



Managerial Factors in Primary Production: Data from a sample of New Zealand Farmers with an Emphasis on Experience as a Factor in Success

Peter Nuthall

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Farmers with an Emphasis on
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May 2009

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Summary

This report presents the data collected from a postal survey of a wide ranging sample of all types of New Zealand farmers. The survey schedule was designed to collect information enabling models to be developed explaining the variables giving rise to a farmer's managerial ability, and to determine and explore farmers' Locus of Control and its relationship to a farmer's managerial ability. The detailed results of these studies have been published elsewhere (see the reference list), but these research articles do not present the full details of the data collected. This report was prepared to ensure these details are available for researchers who choose to further explore these and other issues.

The survey was conducted in late 2006 and achieved a very satisfactory 41 per cent response rate from the stratified sample of 2300 farmers. The data collected included both farm and, especially, farmer data covering both personal information (age, education and the like) and farm management and skill information. Question sets to discover the farmer's management style (personality), locus of control, objectives, self rated intelligence, managerial ability, cash surplus, asset value changes, physical output, experience both as a young person, and as a farmer, and information on a farmer's forebears were all included.

The data was analysed in various ways including producing distributions by farm type and other categories. Factor analyses were also carried out to isolate some of the basic factors explaining farmers' personal features (objectives, managerial style...). The results, and the important conclusions, are all presented.

Various regression equations were explored in explaining managerial ability. It was clear that experience was an important contributor to ability, particularly a farmer's early life experiences. Aspects of a farmer's managerial style (personality) also proved to be important as well as aspects of the farmer's objectives. These results are important for directing efforts to improve the general level of ability in the nation's farm managers. Improvement of, say, 5 per cent would have a marked impact on the efficiency of resource use and the nation's wealth.

Chapter 1

Introduction

It is important to understand the factors that relate to, or perhaps create, managerial ability. This report records all the data obtained from a large sample of all types of New Zealand farmers stratified by size and region. Subsequent to its collection a model to understand the origins of managerial ability was developed using the information collected (Nuthall, 2009a). Also analysed was the data on a farmer's Locus of Control which records the farmer's belief in how much control he has over farming outcomes. This analysis was written up in Nuthall (2009b). Also, some of the material appears in Nuthall (2009c). Despite most of data available from the survey being used in these analyses, the details were not included. As there may be researchers and others interested in some of the details of the data this report containing the full complement has been prepared.

This description follows with a brief review of the factors likely to impinge on managerial ability, and then presents all the data in a sequence of sections together with comment and factor analyses where appropriate following a description of the survey procedures and sampling. Finally the data is used to assess the factors related to self rated ability providing a conclusion on the contribution of this set of data to understanding managerial ability.

Chapter 2

The Literature and Managerial Ability

For assessing variables associated with ability, factors studied have included age, education, experience, training, personality in various forms, objectives, job satisfaction, communication ability, planning, execution and control practices, and many others. Furthermore, while some argue that good managers are born in contrast to being trained, high ability is likely to involve both the farmer's genetic background as well as environmental influences including experience and training. In developing a model of ability it is important to consider all these factors as they may well underlie managerial ability.

An individual's behaviour can be categorized by two broad factors ... personality and intelligence. Young and Walters (2002) related the Myer-Briggs (Myers & McCaulley, 1985) indicator of a persons' personality 'type' to various dairy farming efficiency measures and found significant relationships with efficient physical output (e.g. milk yield). Jose and Crumly (1993) also used the Myers-Briggs test to show that farmers are distinctly different from the general population and, consequently, need to be treated differently. While the Myers-Briggs test has had extensive use, current thinking suggests personality is better described by five basic factors (Matthews & Deary, 1998) – openness, conscientiousness, extroversion, agreeableness and emotional stability.

Another frequently used test measures a person's 'locus of control' (Carpenter & Golden, 1997). This refers to the person's belief in the extent of control they have over outcomes and the factors influencing profit (e.g. weather, product prices...), and is therefore likely to be related to managerial ability.

Warren et al (1974) found managerial ability (as measured by scores on tasks such as planning, organisation, directing...) was significantly related to years of formal schooling. They concluded performance was 20 per cent knowledge, 12 per cent value orientation, 6 per cent job satisfaction and 11 per cent schooling – the remaining 51 per cent was unexplained. Similarly, the many efficiency studies show education as a strong contributor to efficiency (e.g. Dhungana et al, 2004) and, thus, probably managerial efficiency.

Intelligence (cognitive ability) would also be expected to be related to managerial ability. Young et al (2000), for example, while noting many factors were important, concluded cognitive ability predicted the thinking and knowledge criteria aspects of managerial performance.

You would also imagine experience to be important in managerial ability. However, while there is ample data relating age to efficiency (e.g. Dhungana et al, 2004), there are few studies measuring relevant experience and its relationship to managerial ability. Sumner & Lieby (1987), however, did find significant relationships between the years on the current dairy farm and herd size and growth. They also used education, age and the use of various management devices (e.g. herd testing) as independent variables.

Another component of a manager that could be important is their objectives, particularly as many farmers are owner-operator based. In more complex ownership structures the combined objectives of the owners and manager is less likely to be a significant factor. For farm situations, if the manager believes, for example, sufficient leisure time is a priority, this

may well impact on the effort devoted to making decisions and, consequently, impact on, say, efficient least cost production.

In summary, researchers have examined a wide range of factors believed to impact on managerial ability, and many do correlate with ability. There is yet to emerge, however, a consensus on which of the basic human factors do determine a person's managerial ability and their relative importance. This review indicates personality, intelligence, education, training, and experience are likely to be strong contenders.

Chapter 3

The Survey

To obtain as many respondents as possible, a mail survey was used as the question set was relatively simple requiring mainly option ticking. The survey schedule was largely created from previously used question sets which had been well tested through both pre-tests and actual use. The additional question sets were created to obtain information on farmer's experience as previous research suggested factors about a farmer's experience could well be important in developing their managerial ability. It will be seen from the copy of the schedule given in appendix A, that the components of experience covered included general experience, experience during a farmer's school years, and the farmer's skills relative to their forebears. The influence of their parents was also a component. In addition, farm information was obtained as well as information on the farmer's personal attributes. The sections taken from earlier surveys covered the farmer's objectives, management style, and managerial approaches (locus of control). Nuthall (2006) covers some of the managerial style material, and Nuthall (2002) other material collected. It is useful to have several sets of data on farmers' managerial style, objectives, and locus of control which these repeated surveys provide. The data is surprisingly consistent.

The sample was obtained from Quotable Value which holds a database of all parcels of land. The section of the database covering rural properties was used to randomly select 2300 farms. The strata from which they were selected consisted of regional, farm type and farm area groups with the proportion from each being based on the population proportions.

The schedules were posted in August 2006 with a reminder letter and copy of the original schedule sent in September 2006 to those not responding. Each return envelope was numbered in the first mailing to allow checking the returns. As always happens, a significant number of 'gone, no address' returns occurred together with a range of other reasons for non completion such as the farmer had recently deceased. In the end a 41 per cent response rate was achieved. This is somewhat better than the norm and probably reflects the ease with which the questionnaire could be filled in, and the high interest of the farmers in the topics covered.

Chapter 4 The Sample

Relative to the population proportions, the returned sample was very similar in terms of the percentages making up each strata. The percentage difference between the population and sample numbers in each strata were:

	Arable	Dairy	Deer	Pastoral
0 - 50 has groups	0.38 per cent	11.24 per cent	0.2 per cent	3.22 per cent
51- 100 has groups	0.06 per cent	4.72 per cent	0.24 per cent	7.26 per cent
101-150 has groups	0.48 per cent	0.34 per cent	0.16 per cent	3.64 per cent
150 -200 has groups	0.38 per cent	11.24 per cent	0.2 per cent	3.22 per cent
201- 250 has groups	0.06 per cent	4.72 per cent	0.24 per cent	7.26 per cent
251- 300 has groups	0.48 per cent	0.34 per cent	0.16 per cent	3.64 per cent
301- 350 has groups	0.38 per cent	11.24 per cent	0.2 per cent	3.22 per cent
351- 400 has groups	0.06 per cent	4.72 per cent	0.24 per cent	7.26 per cent
401- 450 has groups	0.48 per cent	0.34 per cent	0.16 per cent	3.64 per cent
451 - 500 has groups	0.38 per cent	11.24 per cent	0.2 per cent	3.22 per cent
501- 1000 has groups	0.06 per cent	4.72 per cent	0.24 per cent	7.26 per cent
1000+ has groups	0.48 per cent	0.34 per cent	0.16 per cent	3.64 per cent

The average discrepancy was 1.21 per cent with a standard deviation of 2.05 per cent. The biggest discrepancies occur in the dairying sector with three 11 per cent differences, though some of the pastoral groups have a discrepancy as high as 7 per cent. Overall, however, the sample appears surprisingly representative, at least for the farm types and areas. The returned schedules did not have a region indicator so it was not possible to compare this statistic.

Chapter 5 The Respondents

Tables 5.1, 5.2, and 5.3 give the farm type, labour compliment (including the farm manager) and the farm area distributions.

Table 5.1: Distribution of farm types
(Percentage in each group)

Intensive sheep	30.6
Extensive sheep	13.7
Cattle	15.9
Deer	1.8
Dairy	28.3
Cropping/horticulture	6.9
Other	2.8

Table 5.2: Distribution of labour used (including the manager)
(Percentage with each quantity)

No of people	Per cent
<1	2.1
1.1 – 2.0	33.2
2.1 - 3.0	38.7
3.1 - 4.0	14.4
4.1 – 5.0	6.0
5.1 – 6.0	2.1
> 6.0	3.5

Table 5.3: Distribution of farm area (hectares)
(Percentage in each group)

Area group	Per cent
<= 49	6.4
50 – 99	14.9
100 – 149	10.6
150 – 199	11.1
200 – 249	13.0
250 – 299	7.0
300 – 349	6.8
350 – 399	3.6
400 – 449	4.0
450 – 499	2.2
500 – 549	2.9
550 – 599	2.2
600 – 649	2.5
650 – 699	1.1
>= 700	11.7

Sheep and cattle farming still predominant, but dairy farming numbers are increasing significantly. By far the majority of farms support one to three workers, though there are an appreciable number of farms with significant numbers of employees. Area wise, the majority of properties are still 250 has or less (around 600 acres or less), but again there is a wide range.

Tables 5.4, 5.5 and 5.6 present the distributions of the farmers' age, education (highest level of formal education attained), and their average percentage grade in their last year of formal education. It is also interesting to note that 96.6 per cent of the respondents were male.

Table 5.4: Distribution of the farmers' age (years)

Age group	Percentage
<25	0.2
26 – 35	3.3
36 – 45	15.4
46 – 55	34.4
56 – 65	27.9
>65	18.8

If the ranges are scored 1 through to 6 the mean age score is 4.31 for intensive sheep farmers, 4.53 for the extensive sheep class, and 4.08, 4.67, 4.49 and 4.17 for deer, cattle, dairy and arable farmers respectively. The differences are not major. The average farmer is probably around 50 years old.

Table 5.5: Distribution of highest level of formal education
(Percentage reaching the following levels)

Level	Per cent
Primary school	2.2
Secondary school – up to 3 years	38.6
Secondary school – 4 or more years	30.2
Tertiary education – up to 2 years	15.3
Tertiary education - 3 or more years	13.7

Table 5.6: Distribution of average grade achieved in the last year of formal education
(Percentage in each group)

Grade range(per cent)	Per cent
0 – 20	1.1
21 – 30	1.4
31 – 40	2.5
41 – 50	16.2
51 – 60	32.0
61 – 70	26.1
71 – 80	15.9
81 – 90	4.1
91 – 100	0.7
The mean grade was 62.03 per cent with a std devn. of 12.9	

It is interesting to note the higher numbers in the older age groups. The average age is around 50 years. Schooling wise there is approximately a third who have attended a tertiary

institution, and a third who have completed a full secondary education (as well as those attending a tertiary institute making it approximately 60 per cent completing a full secondary education), and a third attending a secondary school for three or less years (probably mainly three years).

The respondents were also asked to rate themselves for intelligence and managerial ability relative to their peers. For intelligence a five point scale was offered, whereas for ability the rating was based on a ten point scale. The farmers were asked to individually rate the various components generally being regarded as making up total ability.

Tables 5.7 and 5.8 contain the distributions.

Table 5.7: Distribution of the farmer's self rated intelligence.
(Percentage in each category)

Category	Per cent
Highly intelligent	4.8
Reasonably intelligent	59.5
Average intelligence	33.8
A bit below average	1.6
Other	0.3

Table 5.8: Distribution of the farmer's self rated managerial ability in a range of areas.
(Percentage in each category on the scale 10 (excellent) to (poor))

Rating	Type of management/planning				
	Animal/feed	Soils/pasture/crop	Labourer/ contractor	Financial/ marketing	Strategic
1.	0.1	0.3	0.1	0.1	1.1
2	0.1	0.1	0.3	0.7	1.0
3	0.4	0.1	1.0	1.0	1.5
4	0.4	2.4	1.9	4.4	6.3
5	8.1	11.7	11.7	10.9	11.2
6	10.6	11.2	15.3	13.4	15.3
7	17.2	25.1	23.0	25.0	25.1
8	38.3	33.3	28.6	26.5	22.7
9	16.9	12.3	12.4	13.0	12.0
10	7.6	3.5	5.6	4.4	3.7
Mean	7.6	7.2	7.2	7.1	6.8
Std devn	1.4	1.4	1.5	1.6	1.7

Clearly, the majority of farmers believe they are of average or slightly better intelligence, and they have reasonable managerial ability, relative to their peers, with scores of around seven in a ten point scale. There is little difference in the rating for each type of ability other than for strategic (labelled as long term) planning which is slightly lower whereas animal/feed management has a slightly higher average. Such variations are what would be expected.

Chapter 6 Productivity

To provide measures of efficiency the farmers were asked to provide information on changes in their cash surplus after all expenses as well as changes in their net asset value. For the cash surplus they were asked to average the last five years to even out the impacts of climatic factors. Similarly, the change in total asset value was requested for the last five years. To rate physical output efficiency, the respondents were asked to give various measures such as their lambing per cent to replacement flock or sale, wool production per hectare, and similar. Tables 6.1 and 6.2 contain the details of profit and assets for each farm type. Tables 6.3 to 6.4 contain the distributions of the physical output measures (lambing & calving per cent's, wool production per ha and per animal, carcass meat production per ha, and milk solids both per ha and per cow) When used in other analyses, all this productivity data was used to rank the farms relative to their farm type peers on a 1 – 10 scale. This removed the variation expected from farm type as, for example, extensive sheep would be expected to have a lower average lambing per cent than intensive sheep, and so on.

Table 6.1: Distribution of average annual cash surplus change over the last five years (by farm type)

(Column percentages in each category of percent increase)
(a negative figure means a decrease)

Change range (per cent)	Pastoral	Deer	Dairy	Arable
< -20	2.8	18.2	1.9	7.1
-20 - -11	4.7	9.1	3.7	0
-10 - 0	22.0	36.4	25.0	16.1
1 - 5	28.9	18.2	30.0	33.9
6 - 10	21.7	0	21.9	23.2
11 - 15	5.6	18.2	8.7	3.6
16 - 20	6.2	0	3.1	7.1
21 - 25	1.9	0	1.9	1.8
26 - 30	2.8	0	1.9	3.6
31 - 40	1.5	0	0.6	1.8
> 40	1.9	0	1.2	11.8

The mean over all farms was 4.91 per cent with a standard deviation of 14.63 reflecting the high variations. Other than in the deer case (only 11 farms in total) there are no major differences across farm types, though arable farming has slightly higher numbers in the greater increase categories.

For the net asset value change in Table 6.2 the mean across all farms was 73.9 per cent increase with a standard deviation of 79.9. The deer farm figures must be related to there being only 11. For all classes there was a big jump in the numbers reporting around 100 per cent increase so clearly this number attracted the respondents. Otherwise the figures are relatively consistent across farm types though the arable do seem to have a higher increase in total value.

Table 6.2: Distribution of total net asset value change over the last five years (by farm type)
(Column percentages in each category of per cent increase)

Change range (per cent)	Pastoral	Deer	Dairy	Arable
< 0	0.6	0	0	3.6
1 to 10	12.7	27.3	19.2	16.1
11 to 20	12.7	18.2	15.1	12.5
21 to 30	8.8	9.1	11.0	8.9
31 to 40	4.2	9.1	4.6	5.4
41 to 50	14.2	9.1	11.0	17.9
51 to 60	2.5	0	3.5	3.6
61 to 70	1.4	0	4.1	0
71 to 80	2.3	0	3.5	5.4
81 to 100	24.6	18.2	18.6	7.1
101 to 150	5.4	0	1.7	1.8
151 to 200	4.0	9.1	3.5	8.9
> 200	6.5	0	4.1	8.9

Table 6.3: Distribution of lambing per cent survival to sale or into replacement flock
(Per cent in each category for each farm type)

Per cent range	Sheep intensive	Sheep extensive	Cattle	Arable
0 - 100	3.3	10.3	25.6	7.1
101- 110	6.6	9.3	7.7	7.7
111- 120	8.5	29.9	15.4	23.1
121-130	19.9	25.8	23.1	15.4
131-140	29.4	15.5	10.3	11.5
141-150	23.2	8.2	15.4	15.4
151-160	4.3	1.0	0	7.7
>160	4.7	0	2.6	11.5

The number of cattle and arable farms in the analysis was 39 and 26. The average lambing per cent for each type was 135.4, 123.2, 121.8 and 130.2 per cent respectively. The distribution and averages are what would be expected. The differences, however, are not as much as might be expected with perhaps the intensive sheep being lower than it might be relative to the other means.

Table 6.4: Distribution of calving per cent survival to sale or into replacement herd
(Per cent in each category for each farm type)

Per cent range	Sheep intensive	Sheep extensive	Cattle	Dairy
0 - 79	1.5	1.5	1.7	12.4
80- 85	4.4	10.3	10.5	13.9
86- 90	35.3	36.8	21.0	19.0
91- 95	35.3	36.8	29.8	39.4
>95	23.5	14.7	36.8	15.3

The average per cent for each farm type is 92.4, 91.6, 93.1 and 83.6 per cent respectively. There are very few differences except in the case of dairy farming where the mean is markedly different. This is perhaps a reflection on the current difficulties the dairy farming sector is experiencing with empty cows.

Table 6.5: Distribution of wool production per ha greasy
(Percentage in each category for each farm type)

Kg/ha range	Sheep intensive	Sheep extensive	Cattle	Arable
0 – 10	4.9	13.8	6.2	12.5
11- 20	9.0	19.0	12.5	50.0
21- 30	9.0	17.2	31.2	25.0
31- 40	14.6	13.8	12.5	0
41- 50	20.8	19.0	12.5	0
51- 60	15.3	10.3	6.2	0
61- 70	10.4	3.4	6.2	0
71- 80	5.5	0	6.2	0
81- 90	4.2	0	0	0
91- 100	2.1	0	0	12.5
>100	4.2	3.4	6.2	0

Only small numbers of cattle (16) and arable (8) farms enter this analysis. The average wool per ha is, respectively 53.7, 43.8, 41.2 and 24.8 kgs greasy per hectare. These variations follow the land quality and consequent stocking rate other than the arable situation where stocking numbers over the whole farm are low.

For wool production per ewe, the productivity again follows the likely soil quality. The means are 5.3 kgs greasy wool per ewe, 4.9, 4.8 and 4.1 respectively. The intensive sheep level is impressive for mean production.

Table 6.6: Distribution of wool production per ewe greasy
(Percentage in each category for each farm type)

Kg/ewe range	Sheep intensive	Sheep extensive	Cattle	Arable
0 - 2.5	4.0	1.3	4.2	5.9
2.6- 3.5	2.8	15.2	4.2	23.5
3.6- 4.5	19.3	30.3	33.3	41.2
4.6- 5.5	35.8	29.1	37.5	5.9
5.6- 6.5	25.6	12.7	12.5	23.5
6.6- 7.5	7.4	3.8	0	0
> 7.5	5.1	7.6	8.3	0

Table 6.7: Distribution of carcass meat per hectare
(Percent in each category for each farm type)

Kg/ha	Sheep intensive	Sheep extensive	Cattle	Dairy	Arable
0 - 50	3.9	26.5	5.6	12.5	27.2
51 - 100	9.4	29.4	2.8	0	9.1
101 - 150	12.6	8.8	5.5	25.0	0
151 - 200	26.0	17.6	8.3	12.5	27.3
201 - 300	26.0	11.8	16.7	12.5	9.1
301 - 400	13.4	5.9	16.7	25.0	27.3
>400	8.7	0	44.4	12.5	0

There were only eight dairy, and 11 arable farms in this analysis. The mean production for each farm type was 232.3 kgs/ha, 121.6, 443.0, 295.9 and 180.1 respectively. The cattle figure is well above what might be expected so this figure should be questioned. One farmer reported a figure of 1000 kgs/ha, and another 800 kgs., and overall 44.4 per cent reported a yield of over 400 kgs/ha. Perhaps these farmers misread the question.

Table 6.8: Distribution of milk solids per hectare
(Percent in each category for dairy farms)

Kgs/ha	Per cent
0 - 300	2.2
301 - 400	2.7
401 - 500	1.1
501 - 600	2.7
601 - 700	2.7
701 - 800	12.5
801 - 900	17.9
901 - 1000	6.5
1001 - 1100	20.6
1101 - 1200	19.0
1201 - 1300	4.9
1301 - 1400	3.3
>1400	3.8

The mean solids per hectare was 951.5 and solids per cow 352.6. These figures reflect the high production achieved by increasingly professional dairy farmers.

Table 6.9: Distribution of milk solids per cow
(Percent in each category for dairy farms)

Kgs/cow	Per cent
0 - 200	2.1
201 - 275	1.6
276 - 300	10.2
301 - 325	12.8
326 - 350	24.6
351 - 375	11.8
376 - 400	21.4
401 - 425	9.6
426 - 450	4.8
>450	1.1

Chapter 7

Goals, Aims and Objectives

In assessing farmers and their experience, it is important to have a record of their objectives. While some farmers might not appear efficient when judged by their profit and physical output, high values of these outputs might not be their goal. Thus, the farmers were asked to score 20 different statements relating to possible objectives. Details of the full questions are given in the appendix holding the questionnaire. Five 'degree of truth' levels were offered for each statement. Table 7.1 summarises the responses.

Table 7.1: Distribution of the farmers' responses to statements describing possible objectives
(Percentages giving the proportion giving each 'truth' degree)

(True = 1,Not true = 5)						
Objective (paraphrase)	Ave score	1	2	3	4	5
Pass property to family	2.7	28.8	18.4	22.9	10.8	19.1
Earn respect of locals	2.5	25.3	28.6	25.3	11.4	9.5
Comfortable living	1.4	64.3	27.8	6.7	0.9	0.4
Keep debt low	2.3	43.7	18.6	14.5	13.9	9.2
Have holidays and leisure	2.3	33.7	24.9	22.3	10.6	8.4
Attend field days	2.9	16.6	25.4	26.3	15.9	15.9
Important to reduce risk	2.4	29.0	27.1	26.3	12.0	5.5
Develop good conditions	1.7	50.4	34.4	13.9	0.8	0.4
Ensure employees enjoy job	1.5	65.8	24.9	6.7	1.5	1.1
Do jobs I enjoy	1.8	53.0	25.9	15.4	3.6	2.2
Minimise pollution	1.7	54.2	27.8	13.8	2.9	1.2
Experiment with new things	2.5	22.5	28.8	30.7	11.0	7.0
Plan retirement	2.2	35.8	27.7	19.6	9.1	7.7
Increase total assets	2.2	36.0	27.3	21.7	9.8	5.1
Expand size of business	3.4	8.7	16.9	28.9	17.5	28.0
Maximum cash returns	2.0	39.7	33.2	17.6	5.9	3.6
Presence in community	2.5	24.1	28.8	25.3	12.9	8.9
Improve property	1.5	61.7	30.2	6.8	0.9	0.7
Give assets to children	2.5	26.7	29.3	23.7	10.0	10.2
Shifting out of farming	4.5	3.9	3.4	6.1	10.8	75.5

Obtaining a 'comfortable living' and improving the property are by far the highest ranked objectives reflecting the balanced view farmers have for their farming life. The skewed distributions these objectives have stress their importance. Closely related are creating good working conditions and setting the operation up to provide enjoyable jobs. Surprisingly highly rated was the 'minimise pollution' objective, though this goes with improving the property and sustainability.

To summarise the objectives a factor analysis of the objectives was conducted using a Varimax rotation and an Eigenvalue cutoff of one. The factor scores are given in Table 7.2 for values greater than 0.3.

Table 7.2: Farmers' objectives

(Factor loadings for factors with an Eigenvalue of one or greater using a Varimax rotation)

Objective (paraphrase)	Factor number					
	1	2	3	4	5	6
Pass property to family				.68		
Earn respect of locals				.71		
Comfortable living	.38	.44				
Keep debt low					.83	
Have holidays and leisure			.66			
Attend field days			.63	.42		
Important to reduce risk			.33		.74	
Develop good conditions	.50		.31			.31
Ensure employees enjoy job	.69					
Do jobs I enjoy	.56					
Minimise pollution	.64					
Experiment with new things			.59			
Plan retirement			.51			
Increased total assets		.80				
Expand size of business		.68				
Maximum cash returns		.60				
Presence in community	.32		.38	.46		
Improve property	.53	.39				
Give assets to children				.58		
Shifting out of farming						.81

Examining the variables that make up the important components in each factor leads to giving the following names to each. Factor analysis finds the underlying factors the give rise to the observed variables. With six factors it appears that the general farmer has these six factors which underpin his objective set. Each farmer attaches a different level of importance to each factor creating the unique nature of his overall objective.

Factor number	Name
One	Balanced
Two	Profiteer
Three	Way of life
Four	Family supporter
Five	Risk remover
Six	Reluctant farmer

This set of factors seems to reappear, as you would expect, in a range of surveys. For example, Nuthall (2002) found virtually the same factors using the same set of questions.

Chapter 8 Managerial Style

It is often suggested that a person can be defined through their personality and intelligence. Thus, you would expect managerial ability to be related to a farmer's personality. To obtain details of the personality aspect of farmers they were asked to rate the truth of a series of 25 statements (see the appendix for the detailed questions .. under Managerial Style). Rather than talk about personality to practical farmers the set of questions were labelled 'Managerial Style' as this is effectively the information required. Modern personality theory (Matthews & Deary, 1998) contends personality is made up of five basic factors openness, conscientiousness, extroversion, agreeableness, and neuroticism. For this reason, the 'question' set contains 5 x 5 statements to cover the likely components of style with each five question set, randomly dispersed, designed to assess one of the factors. As it turned out in this survey, and in others using the same set, there appeared to be six factors making up a farmer's style, though two are closely related. This 'six set' was used as it is their personality with respect to management that is important. The Tables 8.1 and 8.2 give the farmer scores on each of the statements, and the details of a factor analysis based on the scores.

Table 8.1: Distribution of the farmers' responses to statements describing management style components.

(Percentages giving the proportion giving each 'truth' degree)

(True = 1,Not true = 5)						
Style (paraphrase)	Ave score	1	2	3	4	5
Mulling over decisions	2.0	41.4	30.8	14.5	8.3	5.1
Easy stranger contact	2.9	25.9	19.7	15.6	17.6	21.1
Consult on changes	2.9	17.1	24.4	25.5	19.6	13.5
Family helpful	2.1	26.8	30.0	19.7	9.7	3.8
Overload anxiety	2.6	24.6	28.5	19.2	15.4	12.3
Mistake tolerance	2.8	19.8	25.2	23.5	15.4	16.1
Neighbour sharing	3.0	17.5	24.5	21.5	15.1	21.3
Keep many records	2.4	32.3	22.4	22.7	14.4	8.2
Admire logic	2.2	36.2	28.8	20.4	8.6	5.9
Problems and sleep lack	3.2	15.7	18.8	17.5	21.3	26.7
New things exhilarating	2.0	38.1	33.5	18.4	6.2	3.8
Record and calculate	2.4	31.2	28.0	16.7	14.5	9.6
Concern re other's views	4.0	3.8	8.9	13.5	25.4	48.3
Make do if necessary	2.2	35.5	29.5	20.8	10.4	3.8
Talking over ideas is great	2.0	39.9	31.0	20.3	5.9	2.8
Change is a pain	3.1	15.6	19.1	25.2	22.9	17.0
Continue until job finished	2.3	35.0	26.7	19.4	13.4	5.5
Enjoy farmer organisations	3.1	16.3	20.2	23.2	19.7	20.6
Stickler for checking	3.2	13.1	16.8	25.4	21.0	23.6
Pressure creates crossness	2.8	20.5	27.4	21.0	17.7	13.3
Experience overrules hunches	1.9	40.3	36.9	18.0	3.0	1.7
Let employees do it their way	2.8	16.0	26.9	28.0	17.7	11.4
Like participating in groups	3.0	18.9	19.7	20.5	21.7	19.1
Follow principles no matter what	2.6	18.2	30.1	29.2	15.0	7.5
Forward planning creates peace	2.0	44.1	28.1	17.4	7.6	2.7

There is nothing right or wrong with particular distributions, they merely describe this particular population of farmers. However, there is some evidence to suggest farmers with particular styles are better managers than their colleagues with alternative styles (eg Young and Walters, 2002). The factor analysis described below leads to a categorization of basic styles.

Table 8.2: Farmers' managerial style factors

(Factor loadings greater than 0.3 for the six main factors with an Eigenvalue of one or greater using a Varimax rotation)

Style (paraphrase)	Factor number					
	1	2	3	4	5	6
Mulling over decisions					.51	
Easy stranger contact		.36			.49	
Consult on changes					.70	
Family helpful					.49	
Overload anxiety	.75					
Mistake tolerance					.59	
Neighbour sharing				.35		
Keep many records			.44			
Admire logic		.50	.39			
Problems and sleep lack	.72					
New things exhilarating		.74				
Record and calculate		.48		.31		
Concern re other's views	.61					
Make do if necessary			.41			.37
Talking over ideas is great		.63		.33		
Change is a pain	.32	.54				
Continue until job finished			.58			
Enjoy farmer organisations				.78		
Stickler for checking	.35		.35	.32		.33
Pressure creates crossness	.59					
Experience overrules hunches			.47			
Let employees do it their way						.70
Like participating in groups				.71		
Follow principles no matter what			.53			
Forward planning creates peace			.49			

Given the factors related to each statement, each factor can be named. This provides the following underlying factors making up a farmer's managerial style. Each farmer will have a degree of each factor which combine to make up the totality of his management style.

- Concern for correctness (anxiety)
- Thoughtful creator (openness)
- Conscientious planner (conscientiousness)
- Community spirit (extraversion – community)
- Consultative logician (extraversion – family and friends)
- Benign manager (agreeableness)

The descriptions in the brackets are the names of the prime personality factors in the five factor model. The six style factors are used in an analysis presented later correlating variables to ability.

Chapter 9

Locus of Control

It is hypothesised that each farmer has a unique belief in how much control he can exert over the outcomes from his farm. At one extreme a farmer is called an ‘external’ if he believes outcomes are largely beyond his control so that random variables, such as the rainfall and prices in a distant market, largely give rise to farm outcomes in contrast to the importance of his own decisions. At the other extreme a farmer may believe he is the controller and his decisions have a major bearing on the outcomes (an ‘internal’). The type of farming will clearly influence the real situation, but in general the truth probably lies between the extremes. However, a farmer’s belief possibly influences how he approaches farming and the success of his management, and for this reason it is helpful to know the belief held. This variable recording the degree of control is referred to as the ‘locus of control’ (LOC) and can be set up as a percentage with 0 per cent reflecting absolutely no control and 100 per cent reflecting perfect control.

To determine a farmers’ LOC, a set of statements was developed to which the farmer indicates the degree of truth for his situation on a five point scale with 1 indicating ‘true’ and five ‘not true’. The set of questions are listed in Appendix A under ‘D VIEWS ON MANAGERIAL APPROACHES’.

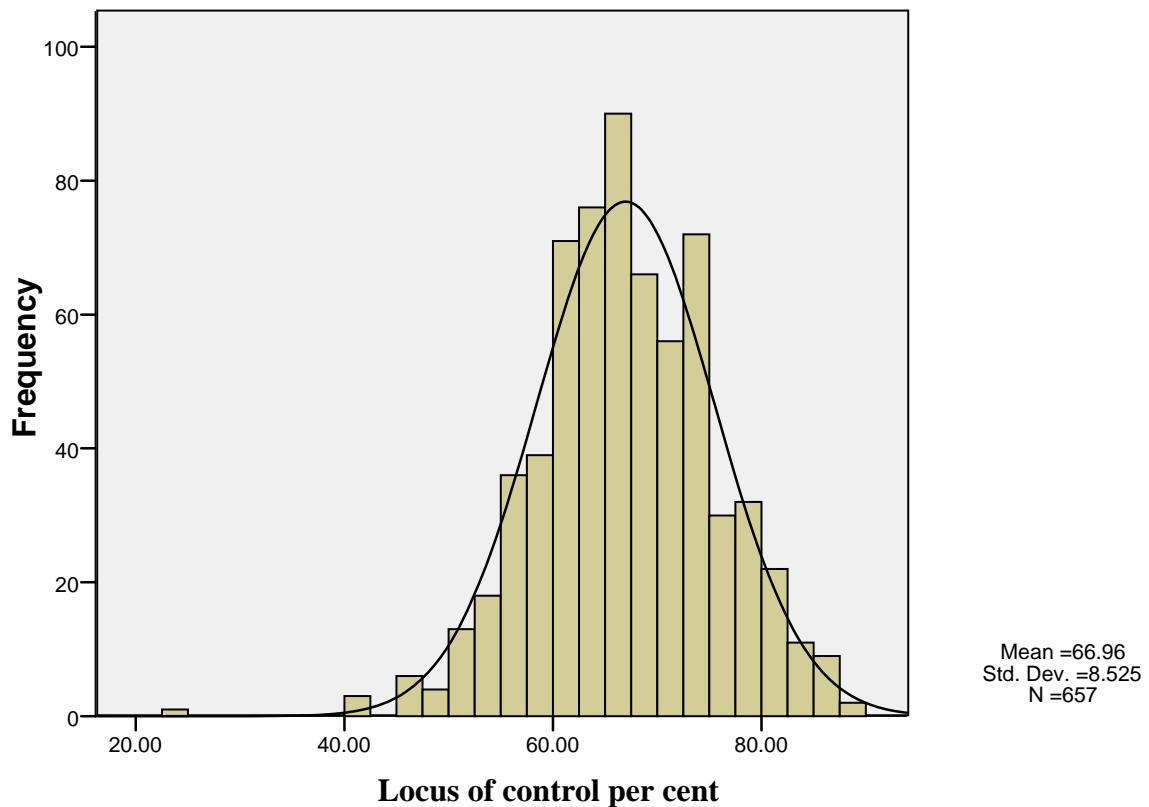
Table 9.1 gives the distribution of the farmers’ answers. The totality of these answers is then converted to a percentage with a sum of 19 (a ‘1’ for each TRUE answer reflecting a control belief, and a 1 for each NOT TRUE answer where the statement does not reflect control, and scores of 2, 3, and 4 for in between answers remembering there are 19 statements in all) representing 100 per cent and a total of 95 representing 0 per cent. Figure 9.1 gives the distribution of the LOC per cent relative to the normal distribution.

Table 9.1: Distribution of the farmers’ truth ranking of the Locus of Control statements.
(Percentage providing each degree of truth with 1 meaning ‘true’ and 5 ‘untrue’)

Paraphrase of statement	Ave score	1	2	3	4	5
I achieve goals	1.86	40.5	41.0	13.2	3.1	2.2
Use trusted techniques	3.66	8.0	11.8	18.9	28.7	32.5
Use same methods over years	3.46	11.6	17.0	16.1	24.6	30.7
Not stubborn	2.17	37.7	27.9	19.4	9.4	5.5
Make own luck	2.24	36.8	29.4	16.1	8.9	8.8
Don’t rely on others	2.69	22.1	26.7	23.4	15.7	12.2
I manage workers successfully	2.50	16.8	35.4	32.9	10.9	3.9
Satisfy other’s wants	4.10	3.8	5.9	13.9	29.1	47.3
Genes determine ability	3.59	8.7	16.6	19.1	17.9	37.7
Neighbours uncooperative	3.70	6.9	11.3	21.3	26.2	34.3
Workers achieve well	1.96	36.9	39.2	17.4	4.3	2.2
Chance causes bad outcome	2.25	33.2	31.4	17.4	13.0	4.9
District affairs controllable	3.14	17.0	19.0	23.8	19.1	21.0
Chance outcomes frustrating	2.52	24.9	29.4	22.5	15.2	8.0
Others get good luck	4.02	4.2	7.4	16.2	26.9	45.2
Careful planner	2.70	23.9	23.8	22.0	18.6	11.7
Stick to tried systems	3.06	16.9	20.8	20.1	23.1	19.0
Failures due to chance	2.49	26.2	26.6	26.4	13.9	6.8
Determined when right	1.85	43.7	33.5	18.0	3.5	1.3

On average, the most ‘truthful’ statement is ‘So far I have managed to largely achieve my goals’ which reflects large numbers of the farmers do believe they have achieved what they want suggesting high levels of control. In contrast the most ‘untrue’ statement was ‘Too often I end up having to run my property to suit others’ demands’ again indicating at least they are not overly influenced by what others want. On the other hand the statement ‘I seldom change my management and production systems unless I’m doubly sure the change will be positive. So much depends on chance’ was rated as being between somewhere in the middle of the truth spectrum indicating the farmers are somewhat wary and, consequently, do not totally believe in their control. These are average responses. Individually there is a wide spectrum of beliefs as indicated by the distribution of the LOC per cent in Figure 9.1. The average is 67 per cent but the range is quite wide being from 40 per cent to nearly 90 per cent. Overall, however, the farmers believe they have reasonable control.

Figure 9.1: Distribution of the respondent’s Locus of Control



A factor analysis revealed the farmers had six core variables expressing their belief in their control level. Table 9.2 contains the loadings giving rise to these six factors.

Table 9.2: Farmers' Locus of Control factors

(Factor loadings greater than 0.3 for the six factors with an Eigenvalue of one or greater using a Varimax rotation)

Paraphrase of belief	1	2	3	4	5	6
1. I achieve goals					.42	
2. Use trusted techniques		.79				
3. Use same methods over years		.67				
4. Not stubborn					.63	
5. Make own luck					.70	
6. Don't rely on others	.38	.32			.42	
7. I manage workers successfully			.37	.38		
8. Satisfy others' wants	.64					
9. Genes determine ability						.76
10. Neighbours uncooperative	.57					.33
11. Workers achieve well	-.37			.54		
12. Chance causes bad outcomes			.67			
13. District affairs controllable					.35	-.32
14. Chance outcomes are frustrating	.61		.42			
15. Others get good luck	.58					
16. Careful planner				.76		
17. Stick to tried systems		.64				.35
18. Failures due to chance			.66			
19. Determined when right			.33	.43		.33

Based on the factor loadings suitable names for these factors are:

Factor	Name
one	People and luck negativity
two	Conservative traditionalist
three	Determined despite bad luck
four	Careful and determined planner
five	Flexible achiever
six	Gene based traditionalist

Producers with a high proportion of factor one have little control belief and tend to be unsuccessful especially in dealing with people, whereas people with a high proportion of factor two believe you should stick to using tried and tested methods to avoid chance problems. Factor three relates to the belief that chance is responsible for bad outcomes (not bad management), whereas factor four involves a belief that careful planning is important and, particularly, leads to good labour outcomes. Factor five represents a positive belief that you clearly make your own luck whereas factor six embodies an acceptance that your genes determine ability, and consequently, outcomes. Any one manager will have a mix of these factors leading to an overall control belief. A five cluster analysis gives clusters containing 23 per cent, 16 per cent, 11 per cent, 25 per cent and 25 per cent of the respondents. The five clusters were 'significantly different' (0.000). This would suggest farmers fall into at least five quite distinct groupings with reasonable numbers in each group.

Chapter 10 Farmers' Experience

10.1 The early years

As shown in the appendix containing the questionnaire, many questions covered the early years of a farmer's life with respect to items likely to impact on beneficial experience. The following tables summarise this information. For the number of farming generations in the family the mean was 3.2 where the current manager was included in the count. Those with only one generation were 12.3 per cent of the sample, 17.4 per cent had two generations, 35.0 per cent with three generations, 22.6 per cent four, 8.9 per cent five, 1.9 per cent six leaving 1.7 per cent for greater than six generations. If a generation gap is assumed to be 25 years some farmers have had a 150 year history.

For the number of years of managing it took to become a reasonably competent farmer, 17.7 per cent believed it was two or less years, 22.1 per cent two to four years, 30.2 per cent four to six years, 3.5 per cent six to eight years, 19.1 per cent eight to ten years leaving 7.4 per cent believing it took longer. There was only a 10.2 per cent ** correlation between the farmer's self assessed managerial ability and the number of years to attain competency. For country schooling, 81.3 per cent of the respondents took their primary education in a county area (defined as a school in a district with less than 1000 people), whereas only 38.4 per cent received their secondary education in a county area (which in this case was defined as a school in a district with up to 3000 residents).

Tables 10.1, 10.2 and 10.3 present data on the years of experience obtained by farmers, the exposure farmers' received to various useful lessons, and their skill relativities between the farmer and his forebears.

Table 10.1: Years of experience at various levels
(Column percentages)

	Years on Current farm	Years managing Current farm	Years managing Previous farm	Years working on Farm/s before managing
< 5.1	7.7	8.6	49.7	37.3
5.1 - 10.0	9.9	11.4	14.6	40.9
10.1- 15.0	9.4	12.8	8.4	10.8
15.1- 20.0	8.7	14.0	8.3	4.6
20.1- 25.0	7.9	12.0	3.3	1.9
25.1- 30.0	12.3	15.4	4.8	3.7
30.1- 35.0	5.8	8.1	3.2	0.7
35.1- 40.0	8.4	8.8	3.3	1.2
40.1- 45.0	6.5	3.6	2.1	0.2
45.1- 50.0	7.9	3.4	1.5	0.4
50.1- 55.0	4.8	0.9	0.4	0.0
55.1- 60.0	3.7	0.6	0.4	0.2
>60.0	5.8	0.4	0.0	0.0
Mean	30.3	23.0	11.1	8.1

Table 10.2: Distribution of the farmers' truth ranking of experience/learning situations in their younger/school years

(Percentage providing each degree of truth with 1 meaning 'true' to 5 'untrue')

Paraphrase of statement	Ave score	1	2	3	4	5
Encouraged to use imagination	2.2	40.2	25.8	19.7	7.9	6.5
Encouraged to improve observation	2.3	32.7	26.1	23.0	10.8	7.4
Encouraged to 'get along' with others	1.8	52.1	25.4	15.1	5.3	2.1
Agr knowledge learnt over 5-10 years	3.3	15.6	15.2	21.8	20.8	26.6
Agr knowledge learnt over 11-15 years	2.5	22.0	30.7	28.2	12.0	7.0
Agr knowledge learnt over 16-20 years	1.7	59.1	23.5	9.0	3.8	4.5
Helped frequently with farm jobs	1.4	75.4	14.1	6.3	2.1	2.1
Reasons for jobs always explained	2.5	25.5	28.5	24.7	13.3	8.0
Listened to discussions on finances/planning	3.5	11.5	11.6	23.4	22.2	31.3
Listened to discussions on technical issues	2.9	18.4	24.2	22.4	18.6	16.3
Opinion asked about decisions	3.7	7.3	10.4	22.6	26.1	33.6
Wanted to know reasons behind decisions	2.8	20.3	21.4	26.2	20.8	11.3
Early learning of little help now	3.8	7.0	10.5	18.2	20.4	43.9

Table 10.3: Distribution of the farmers' belief of their characteristics relative to their forebears

(Percentage providing each degree of truth with 1 meaning 'true' to 5 'untrue')

Paraphrase of characteristic	Ave score	1	2	3	4	5
Skills better than parents for animals/feed	2.2	37.5	26.6	23.3	6.1	6.5
Skills better than parents for soils/plants	2.1	37.4	30.4	22.0	4.7	5.6
Skills better than parents for lbr manag't	2.6	25.1	25.4	33.0	7.1	9.5
Skills better than parents for financial/mktg	2.2	35.2	24.4	26.8	8.0	5.6
Skills better than parents for strategic plans	2.3	31.4	27.7	30.1	4.9	5.9
Objectives different from parents	2.8	28.2	20.7	17.9	12.1	21.0
Objectives very different from grand parents	2.8	30.8	12/8	22.7	12.4	21.3
Parents had greater inherent intelligence	3.8	4.8	6.5	31.5	20.7	36.4
Subsequent generations have better skills	2.6	27.3	26.3	19.7	10.7	16.1

The average number of years on the current farm is higher than might be expected, but is a reflection of the ageing population of managers. This number doesn't quite relate to the mean number of 23 years as manager and the eight years on farms before becoming a manager. The difference must be due to farm movements. Given the 23 years and the number of years managing a previous farm gives a total of 34 years managing on average. This is a long time and a question on what might happen if there was a greater turnover is relevant.

This slow turnover of managers is a concern if the data in Table 10.2 does truly reflect that there is an improvement in management and other skills as the generations move on. Overall the farmers' believe their skills, particularly for soils, pasture and crops are much better than their forebears. Logic would expect this given the increasing level of higher education and general emphasis on efficient management in contrast to being able to continue farming for a 'way of life' attitude. But the current farmers do believe that their intelligence is no better than their parents. There is no reason to believe this would not be the case.

The information in Table 10.1 shows most farmers helped on the home farm when young, and they strongly believe they learnt a considerable amount during their late teens in contrast

to earlier times. However, they believe the material learnt in early times was by no means lost. The respondents certainly believe that their parents helped them acquire basic skills such as being good observers, and having a good imagination, and they involved them in discussions on technical issues, but not for financial and planning issues. It is suspected a feeling that such issues are 'private' still prevails.

10.2 The later years General experience

The following tables encapsulate the information obtained.

Table 10.4: Distribution of the farmers' belief on the source of their learning in various knowledge areas

(Percentage of each 'amount learnt' score with 1 meaning 'a lot' to 5 'not a lot')

Knowledge source	Ave score	1	2	3	4	5
TECHNICAL KNOWLEDGE						
School/college/tertiary institutes	3.1	22.1	16.4	19.2	17.0	25.2
Watching parents/relatives	2.2	35.6	30.5	20.2	7.1	6.6
Watching other farmers	1.9	40.9	37.7	16.3	3.6	1.5
Field days	2.5	23.9	29.2	26.1	11.8	8.9
Reading books, magazines, papers....	2.0	36.5	36.4	18.8	5.4	8.9
Radio/programmes	3.1	13.0	17.4	31.6	21.0	16.7
Short courses/lectures	3.1	15.3	23.8	18.8	18.4	23.6
Advisors/consultants of various kinds	2.8	26.5	23.1	16.6	14.9	18.9
Company representatives	3.2	8.7	19.7	30.6	20.8	20.2
FINANCIAL KNOWLEDGE						
School/college/tertiary institutes	3.4	18.2	15.3	15.3	15.3	35.9
Watching parents/relatives	2.5	25.4	27.5	26.8	10.5	9.7
Watching other farmers	3.2	10.8	18.5	30.0	19.2	21.5
Field days	3.6	9.0	10.2	26.4	23.4	31.0
Reading books, magazines, papers....	2.6	21.4	28.5	26.8	13.7	9.6
Radio/programmes	3.7	7.0	7.4	24.2	28.0	33.3
Short courses/lectures	3.4	12.2	17.1	19.0	18.7	33.0
Advisors/consultants of various kinds	2.7	25.7	25.7	17.7	13.9	17.0
Company representatives	3.8	6.1	9.9	21.0	22.5	40.5

Table 10.5: Distribution of the farmers' belief on the truth of various statements about learning from experience and situations

(Percentage of each degree of truth score 1 meaning 'true' to 5 'not true')

Paraphrase of statement	Ave score	1	2	3	4	5
Make mistakes several times before learn	3.7	10.3	11.6	17.1	23.1	37.9
Should spend more time reflecting to learn	3.1	10.6	22.7	26.4	22.5	17.8
Manager shared decision thoughts with me	3.2	13.4	19.6	26.2	19.0	21.7
Management of helpers has improved	2.7	20.1	25.7	29.3	13.3	11.6
No extreme condition experience pre management	3.3	20.5	15.3	11.6	15.0	37.7
Many mistakes when first a manager	2.7	22.3	24.9	23.9	17.3	11.5
No major problems experienced when managing	4.3	6.0	5.6	7.7	9.9	70.7
Helpers have been cooperative with good output	2.2	35.3	35.1	14.4	8.2	6.9
Mainly learnt from real headache situations	2.6	19.3	28.8	30.3	14.2	7.3
New conditions challenge & require new solutions.	2.2	34.1	33.0	20.7	7.6	4.6
Experience reduces formal time on decisions	2.4	26.0	35.5	17.5	10.7	10.2

Considering Table 10.4, the main sources of farmer's technical knowledge is clear with 'watching other farmers' leading the way. Reading is also very important as is watching parents and relatives, but clearly the respondents think the experience to be had over the fence is better than the home experience, but not by a lot. Field days are also regarded as being important which is, of course, a structured watching of other farmers. Learning by example clearly features highly in farmers' eyes.

For financial knowledge, the same concepts apply, but in this case 'watching parents/relatives' is the most important source as the farmers are unlikely to have information on other farmers' financial details. Reading is also important, but a new important source is consultants/advisors who may well have information on the farmer's financial situation and can offer appropriate knowledge and lessons. Overall, however, the mean scores are higher for the financial knowledge area indicating the farmers do not obtain as much knowledge from the various sources as in the case of technical information.

The data in Table 10.5 indicates the farmers believed they have improved their management of employees and contractors through experience, but that in general workers are helpful and productive. The respondents believe new situations need assessing leading to new solutions, as might be expected. But the scores also indicate they believe difficult situations are very helpful in improving their management through the experience. The farmers also believe they are relatively quick at learning and they do not require repeat mistakes before the lessons to be had are learnt. Whether these figures represent the real situation is difficult to judge.

As a proxy measure of how important field days are to farmers they were asked the greatest distance they had travelled to attend one. The mean was 600.1 kms, but this figure is skewed

by the small number of farmers giving very high kms resulting from a trip to, say, the UK where they no doubt attended a local field day. The more common maximum distances were much less with 40.1 per cent travelling less than 100 kms, 23.3 per cent 101-200 kms, 14.5 per cent 201-300 kms, 5.1 per cent 301-400 kms, 4.0 per cent 401-500 kms leaving 12.1 per cent travelling more than 500 kms. Of course, these figures reflect the maximum distance which may have been travelled just once. Finally, the farmers were asked to rate how much they had learnt in each of the four quarters of their entire agricultural career. The mean scores on a scale 1='not much' to 5='a lot' were 3.4 for the first quarter, 3.7 for the second, 3.9 for the third, and 3.8 for the last quarter. Clearly, the farmers believed they learnt reasonable amounts in each quarter with the latter two being slightly more important.

10.3 The principal components of the experience data

It is difficult to encapsulate the information available in all the experience data. Consequently a number of factor analyses were conducted to summarize the data into its core information. The first analysis involved the five core variables involving time, the second the 10 variables involving forebears, the third the parental influence variables (13 core variables), and finally the 17 variables on experienced based learning gave the fourth set.

The following tables give the factor scores for each of these analyses where only the scores greater than 0.3 are presented. The factor analyses all used a Varimax rotation and selected factors with Eigenvalues of one or greater.

Table 10.6: Farmers' time based experience factors

(Factor loadings greater than 0.3 for the factors with an Eigenvalue of one or greater using a Varimax rotation. Explained 62 per cent of variance)

Paraphrase of variable	Factor one	Factor two
Years on current farm	0.92	
Years managing current farms	0.88	
Years managing previous farms	0.64	
Years on farms before managing		.76
Generations of farming history		.67

Table 10.7: Factors expressing farmers' relationships to forebears

(Factor loadings greater than 0.3 for the factors with an Eigenvalue of one or greater using a Varimax rotation. Explained 73 per cent of variance)

Paraphrase of variable	Factor 1	Factor 2	Factor 3	Factor 4
No of generations		0.92		
Better than parents(animals/feed)	0.78			
Better than parents(soils/plants)	0.84			
Better than parents(helpers mgmt)	0.40		.81	
Better than parents(financial/mktg)	0.77			
Better than parents(strategic plans)	0.75			
Objectives different from parents		0.88		
Different objectives to grandparents		0.89		
Parents have greater intelligence				0.88
New generations have better skills	0.51			0.46

Table 10.8: Factors expressing parental influences on farmers

Paraphrase of variable	Factor 1	Factor 2	Factor 3	Factor 4
Country primary school				0.76
Country secondary school				0.78
Encouraged to use imagination			0.83	
Encouraged observation skills			0.75	
Encouraged to get along with others			0.65	
Successful agr learning ...5-10 yrs		0.80		
Successful agr learning ...11-15 yrs		0.87		
Helped with farm jobs over school yrs		0.70		
Reasons always explained	0.61			
Listened to talk on financial things	0.84			
Listened to talk on technical things	0.80			
Opinion asked when decisions made	0.77			
Wanted to know reasons for decisions	0.73			

Table 10.9: Factors expressing farmers' learning from experience

Factor loadings greater than 0.3 for the factors with an Eigenvalue of one or greater using a Varimax rotation. Explained 61 per cent of variance

Paraphrase of variable	1	2	3	4	5	6	7
Make mistakes several times to improve	0.73						
Spend more time reflecting on lessons	0.73						
Managers discussed decisions with me						0.64	
Amount learnt in first quarter of experience			0.84				
Amount learnt in second quarter of experience		0.32	0.84				
Amount learnt in third quarter of experience		0.84					
Amount learnt in last quarter of experience		0.86					
Managers of helpers improved significantly				0.42			
Pre manager, no major problems due to conditions					0.55		
Made mistakes when first a manager	0.60						
Years to become a competent manager							0.82
Furthest distance travelled for field day					0.30	0.57	
No major problems encountered					0.69		
Helpers cooperative and produce well					0.36	0.47	0.54
Learnt from situations not going to plan	0.31			0.60			
New conditions challenge & require new solutions				0.66			
Experience reduces formal time on decisions	0.33			0.63	0.30		

Based on the loadings on the variables these factors can be given names. A suitable set might be the following:

Experience based on time

- Years of managing experience
- Pre-management experience

Forebears

- Ability better than parents
- Objectives different from parents
- Labour management across generations
- Generation differences in intelligence and ability

Parental influences

- Early management involvement
- Early agricultural experience
- Training in basic management skills
- Country schooling - primary and secondary

Experienced based learning aspects

- Learning from mistakes
- Learning from the recent past
- Learning from early experiences
- Development of tacit knowledge (intuition)
- Experienced good luck, few problems
- Help and support from colleagues
- Speed of learning management skills, including labour factors

Effectively, the factor analyses suggests 17 base variables can be used to express the components of a farmer's experience given the set of questions asked in the questionnaire. This does not mean other experience factors are not important in assessing a farmer's experience. Other researchers might suggest further variables that could well be important aspects of experience. This needs further investigation, perhaps through talking more to farmers and consultants.

Chapter 11 Conclusion

A large amount of data has been presented which can be used in a number of ways and studies. The data was collected with the prime purpose of determining the factors giving rise to managerial ability as this 'resource' is very important in making efficient use of land, labour and capital. Understanding managerial ability provides a means to improve its general level both collectively and individually. Nuthall (2009a) gives full details of a structural equation model explaining ability, and provides data on the relevance of the factors constituting the origins of ability. Effectively the model demonstrated the importance of experience in developing high ability. A farmer's management style factors are also important, as is his intelligence, but the latter two factors have a much smaller impact than experience and its components.

To provide a relatively straight forward explanation for this report, a linear regression with the farmers' self rating of ability as the dependent variable was calculated. The independent variables included the farmer's personal information such as his age, education, self rated intelligence, but also all the factors representing a farmer's management style, objective set, locus of control, and experience (time based, forebears, parental influences and general learning) as discussed in the earlier section. This equation was highly significant with an R^2 of 0.53. However, some of the variables were insignificant so the equation was recalculated with variables dropped if they had a significance probability of greater than 0.29. This resulted in a highly significant equation (.000) with an R^2 of 0.403. While this is not particularly high with 60 per cent of the variance unexplained, it does give ideas on the important factors. In reality, the situation is probably more complex than a simple linear relationship (see Nuthall, 2009a). One of the relevant factors is that a simple self rating score is not a particularly accurate way of measuring ability. The parameters of the equation calculated are given below:

Variable	Standardized regression coefficient	Significance probability
Constant	3.57 (not standardized)	.000
Age	.084	.105
Self rated intelligence	.142	.007
Productivity(physical)	.108	.035
Experience-learning from mistakes	.199	.000
Experience-learning from recent past	.073	.164
Experience-good luck, few problems	.064	.219
Early management involvement	.077	.140
Ability better than parents	.179	.001
Generation differences-int./ability	.177	.001
Style – anxiety	.080	.121
Style – creator	.282	.000
Style – extroversion	.146	.006
Objective – balanced	.156	.002
Objective - way of life	.074	.191
Objective – risk remover	.117	.028

The standardized coefficients are presented as the units vary markedly between variables. The least significant variable is the 'good luck/few problems' experience factor with $p=0.219$. That is, there is nearly an 80 per cent chance that the variable is significantly different from zero. This is still quite reasonable. It will be noted there are several negative coefficients, but these must be interpreted with the scoring system in mind. For example, the self rated intelligence variable is negative as the scoring system had 1 as representing 'highly intelligent'. The 'productivity' variable was constructed from the physical output measures such as the lambing per cent. For each farm type the output figures were converted to a 1 to 10 scale. Each was then averaged and adjusted so that each farm type was made comparable before combining into one scale for the whole sample. To assess the importance of productivity in managerial ability, the 0.108 coefficient must be related to this ten point scale so the total impact of productivity on ability (also measured on a ten point scale) can be as high as nearly 1. Relate this to the constant of 3.57.

For the management style variables, anxiety (concern for correctness) is undesirable, but having a creative personality (openness) is particularly beneficial, as is being an extrovert, but only about half as important as an open personality. For the objectives, remembering that a low score represents 'truth' for the statements expressing various objectives, having a 'risk removal' attitude is not desirable, but a leisure/way of life approach to farming is related to success. To understand why this conclusion is made, refer to the statements which make up each factor. A high score ('not true') is undesirable. The other important variables relate to experience. As you might expect, learning from mistakes is particularly important, as are making sure your skills are much better than your forebears. This conclusion, is of course, rather obvious.

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APPENDIX A THE SURVEY SCHEDULE

MANAGEMENT SYSTEMS RESEARCH UNIT
AGLS Division *August/September 2006*



NATIONAL SURVEY ON MANAGERIAL FACTORS

Please complete and return this questionnaire using the enclosed postage paid envelope. All information provided will be kept in strictest confidence to the researchers involved. If you are not the operator/manager of the property please pass the questionnaire on to this person.

Many of the 'questions' are statements with five boxes beside them - tick only the ONE that best records the degree of truth in the statement. For example, if 'TRUE NOT TRUE' is offered, tick the middle box if the statement is half true, or one of the other boxes if it is 'truer', or closer to 'not true'. Other 'statements' have A GREAT DEAL and NOT MUCH as the extremes, and others 'NOT MUCH' and 'A LOT'. Other questions require you to enter a number, or Y/N (YES/NO) in a box, or simply tick an option.

A. GENERAL

1. **Farm Type.** Please tick ONE box representing the MAJOR enterprise type on the property you operate.

intensive sheep	<input type="checkbox"/>	extensive sheep	<input type="checkbox"/>	deer	<input type="checkbox"/>	cattle	<input type="checkbox"/>
dairying	<input type="checkbox"/>	other animal	<input type="checkbox"/>	fruit	<input type="checkbox"/>	cash crop	<input type="checkbox"/>
ornamental/flowers	<input type="checkbox"/>	vegetable	<input type="checkbox"/>	other	<input type="checkbox"/>		

2. **Labour.** Including the working manager, please give the number of equivalent full time adult people it takes to run the property (use fractions if necessary, e.g., 1 ¾)

3. **Area.** What is the total land area used in the operation, including rental/leased land? (cross out the acres or hectares sign depending on the unit used)
HAS / ACRES

B. EXPERIENCE BACKGROUND

- | | | |
|---|-------|---|
| 1. How many years have you lived on your current farm? | Years | <input style="width: 40px; height: 20px;" type="text"/> |
| 2. How many years have you managed your current farm? | Years | <input style="width: 40px; height: 20px;" type="text"/> |
| 3. How many years have you managed any previous farm/s? | Years | <input style="width: 40px; height: 20px;" type="text"/> |
| 4. How many years have you worked on a farm/s before becoming a manager? | Years | <input style="width: 40px; height: 20px;" type="text"/> |
| 5. Did you attend a country primary school (one in a district less than around 1000 people)? | Y/N | <input style="width: 40px; height: 20px;" type="text"/> |
| 6. Did you attend a country secondary school (one in a district less than around 3000 people)? | Y/N | <input style="width: 40px; height: 20px;" type="text"/> |

In my younger years I WAS specifically encouraged to:

7. use my imagination to find solutions and how things worked, TRUE NOT TRUE
8. improve my observation skills of the surroundings and markets, TRUE NOT TRUE
9. 'get along' with friends and relatives. TRUE NOT TRUE

Up to age 20 years, as far as you can remember, how much 'agricultural knowledge' did you successfully learn over:

10. Five to ten years of age? A GREAT DEAL NOT MUCH
11. Eleven to fifteen years of age? A GREAT DEAL NOT MUCH
12. Sixteen to twenty years of age? A GREAT DEAL NOT MUCH

(SKIP THIS NEXT SECTION IF YOU DIDN'T LIVE ON A FARM BEFORE STARTING FULL TIME EMPLOYMENT)

C. EXPERIENCE OVER SCHOOL YEARS

1. I frequently helped with farm jobs. TRUE NOT TRUE
2. The reason behind a job on the farm was always explained TRUE NOT TRUE
3. I frequently listened to discussions on financial and long term planning matters. TRUE NOT TRUE
4. I frequently listened to discussions on technical matters (animals, plants, soils, buildings.....). TRUE NOT TRUE
5. I was often asked my opinion when decisions were made. TRUE NOT TRUE
6. I always wanted to know the reasons for all decisions. TRUE NOT TRUE
7. There have been so many changes in the technology and management systems that what I learnt in my early years is of little help now. TRUE NOT TRUE

D. MANAGERIAL STYLE

Tick ONE box that best records your degree of belief in the statements.

1. You tend to mull over decisions before acting. TRUE NOT TRUE
2. You find it easy to ring up strangers to find out technical information. TRUE NOT TRUE
3. For most things you seek the views of many people before making changes to your operations. TRUE NOT TRUE
4. You usually find discussing everything with members of your family and/or colleagues very helpful. TRUE NOT TRUE
5. Where there are too many jobs for the time available you sometimes become quite anxious. TRUE NOT TRUE

6. You tend to tolerate mistakes and accidents that occur with employees and/or contractors. TRUE NOT TRUE
7. You share your successes and failures with neighbours. TRUE NOT TRUE
8. Keeping records on just about everything is very important. TRUE NOT TRUE
9. You admire farming/grower colleagues who are financially logical and don't let emotions colour their decisions. TRUE NOT TRUE
10. You sometimes don't sleep at night worrying about decisions made. TRUE NOT TRUE
11. You find investigating new farming/growing methods exhilarating and challenging. TRUE NOT TRUE
12. You tend to write down options and calculate monetary consequences before deciding. TRUE NOT TRUE
13. You tend to worry about what others think of your methods. TRUE NOT TRUE
14. You are happy to make do with what materials you have to hand. TRUE NOT TRUE
15. You find talking to others about farming/growing ideas stimulates and excites you as well as increasing your enthusiasm for new ideas. TRUE NOT TRUE
16. Having to make changes to well established management systems and rules is a real pain. TRUE NOT TRUE
17. You normally don't rest until the job is fully completed. TRUE NOT TRUE
18. You normally enjoy being involved in farmer/grower organisations. TRUE NOT TRUE
19. You sometimes believe you are too much of a stickler for checking and double-checking that everything has been carried out satisfactorily. TRUE NOT TRUE
20. When the pressure is on you sometimes become cross and short with others. TRUE NOT TRUE
21. You generally choose conclusions from experience rather than from hunches when they are in conflict. TRUE NOT TRUE
22. You are inclined to let employees/contractors do it their way. TRUE NOT TRUE
23. You not only speak your mind and ask questions at farmer/grower meetings, but also enjoy the involvement. TRUE NOT TRUE
24. It is very important to stick to management principles no matter what the pressure to do otherwise. TRUE NOT TRUE
25. You are much happier if everything is planned well ahead of time. TRUE NOT TRUE

E GOALS AND AIMS

Tick ONE box that best records your degree of belief in the statements.

1. It is very important to pass on the property to family members. TRUE NOT TRUE
2. It is important to earn the respect of farmers/growers in the local community. TRUE NOT TRUE
3. Making a comfortable living is important. TRUE NOT TRUE
4. It is very necessary to keep debt as low as possible. TRUE NOT TRUE
5. It is essential to plan for reasonable holidays and plenty of leisure time. TRUE NOT TRUE
6. Attending field days and farmer/growers meetings is vital. TRUE NOT TRUE
7. It is very important to reduce risk using techniques like diversification, farming conservatively, keeping cash reserves TRUE NOT TRUE
8. Developing facilities and systems that give good working conditions is crucial. TRUE NOT TRUE
9. It is very important to ensure employees enjoy their jobs. TRUE NOT TRUE
10. Doing jobs that I enjoy is a very important part of the operation . TRUE NOT TRUE
11. Minimising pollution is very important. TRUE NOT TRUE
12. I enjoy experimenting with new products and production systems. TRUE NOT TRUE
13. Proper retirement planning is a major consideration. TRUE NOT TRUE
14. You must always be striving to increase the total value of assets. TRUE NOT TRUE
15. Constantly expanding the size of the business is absolutely necessary. TRUE NOT TRUE
16. Aiming for maximum sustainable net cash returns is very important. TRUE NOT TRUE
17. Maintaining a presence in local community activities is important. TRUE NOT TRUE
18. It is very important to improve the condition of the property (fertility, facilities). TRUE NOT TRUE
19. Giving assets to the children so they can pay for education and/or set up businesses is very important. TRUE NOT TRUE
20. While I don't particularly enjoy farming, I carry on as I don't have a background that allows shifting into another occupation. TRUE NOT TRUE

F. FOREBEARS

1. How many continuous generations back does your farming history go? (count yourself as one generation).

For the following tick ONE box that best records your degree of belief in the statements.

As sometimes happens through generations, my management skills are better than my parents for....(skip questions 2 & 3 if you **did not** have farming parents)

- | | |
|---------------------------------------|--|
| 2. Animal/feed management | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 3. Soils/pasture/crop management | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 4. Labour/contractor management | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 5. Financial and marketing management | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 6. Long term (strategic) planning | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
-
7. My overall objectives in life are quite different from my parents. TRUE NOT TRUE
8. My grandparents had very different objectives to me. TRUE NOT TRUE
9. For whatever reason, I believe my parents had greater inherent intelligence than me. TRUE NOT TRUE
10. Even given the improving technology, it appears to me each new generation of managers has better overall management skills than the previous generation. TRUE NOT TRUE

G. EXPERIENCE ... GENERAL

*Relatively speaking, it can be said that I learnt a lot of **TECHNICAL** knowledge and skills from:*

- | | |
|---|--|
| 1.School/college/tertiary institutes? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 2.Watching parents/relatives? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 3.Watching other farmers? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 4. Field days? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 5. Reading books, magazines, papers.... ? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 6. Radio/TV programmes? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 7. Short courses/lectures? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 8. Advisors/consultants of various kinds? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 9. Commercial company representatives? | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |
| 10. Other (.....) | TRUE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NOT TRUE |

Relatively speaking, it can be said I learnt a lot of **FINANCIAL** knowledge and skills from :

- 11. School/college/tertiary institutes? TRUE NOT TRUE
- 12. Parents/relatives? TRUE NOT TRUE
- 13. Other farmers? TRUE NOT TRUE
- 14. Field days? TRUE NOT TRUE
- 15. Reading books, magazines, papers.... ? TRUE NOT TRUE
- 16. Radio/TV programmes? TRUE NOT TRUE
- 17. Short courses/lectures? TRUE NOT TRUE
- 18. Advisors/consultants of various kinds? TRUE NOT TRUE
- 19. Commercial company representatives? TRUE NOT TRUE
- 20. Other (.....) TRUE NOT TRUE

- 21. I accept that I have to make a mistake several times before I improve my managerial skills for the problem... TRUE NOT TRUE
- 22. I should spend more time reflecting on what has occurred to tease out the lessons for improved management. TRUE NOT TRUE
- 23. For the farms I worked on before becoming a manager, generally the manager discussed with me all decisions that needed taking in a positive and thoughtful way. TRUE NOT TRUE

Over your entire agricultural career, how much did you learn about managing a farm over each quarter of this time?

- 24. The first quarter? (earliest period) NOT MUCH A LOT
- 25. The second quarter? NOT MUCH A LOT
- 26. The third quarter? NOT MUCH A LOT
- 27. The last quarter? (the most recent) NOT MUCH A LOT

- 28. My management of employees &/or contractors has improved out of all recognition over the years. TRUE NOT TRUE
- 29. Prior to becoming a manager, my farming experience had not encountered major problems caused by extreme conditions of any kind (prices, weather, events, breakdowns....) TRUE NOT TRUE
- 30. In hindsight, I made quite a few mistakes when I first became a manager. TRUE NOT TRUE

31. How many years of managing do you believe it took you to become a 'reasonably competent' manager? Years

32. What is the furthest you have ever travelled to attend a field day/instruction course/demonstration in order to further your agricultural management skills? Kms

33. Over my managing career I've been lucky not to encounter major problems in any form (eg extreme prices/costs, weather, interest rates, diseases.....)
TRUE NOT TRUE
34. Over my managing career I've been lucky in that the majority of employees and contractors have been cooperative and have produced good results.
TRUE NOT TRUE
35. While practice makes perfect, I have mainly learnt better management through situations that have not gone to plan and caused real headaches.
TRUE NOT TRUE
36. I find my management is constantly challenged by new conditions and situations that mean I have to come up with different solutions and systems compared to the past .
TRUE NOT TRUE
37. Increasingly over the years I'm finding I spend less time formally analysing/thinking about decisions before coming up with a solution and carrying it out. TRUE NOT TRUE

H. VIEWS ON MANAGERIAL APPROACHES

For each of the following statements indicate how true it is.

1. So far I have managed to largely achieve my goals. TRUE NOT TRUE
2. I never try anything that might not work. TRUE NOT TRUE
3. I'm using exactly the same production methods that I have used for many years because they have stood the test of time. TRUE NOT TRUE
4. It's no use being stubborn about a job or management approach that doesn't initially work. TRUE NOT TRUE
5. I reckon 'good luck' doesn't exist - 'luck' is really good management, and 'bad luck' poor management. TRUE NOT TRUE
6. It is safer not to rely on others to get the job done well and on time. TRUE NOT TRUE
7. I'm able to get others to do the jobs my way. TRUE NOT TRUE
8. Too often I end up having to run my property to suit others' demands. TRUE NOT TRUE
9. While being a good manager involves some training, experience and reading, management skill is mainly determined by your genes. TRUE NOT TRUE
10. You can work hard at creating good relationships between neighbouring managers, but often your efforts fall on deaf ears as people are commonly uncooperative and self-interested. TRUE NOT TRUE
11. I find most employees work hard and finish the tasks set very adequately after a bit of training where necessary. TRUE NOT TRUE
12. The years when the property has shown poor production and/or profit have been due to circumstances totally out of my control. TRUE NOT TRUE

13. In local body affairs it's easy for a hard working and dedicated individual to have an impact in getting changes for the better. TRUE NOT TRUE
14. Often I get frustrated as circumstances beyond my control impede the smooth progress of my management plans and decisions. TRUE NOT TRUE
15. Some people seem to be just lucky and everything works out for them, but it hasn't happened to me much. TRUE NOT TRUE
16. I tend to carefully plan ahead to ensure my goals are achieved, and often do budgets and commit my ideas to paper. TRUE NOT TRUE
17. I seldom change my management and production systems unless I'm doubly sure the change will be positive. So much depends on chance. TRUE NOT TRUE
18. When things go wrong it is so often due to events beyond my control - the weather ruins the hay, the wool auction I choose has a sudden price dip. TRUE NOT TRUE
19. When I know I'm right I can be very determined and can make things happen. TRUE NOT TRUE

I. PERSONAL FEATURES AND OUTPUTS

1. Which age group do you fall into? (tick ONE box)
- | | | |
|---|--|--|
| less than 25 years <input type="checkbox"/> | 26 - 35 years <input type="checkbox"/> | 36 - 45 years <input type="checkbox"/> |
| 46 - 55 <input type="checkbox"/> | 56 - 65 years <input type="checkbox"/> | greater than 65 years <input type="checkbox"/> |
2. What was the level at which you stopped your formal education? (tick ONE box)
- | | |
|---|---|
| Primary school <input type="checkbox"/> | Secondary school - up to 3 years <input type="checkbox"/> |
| Secondary school - 4 or more years <input type="checkbox"/> | Tertiary education - up to 2 years <input type="checkbox"/> |
| Tertiary education - 3 or more years <input type="checkbox"/> | |
3. For your LAST year of formal study, what was your average **per cent grade** (as you recall)? per cent
4. Please indicate your gender by putting **F**(emale) or **M**(ale) in the box.
5. Please rate yourself in general intelligence - tick ONE box. (If you are uncomfortable answering this question, leave blank.)
- | | | |
|--|---|---|
| Highly intelligent <input type="checkbox"/> | Reasonably intelligent <input type="checkbox"/> | Average intelligence <input type="checkbox"/> |
| A bit below average <input type="checkbox"/> | Other <input type="checkbox"/> | |

If all farmers were rated on a 10 (excellent) to 1 (poor) scale for managerial ability, at what level of skill rating would you give yourself for each of the following areas?

- | | |
|---------------------------------------|----------------------|
| 6. Animal/feed management | <input type="text"/> |
| 7. Soils/pasture/crop management | <input type="text"/> |
| 8. Labour/contractor management | <input type="text"/> |
| 9. Financial and marketing management | <input type="text"/> |
| 10. Long term (strategic) planning | <input type="text"/> |

11. Over the last FIVE years, by what per cent has your **average annual cash surplus**, after tax and mortgage payments, been increasing/decreasing? per cent
 (cross out one of INCREASE/DECREASE)

12. For the last FIVE years, by what per cent has your TOTAL NET ASSET VALUE increased/decreased? (cross out one of INCREASE/DECREASE) per cent

With respect to the production on your farm, where applicable and known:

13. What is your average lambing per cent survival to sale &/or into replacement flock? per cent

14. What is your average calving per cent survival to sale &/or into replacement herd? per cent

15. What is your estimate of your average wool production per hectare (greasy)? kgs

16. What is your average wool production per ewe (greasy)? kgs

17. What is your estimate of your average carcass meat production per hectare ? kgs

18. What is your average 'milk solids' production per hectare? kgs

19. What is your average 'milk solids' production per cow? kgs

THANK YOU VERY MUCH FOR TAKING THE TIME AND THOUGHT TO COMPLETE THIS QUESTIONNAIRE.

The results will be used to develop management skill training methods. They will also be published in the popular press for your general information.

Please return the completed questionnaire using the enclosed envelope. A stamp is NOT required.

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