers giving each comment where significant).

SMASH is doing a great job and we enjoy meetings (50) Keep up the good work. We enjoy the meetings as it is valuable to see what other farmers are doing. We find value in visiting speakers (meeting comments in general ... (19) . Keep the discussion groups going (12). Information on labour issues is valuable. Information on share milker contracts is useful (4). Information and discussions on effluent systems and regulations are valuable (2). Keep discussions focused on local issues (5). Winter meetings are desirable. Information and assistance on purchasing farms would be helpful. Discussions on succession and retirement are useful. Providing help in making the farms more profitable is desirable (6).

It is clear the farmers surveyed were very supportive of the help provided by SMASH, particularly where visiting speakers are organised.

Farmers' Objectives and Management Styles Small Relative to Larger Farmers

It is valuable to compare the objectives of the different groups of farmers as it leads to a better understanding of the small farmer group. The same applies to their relative management styles. Questions come up on whether the small farmers stay as small farmers due to their objectives, or do they modify their objectives to suit the fact their businesses are relatively small? With the data available it is impossible to conclude on this issue. However, it is important to at least know whether there are differences.

For the farmers' management style, similar comments apply. Given differences, thought might be given to moving the styles to one more appropriate for the farmers' objectives. Table 12.1 contains the comparative data.

Table 12.73: A comparison between small farmers' objectives and management styles relative to larger farms farmers'. Average factor scores for each group with the larger farms coming from survey '06 and survey '13.

Objective/style Factor*	Small farms	Survey '06 large farms	t test significance probability (col1/col2)	Survey '13 large farms	t test significance Probability (col1/col4)
Obj balanced	.999	.089	.000	.034	.000
Obj risk remover	-.193	-.007	.004	-.194	.978
Obj way of life	-.628	-.116	.000	-.157	.000
Obj reluctant famer	.567	-.099	.000	-.227	.000
Obj community supporter	.174	.401	.007	.212	.588
Obj family supporter	.282	-.030	.001	-.085	.000
Style consult logician community	-.255	-.178	.388	-.272	.819
Style correctness seeker	.185	-.062	.001	-.072	.000
Style consult logician family and friends	.198	-.082	.000	-.087	.000
Style conscientious planner	.283	.024	.000	-.038	.000
Style thoughtful creator	-.293	-.136	.031	.022	.000

Style benign manager	-0.410	-0.093	.000	-0.076	.000
Locus of control (%)	67.22	67.55	.600	68.17	.008

* note Refer to the sections on goals and managerial style for full details of the factors and their calculation. Due to the scoring system with 1 meaning tending to the description of the objective or style, and 5 the opposite, a lower score means true. The scores are negative in many cases as they are the factor estimates based on the combinations of the core questions.

Considering the first two columns (small farms v large farms ex survey '06), other than the style factor community consultor, the differences are all significant. But not so the locus of control, but this is different for the survey '13 large farm comparison ... the conclusion being that size of farm differences in the farmers' LOC are probably not that relevant. When comparing the small farms with the large from survey '13, again most of the differences are significant other than for the objective factors 'risk remover' and community supporter. For the style factors, it is only the community consultation tendency where the differences are not significant.

For the objective factors, there are again clear differences between small farmers and their larger counterparts. The balanced objective is less prominent in the small farmer group (perhaps they cannot afford to cover all bases), but they are certainly have a real interest in the 'way of life' aspect of farming. The small farmers are more interested in reducing risk for obvious reasons, and there is less of the reluctant farmer aspect in their objectives. Interestingly, the smaller farmers are less interested in supporting their families, again, perhaps the farm size limits their possibilities for this objective.

The management styles also bring out some logical differences. Small farmers tend to involve themselves in community situations, and are more thoughtful and creative than their counterparts ... this again is probably an aspect which shows more on small farms due to necessity. On the other hand, the small farmers do not stress the need to be correct in their operations and analyses... perhaps they do not really know how? Furthermore, and somewhat similarly, their nature is not to consult much with family and friends, and are less conscientious.

With all these highly significant differences the conclusion that small farmers are inherently different starts to emerge. These differences will undoubtedly be partly genetic. It would be very interesting to go back several generations to see the progression into farming and the inheritances that have occurred. And similarly educational differences. The data available suggests the larger farmers are older and spend slightly less time in formal education. The latter would follow from the former in that younger people tend to stay longer in formal education.

Besides the differences between large and smaller farmers, objective and management style differences also occur with variables like farmer age and education and ownership. Tables 12.2 and 12.3 contain the data comparing the objectives and styles for different levels of key variables. Age and education clearly have impacts on both objectives and management style, but whether the farmer was born and bred in rurality has less impact. Given the likely origins of objectives and style this is to be expected.

Younger farmers, relative to their older counterparts are more likely to have balanced (mixture) objectives, are less risk averse and less interested in farming simply as a way of life. But, they are still keen on family support, no doubt with younger families. Relatively, the younger farmers are less concerned with doing everything correctly, more conscientious, more creative, but less benign than their counterparts. It is also interesting to note farmers born and bred rurally do not feel the need to consult more, and are rather more reluctant farmers than ‘townies’. Perhaps many did not have much of a choice.

Education also impacts on objectives and style. The more educated farmers tend to take less risks, and are more enthusiastic over farming (perhaps they recognize the alternatives offer less rewards?). Education also seems to confer a consultative spirit, but less concern over being correct. Perhaps doing the right thing has become intuitive. Education also seems to confer greater thoughtfulness and ‘benignness’.

This information further reinforces the impact of core factors on the farmers’ objectives and management style. This all adds up to the wide range of farmer types approaching extension information differently, and of making use of any information provided in different ways and to a different extent.

Table 12.74: The differences in the farmers’ objectives and management style relative to age, education and whether the farmer was born and bred in a rural area. Average factor scores and the significance probability (t test sign prob) of the differences

Objective or style	Age < 45 yrs	Age 45+ yrs	Sign prob	Edn < dip*	Edn dip & >	Sign prob	Born & bred	Not born & bred	Sign prob
Obj balanced	.354	.642	.000	.460	.430	.589	1.04	.858	.026
Obj risk remover	-.058	-.225	.000	-.143	-.056	.054	-.216	-.119	.155
Obj way of life	-.233	-.486	.000	-.330	-.289	.354	-.621	-.661	.587
Obj reluctant farmer	.094	.338	.000	.101	.284	.001	.650	.265	.000
Obj com’nty supporter	.108	.181	.226	.164	.087	.179	.191	.113	.380
Obj family supporter	.071	.264	.002	.192	.051	.020	.248	.405	.129
Style consult community	-.166	-.234	.267	-.218	-.147	.230	-.209	-.435	.025
Style correctness	.109	-.049	.003	.006	.137	.009	.157	.290	.112

Style consult family	.073	.006	.009	-.020	.158	.000	.214	.141	.055
Style conscientious	.053	.299	.000	.146	.113	.325	.285	.277	.878
Style creator (thoughtful)	-.109	.264	.003	-.052	-.319	.000	-.300	-.267	.695
Style benign	-.206	-.318	.029	-.208	-.305	.050	-.444	-.289	.027
Locus	67.52	67.35	.663	68.34	66.15	.000	66.87	68.46	.004

As the data in Table 12.3 shows, whether a farmer employs labour, whether the farmer is a share milker, and the farmers debt situation is related to objectives and style for some of the characteristics. The farmers' attitude to risk, debt and employment is more than likely a function of her/his background. The share milker situation is probably more of a reflection of the stage of life. It would be interesting to know how many of the owner /operators were once share milkers ... perhaps that relates to their current 'small' categorisation?

Whether a farmer is keen on expanding and employing labour, and similarly getting into further debt is likely to be just as much a function of their personality and background as to the simple economics of enlarging the business.

Table 12.75: The differences in the farmers' objectives and management style relative to whether labour is employed, financial equity and farm ownership. Average factor scores and the significance probability (t test sign prob) of the differences

Objective or style	Employ labour	No labour	Sign prob	Equity > 60%	Equity <= 60%	Sign prob	Owner operator	Share farmer	Sign prob
Obj balanced	.657	.333	.001	1.033	.884	.077	1.070	.782	.000
Obj risk remover	-.104	-.114	.888	-.105	-.280	.012	-.157	-.296	.037
Obj way of life	-.410	-.389	.781	-.557	-.709	.041	-.652	-.566	.234
Obj reluctant farmer	.358	.108	.007	.579	.521	.544	.595	.465	.159
Obj com'nty supporter	.007	.170	.075	.063	.309	.005	.218	-.016	.007

Obj family supporter	.212	.029	.063	.291	.310	.858	.278	.322	.667
Style consult community	-.180	-.217	.703	-.259	-.325	.523	-.252	-.286	.734
Style correctness	.134	.049	.301	.307	-.002	.000	.235	.056	.030
Style consult family	.135	.028	.004	.243	.094	.000	.252	.043	.000
Style conscientious	.174	.028	.008	.240	.343	.064	.245	.387	.008
Style creator (thoughtful)	-.235	-.316	.295	-.316	-.269	.596	-.308	-.254	.518
Style benign	-.310	-.237	.339	-.382	-.450	.358	-.408	-.435	.691
Locus	67.26	66.56	.245	67.26	67.56	.604	67.21	67.43	.696

Efficiency and Expansion

Farming efficiency is reflected in a number of variables. The one available from the survey was production per hectare. Given the farmers' total production and effective area, kgsMS/ha was calculated and used as the dependent variable in a linear regression. This relationship can provide pointers to where extension should be directed. Given the variables available, the following equation was estimated through initially including many more variables but subsequently dropping the less significant.

$$\text{KgsMSperHa} = 429 - 179 R + 75.7 \text{ Obj3} - 41.4 \text{ Obj5} + 29.6 \text{ Obj6} + 16.2 \text{ LOC} - 112 \text{ B\&B}$$

(R²=.221) (.159) (.000) (.028) (.117) (.191) (.000) (.009)
(Sign=.000)

Where R=region (1=Taranaki, 2=Waikato, 3=Northland)
 Objx = factor score on importance of Objective x (3= risk remover,
 5=community supporter, 6=family supporter)
 LOC = locus of control %
 B&B = born and bred in a rural area (1=yes, 2=no)

As would be expected the region of the dairy farm impacted on efficiency thus removing some of the variation due to soils and climate. The other variables suggest risk and community/family support objectives have an impact. And as would be expected, the farmer's LOC is important reflecting the need to work with farmers on creating realism over what they can control. While it seems being rurally born and bred is a disadvantage, this is history. Perhaps such people are somewhat complacent. This could be target for extension work.

Further working with the idea of finding out factors impinging on expansion, whether the farmers have enlarged their herd by at least a third was used in another analysis. A logistic regression explaining whether the farmer has increased the herd by at least a third gave the following antilogged values for each explanatory variable (significance prob in brackets):

Age code 0.659 (.005) Born & Bred Rurally 2.283 (.025) Locus% .944 (.082)
 No. of staff employed .235 (.000) Cows Per Labour Unit .989 (.000) Ownership (1 or 2)
 1.817 (.114) Sleep@night 1.182 (.182)

The equation had a Nagelkerke R² of .284 and the Chi square probability value of .000.

While the equation only explains slightly less than a third of the variance, it is highly significant, and the coefficients are largely relatively significant. The coefficients are interpreted through realising a value greater than one increases the chance of the farmer having increased her/his herd by at least a third, and a value below one decreases the chance. Thus, increasing age, higher LOC, number of staff employed, and cows per person all decrease the chance of having had increased the herd by a third. In contrast being born and bred rurally, sleeping well at night (non worrier) both increase the chance. Furthermore, interestingly, the ownership variable indicates a share milker is likely to have increased the herd by at least a third as might be expected.

For extension purposes, this relationship does not provide much useful guidance as age, 'born and bred' and ownership are all factors that can't be influenced. The cows per person coefficient reflects the need for smaller farmers to work harder and no doubt staff employment is a function of other factors. But what can be influenced is the farmer's approach to stress and resultant anxiety. Removing unrealistic concerns will have positive benefits in more ways than one.

Conclusions

The information collected provides clear directions over the farmers' views on how best they can be assisted. And just as importantly, the survey provides data on the farmers', and farms', characteristics. These stress the importance of the farmers' nature with respect to prospects for the future and change.

If remaining static, small farmers will eventually find themselves in an intolerable financial situation. However, whether this state is actually reached must depend on their current age and their retirement situation.

Despite the economic imperatives, one clear conclusion is that a significant number of the farmers are not concerned over handing on their farms to the next generation, nor on expanding production or diversifying. It appears many are happy to accept their smallness and see out their farming days as best they can with paying off any debt as a priority if surplus funds are available. This strategy provides the maximum capital for inevitable retirement. This conclusion is reinforced by Westbrooke (2013) who found similar factors in interviewing a small group of farmers.

The information provided on the features of the North Island small dairy farms is something not previously publicly available other than limited information through the Dairy NZ surveys. These do not publicly provide 'small' farm classifications with associated data, nor do they collect much of the information requested in this survey. Statistics such as farm areas, labour use, cow numbers, and production levels are all presented, but in addition, knowledge of the farmers' preferences for information, and their problems and challenges faced are all provided, and more too.

The data makes it clear the small farmers largely work hard, and where employed labour is not used, their productivity is higher than on labour employing farms. Similarly farmers who have increased their herd by at least a third since starting tend to be more efficient, and they also happen to be newer to farming. The farmers have relatively high equity and are very keen to be debt free (as they were in a much earlier survey ... Parker et al (2000)). But what is interesting, and probably expected, is that efficiency seems to decline as equity rises.

It is also clear about a third of the farmers have off farm financial interests, though the size of these investments is not known. The off farm investors are not bothered with managing staff, are relatively determined and also interested in maximising profit. This is all that might be expected, but at least the data confirms this.

Overall, the farmers rate both maximum sustainable cash returns and leisure time quite highly as objectives even though one can compete with the other. But it is also clear the farmers, on average, do not rate passing the farm onto the family at all highly. Perhaps the small nature of their farms makes them believe their offspring would be better off in another occupation. However, this conclusion does not apply to all the farmers with some rating setting up their children on the farm highly.

Possibly the farmers' general lack of an ambition to expand and grow is why they do not report being, on average, of an anxious disposition, and this might also relate to not worrying about handing the farm onto their children. However, in general they are industrious as

exemplified by their clear belief that they do not easily give up on jobs working away until full completion. The farmers also express their excitement in new ideas and methods, and seeking out information to help change.

Despite their apparent lack of ambition to expand, the farmers do appear to have a slightly higher LOC percentage than the general population of farmers (67.46 per cent as against 66.96 per cent). Perhaps this simply reflects they feel in control with their low debt situation.

Some of the lack of expansion plans comes out in the farmers noting that selling their current farm (and perhaps purchasing a larger farm) is not high on their agenda with respect to their 10 year plans. Nor is the possibility of adding to their current farm area by buying locally (nor, as noted, of passing the farm to family). However, the farmers note they would like to employ labour (who would not like to hand over some of the chores?), but they doubt whether they would invest in labour saving technology. Perhaps they do not have the throughput to justify the expense.... or at least this is their conception of the situation.

But despite these negative reactions the farmers still believe they will increase output by at least 10 per cent within ten years. This is where they would, on average, want to concentrate their efforts being 'luke warm' over diversification, over purchasing another farm or investing off farm. As noted, their ten year plan is heavily concentrated on reducing debt. This would provide stability, and a buffer, and, of course, retirement income when the time comes.

As to be expected, the farmers' current age does impact on their ten year plans, as does the farmers' LOC ... the higher their LOC, the keener they are on expansion given their feelings of control. The level of equity also impacts on the farmers' attitude to expansion in the ten year goals with the higher the equity the greater the interest in expansion. And it seems, spots do not change for farmers who have increased output by a third in the past wish to continue to expand as shown by their ten year plans.

When it comes to the challenges to their ten year plans, the main concerns are questions relating to environmental regulations and requirements, and finding suitable labour (which has been a major problem generally for many years). As expected, the other major questions in the farmers' minds is the availability of cash and finance in various guises.

The other factors listed in the survey did not rate at all highly as challenges managing labour, talking to the next generation, their general farming knowledge, the technology available, and risk factors were all not of any great concern. On the other hand, the group of farmers with an anxious disposition did find most issues listed to be of concern.

For the preferred extension methods, the farmers rated most methods listed in the questionnaire relatively highly. This included lectures from experts, workshops, farmer case studies, and discussion groups (though the latter two were down slightly on the preference scales). While still giving a positive response, the farmers rated slightly lower the use of booklets and the WWW as extension media. However, the use of computer based simulated 'what if' scenarios was not at all popular, though the younger farmers were not quite as ambivalent about the computer based systems. And there were also differences in attitude according to the farmers' objectives and management style.

As a kind of safety valve, the farmers were asked for any comments they might wish to make on any issue or factor. These did not raise any additional points than had already been discussed. But they did reinforce the concerns over environmental, debt and financial matters, and also succession questions.

What was striking from the comments was the number of farmers who commented how they gained from the activities of SMASH reinforcing the current approach. Of course, most are already members of the organisation.

Given the data available from earlier surveys it was possible to compare the objectives and management styles of the farmers relative to large dairy farms. This showed quite large and significant differences. Similarly, age also has an impact, particularly on the objectives as the various stages in the typical life cycle evolve. The data was also used to examine the farmers' efficiency using the only efficiency variable available (production per hectare). This showed the farmers' LOC as well as their objectives impacted on efficiency... that is, the farmers' belief in what they control and their specific goals. Also, when analysing the farmers who had increased production by at least a third, this increase was explained by the farmers' LOC and their level of anxiety. Effectively, LOC, objectives and personality were influential in more ways than one.

All the analysis makes it clear the farmers can be grouped using two basic attitudes. One group are largely content with their current situation, and another keen on expansion to improve their finances and cover themselves for future cost price squeezes. Succession questions will also be in their minds as a factor in expansion. Which group a farmer falls into depends in part on their personality and background. Some farmers are entrepreneurs, and others content to work out their lives using their current circumstances. Each group will clearly have different information and extension needs, though it must also be recognised accepting just a two group scenario is a simplification for in reality the boundaries will be fuzzy and merging.

Of significance is that Parker et al (2000) came to similar conclusions from their survey. Their farmers were content in their current farm location (moving meant creating new social links and arrangements), were not focused on expanding production through employing labour or a share milker, but were certainly keen to purchase land locally if it should come on the market. Few of the farmers expected their children to continue on the farm, and when surplus cash was available the priority was to reduce debt. To cap it off, even over a decade ago, the farmers' largest concern was based on environmental questions.

Given the farmers stated goal to increase production, an option is to follow a pasture based, low input system and reduce the need for capital investment in intensification infrastructure. This pasture based system has been the cornerstone of New Zealand's traditional low, or cost minimisation, approach (Shadbolt, 2012). Westbrooke (2013) found many small herd owners preferred this farming system, due to the lower capital requirement and its simplicity. Low input pasture systems can also be extended to once-a-day milking, which has the major benefit of substantially reducing the workload. Small farmers also believed that a low-input pasture system could survive low pay-outs, such as in the 1980's, which many interviewees recalled (Westbrooke, 2013), and also the current price scenario.

The conclusions, which are reinforced by the earlier studies, lead the way to extension groups developing systems to assist the small farmers. Examples include providing, say, workshops

on environmental planning, mentoring groups to assist succession, and similarly workshops on retirement planning. In addition, financial management would be of interest to the 'expanders'. Both groups need to be catered for in the interests of national efficiency.

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Appendix 1
Survey Questionnaire

Note the space for the comments section has been reduced, to reduce the space used in this report.

Questionnaire for the telephone interviews of small dairy farms

Hello, I'm <name> ringing on behalf of SMASH, the farmer led smaller herds group.

You are invited to participate in a project that aims to find out where smaller dairy farmers would like their businesses to be in 10 years and information and tools that would help you get there.

The work is funded by SMASH and DairyNZ, and your phone number was selected from the SMASH database, or the electoral roll.

We know your time is valuable, so we will randomly select three farmers to receive a \$200 Farmlands voucher. Your responses would be kept strictly confidential, and non-identifiable.

Would you have 10-12 minutes to help us?

The results will be published on the SMASH, DairyNZ and ONEFarm websites.

Your participation is voluntary and you are welcome to withdraw by the 14th of December 2014 and your information will be destroyed. If you have any concerns, or would like to withdraw after you have completed the survey please contact Victoria Westbrooke a Lecturer at Lincoln University, on 03423 0272. This research has been reviewed and approved by the Lincoln University Human Ethics Committee.

If yes Is now a good time to talk? *If not when* could we ring back over the next couple of days?

1) Firstly, some background information on your farm
 <last season refers to 2013/14)

a) Are you a land owner/sharemilker/manager or farm staff? <if staff or a manager please explain we were wanting to talk with owners and 50-50 sharemilkers, thank them for their time>	
b) What's the effective area of your farm?	
c) What was the peak number of cows that you milked last season? <if over 350 cows please explain wanting to talk with farmers with less than 350 cows and thank them for their time>	
d) How many kgs of milksolids did the farm produce last season?	
e) Did you employ any staff last season? If so how many?	

f) Have you increased your herd size by at least a third since your first season (Y/N)?	
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2) So Thinking ahead 10 years, could you please rate how likely these future options are to happen, using the scale 1, very **unlikely** to 5 very likely,

What is the likelihood of you.....

(if the participant is a non-land owner, please don't ask the *shaded* questions)

	V. Unlike		Neutral		V. likely	Already doing
a) Selling the farm within 10 years	1	2	3	4	5	
b) Selling the home farm and moving to a larger farm?	1	2	3	4	5	
c) Increasing the size of the current farm e.g. by purchasing adjoining land	1	2	3	4	5	
d) The farm being transferred to 1 or more children	1	2	3	4	5	
e) Employing a non-family worker/sharemilker	1	2	3	4	5	
f) Doing the majority of the work	1	2	3	4	5	
g) Investing in on-farm technology to do farm work e.g. automatic cup removers, robots	1	2	3	4	5	
h) Increasing production by more than 10%	1	2	3	4	5	
i) Diversifying the current business e.g. into dry stock, tourism	1	2	3	4	5	
j) Investing in another farming business, as well as the current farm?	1	2	3	4	5	
k) More than 20% of your income coming from non-farm investments or wages?	1	2	3	4	5	
l) Reducing the farm debt to very low levels?	1	2	3	4	5	

3) Thinking about your most likely farming plans that we have just discussed, could you please rate the level of the following challenges?....using the scale of 1 no challenge to 5 very challenging

How much of a challenge is....

	None				V. chal
a) The level of cash returns from your farm over the last 4 seasons	1	2	3	4	5

b) The level of cash return from your potential future plan	1	2	3	4	5
c) The amount of capital and/or debt needed for your possible future plan	1	2	3	4	5
d) The level of risk with your potential plan	1	2	3	4	5
e) A lack of knowledge and/or detail about your future plan	1	2	3	4	5
f) Environmental regulations and issues	1	2	3	4	5
g) Lack of suitable, cost effective technology	1	2	3	4	5
h) The difficulty of discussing the potential future plan with the next generation	1	2	3	4	5
i) Being able to find suitably experienced staff	1	2	3	4	5
j) Your willingness and capability to manage staff	1	2	3	4	5

4) With regards to <the highest ranked challenge>, could you describe in more detail how this could affect your possible future plan(s)

5) Thinking about your management, could you please rate the following statements on a 5 point scale where 1 is strongly disagree, to 5 strongly agree

	S. Disagree				S. Agree
a) You tend to tolerate mistakes and accidents that occur with employees and/or contractors	1	2	3	4	5
b) You sometimes don't sleep at night worrying about decisions made.	1	2	3	4	5
c) You find investigating new farming methods exhilarating and challenging	1	2	3	4	5
d) You normally don't rest until the job is fully completed	1	2	3	4	5
e) You speak your mind and ask questions at farmer meetings.	1	2	3	4	5
f) It is very important to pass on the property to family members	1	2	3	4	5
g) It is essential to plan for reasonable holidays and leisure time	1	2	3	4	5
h) When things go wrong it is often due to events beyond my control, e.g. weather, product prices	1	2	3	4	5
i) Aiming for maximum sustainable net cash returns is very important	1	2	3	4	5

6) What topics or tools could SMASH provide to help you with your 10 year plan?

<i><Write Topic/tools, could be more than two...></i>	Could you describe the <topic> tool in more detail? <i><we are looking for aspects or details that could be provided covered at workshops etc></i>

a) Thinking about how you would like the information and tools provided, could you please rate the following options on a 1-5 scale where 1 is 'no preference' and 5 a 'high preference' for the option.

	Don't prefer		Neutral		S. Prefer
One-day workshop	1	2	3	4	5
b) Discussion groups – meeting with the same group several times	1	2	3	4	5
c) Listening to expert speakers	1	2	3	4	5
d) Listening to farmers – case-studies	1	2	3	4	5
e) Information provided in a written booklet	1	2	3	4	5
f) Information provided on the internet	1	2	3	4	5
g) Discussing the topic with other farmers	1	2	3	4	5
h) Working though 'what if scenarios' through a computer model	1	2	3	4	5

7) The final section is some general information on yourself and the business

a) With regards to your age, what decade are you in?	20-30	30-40	40-50	50-60	60+
b) Were you born and bred in a rural area?	Yes	No			
c) What is your highest level of education?	Secondary	Farm cadet /certificate	Diploma	Degree+	other
d) Do you have any non -farming businesses/investments?	Yes	No			
e) Do you have financial interests in other farming businesses as well as the home farm?	Yes	No			
f) What % of equity do you have in your farming business	%	Prefer not to answer			

Equity is the proportion of the business owned by the farmer, i.e. not debt

8) Any other comments on your future plans or how SMASH could help?

Please thank the participant for their time and input

End of interview

Gender of participant: Male / Female
 Region : Northland /Waikato / Taranakai
 Survey code _____

Additional information if needed...

Mental Health services for farmers: Rural Support ph 0800 787 254

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