A pilot study of the relationship between
Farmer Education and Good Farm Management

A report for the Rural Industries Research and Development Corporation
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Foreword

Over the past few years, there have been concerns that many Australian farms may not be viable in the long term. There also have been claims that this could be related to farmers’ level of education and training and their management expertise.

Research done in some developing countries pointed to a link between levels of education and agricultural output. This report deals with the literature on that relationship.

It sets out to define “farmer education” and “good farm management” and describes the nature and sources of farmer education.

It looks at how much formal education Australian farmers generally have and how much of their learning has been acquired informally and “on the job”.

The report concludes that Australian farmers are not as poorly educated as statistics on their formal education would suggest. Farmers placed much importance on life-long learning and the need for future farmers to be more highly educated.

The connection with productivity could be in the extent to which skills and competencies are developed and applied. This would need further research and this project sets out a framework for a comprehensive investigation into the relationship between farmer education and good farm management.

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Most of the literature review for the report, all the interviews, the initial analysis of the data and much of the writing of the report was undertaken by Annette Lamont whose commitment to the topic contributed to the high level of interest shown in the project by people in the local community and beyond.

Tony Dunn’s important contribution was in his advice on the design of the pilot study (including the interview questions and techniques), as well as on the analysis of the data collected. He also provided valuable advice on sources of information for the literature review, based on his considerable experience in agricultural extension and education. In addition, he undertook a considerable amount of editorial review.

As principal researcher for the project, Geoff Bamberry’s role was mainly a co-ordinating one focusing on the design and direction of the project and the report. His background in management, public policy and regional development was useful in writing sections of the material in Chapters 2, 4 and 6, as well as in writing the Conclusions and Recommendations of Chapter 8 and the Executive Summary. He also undertook much of the editorial work.

The research team obtained valuable advice from an advisory group, especially on the general direction and methodology of the study in the early stages of the project. Members included Andrew Smith, Robert Macklin and Eddie Oczkowski of the School of Management, and Allan Tunstall of the School of Agriculture. In addition, a considerable amount of preliminary work in defining the scope of the project was undertaken by Rod Francis of the School of Education.

The project team acknowledges the extensive input from Margaret Nichol of the School of Management and thanks her for her valuable support in processing numerous drafts of the report, as well as for designing the lay-out and for providing helpful advice and assistance on presentation including references and bibliography.
Executive Summary

Chapter 1: Introduction

This chapter outlined the background to the discussion paper, discussed some key issues relating to the terminology used, described the objectives for the project and outlined the structure and content of the paper.

It was pointed out that the project developed out of concerns emerging from claims that many Australian farms were not viable in the long term. While it was recognised that farmers faced problems in the economic environment, questions were raised about the level of farm management expertise of Australian farmers and their level of formal education. Comparisons had been made with some of our agricultural trading competitors with claims made that Australian farmers are less educated than their overseas counterparts. Also, there was some research undertaken in developing countries which seemed to show a link between levels of education and agricultural output. This led to the idea of reviewing the literature on the relationship between farmer education and farm management ability.

In the planning stage of the project it was decided to use the broader term ‘farmer competencies’ rather than ‘farmer education’. However, it was realised that this could lead to confusion. The literature generally uses ‘farmer education’ in the broader sense and good farm management is generally described, both by writers and farmers, in terms of competencies. It was therefore decided to use the term ‘farmer education’ but to subdivide it into formal and informal categories to reflect the significance of this distinction in the findings.

It was found that some of the original objectives for the project needed re-wording or modification. The revised objectives can be summed up as follows:

- to determine adequate operational definitions of farmer education and good farm management;
- to describe the nature and sources of farmer education;
- to comment on any initial findings regarding the relationship between farmer education and good farm management;
- to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management.

Finally, the structure and content of the discussion paper were outlined, including a brief statement of the aims and key issues covered in each chapter.

Chapter 2: Overview of the Agricultural Industry

The aim of this chapter was to provide an overview of the key factors influencing the agricultural industry in Australia to provide an overview of the economic and social factors impacting on farm management and farmer education.
The section on the domestic environment began with an overview of national economic factors such as the restructuring of the agricultural industry which has resulted in a decline in the number of farming establishments and an increase in their size. The literature also indicated the likelihood of Australia’s trade deficit continuing to be a problem in the short-term and commented on the potential for agriculture to reduce the deficit, particularly through value adding to agricultural commodities.

The literature drew attention to the impact of regional development on the agricultural sector. This occurs through government expenditure on programs to develop infra-structure and provide support for the expansion of existing businesses and the development of new businesses. These programs benefit the farming sector by encouraging the processing of primary products within the regions and through the creation of jobs which provide off-farm employment opportunities for members of farming families.

A related domestic impact on agriculture identified was the changing views of governments on the role of the public sector in areas such as decreasing budgetary allocations to agricultural extension services. Attention was drawn to the increased environmental awareness of farmers and their recognition of the need to pursue sustainable agricultural practices. Problems referred to in this context included financial constraints on farmers and insufficient government support for Landcare programs.

Reference was made to issues in the international environment having an impact on agriculture such as unfavourable terms of trade, exacerbated by subsidies paid to overseas producers by their governments. Progress in gaining greater market access for Australian produce was expected to be slow in the short-term but there were longer-term expectations for a more open global market which would provide opportunities.

A number of writers drew attention to the developed economies of North East Asia and the less developed but growing economies of South and South East Asia as expanding markets for Australian agricultural produce. Others suggested that political changes in Eastern Europe may lead to export opportunities for Australian producers though this could be accompanied by possible competition. Other potential international opportunities identified included demands for quality food free from contaminants. However, it was suggested that Australian producers would have to meet increasingly rigorous quality standards at the same time as maintaining sustainable agricultural practices.

While the precise nature of the impact of technological developments in agriculture was considered difficult to predict, it was generally accepted that past trends would continue, possibly at an accelerated pace. The adoption of new technology was thought to be crucial for the future competitiveness of the industry.

Marketing was identified by some as the most significant factor influencing the ability of the agricultural sector to take advantage of opportunities for business growth. Major trends in marketing were outlined and the need for producers to become more directly involved in marketing was raised.

Two areas were covered in the section on the human factor and social dimension in agriculture. The first described a range of adjustment strategies used by farming families to cope with structural change. While some have had to leave the industry abruptly, others have been able to make gradual changes such as reducing economic dependence on the family farm or gradually increasing the scale of farming enterprises. Second, there have been significant changes in the roles women play on farms. While more farm women are now engaging in off-farm work, there is also evidence that many are becoming increasingly involved in farm management activities such as financial management, marketing, technical monitoring and the development of new enterprises, in addition to traditional roles.
Chapter 3: Farmer Education

The main aim of this chapter was to review the literature on farmer education to see if it confirmed the view that higher levels of farmer education result in better farm management evidenced by higher levels of agricultural productivity. Other aims included identifying trends in the level of education of Australian farmers and identifying trends in farmer attitudes and preferences towards both formal and informal education.

The literature reflected little conclusive evidence of a strong relationship between levels of formal farmer education and agricultural productivity and, in turn, good farm management. While writers such as Wharton (1963) identified positive benefits of education in general, and Lockheed, Jamison and Lau (1980) claimed to have measured improvement in productivity in developing countries resulting from increased years of schooling, others such as Stayner (1969) and Phillips (1994) argued that, in Australia, factors in the external environment may have a greater effect on farm income than the level of farmers’ education. Buggie, in particular, argued that farmers’ intelligence, knowledge and self-awareness are more significant factors for farm management performance.

In relation to the level of education of farmers, it was found that some of the statistics are incomplete as they have not included the education levels of women and other family members involved in the operation of the farm. It was also argued that formal educational attainment is an inadequate measure of the level of farmer education in general as farmers educate themselves in a wide variety of informal ways which are difficult to measure. However, there is evidence that the levels of formal education of farmers are rising, particularly amongst younger farmers and women farmers.

A review of current approaches to formal agricultural education identified a wide range of findings. The McColl Report (1991) on the content and effectiveness of tertiary agricultural education looked at the impact of sectoral changes on the nature of future agricultural education. Key recommendations included the need to:

- obtain input from a broad range of disciplines;
- develop skills in integrating and applying knowledge from these disciplines;
- facilitate access by rural people to formal education through non-standard and special entry, articulation with TAFE courses and credit transfer.

In relation to farmer attitudes towards formal agricultural education and their level of participation in the system, the literature revealed concerns about the perceived low participation rates of farmers. Studies have identified a wide range of factors influencing farmer attitudes:

- the practicality and applicability of courses to farmers’ individual situations and local conditions;
- the availability of appropriate information about the content of courses and the teaching approaches used;
- delivery modes and assessment strategies making allowances for the seasonality of farm work and farm commitments.

While there was some common ground between farmers and educationists as to preferred content and delivery methods of courses, significant differences were also identified. Other factors affecting current approaches to formal agricultural education include the need:

- to attract more high quality students;
• to encourage the development of lifelong learning skills including self-directed learning, information handling and managing change;
• to expose students to a climate of intellectual inquiry and broad vision.

A review of the literature indicated that farmers learn from a wide variety of informal sources combined with ‘learning by doing.’ Within this approach, a wide range of information sources is being used, both spoken and written, recent developments being in the area of computer data bases and the Internet, and an increasing use of specialist advisers.

The other major development has been the increased use of farmer-directed groups. Advantages of these groups include:

• sharing of knowledge and information;
• identification of information needs;
• identification of farm management problems;
• recognition by members of the need to upgrade their skills in particular areas;
• realisation of the need to learn problem-solving skills to cope with change;
• ability to set the agenda in line with group needs.

Observation of these groups has helped to clarify how farmers learn and their preferences in approaches to learning. Comprehensive lists of these preferences have been provided in the literature. These preferences can be summed up as follows:

• content - meeting specific needs for knowledge and skills relevant to current and future developments, including learning skills;
• approach - short, modularised courses encouraging participation, project-based learning, developing competencies, practical, measurable outcomes;
• delivery - flexibility to accommodate seasonal work demands, home study plus local support where possible, provision for some social interaction.

The literature reviewed had little to say about measuring the levels of farmer education in its broader sense. Years of schooling is used as a measure in some of the economics-oriented literature, particularly in relation to developing countries. Census data from the Australian Bureau of Statistics focuses on ‘highest level of qualification attained’ as a measure which takes account of formal education only. Measurement of informal education may require a new approach with emphasis on competencies. This is discussed further in Chapter 6 in relation to competency-based learning and recognition of prior learning.

Chapter 4: Farm Management as an Academic Discipline

The review of the literature has shown that the academic discipline of farm management has changed significantly over a number of years, influencing the content of courses in this area of study. The early emphasis on farm production economics covered areas such as budgeting (including the gross margin and cash flow budgeting) and production planning. Production economics came to be seen as too limiting and its critics advocated a ‘whole farm’ approach emphasising the multidisciplinary nature of farm management. Dean (1968) argued that this approach was generally accurate but was not clearly defined.
Other approaches included farm business management, agricultural economics, farm management accounting and the integrated husbandry approach. Dean considered all of these to have ‘too narrow a view.’ An additional approach, referred to as ‘the science and business of farming,’ was regarded by Dean as being incomplete due to various social and financial aspects being overlooked.

Further contributions to the academic discipline from systems theory, the social sciences, business management and information science have broadened farm management into a multidisciplinary field of study. Schapper (1966) provided a clearer definition of the discipline and argued that it comprised technical, financial, sociological and psychological components. Buggie’s research (1981) confirmed this and identified key areas which needed further research to provide a more comprehensive view of the farm as a socio-technical system. He argues that lack of co-operation between contributing disciplines has impeded the development of farm management as an integrated academic discipline.

The chapter continued with an overview of the strengths and limitations of farm management as an academic discipline followed by a discussion of how changes in the discipline have been reflected in the content of courses. In general, broader, more integrative courses are being offered covering the range of ‘components’ identified by Schapper, Buggie and others. At the same time, contributing disciplines have provided more narrowly-focused courses in areas such as farm financial management and agricultural marketing.

However, while farm management has incorporated ideas from other disciplines, there is still a tendency for the input from the social sciences, other than economics, to be limited. Scrutiny of courses often reveals a lack of appreciation of the complex interactions between people on and off the farm - forces which provide the farming enterprise with its purpose and goals. Such processes, where addressed, tend to be included in subjects in the Extension area.

Chapter 5: Good Farm Management

The aim for this chapter was to review the literature to see if there was a consensus as to what constitutes good farm management. This began with an overview of the economic forces impacting on farm management that must be dealt with to achieve good farm management. Such economic forces were found to include structural adjustment, the decline in the terms of trade for agricultural commodities, the effects of deregulation, developments in globalised agricultural trade such as quality standards, and issues of sustainability.

Criticisms of current approaches to farm management in Australia were reviewed as these are useful in suggesting what needs to be done to improve the standard of farm management. While many of the criticisms related to weaknesses identified in marketing, other areas of criticism related to inadequacies in long term planning, political and industry impediments and the need for more progressive attitudes.

These areas were followed by the central theme of the chapter, identifying what constitutes good farm management. There is general consensus in the literature on an extensive listing of the competencies required for good farm management and these were summed up in the following broad categories:

- management of the technical aspects of farming;
- decision-making and planning;
- financial management;
- marketing management;
- human and physical resource management;
integrative skills;
personal attributes.

This was followed, for comparative purposes, with a review of the key competencies for good management identified in the general business management literature. It was found that while there are many managerial competencies common to both areas of management there are also significant differences mainly related to variations in the size of organisations, the scale and breadth of operations, the human resource element and differences in financial management.

The chapter concluded with a detailed review of the literature on measuring good farm management. This included material on the problems of measuring management ability, using size and output categories as measures, and using various benchmarks to measure good farm management.

**Chapter 6: Competency-Based Training in Farm Management**

This chapter reviewed the literature on competency-based training in agriculture. There has been an increased interest in vocational education in recent years, including governmental legislation and policies on industry training. Related developments have become known as the Training Reform Agenda and include areas such as national competency standards, the assessment of competencies for various industries, recognised prior learning, credit transfer, course articulation and competency-based training.

Various groups in the agricultural industry have recognised the need to raise the standards of training and have sought to develop national competency standards for different sections of the industry. Professional associations in agriculture have been active in these developments, one example being the Australian Institute of Agricultural Science (AIAS) which offers professional accreditation to people in rural industries through its CPAg program (Certified Practising Agriculturalist).

Following consultation within the industry across Australia, the Rural Training Council of Australia (RTCA) formulated national competency standards in ten major areas. While the proponents comment enthusiastically on the benefits of using these standards as the basis for assessing competencies and for developing training programs, potential shortcomings have also been identified in their application to farm management. These were outlined in the chapter.

The assessment or auditing of farmers' competencies was seen to be important in determining the training and education needs of farmers. While basic competencies can be easily assessed, it is more difficult to assess higher-order competencies such as decision-making, processing information, and co-ordinating a number of activities. Despite the difficulties, tools have been devised, such as the Skills Evaluation and Education Kit prepared by Stephens, McGuckian and associates, to assist in the process of assessment and auditing.

Recognised prior learning (RPL) has been developed as a means of formally assessing knowledge and skills gained through work and life experience. It is seen as especially useful for assessing farmer competencies gained through informal education. However, further work is said to be needed to make RPL more cost-effective. Other methods being used to reduce training costs and open up opportunities include credit transfer (i.e. recognition of previous formal education with exemption from part of a proposed course) and course articulation, where further formal study can be added to formal study completed at a lower level.

A case study of competency-based training within the Westpac Banking Corporation was provided for comparative purposes, followed by an overview of some examples of competency-based training in
agriculture. These include current and proposed TAFE courses in farm business management, a course linking TAFE studies with the Bachelor of Business at Southern Cross University and courses offered through the combined efforts of the National Farmers’ Federation, TAFE and the Industry Training Advisory Board for Agriculture. Jackson (1995) has argued that competency-based training can be incorporated into the higher cognitive development areas included in university courses.

Chapter 7: The Farmer Interviews - Methodology and Findings

This chapter was divided into two parts: Part A described the methodology used and Part B outlined the findings from the farmer interviews. Part A began with the main aims of the survey which were to interview farmers in the Coolamon district to obtain data on their previous learning experiences and their current approaches to farmer education as well as their views on what constitutes good farm management.

The methodology involved a series of in-depth interviews of sixteen farmers (seven couples and two single farmers) based on a semi-structured interviewing technique. Because of its exploratory nature, this approach was thought to provide a better understanding of farmers’ views than responses to a written questionnaire. The responses indicated that the methodology was appropriate. Part A also included an outline of the criteria for the number and selection of interviewees as well as the interview procedures and protocol. Approaches to analysing the data were discussed and the advantages and limitations of the methodology were listed.

Part B outlined the findings of the interviews, first outlining farmers’ previous learning experiences and their current approaches to learning, and second, discussing their views of what constitutes good farm management. Responses about previous formal education varied from those who felt it had not been relevant for their farming career to those who commented that agricultural college or university had been a good preparation for farming. The main advantages of previous formal education were said to be learning how to learn. In discussing current learning, formal education was mentioned infrequently - generally short courses to obtain specific knowledge and skills needed.

Responses about previous informal education indicated that it often began with growing up on a family farm and developed through learning by experience in working on a farm. Family members, neighbours and friends were mentioned as important influences. Current informal education sources included other farmers, family and friends in other businesses, visits to other farms, organised field days, agricultural suppliers and service providers, agricultural consultants, seminars and conferences, farmer associations and farmer-directed groups, as well as media including newspapers, journals, radio and television.

Those interviewed saw education as a life-long process of information gathering, sorting, analysing and evaluation. The main triggers for learning mentioned were solving specific problems, pursuing opportunities, learning about changes in the farming environment and implementing change. Most commented that they expected future farmers to obtain a higher level of formal education, including an understanding of external factors affecting the management of the farm as well as the technical and management aspects. Most of the farming families interviewed were encouraging their children to extend their formal education.

Accreditation was identified as likely to influence farmer education in the future, some seeing its potential for providing expertise and formal qualifications which would be useful for new farm enterprises or off-farm business ventures. Other expected influences included structural change affecting the scale of farming operations and the increasing rate of change in the use of technology. Mention was made of the need to improve the image of farming as a career, to bolster morale to encourage farmers to undertake further education, and to attract capable people into farming.
In seeking their views on what constituted good farm management, key areas of questioning included areas such as changes in farm management practices, definitions of farm management, the competencies required for farm management, their perceptions of good farm managers, and measuring good farm management.

Respondents were asked what they thought were the key factors that had triggered changes in their farm management practices and to give examples of changes they had introduced. Some commented that changes had been triggered by emerging opportunities or by problems requiring attention, both being related to farm profitability. The changes ranged from production management such as the introduction of canola, the use of new techniques such as direct drilling, stubble retention and minimum tillage to business management factors such as the use of computers and changes in approaches to marketing.

In defining farm management, a long list of factors emerged which can be summed up in the following areas: decision-making, financial management, technical aspects and local knowledge, marketing, risk management, planning and managing change, establishing an appropriate farm business structure and handling family relationships. Respondents also frequently included personal attributes and the need to integrate the various components.

Responses on farm management competencies can be grouped into the following areas: effective decision-making ability, financial management skills, technical skills, local knowledge and resource management skills, marketing ability, ability to experiment and change, business management skills, lifelong learning skills and a range of personal attributes. The competencies identified were consistent with general definitions of farm management and emphasised the large range of skills required.

The main ways of measuring good farm management mentioned were financial monitoring, technical monitoring and obtaining feedback from out-sourced expertise. While different practices emerged, all farmers commented on the importance of monitoring and evaluating.

Chapter 8: Conclusions and Recommendations

The main aim of Chapter 8 was to sum up the findings of the literature review and the farmer interviews in relation to the project objectives, to outline any additional findings and to list some recommendations.

In relation to the objective of describing the nature and sources of farmer education, it was found that while some farmers are obtaining their initial farmer education through formal sources, there are many who obtain most of their education in farm management from informal sources and learning on the job. Changes in the content of formal education in farm management have reflected changes in approaches within the academic discipline with a trend towards approaches which are multi-disciplinary and integrative in nature.

Informal education was found to come from a very wide range of sources with an increasing significance in the role of farmer-directed groups. Farmers were found to often engage in a style of learning associated with information gathering and sorting to deal with specific problems and opportunities. Their preferred approaches to learning have implications for organisations involved in farmer education.
In relation to the objective of determining an operational definition of farmer education, it was found that the definition needs to include both formal and informal components. Measurement was found to be difficult in that while traditional measures such as highest qualification achieved can be used for formal education, measures for informal education have not been available. Use of the Australian Standards Framework (ASF) system, together with national competency standards, was discussed as a potential approach to help determine an operational definition.

Similarly, it was found that there are difficulties in defining the broad area of farm management and in measuring how well it is practised. It was found that farm management was generally defined in terms of competencies, summed up in the following broad categories:

- financial viability skills;
- technical skills;
- business management skills;
- human and physical resource management skills;
- personal attributes.

The literature on farm management as an academic discipline was found to have much in common with the above broad categories though with less emphasis on competencies and the social aspects of farm management. A comparison of farm management competencies with general business management competencies found that while there are many similarities, there are also some significant differences.

Key points from a detailed discussion on the difficulties in constructing precise measures of good farm management focussed on the need to take a long-term approach, the need to make allowances for different categories of farms (e.g. size, full or part-time operation, etc.) and the need to identify critical areas for success. Reference was made to recent developments in these areas in programs such as the FAST Project where key financial indicators have been identified and have been applied in benchmarking systems.

In meeting the objective of commenting on any initial findings on the relationship between farmer education and good farm management, it was found that there is little conclusive evidence of the relationship in measurable terms. However, there is a general consensus in the literature and amongst farmers interviewed that a strong relationship exists.

It appears that Australian farmers are not as poorly educated as statistics on their formal education suggest because of their practice of gaining much of their education informally. Approaches seeking to measure the relationship in terms of productivity outputs were generally seen as unsatisfactory in the Australian context, especially where attempts were made to make comparisons with other countries. Evidence of the importance placed on education by farmers was seen in their comments that it was a life-long process, their views that future farmers would need higher levels of formal education, and the trend for them to encourage their children to undertake additional formal education.

The final objective for the project was to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management. It was argued that if a long-term objective is to improve profitability and viability of farming enterprises, future research needs to focus on those factors which make the greatest contribution. A series of
investigations into related areas may be more appropriate than a single investigation into the relationship between farmer education and good farm management.

One approach identified as having potential is for a study of enterprises recognised as being successful by the FAST Project to identify the success factors. Farmer education could then be designed to enable farmers to learn about these successful approaches to farm management. It was also suggested that because of the wide scope of farm management, a better understanding of it could be achieved by research into its various components such as finance, marketing, etc. Other areas of farm management suggested for further research include:

- further identification and clarification of farm management competencies and updating previous work in this area;
- developing strategies to help integrate the knowledge and skills of women into the mainstream of farm management and to assist in their further development;
- investigating the existing and potential use of out-sourced expertise and advice in farm management.

As well as investigating how the success factors in farm management could be linked to the content of farmer education, other suggestions for further investigation included the following areas:

- the contribution of informal education to farm management ability and potential additional sources of informal education;
- how the concept of life-long learning by farmers can be incorporated into access to and provision of farmer education appropriate to the various stages of a their career and the stage of development of their farming enterprises;
- the learning techniques used by farmers in their informal education and how these techniques might be adapted for use in formal learning contexts and in the provision of information on the Internet;
- the use of farmer groups as a means of raising farmers’ awareness of farm management competencies and providing an avenue for learning in this area.
Chapter 1: Introduction

Background to the Project

This project developed out of concerns emerging from claims that many of Australia’s farming enterprises were struggling to survive, that many were no longer viable in their long-term ability to provide an adequate return to their owners and that only a limited percentage of farms could be viewed as successful and sustainable enterprises. While it was recognised that many of the problems resulted from long-term economic forces beyond the control of farmers, questions were raised about the level of farm management expertise of Australian farmers. This in turn raised questions about the levels of formal education of farmers. Was a lack of formal education affecting the ability of farmers to manage their farming enterprises effectively?

Australian Bureau of Statistics (1992) data suggests that compared to other sectors in the Australian economy agriculture has the lowest percentage of employed persons with post-school qualifications - 31 per cent compared to an overall average of 51 per cent. Further, there is evidence to suggest that compared with some of our agricultural trading competitors Australians are less well educated (Maglen, 1990). For example, the labour force with university degrees in Australia is 8 per cent whereas in the United States of America it is 19 per cent. If these lower levels of education translate to the lower productivity and performance rates for Australian farmers, then these education rates represent a reason for serious concern.

There is some econometric evidence showing a positive and significant relationship between education levels of farmers and agricultural productivity (Jamison & Lau, 1982). However, this econometric evidence may be misleading as it is narrowly focused. The literature uses narrowly defined measures of education such as high-schooling only, and measures productivity purely from a technical efficiency perspective (i.e., input-output ratios). The studies commonly referred to in this regard have primarily been carried out in developing countries in an environment where technical improvements have made a high impact which may distort the effects of education. No conclusive evidence has been found for the Australian situation.

On the other hand, it has been argued that it is inappropriate to attempt to judge the educational levels of Australian farmers by looking at their levels of formal education. It is well known that many farmers, particularly in the past, did not undertake formal education beyond secondary school. However, most of these farmers gained an informal education, initially by learning on the job while growing up on a family farm or through the jackaroo system and later by a continuous approach to learning by doing and through a wide range of experiences and sources of information.

Terminology

In the planning stage of the project we considered not using the term ‘farmer education’ but substituting a broader term ‘farmer competencies’ which would encompass a number of areas of farmers’ learning such as knowledge, skills, experience and attitudes. However, as we progressed with the literature review we realised that taking this approach could lead to confusion for those reading the report.
First, the literature we reviewed generally used the term ‘farmer education’ in the broader sense in which we planned to consider it. The more logical way of dealing with the breadth of the concept seemed to be to divide it into formal and informal farmer education. The term ‘formal education’ is used to cover learning obtained through formal institutions, usually through structured courses, either long or short in duration and including knowledge, skills and attitudes. Knowledge is frequently subdivided into two types, ‘theoretical’ and ‘practical,’ though these terms are generally not defined. A particular category of skills is frequently referred to as ‘generic’ skills or learning, to cover areas such as decision-making or ‘learning to learn.’ Informal education is generally used to cover other forms of farmer education such as growing up on a farm, learning while working on a farm including the jackaroo system, attending field days, attending seminars and obtaining information from a wide range of sources, both interpersonal and mass media.

Second, we found that, when writers set out to discuss good farm management or when farmers sought to explain what they thought constituted good farm management, both groups tended to do this by listing a range of competencies and personal attributes. In addition there was another body of literature dealing with national competency standards in industry and competency-based training. We concluded that to attempt to use the term ‘farmer competency’ as a substitute for ‘farmer education’ would cause confusion. We have therefore used the term ‘farmer education’ but in its broader sense of both formal and informal education as outlined above. The terms competency/competencies have been used, as in the literature, to explain what constitutes good farm management as well as to discuss issues associated with the national training agenda such as national competency standards and competency-based training.

Objectives

Making the substitutions in the terminology as outlined above, the original objectives (as set out in the project submission) included the primary objective of establishing a framework for a comprehensive and subsequent investigation into the relationship between farmer education and farm management ability. Sub-objectives included the following: to determine adequate operational definitions of farmer education and farm management ability, to ascertain, based on interview data from a pilot study, an initial indication of the extent and type of education held by farmers, the extent to which good farm management is practised and the strength of the relationship between farmer education and good farm management.

Initial reading of the literature together with preliminary discussions held with a number of people indicated the need for some modifications to the original objectives. The wording of some of the original objectives associated with the interviews planned for the pilot study seemed to imply the need for quantitative analysis inappropriate for such a small-scale survey. A more qualitative approach was therefore taken.

Rather than focus on the extent and type of education held by farmers, attention was directed towards its general nature. This included the sources of their education, with particular emphasis on the wide range of informal sources. Similarly rather than focus on the extent to which good farm management is practised, farmers were asked to provide detailed comments on their perceptions of good farm management, including descriptions of the qualities of good farm managers known to them. It was felt that these modifications would overcome the potential problems identified, while still contributing to the objective of determining adequate operational definitions of farmer education and farm management ability as well as helping to establish a framework for a subsequent investigation into the relationship between the two areas.
Structure and Content of the Discussion Paper

It was felt that in reviewing the literature on farmer education and farm management there was a need to view these concepts and developments associated with them in a broader context. It was therefore decided to provide an overview of the agricultural industry in Australia. This material has been included as Chapter 2 and covers five broad areas: the domestic environment, the international environment, technological developments, the marketing environment, and the human and social dimension.

Chapter 3 seeks to meet the project objective of reviewing the literature on farmer education to explore the viewpoints observed in preliminary reviews that higher levels of farmer education lead to higher levels of agricultural productivity. Other issues investigated in the literature include trends in the level of formal educational achievement of Australian farmers, problems of measuring these levels, trends in the nature and content of formal and informal farmer education, farmers’ attitudes towards these two approaches to education and their personal preferences in approaches to learning.

The literature review identified a significant body of information on farm management as an academic discipline. Its impact on farmer education seemed to justify its inclusion as a separate chapter (Chapter 4). The review shows that the academic discipline, to a certain degree, has moved away from a farm production and agricultural economics orientation to a broader multidisciplinary approach. The review shows how these developments have affected the content of courses and textbooks on farm management. It shows that material from a range of disciplines has been included in more integrative textbooks and courses and, in addition, material from some of these disciplinary areas has been developed into specific courses.

The literature on farmer education also included a body of information on national competency standards and competency-based training in farm management. This is part of a development which has become known as the Training Reform Agenda which also includes issues such as recognised prior learning, credit transfer and course articulation. While this material could have been included in the chapters on farmer education, because of its emphasis on competency-based training for farm management, it was felt that this material would be better placed as Chapter 6, after the chapter on Farm Management which also has a strong emphasis on competencies. In addition, a case study on competency-based training in management is outlined for comparative purposes and a section on ‘raising professional standards in agriculture’ is included because of its focus on competencies.

The project objective of seeking an operational definition of good farm management is addressed in Chapter 5. To see if there is a general consensus on the definition, a broad perspective is taken in reviewing the literature. First, the literature providing a general overview of current economic influences on farm management is reviewed, followed by an overview of criticisms of current approaches to farm management in Australia. It is felt that this literature provides some indication of the requirements for good farm management.

This is followed by a focus on the central issue of identifying definitions of good farm management in the literature. Most of these are expressed in terms of competencies and personal attributes. For comparative purposes some of the general business management literature is reviewed showing that good management in that area has also generally been defined in terms of competencies and personal attributes. Literature on measuring farm management is also reviewed for its value in helping to clarify what constitutes good farm management.
Chapter 7 covers the pilot study mentioned in the objectives. Owners of nine farming enterprises were interviewed, in seven cases husband and wife being present. The in-depth interviews generated a considerable amount of useful data. Farmers were asked about the major influences on their farming education in the past, their current sources of information, the learning processes they used and their expectations about farmer education in the future.

In seeking their views on good farm management, farmers were initially asked what they believed to be the key issues in farm management, what had triggered change in their farm management practices and to give examples of changes they had introduced. Other more direct questions were asked on how they defined farm management and what they regarded as the competencies required for good farm management. The latter information was sought in association with questions asking them to identify and describe examples of good farm managers known to them.

Chapter 8 is a concluding chapter summing up the findings of the literature review and the interviews in terms of the objectives set down for the project.

Summary

This chapter outlined the background to the discussion paper, discussed some key issues relating to the terminology used, described the objectives for the project and outlined the structure and content of the paper.

It pointed out that the project developed out of concerns emerging from claims that many Australian farms were not viable in the long term. While it was recognised that farmers faced problems in the economic environment, questions were raised about the level of farm management expertise of Australian farmers and their level of formal education. Comparisons had been made with some of our agricultural trading competitors with claims made that Australian farmers are less educated than their overseas counterparts. Also, there was some research undertaken in developing countries which seemed to show a link between levels of education and agricultural output. This led to the idea of reviewing the literature on the relationship between farmer education and farm management ability.

In the planning stage of the project it was decided to use the broader term ‘farmer competencies’ rather than ‘farmer education’. However, it was realised that this could lead to confusion. The literature generally uses ‘farmer education’ in the broader sense and good farm management is generally described, both by writers and farmers, in terms of competencies. It was therefore decided to use the term ‘farmer education’ but to subdivide it into formal and informal categories to reflect the significance of this distinction in the findings.

It was found that some of the original objectives for the project needed re-wording or modification. The revised objectives can be summed up as follows:

- to determine adequate operational definitions of farmer education and good farm management;
- to describe the nature and sources of farmer education;
- to comment on any initial findings regarding the relationship between farmer education and good farm management;
- to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management.

Finally, the structure and content of the discussion paper were outlined, including a brief statement of the aims and key issues covered in each chapter.
Chapter 2: Overview of the Agricultural Industry

Introduction

This chapter provides an overview of the agricultural industry in Australia. It begins with a review of the literature on domestic and international factors influencing the environment in which farm managers operate. Other factors impacting on the future directions of the agricultural industry are also discussed. This is followed by a discussion of the role of technological development in the industry. The marketing environment is addressed as an issue attracting increasing attention in farm management and the industry as a whole.

The final section of this chapter reviews some of the literature on the human and social dimensions of agriculture which influence the response of farm managers to their operating environment. The impact of human behaviour on agricultural adjustment and the increasing awareness of the role of women and family members in farm businesses are discussed to emphasise the impact of social and behavioural factors on farm management.

The Domestic Environment

National Economic Factors

The New South Wales Standing Committee on State Development, as part of its review of regional business development, prepared a discussion paper on ‘Trends, Policies and Issues.’ The Discussion Paper identified a number of trends bringing about changes in the structure of Australian agriculture over the past few decades. These trends include the following:

- a dramatically declining contribution by the agricultural sector to both gross domestic product and to export earnings;
- a substantial decline in the overall number of farms and an increase in their size;
- continuing technological change and a significant fall in the number of people employed in agriculture;
- an increase in the amount of off-farm work undertaken by farmers and their partners;
- low commodity prices currently paid to farmers in a number of key sectors, with resulting falls in farm incomes;
- difficulties in the marketing and sale of some products, for example, wool;
- severe drought across much of inland eastern Australia;
- an escalating level of farm debt in the late 1980s, caused in some cases by farmers purchasing additional property at inflated prices then facing very high real interest rates;
- an increasingly uncertain international trading environment, with growing and well-publicised allegations by Australian farmers against the agricultural policies of foreign governments which either protect their own primary producers through subsidies or allow the dumping of their products in markets traditionally serviced by Australia; and
- a rise in the amount of government assistance given to farmers, for example through the Commonwealth’s Rural Adjustment Scheme.
The Discussion Paper also provided some statistical evidence to show the level of change that has occurred. The following are some indicators of this change (ABARE, 1992, in NSW Standing Committee on State Development, 1993, p. 41):

- The number of agricultural establishments has declined from a peak of 205,700 in 1955-56 to 124,975 in 1990-91.
- The number of people employed on farms (including self-employed, paid employees and unpaid family workers) fell from the peak of 488,600 in 1953-54 to 373,700 in 1991-92.
- The percentage of the workforce employed on farms has fallen from 10.3 per cent in 1962-63 to 5 per cent in 1991-92.
- The contribution of the farm sector to GDP has dropped from 26.1 per cent in 1950-51 to 2.6 per cent in 1991-92, while the non-farm rural contribution has fallen from 12.2 per cent in 1963-64 to 3.3 per cent in 1990-91.
- The contribution of farm produce to total exports has fallen from 83.5 per cent in 1950-51 to 20.6 per cent in 1991-92.

Australia’s trade deficit is highly likely to dominate economic policy in the short term. It is increasingly argued that a reduction in this deficit will not come from a resurgence of traditional manufactured exports alone. Pappas et al. (1989), in their assessment of the Australian manufacturing economy, support this view. They have pointed out that manufacturing for export in Australia is disadvantaged by distance from world markets, the fact that small domestic markets require growing firms to make premature investments in export infrastructure, Australia’s commodity-driven currency, and the pressures to move production off-shore since the volumes required to competitively service overseas markets are huge compared to Australia’s domestic markets.

They further argue that it is the potential volumes in primary industries for value-adding that can make an impact on the trade deficit. This will require identification of where our comparative advantage lies and may call for major changes in manufacturing and agricultural policy in Australia. In a related study, however, Banks, Pearce and Vincent of the Australian National University made the point that increasing production from primary industry to overcome the trade deficit with current technology is ultimately limited without putting land and water resources at risk (in Reeve et al., 1990, p. 6).

**Regional Economic Factors**

The trends outlined above have had a significant impact on regional economies. This impact is said to be occurring through the processes of farm amalgamation, farm enlargement and the shedding of non-family labour from farms (Taylor, 1991, p. 257, in NSW Standing Committee, 1993, p. 42). These processes in turn have impacted on regional areas resulting in a decline in the economic prosperity of some of the smaller rural towns. Taylor comments that ‘fewer farms in rural areas means fewer clients for businesses in rural towns to serve and, therefore, fewer jobs.’ For example, in the Coolamon Shire the number of agricultural establishments dropped from 351 in 1980 to 300 in 1987 and to 267 in 1992 (Bamberry & Norris, 1996a, p. 11; ABS, 1981-94).

On the other hand, some analysts argue that the decline in the farm sector has not been as serious as the impression given in the media. Sorensen has outlined the following points to show that there are also some positive trends when a broader view is taken of the rural economy:

- several primary industries are currently [in 1991] doing well, such as cotton, beef, wine, pigs and parts of horticulture;
- the recession’s severity varies from one farm to the next according to the quality of financial management, with debt free farms generally not at risk;
- often analysts ignore off-farm income when speaking about the difficulties of farmers;
- rural areas are now used for many more economic activities than was the case in the past, including tourism and recreation, hobby farming, rural retreating, long-distance commuting, education and diversified industries;
- the coming of corporations to country areas is providing increased capacity to survive downturns;
- the unemployment rate in many country towns is either no worse than, and in some cases, is better than that in the metropolitan area; and
- the emotional appeal of the traditional family farm which has been in the family for possibly many generations may obscure a more hard-headed approach to business failure (Sorensen, 1991, pp. 19-20).

These points tend to support the view that the agricultural sector is not under as much threat as implied by some commentators and that the role of agriculture in many rural economies is no longer as critical as it was previously. The latter point of view has been argued by Stayner and Reeve in what has been referred to as ‘the uncoupling thesis,’ i.e. there has been a break in the economic dependence linkage of regional areas on the agricultural sector. Stayner and Reeve outline the following as factors contributing to the loosening of the linkages:

- replacement of labour-intensive farm-based inputs by more technologically complex purchased inputs has moved the location of value-adding processes from on or near-farm to the larger regional centres or metropolitan areas;
- there is an increasing complexity of capital inputs, with local firms less likely to be able to service them;
- the substitution of off-farm or contract labour for on-farm labour has led to a leakage of income from the local area;
- increasing debt servicing is also leading to more leakage of farm income from the local area;
- changes are occurring in retailing, with the growth of larger retailers in the main centres providing the increasingly sophisticated range of products required;
- centralising tendencies in the professions have favoured the larger centres, with an increasing number of business and related services only available there, and better roads and cars making it easier to get to those centres; and
- the main features of the population turnaround have been unrelated to farming - internal migration has favoured several types of rural settlements, and this has lessened the relationship between farming and the towns (Stayner & Reeve, 1990, pp. 2-3, in NSW Standing Committee, 1993, p. 44).

The New South Wales Standing Committee commented in its Discussion Paper that the work of Stayner and Reeve indicates that the view that the economies of rural regions are highly dependent on the agricultural sector is outdated in a majority of cases and that ‘the explanation of the economies of many rural regions is far more complex.’ However, the Paper goes on to add that the economic performance of the farming sector is still critical in a number of non-metropolitan regions (NSW Standing Committee, 1993, p. 45).

In terms of government policy, the concentration of Australia’s population in major urban centres adds to the difficulty of attracting government support to the agricultural producer and rural population. There is a general lack of awareness of rural life by city dwellers. The vast majority of the Australian population lives in coastal cities and many of these people have no experience of rural life. There is no widespread support from metropolitan residents to preserve or subsidise the infrastructure required for people to live in rural areas.

The recent closure or relocation of many government services from regional locations to major urban centres exemplifies current policy in this area. The lack of adequate government support for long-term
regional development has a significant impact on employment opportunities for the rural population, as well as affecting levels of infrastructure required for the processing and transport of agricultural produce. There is also the broader effect of the provision of services such as education, health and infrastructure in attracting economic development investment from outside the rural regions.

In some cases the viability of a country town and its ability to adequately service its surrounding agricultural area can be threatened by inappropriate policy decisions by the local government authority. An example of this is the proposal by the Berrigan Shire Council to move its administrative centre from the town of Berrigan which has not been growing to the town of Tocumwal which has experienced consistent growth. Implementation of such a proposal could set in motion a cumulative process of decline for the town of Berrigan and damage its ability to provide services and some sources of employment for the surrounding agricultural area (Bamberry, 1996b).

The issue of regional development affects a wide spectrum of farmers, from those adjusting out of the industry to those pioneering its most innovative developments. At present, opportunities for off-farm employment by family members are limited because of the generally small scale of regional manufacturing such as value adding to farm products. For example, a study of manufacturing in the Riverina Region found that 92 per cent of all manufacturing establishments in the region in 1992 employed fewer than 50 people, and in most cases fewer than 20. Even the larger regional centres such as Wagga Wagga and Griffith provide limited employment in manufacturing with 2,809 and 1,678 jobs respectively. Additional value adding and manufacturing needs to be undertaken in country towns and cities to stimulate regional development which in turn would provide economic opportunities for the rural sector (Bamberry, 1995b). Increased political awareness and representation may be required by members of the rural community to address these issues (Clark, pers. comm.).

Changes in the Relationships Between the Public Sector and Agriculture

Major changes have occurred as a result of decreasing budgetary allocations to traditional extension and support services for producers, as well as through public pressure on government to deal with problems of food quality. Examples of changes in the relationships between the public sector and agriculture include (Reeve et al., 1990):

- deregulation of marketing arrangements;
- reduction in state extension services;
- increased regulation of areas such as product quality, land use and other environmental factors;
- increased focus of government-sponsored research on short-term productivity gains or areas with a high political priority (e.g., changes in Victorian research proposed in the Baker Review);
- targeting, in departmental extension, of farmers using unsustainable practices rather than the successful innovative farmers;
- increasing influence over farmers’ management practices by agencies such as soil conservation services.

Sustainable Agriculture and Environmental Awareness

Many facets of the agricultural production process will become increasingly affected by these issues. Government regulations on chemical use, land use, water quality, product quality and other related areas may increase over the short term. Producers will have to consider long term sustainability of their production processes in terms of their natural resources. This will have implications for production, management and marketing functions.

Results from a survey conducted by the New South Wales Environmental Protection Agency (1994) illustrate significant differences in attitudes between respondents from the city and the country. Country people were found to be more knowledgeable and more aware of their impact on the environment than their city counterparts. They placed a high emphasis on waste management and
disposal, and water quality in creeks and rivers. They also identified soil erosion and land degradation as environmental priorities. City counterparts emphasised ocean and beach pollution, fresh water and air pollution as the most important issues. Country people had more positive attitudes towards the environment and felt as individuals they could do a lot to help protect the environment. The NEP scale (New Environmental Paradigm) was used to test peoples’ attitudes towards the environment. The higher the NEP score the more pro-environment people are.

- NEP scores tended to rise with household income;
- respondents in rural areas, small towns and Newcastle and Wollongong had the highest proportion of high NEP scores;
- younger people tended to have higher NEP scores;
- NEP scores tended to rise with levels of education.

It is interesting to consider these results in terms of farmers’ commitment to sustainability and the dilemma they face in attempting to improve profitability while ensuring the sustainability of their natural resources (Reeve, in Lawrence et al. (eds), 1992). There is evidence of farmers’ frustration with increasing government regulation on rural environmental issues without adequate consideration given to the availability of resources to carry out required programs. A degree of frustration is also evident with the Landcare movement in this regard. Many farmers feel overwhelmed by the environmental challenges they face, particularly when they also feel ill-equipped physically and financially to deal with them. Failure to act will increase their problems. Leading farmers in the Landcare movement have limits on the time and resources they can commit to increasing general awareness of the issues and are keen to see more progress in implementation of programs on-farm (Martin & Green, pers. comm.).

**Structural Changes in the Agricultural Industry**

The pervading cost-price squeeze is generally regarded as being a significant factor affecting the expansion of larger farms and the changes in income sources for smaller farms. However, many problems in the structure of the Australian agricultural industry today have arisen historically as a result of larger land holdings being divided after World War I and World War II to provide land for returning soldiers. Many holdings were too small to remain viable and others have become so over time or through further subdivision. At the same time, in many areas, with the trend for a reduction in the number of agricultural establishments, the ensuing merging of farms has resulted in an increase in the size of farms.

The pervading ethos that ‘farmers must farm’ has perpetuated the problem of people remaining on unviable-sized farms. Farms in this category cannot adequately support a family and this has affected farm operation and development. Although it is anticipated that larger farms will continue to be predominantly family run, land ownership systems may change due to the difficulty faced in financing increased land purchases at a time of reduced farm income.

These fewer larger farms will be more complex business units and will require significant changes in management practices. Smaller farms will continue the trend of reliance on off-farm income to supplement farm income. The issue of regional development will be relevant in the provision of infrastructure for expanding farm businesses and the provision of opportunities to supplement farm income with off-farm employment. Other strategies to improve profitability when limitations are imposed by farm size include:

- viable diversification;
- value-adding production enterprises;
- co-operation to enhance the scale of operations;
- time management;
- use of advisors and;
• strict cost controls. (Clark, pers. comm.).

The adoption of these strategies will have implications for changed management practices and skills.

The Impact of Drought on Farm Financial Performance in the 1994/1995 Period

The impact of the 1994/95 drought on farm incomes and profitability will continue to have a significant impact on incomes into the following period. The proportion of farms with negative farm income is expected to remain constant at about 67 per cent in the 95/96 period. The decline in farm profit is chiefly the result of lower farm cash incomes, as the changes in trading stocks and imputed values from operator and family labour and depreciation are mostly unchanged from the previous year. The regional variation in broadacre income and profitability is significant in the 94/95 period due mainly to the effects of the drought (ABARE, 1995).

The effects of periodic drought have always influenced Australian agriculture and will continue to do so. With increasing pressure on the sector to improve profitability, the importance of risk management strategies for drought and market fluctuations will also increase. The successful implementation of such strategies will require more sophisticated management and marketing skills.

The International Environment

Terms of Trade and Farm Income

Terms of trade are not currently favourable to the Australian producer due to low commodity prices in international markets. This has been the situation for some years. Many countries with whom Australia competes for overseas trade in primary production subsidise their producers. Examples in the United States include the following:

• Budget expenditure on agricultural support is over US$10 billion per year.
• United States farmers have been receiving 41 per cent more for supported products than they would have if they had received world market prices in the period 1980-1993, because of payments by United States taxpayers and consumers.
• The Export Enhancement Program and the Dairy Export Incentive Program employed by the United States have been shown to depress world prices from time to time and adversely affect income of producers in other countries (ABARE, 1995a; Roberts et al, 1995; Anania et al., 1992; Short & Pascoe, 1992).

Australia may be highly efficient on the basis of production per person, but there is little recognition of this in prices obtained by producers (Brennan, 1995; Roberts & Whish-Wilson, 1993).

Economic Growth in Asia

The emergence of the large, growing, advanced economies in North East Asia and the growing, less developed economies of South and South East Asia will have an increasing impact on the Australian export trade in agricultural commodities. Hooke (1989) has made projections showing that developing Asia will contribute 60 per cent to world income by the year 2050, in comparison to its contribution of 21 per cent in 1990. Forty per cent of world income by 2050 is expected to be produced by China and India alone. World agricultural demand in 1990 is said by Hooke to have been in the order of $1,500 billion and projected to rise to $7,500 billion by 2050 (Hooke, 1995).

A decrease in the area of arable land, coupled with decreasing growth in land productivity in developing Asia, is expected to result in strong growth of agricultural imports into the region. Rapid
economic growth in the short to medium term in Hong Kong, Taiwan and Korea with the possibility of similar growth in China in the long term has also been predicted (Garnaut, 1989; Hooke, 1995).

Hooke notes, however, that his projections may be affected by environmental and resource constraints. For example, per capita gross domestic product is generally positively correlated with per capita fossil fuel consumption and hence carbon dioxide production. Even modest increases in per capita fossil fuel consumption would contribute to the greenhouse effect more significantly than any reduction made by Western nations (Erlich, in Reeve et al., 1990, p. 2). Hooke further states that protectionist policies in developing Asia may also affect his projections, but that GATT pressures and the continued de-regulation of Australian trade may inhibit increased use of these policies.

**Progress in Free Trade, with Impacts in Europe, the United States and Asia**

Development towards free access for Australian agricultural products to markets of Europe, the United States and Asia is expected to be slow and fitful (Reeve et al., 1990). Australia in the short term will continue to face competition from subsidised agricultural production in some commodity lines, as well as tariffs and non-tariff barriers applied by other countries to prevent the entry of value-added products. Reeve et al. (1990) argue that this will continue to place pressure on farmers to keep costs down and continue the on-going need for higher levels of managerial skill amongst producers.

General progress towards free trade is expected to herald the emergence of a globalised agribusiness system. The effects of this may include:

- requirements for consistency and reliability in production;
- large scale marketing;
- improved efficiencies in transport and commodity handling;
- continuing need for new products;
- improved quality and more precise specification in existing products (Reeve et al., 1990, p. 3).

**Political Changes in the Eastern Bloc**

It has been argued that the current political reforms occurring in Eastern Europe will have the following implications for Australia:

- increased purchases of agricultural products in the short term;
- a possible change in the composition of agricultural imports into Western Europe in the longer term;
- increased demand for particular commodities as the Eastern Bloc focuses on tradeable commodities for which it holds a comparative advantage rather than on self sufficient agriculture;
- the possibility of the Eastern Bloc becoming a direct competitor in export trading;
- an increase in world agricultural commodity trade in the medium to long term, if economic development follows reform (Reeve et al., 1990).

**Increasing Market Emphasis on Product Quality**

Reeve et al. (1990) hold the view that there are potential opportunities for Australia due to changes in consumer preferences. Growing consumer demand for nutritional quality and freedom from contaminants exemplify increasing emphasis on non-price attributes of food products. Australian agricultural industry will need to cater for these preferences to maintain market share.

As Australia is in a position to meet European quality criteria at a lower cost than European counterparts due to its significantly lower intensity of land use, a comparative advantage may be presented by this consumer demand. The livestock industry may be particularly advantaged. Reeve et
al. (1990) make the comment, however, that there will be an accompanying need for improvement in product description and in market specification if the opportunity is to be realised.

**Increasing Adoption of Sustainable Agriculture in the Developed Nations**

There have been many recent policy initiatives taken by overseas countries to increase the sustainability of agriculture, triggered by increased public concern about the impact of agriculture on the environment and on human health, as well as its over-dependence on fossil fuel. Reeve et al. (1990) cite examples of these policies in the United States, the United Kingdom, and the European Community. These types of initiatives will set quality standards that Australia will have to meet in order to match competition in European and American markets.

**The Impact of Global Environmental Change**

Despite significant uncertainty about the impact of global changes in the environment, it is accepted that change is occurring. Strategies will have to be developed to assess and respond to environmental change in the marketing and production sectors of agriculture.

Possible impacts of the greenhouse effect and ozone layer depletion have been recently analysed to include effects of lower rainfall in various wheat producing zones of the northern hemisphere, flooding and saltwater intrusion in low lying rice growing areas due to increased UV radiation, and the potential deleterious impact of increasing methane levels from livestock and rice production (Reeve et al., 1990, p. 5). Desertification, soil erosion, urbanisation and even slight rises in sea level will continue to deplete the stock of arable land in many third world countries. Their growing reliance on imported food products will have an impact on Australian agriculture as a supplier.

Government policy initiatives in response to the fear of global warming and other potential problems may also have a significant impact on agriculture. Australian agriculture’s comparatively lower level of inputs may be the basis for future comparative advantage in this regard.

**Technological Developments**

Technological developments have been responsible for many of the major advances in productivity in Australian agriculture. While prediction of the impact of future technological development is difficult, it is considered that it will be crucial for the future competitiveness of the industry. Food and fibre technology, along with developments in value-adding, are considered potential areas for increasing Australia’s competitive advantage. Increased scrutiny of the environmental impact of new technology will, however, place constraints on future developments. Areas where technological developments are expected to impact on agriculture include the following:

- overcoming resistance problems in pest management (this will require improved knowledge and management skills in bio-physical areas);
- adopting technology speedily to ensure competitive advantage;
- improving production efficiency through the use of biotechnology;
- introducing new information systems to meet changing marketing strategies and the need to assess and access new technologies;
- adopting mechanical, computing, electronic and biological technology to increase productivity (this will require increased management skills) (Agrimark, 1989).
The Marketing Environment

Marketing was identified by panellists in the Agrimark study (1989) as the most significant means for farmers to take advantage of opportunities in the environment. Marketing was also considered to have the potential to assist farmers to increase their ability to manage risk.

The major trends in marketing identified in the Agrimark study (1989) include:

- a shift from a commodity to a market segmented approach;
- increased emphasis on quality;
- increasing precision in demand for particular product attributes;
- more sophisticated grading systems;
- increasing demand for convenience, at the consumer level;
- increasing demand for product specification.

Producers will have to develop closer relationships with agribusiness to extend their knowledge and understanding of the markets they supply. Producers who become directly involved in marketing will need basic business skills combined with international marketing expertise and the ability to manage international business transactions (Lees & Reeve, 1991).

Human Factor and Social Dimension

The Impact of Agricultural Adjustment

A survey by Salmon, Fountain and Hawkins in 1973 drew attention to the human and social factors affecting responses to economic and technological pressures in agriculture. While more recent studies have investigated this area, the findings have not significantly altered. The Salmon et al. (1973) survey points out that the concept of economic change in agriculture is generally referred to as ‘agricultural adjustment.’

Throsby (1972) defines adjustment as ‘the adaptation of rural industries to a changing economic environment’ and identifies two main aspects of adjustment. The first is the technological aspect and is described as the substitution of technology (i.e. equipment or production methods) for labour in farming. The second is the economic aspect - the alteration of enterprise scale to achieve optimal utilisation of resources. Throsby argues that an adjustment process takes place when adaptation occurs as a response to a changed economic environment. He adds that a problem arises if the required adaptation fails to take place or does not occur fast enough.

At the time, it was considered that the expected human adjustment was not occurring fast enough. The Agricultural Extension Research Unit at Melbourne University found in several surveys that, despite economic pressures in the industry, the farmer was more likely to resist efforts to change than to relocate to other industries or occupations. Another study emphasised the importance of recognising ‘the conflict between the Australian farmer and the impersonal, relentless forces of the technological revolution that is taking place in our agriculture’ (Salmon et al., 1973, p. 11).

Watson and Vincent (1973) made the following points about the adjustment attitudes of farmers:

Farmers as a group, despite vocal pleas to the contrary by the media and politicians, have an extraordinary capacity to survive adverse periods. The very nature of their occupation
demands an ability to successfully negotiate crises, both climatic and economic in nature. Their will to continue is reinforced by considerations such as the non-monetary benefits they attach to their farm way of life, and their generally poor employment prospects outside agriculture. These factors, combined, create in the minds of many of them considerable apprehension and even fear about an alternative life style and occupation in what they regard as, at best, uncertain and, at worst, hostile social surroundings of the cities.

However, farm families develop adjustment strategies that are often long-term and which may involve the following processes:

- a decreased dependence on farming as an occupation, generally in two stages - firstly the addition of a second occupation, and secondly, a shift in occupation, often a non-farming one;
- an abrupt shift of occupation to a non-farm one, if slow adjustment is not an option.

An adjustment is generally not made by moving the family to a locality with greater opportunities. However, dependants frequently use their education to take advantage of job opportunities and move out of farming. This pattern of adjustment is mainly inter-generational (Reeder & LeRay, 1970; Napier & Scott, 1994).

The impact of social and behavioural factors on farm management is now widely accepted. The attitude and behaviour highlighted in the point above is relevant when considering the attitudes of many farmers to education. Formal education is often considered to be irrelevant by the current generation of farmers but they see it as being relevant for the next generation to enhance employment options (Hawkins et al., 1974; Kondinin Group, 1995).

**Changing Role of Women in Agriculture**

In line with changes in the agricultural industry and society at large, the way in which women contribute to the operation of farms, including on- and off-farm work, is also changing significantly. Women were traditionally the housekeepers on the farm, responsible for the care and nurturing of family and often contributing to production and the reduction of domestic consumption costs with their own cottage industries (Alston, 1995; Fink, 1986; Bamberry, 1991; Hucker, pers. comm.).

The changes in agricultural production technology and the economic problems facing many farm families have affected the role of women on farms. It is reported that an increasing number of women are becoming involved in day-to-day farm production activities due to the reduction in hired labour on farms. Also, more women are working off-farm to generate additional income (ABARE, 1995; Alston, 1995). Despite these increasing demands placed on women, there is no evidence of a reduction in their responsibility for domestic work. In fact, the traditional male dominated power structures, ownership arrangements and decision making patterns continue to operate in most farming enterprises (Alston, 1995).

In analysing the role of women on farms, the viability, structure and scale of the farm operation needs to be considered. While off-farm work is increasing for many women, farms of increasing scale are requiring increased input into more specialised management functions. There is evidence that women on larger farms are fulfilling many of these new or growing roles. Crop monitoring, financial management, management of off-farm investments, marketing, human resource management and information gathering are examples of these roles. Many are more familiar to women than the physical, mechanical, technical and generally ‘outdoor’ aspects of farm operation. They are also roles which can be performed in more flexible time frames and combined with other commitments.

The recognition by a farm business of the importance of assessing and utilising all available human resources and developing a structure which does not alienate the female contribution may provide a
new phase for the role of women on larger farms. Many women in these operations are not actively included in the farm business and feel alienated from it. As a result, some of these women are working off-farm, not primarily motivated by the income generated but by a combination of factors, including self-esteem (Alston, 1995; Gamble et al., 1995). Involvement in voluntary and community work may also provide a level of satisfaction and self-esteem not gained in on-farm work. Similar feelings about community involvement were identified in a case study of women adjusting from a rural and semi-rural lifestyle to a suburban one on the western outskirts of Sydney (Bamberry, 1992). It may be that many farms would benefit from changes in attitudes towards the roles of women in farming and a corresponding restructuring of their human resource management practices.

Because of the alienation felt by some younger women in their farming situation, the fact that many farms will not be viable in the long term, and the poor image of agriculture in the community, many farmers, and particularly farm women, are encouraging their children to pursue careers outside agriculture. The implications of this for future family farming and perhaps the industry generally are significant in the potential loss of the more able from the industry (Alston, 1995, p. 152).

On the other hand, Alston (1995) and others have also found that farm women have a strong commitment to their family farming lifestyle, the viable operation of the farm, the nurturing of their family and their support for the local community and the industry at large. Satisfaction with their work is recorded in many case studies, despite a lack of public visibility and, in many instances, recognition. The implications of this commitment for the long term of the family farm are difficult to assess. It may be that this commitment will be a trigger for the increased participation of women in the management of farms despite reluctance by some male partners to actively encourage this.

The emerging organisation of rural women into discussion groups, rural women’s networks and the initiative and energy reflected in the organisation of the Women in Agriculture Conference held in Melbourne in 1994 indicates that Australian rural women recognise the need to take a more active and visible role in the industry. The increasingly difficult circumstances many farming families are facing, particularly exacerbated by the drought and falling commodity prices, have apparently been a major trigger in this movement. The confidence reflected by rural women active in this area has given others confidence to contribute to this movement. The knowledge of the industry and experience of Australian rural women, combined with what has been described as a culture of communication and information sharing, will form a strong base for their input into the industry in future (Salce, in Bowden, 1995, p. 352).

The increasing interest in the area of the role of women on farms has highlighted the lack of studies on the contribution of women to agriculture. In recent years there has been some attempt to rectify this, with the collection of statistical data on the work roles of farm women and their educational qualifications. Data on social issues is being collected, particularly issues with a strong impact on the lives of women and families in country areas (for example education, health, transport, communication, welfare and physical amenities) (ABARE, 1994; Gooday, 1995). More meaningful data is required, however, to ensure that resources currently targeted to rural women and communities are appropriately channelled to meet their needs.

Coming from different disciplines such as Sociology and Economics, there is a growing collection of qualitative data on Australian women’s roles on farms. Recent studies further emphasise the broad range of roles assumed by women on farms and the difficulty of ‘categorising’ individual farm situations into a meaningful framework for analysis. Many of these works, however, will form the basis for increased awareness of the role women play in farm businesses. Specific analysis of these roles is limited, however, and requires further attention (ABARE, 1995; Williams, 1992; Lewis, 1990). The recent ABARE report, Women on Farms (Gooday, 1995), presents some preliminary data and analysis of women’s roles on broadacre and dairy farms as a basis for developing and evaluating social policy to support this sector. The survey, which is pertinent to the scope of this project, focuses on women’s roles both on and off-farm, and on their formal educational levels (Alston, 1995).
Data from the 1993/94 ABARE Farms Survey of broadacre and dairy farms highlights the following points on family-run farms:

- Forty per cent of partners in family farms are women who provide around 18 per cent of family and partner labour on these farms.
- Thirty five per cent of males and forty nine per cent of females completed between five and six years of high school.
- Eighteen per cent of females, roughly twice the proportion of their male counterparts, have completed a tertiary education.
- In 1993/94, 23 per cent of females were involved in non-farm work for wages or salaries compared with only 6 per cent of males.
- Approximately 6 per cent of women work for more than 26 weeks per year off-farm compared to 2 per cent of males.
- There appears to be a positive relationship between time worked off-farm and education levels for women. The relationship for men was not as strong.
- The average amount earned by women off-farm was $26,690 per annum (about the same as that earned off-farm by males for equivalent time).
- Women on dairy farms and mixed livestock farms work longer hours on-farm per annum than counterparts on cropping or sheep farms.
- Contacts rated rural employment opportunities and the performance the rural sector as the most important issues affecting rural Australia (with females rating the former and males the latter as the most important).
- Twenty five per cent of farm families rated the performance of the farm business and the rural sector as the most important issue of concern, 23 per cent educational facilities and 19 per cent rural employment opportunities (Knopke, 1994).
- Women with a higher formal education level generally worked for longer periods off-farm compared with other women.
- On farms with relatively higher debt levels, women in general were found to spend more time working both on-farm and off-farm.
- The amount of time women spent working on-farm was found to decrease as the size of the farm decreased, in terms of area operated.
- The number of weeks women spent working off-farm was generally lower for farms with higher capitalisation (Gooday, 1995).

Although these findings are a starting point in analysing women’s roles and contribution to family farm operations, there are many issues which require further research to clarify the picture of what women do. This point can be illustrated by the fact that the definition of on-farm work did not include any analysis of ‘household work.’ In a farm context, this requires more attention. Many farm management tasks are ‘hidden’ in these duties, but would necessitate the employment of labour in other business operations. Examples of this include co-ordination, communication, reception, secretarial, administration, delivery and purchasing roles which are performed daily by the majority of farm women but are not reflected in statistical data as on-farm work. When these roles are performed by women who are highly aware of the farm business operation, and often key decision-makers, the nature of this work becomes more complex and the degree of decision-making and influence on the farm business operation carried out by women, under the guise of domestic duties, may be undervalued.

On another level, many women have a major input into the strategic planning and management operations of farm businesses. As time spent on formulation and subsequent implementation of
strategic plans may not be formalised, farm women’s roles as ‘directors’ may be overlooked. There is no measure of the business expertise input from farm women as it is often an informal input and in many cases may go unrecognised.

Thus, while a start has been made on the empirical analysis of women’s roles on farms, existing data is inadequate in providing conclusive evidence on the extent of women’s contribution to farm management. This in turn makes it difficult to place an accurate value on their economic contribution to family farms. A redefinition of the traditional view of on-farm work may also be required before meaningful data can be gathered.

The Women in Agriculture Conference held in Melbourne in 1994 investigated rural women’s needs. The conference focused on increasing the recognition of women’s involvement in agricultural productivity, in economic development in rural areas and in the development of stronger links and networks for women in agriculture. Issues discussed at the conference included the following:

- women’s economic literacy;
- the relationship between environment and economy;
- identifying economic and environmental matters of special significance to women;
- how to move away from a paradigm of consumption and ownership which is believed to be unsustainable (this raised the issue of undervaluing the price of food in terms of real costs of production, and returns to farmers not reflecting real costs of production with regard to care of land resources);
- concern regarding the ‘national accounting system’ which does not take into account the loss of wealth due to mining, agriculture, etc., but accounts for the cost of failed clean-ups in the environment;
- education;
- sustainability;
- decision making and participation;
- networking;
- visibility and recognition of women’s work in agriculture;
- difficulties encountered by women in obtaining information;
- difficulties faced by women in developing skills and acquiring new technology;
- access to education for women and support to attend and participate in appropriate courses.

Some of the outcomes of the conference were:

- the Australian Law Reform Commission is investigating the legal status of women on farms;
- a global network of women in agriculture has been initiated;
- pressure has increased for a greater participation by rural women in agricultural organisations and decision making bodies;
- a Foundation for Australian Agricultural Women has been proposed to serve as a funding body for increasing women’s access to education and training in agriculture.

Summary

The aim of this chapter was to provide an overview of the key factors influencing the agricultural industry in Australia to provide an overview of the economic and social factors impacting on farm management and farmer education.

The section on the domestic environment began with an overview of national economic factors such as the restructuring of the agricultural industry which has resulted in a decline in the number of farming
establishments and an increase in their size. The literature also indicated the likelihood of Australia’s trade deficit continuing to be a problem in the short-term and commented on the potential for agriculture to reduce the deficit, particularly through value adding to agricultural commodities.

The literature drew attention to the impact of regional development on the agricultural sector. This occurs through government expenditure on programs to develop infra-structure and provide support for the expansion of existing businesses and the development of new businesses. These programs benefit the farming sector by encouraging the processing of primary products within the regions and through the creation of jobs which provide off-farm employment opportunities for members of farming families.

A related domestic impact on agriculture identified was the changing views of governments on the role of the public sector in areas such as decreasing budgetary allocations to agricultural extension services. Attention was drawn to the increased environmental awareness of farmers and their recognition of the need to pursue sustainable agricultural practices. Problems referred to in this context included financial constraints on farmers and insufficient government support for Landcare programs.

Reference was made to issues in the international environment having an impact on agriculture such as unfavourable terms of trade, exacerbated by subsidies paid to overseas producers by their governments. Progress in gaining greater market access for Australian produce was expected to be slow in the short-term but there were longer-term expectations for a more open global market which would provide opportunities.

A number of writers drew attention to the developed economies of North East Asia and the less developed but growing economies of South and South East Asia as expanding markets for Australian agricultural produce. Others suggested that political changes in Eastern Europe may lead to export opportunities for Australian producers though this could be accompanied by possible competition. Other potential international opportunities identified included demands for quality food free from contaminants. However, it was suggested that Australian producers would have to meet increasingly rigorous quality standards at the same time as maintaining sustainable agricultural practices.

While the precise nature of the impact of technological developments in agriculture was considered difficult to predict, it was generally accepted that past trends would continue, possibly at an accelerated pace. The adoption of new technology was thought to be crucial for the future competitiveness of the industry. Marketing was identified by some as the most significant factor influencing the ability of the agricultural sector to take advantage of opportunities for business growth. Major trends in marketing were outlined and the need for producers to become more directly involved in marketing was raised.

Two areas were covered in the section on the human factor and social dimension in agriculture. The first described a range of adjustment strategies used by farming families to cope with structural change. While some have had to leave the industry abruptly, others have been able to make gradual changes such as reducing economic dependence on the family farm or gradually increasing the scale of farming enterprises. Second, there have been significant changes in the roles women play on farms. While more farm women are now engaging in off-farm work, there is also evidence that many are becoming increasingly involved in farm management activities such as financial management, marketing, technical monitoring and the development of new enterprises, in addition to traditional roles.
Chapter 3: Farmer Education

The Relationship Between Formal Farmer Education and Agricultural Productivity

Previous writing on the formal education levels of farmers suggested that Australian farmers have a low level of formal education compared with their overseas counterparts and that this is a matter of concern to the industry. Concern exists because there is evidence from other countries showing a positive relationship between the education levels of farmers and agricultural productivity (Jamison & Lau, 1982). The belief that economic growth and development requires continued expansion of education, especially at higher levels and in the technical and vocational areas, is widely and uncritically held. It was supported by the Australian Government’s Green Paper on higher education in 1987 and a CEDA study by Drake and Niewenhuisen in 1988.

In general terms, it has been argued by Azhar (1991) that there are two aspects to this relationship: first, through the choice of new and better inputs (allocative efficiency); and second, through the better utilisation of existing inputs (technical efficiency). Furthermore, empirical research has provided production frontiers and calculations of statistical relationships between education and economic efficiency (Jamison & Lau, 1982; Kumbhakar, Ghosh & McGuckian, 1991; Battese, 1992). In addition, empirical production functions have been used to estimate the technical relationship between inputs (e.g. land, labour, capital) and output (e.g., wheat production).

Maglen’s views in his 1990 book can be summed up by the following points:

- There is little concrete evidence to support the view that expansion of education will lead to increased agricultural productivity.
- What evidence exists is somewhat inconclusive.
- There is a strong reluctance to question the view.
- An analysis of the evidence on a macro-economic scale reflects the assumption of the link rather than concrete evidence (based on a country’s economic performance over time and on comparisons of economic performance across countries).
- An analysis of the evidence on a micro-economic scale is fragmentary and inconclusive. It relates mainly to lower levels of education and mostly to the performance of agricultural workers in developing countries.
- Efforts to identify positive links between education and technological change have been more encouraging. This work has been mainly in the agricultural sector but has failed to demonstrate that adoption of new technology will lead to higher production, higher average labour productivity or faster rates of economic growth.
- Recent studies focusing on structural and qualitative aspects of education and training and their effects on productivity differences between workers may provide more evidence for the relationship.
- The assumption that increased education increases productivity and is reflected in higher earnings is of little practical value.
- Some studies have shown that productivity gains associated with education are determined more by the quality of the grounding received in mathematics, science and languages, coupled with the quality of the on-the-job training, than by the amount of education undertaken prior to entering the workforce.
- A broader more realistic view of the issue requires consideration of how labour markets actually work, how jobs are created and how employment is structured.
Thomas (1993) has also reviewed the fundamental literature on the link between education and economic development. He comments that after forty years of increasingly sophisticated research, there is agreement that the role of education in economic development is subtle, complex and wide ranging. He argues that although there is no direct link between education levels and economic development, education levels are positively related to variables which are themselves indicators of economic development. Thomas makes the following points:

- The interaction of education with the set of economic policies which promote or inhibit development must be considered.
- Education and its institutions exist for a range of purposes not solely related to matters economic.
- The impact of basic levels of education on output in the agricultural sector have been found to be relatively large (Jamison & Lau, 1982). This is particularly evident in ‘modernising’ agricultural regions with the adoption of improved technology.
- There is an indication that public investment in ‘generic’ education is more worthwhile, over time, than investment in vocational education.
- Vocational education is much more expensive than general education and, if unconnected to an employer or group of employers, does not appear to advantage graduates in finding work or earning higher wages (World Bank, 1991).
- Generic schooling enhances vocational and on the job training (Psacharopoulos, 1987).
- Generic schooling facilitates technology transfer. Successful development and application of technology requires capital, management, organisation and experience.
- Enterprises are more efficient in the provision of vocational training as they are able to put the training in the context of the whole technology of production.
- Education as consumption is higher in developed regions on the basis that all consumption is higher but the causality of the relationship is in the wrong direction. He argues that development is a prerequisite for education.
- There should be more focus on the outcomes of education.
- ‘Progress in education is to be sought mainly as an end in itself, but the evidence is that education promotes economic growth and thus puts other goals of development within reach’ (World Bank, 1991, p. 56).
- Universities should be supporting quality, universal and general education.
- Universities should be providing forums and other opportunities for science, technology and learning to be exposed to world best practice.

Phillips (1994) asserts that there is general consensus that education has a positive effect on agricultural productivity. In a widely acknowledged study, Lockheed, Jamison and Lau (1980) presented a survey of research investigating the effect of farmer education on farmer efficiency in less developed countries. They concluded that, on average, four years of schooling resulted in a 7.4 per cent improvement in output, providing some evidence to support the conventional wisdom. The Lockheed et al. study paid considerable attention to the hypothesis of Schultz (1975) that the effect of education is strongest in a modernising environment. Issues raised in these studies include:

- Whose education should be studied in family farm situations?
- How should education be measured?
- How should output be measured: physical output; value of one or various crops; or as value-added with only fixed inputs as variables?

Welch (1970) referred to these measures as engineering, gross revenue and value-added functions respectively. He argued that they measure the potential effect of education on farm productivity. Phillips (1994) states that few studies have used the measurement of output and this is why there has been less support for the relationship between education and farm productivity than expected.
The work of Lockheed *et al.* also reflects what appears to be strong regional effects. They suggested that this may be a result of varying degrees of rapid technological change occurring in the areas they studied. With development in Asia occurring at a faster rate than in Latin America, a stronger relationship can be observed in the former (based on the Schultz hypothesis).

Another issue related to the measurement of productivity is that of inputs. There is a tendency for the effect of inputs such as fertiliser and extension services to be mistaken for an education input (Phillips, 1994, p. 58). Overall, Phillips’ study supports the work of Lockheed *et al.*, but further research is called for to explain the regional differences between Asia and Latin America.

A study by Azhur (1991) was based on the hypothesis that education accelerates the process of economic growth by an allocative effect, including the adoption and diffusion of new technology (i.e. better allocation decisions), and by a worker effect in which more efficient use is made of given inputs (i.e. the technical efficiency aspect of production). It was hypothesised that these effects are enhanced in times of changing technology. The hypothesis was tested in Pakistan during the Green Revolution when new crop varieties disturbed the prevailing equilibrium.

Azhur concluded that education hastens the process of required change and therefore has an impact on technical efficiency through a better utilisation of given inputs (e.g. the same inputs with a different timing give different results). He also concluded that education affects productivity in two ways - through a choice of better inputs (allocative efficiency) and through a better utilisation of existing inputs (technical efficiency or worker effect). The study also found that education has a more pronounced effect on technical efficiency in the case of new crop varieties.

While it was recognised that agricultural productivity may be affected by the education of all people working in the industry, the study undertaken by Wharton (1963) focused on the education of the rural workforce, i.e. producers, labourers, contractors and unpaid family farm labour. It was argued that, while it may not be possible to cost all the benefits of education, they may still have economic characteristics. It was argued that expenditure on education can be regarded as both consumption and as investment. It was also argued that, since farmers are both labour and management, the effects of education are particularly pervasive, with both vocational and non-vocational education impacting on earning potential. Wharton comments:

> Education pushes back cultural prohibitions; it widens the scope for decision making because it broadens a person’s ideas of the ‘possible’; it very often causes frustrations which usually lead to political activity with important economic consequences; it makes it easier for a person to think through the problems which he faces and not merely accept them as unchangeable ‘givens’ or the decrees of the Gods (1963, p. 10).

Some of the benefits of education identified included:

- changes in values which introduce questioning;
- the development of disciplined thought processes;
- potential increased income effects;
- cultural benefits.

However, factors other than formal education have also been identified as contributing to the productivity of the rural workforce (Westermarck, 1951; Stayner, 1969). These include the following:

- the length of farming experience being a substitute for formal education (length of farming experience in a similar situation was considered as well as the total number of years farming);
• the length of farming managerial experience;
• non-farming experience in terms of its effects on value exposure;
• the number of years of contact with farm management consultants;
• educational attainments of owner-operator’s wife.

Stayner (1969), in a publication on the relationship between education and agricultural output, reported on a study undertaken through the University of New England. The main findings of the study were:

• No measure of education was found to be statistically significant to explain differences in output.
• Farm experience was found to be more significant than managerial experience in a statistical sense.
• ‘Unweighted sums of experience’ were thought to be more appropriate measures than ‘weighted sums of experience.’
• The interview information gathered did not suggest any association between the educational levels of the farmers and their managerial performance.

Some issues which emerged from these findings include the following:

• The variables used to measure education did not accurately measure the productive effects of education. Aspects of education not accounted for may be very important in contributing to output (i.e. quality of education, effects of different education institutions and environments, the effect of informal education, e.g. contact with other farmers, and effect of specific experiences).
• A production model may not be the most appropriate framework for studying the effects of farmers’ education. The economic effect of education may not be well reflected in the conventional measure of ‘total farm income.’ A profitability measure, e.g. return on total assets, may be more appropriate.
• Some of the findings could imply that education has an influence on managerial efficiency rather than output.
• The most important economic effect of education may be the increased occupational mobility of young people in rural areas.
• It is difficult in Australia to identify wide ranges in educational attainment between rural areas.
• Different levels of schooling should be accounted for in measuring education.
• The relationship between the level of education and the rate of adoption of technology deserves more attention.
• There is little data on capital inputs in Australian agriculture.
• There would be value in analysing changes in productivity to identify the most important sources of these changes.
• Farmer education may be found to be a more significant input into a production function in a much larger sample of data.
• Insight into the effects of different kinds of education could be gained by analysing factors such as quality of schooling, informal education sources, and the effects of contact with management consultants.
• There appears to be value in pooling cross-sectional and time series data with inter-farm and inter-year factors for the same group of farmers.
• Comparison of education/income data between industries may be of limited use to the agricultural sector as income may be more dependent on physical capital than ‘human capital.’ Such distributions, however, may provide farmers with an indication of the opportunity costs of remaining in farming.

There is evidence that, despite significant inputs into farmer education in countries such as the United States, positive net returns for the sector have actually fallen despite significant increases in productivity. This reinforces the view that factors in the external environment, in which farmers operate may have a more significant effect on income than factors that can be managed (Stayner,
In these studies, the emphasis had shifted from a focus on productivity to a focus on farm income. While linked to productivity, farm income is a separate and more direct measure of good farm management.

However, farm income may be affected more by factors such as capital, scale of operation, value of land, the structure of the family farm business and the motivation and personal goals of the operators than by the actual management skills of the people running the farm. There is some evidence of this in current comparative analyses being conducted on farm business operations in the FAST Project (Rendell et al., 1996).

While education may have a significant impact on technical and production techniques, the current emphasis on such competencies as integrative skills and ability to learn and adapt to changing circumstances requires a broader view of competency development. It would appear that competence in the latter comes from non-vocational education or innate ability.

Buggie states that the evidence linking early adoption of new ideas in farming to levels of educational achievement are not unequivocal and that Rogers and Shoemaker cited 277 studies of which 72 per cent support and 26 per cent do not support the proposition (Roger & Shoemaker, 1972, in Buggie, 1977). Buggie further argued that, because the more intelligent tend to remain longer in the formal education system, the relationship of education to innovativeness is primarily a relationship between intelligence and innovativeness. Rogers and Shoemaker (1972) cite five studies to support the positive correlation between early adoption of new ideas and intelligence.

Buggie sees limited value from the study of causal connections between education and farm management performance if other determinants of education and performance are not accounted for. He argues that farmers’ intelligence, knowledge and self-awareness also significantly affect their management performance. He expands this argument by pointing out that a more developed farm is a more complex system to manage, requiring closer monitoring and better and more complex decision making. If information processing ability is viewed as requiring a fairly high level of intelligence, this does not mean that people of average intelligence cannot be good farmers. It is argued that high motivation and a developed sense of self-awareness can also lead to successful performance. Buggie believes that farmers exhibiting these characteristics often adopt farming systems appropriate to their capabilities and situation (Buggie, pers. comm. 1996).

In summary, the literature reviewed reflects little conclusive evidence on the precise nature of the relationship between farmer education and good farm management. Each study in the area, however, has contributed to the understanding of the relationship in some way, if only to reinforce its complexity and the difficulties in attempting to measure its strength. Research has added to our understanding of the relationship and to the realisation that Australian farmers are not an homogeneous group in terms of their levels of educational achievement.

### Educational Levels of Australian Farmers

Problems have been encountered in accurately measuring the levels of both formal and informal education of Australian farmers. To date, statistics have not reflected the levels of formal education held by farm family members as they often exclude consideration of the educational levels of women and other family members involved in the family farm operation. The input of family members into the farm business operation requires assessment to gain a true picture. Measuring the inputs of family members and their various effects on decision making is difficult but important.

ABARE is addressing this issue in current data collection for its *Farms Survey*. However, the statistics gathered are not comprehensive because the sample is limited. The recent Kondinin survey on farmer education shows that female farm members have a significantly higher level of tertiary
education than their male counterparts but the significance of this has not been analysed (Kondinin Group, 1995).

These and other problems surrounding the assessment of formal and informal farmer education can be summed up as follows:

- In the broadest sense there has been no comprehensive assessment of farmers’ educational achievements. Statistics on formal education levels attained are available but are too narrow to infer skills and competence.
- Measurement of formal educational attainment alone gives a limited view of farmers’ knowledge and skills as farmers educate themselves in a wide variety of informal ways. This has been accepted in the concept of recognised prior learning (RPL) which is discussed later in this report.
- Concern about low levels of formal education is important in regard to ‘learning to learn’ or ‘learning to change.’ However, low levels of formal education may not mean that a farming community is incompetent or poorly informed.
- Available statistics have only measured formal education levels of those people classified as farmers in the census, but do not recognise the education levels of others in the farm family household who may have significant input into management decisions.
- People who farm part-time and many farm women may not be identified as farmers in the statistics. Data on all the household is needed. Many women, for instance, will identify themselves by their past or part-time career status rather than as farmers, while at the same time having significant input into many farm decisions and the day-to-day operations of the business.
- Assessment of farm children’s education would also add insight. Data from this study illustrates this.
- Data on part-time farmers and farmers leaving the industry is also needed.
- Formal education gained may not relate to farming expertise required or demonstrated.
- Generic or higher order competencies such as decision making and information management need to be recognised and measured. The literature and observations suggest that these are crucial in the increasingly complex farm business environment.

There is evidence, however, that the levels of formal education in the farming community are rising. Information from the Australian Bureau of Agricultural and Resource Economics shows a seven per cent increase in the number of farm operators with post-school qualifications from 1981 to 1994 (ABARE, 1994).

The Kondinin Group 1994 National Agricultural Survey of 1300 group members found that 43 per cent of key farm decision makers have a post-school qualification comprising: 18 per cent with a TAFE qualification; 14 per cent with an associate diploma or diploma; and a further 11 per cent with a degree or higher. The survey also reported that younger farmers had a higher level of education compared with older farmers. Half the farmers younger than 36 years of age held tertiary qualifications compared with only 35 per cent of farmers over 50 years of age.

Furthermore, on half the farms in the survey there was a spouse or partner with a tertiary qualification. Some 41 per cent of the non-tertiary educated young farmer group indicated that there was a partner or spouse with a tertiary qualification. The 1994 ABARE Farm Survey revealed significantly more spouses with tertiary education than farm operators, and found that the number of farm spouses with qualifications was rising at a faster rate than that of farm operators (ABARE, 1994).

Finally, although the members of the Kondinin Group would generally be regarded as the more progressive farmers with regard to their information gathering techniques, the survey does provide an indicator of trends and attitudes in this sector.
Current Approaches to Formal Agricultural Education

The McColl Report on Agricultural and Related Education

In 1990, a committee chaired by McColl reviewed the content of tertiary agricultural education, assessed its effectiveness, and made recommendations to promote its development. In the section analysing future demand for agricultural education a list of important factors was identified. These included:

- an increasing emphasis on achieving sustainable development within the constraints of the environment - requiring graduates to be well trained in the relevant disciplines in an integrative way;
- preference by some employers for graduates with generalist training providing flexibility in tackling an increasingly complex range of tasks;
- changes in the nature of public sector employment with emphasis on more experienced and more specialised personnel;
- changes in the delivery of extension services by the Department of Agriculture;
- changes in agricultural production and marketing with an increased emphasis on purchased inputs and services, increasing size of farms and complexity of decision making requiring better trained farm managers;
- research by higher education institutions and organisations such as CSIRO tending to become more scientifically, rather than agriculturally, oriented;
- a continuing need for agricultural scientists in research institutions to ensure the essential applied focus of research is supported by the Rural Industry Research Funds;
- increasing opportunities for the private sector to expand its role in providing services through commercial companies or through independent consultants;
- the expected future expansion of value-adding and processing of natural resources requires more training in business and in food science and technology;
- the potential for a private sector role in growing and managing trees and forests;
- the trend towards a general upgrading of skills in many occupations;
- an increasing role for higher education in continuing education (McColl, 1991).

The report also identified the need for an increased emphasis on the following in future agricultural courses:

- environment and resource management and sustainable development;
- materials integration;
- student-centred learning and problem-solving skills;
- teamwork, communication and extension skills;
- technical management;
- business management;
- marketing (particularly international);
- economics and policy.

Among other recommendations which may have a significant impact on the education of farmers in the future are the following:

- integration of courses across categories and levels of awards;
- a system for non-standard and special entry, articulation with TAFE, and credit transfer.
The report also stressed the importance of including a broad range of disciplines within agricultural education in the future and the importance of developing skills to integrate and apply these disciplines. This was seen to result from the need to address the interdependence of the farming resource base (a biological system) and the business environment.

Many of the recommendations of the McColl Report complement findings in this project, for instance its recommendations on course content and the breadth of knowledge and skills required. The Report also emphasised the importance of generic competencies to integrate and apply knowledge, and the need to facilitate rural people’s access to the formal education system in a more convenient and flexible fashion, with consideration of individual needs.

**Farmer Participation in Formal Agricultural Courses**

There has been extensive research into farmers’ participation in education and training courses. Literature on adult education and learning also deals with this issue. The Rural Training Council of New South Wales recently commissioned a report on rural participation in vocational education and training which offers a critical evaluation of the current provision of formal vocational training in rural areas. It supports the findings of many previous reports and raises the question as to why no action has been taken in response to such consistent findings. The emphasis of the survey was on training delivery, but the issue of content was also raised. The findings of the report with regard to farmers’ opinions are outlined in the following sections on farmer attitudes to formal education and farmer preferences in education and training (Rural Training Council, 1995).

Lees and Reeve (1991) assert that the following factors inhibit the participation of farmers in formal courses:

- There is an underlying belief that if people have land they will by some form of instinct know how to manage it.
- As Australia is a very challenging country in which to farm, with regard to climate, soil types, markets and interest rate changes, a key skill which has to be mastered is that of managing variability. This is not well developed in formal courses.
- Courses for farmers have historically been developed by agriculturalists rather than farmers. There is evidence that each group has differing perceptions of the competencies required to be a farmer.¹
- Farmers have questioned the relevance of courses in farm management for their daily farm operations.
- It is difficult to establish a clear link between formal qualifications and financial returns over time.
- Historically, farmers have tended to encourage their brighter sons to seek further education and have encouraged the poorer academic performers to remain on the farm. The skills perceived to be important for farming were practical, and a formal education was not seen as essential to be an effective farmer. The view that agricultural courses were too theoretical also influenced these beliefs.
- Farmers tend to perceive themselves as ‘independent and self-sufficient’ and to view their occupation as being unlike all others (Bell & Pandey, 1986). Studying to be a farmer does not sit well with these attitudes.

¹ This conclusion was also reached in the survey conducted by Hawkins *et al.* (1974).
Although current farmers may have low participation rates in formal education, future farmers may exhibit very different patterns. A number of factors may affect this. The Kondinin Group’s recent report on education provides some support for the view that farmers now entering the industry have higher levels of formal education. It also indicates that attitudes towards the benefits of formal education in running a farm business may be changing in a positive way. Respondents to a survey indicated that their participation in a tertiary level course had been effective in developing their problem solving skills and had instilled a culture of questioning and seeking information (Hamilton, 1995). Such attitudes are likely to encourage greater participation.

**Farmer Attitudes Towards Formal Agricultural Education**

A study by Hawkins, Almond and Dwyer (1974) recognised that past studies on farmer education, based on concern for low participation rates, had paid little attention to the main component of the rural system - the farmer. Dean (1968) also emphasised the importance of identifying farmer opinions on education and the reasons underlying them in order to enhance educators’ understanding of their clients. The Hawkins et al. (1974) study surveyed farmers’ opinions and attitudes towards post-secondary farmer education in four areas of New South Wales and Victoria and compared these with the perceptions of teaching staff at seven agricultural colleges in these states.

The study was based on the premise that educators view agricultural education as a key component in developing the human resource input into farm systems and in assisting the adjustment to change. It was also considered that the managerial ability of farmers needed to be improved in order to make efficient use of all resources available to a farm (Dean, 1968; Williams & Macauley, 1972). The work of a number of US economists demonstrating the economic returns resulting from education was cited. No comparable Australian data was found to exist.

Campbell (1968, 1971), however, in discussing the relationship between agricultural productivity and educational attainment in Australia, argued that farmers of the 1980s would have to be more commercially orientated than their predecessors, needing more technical, scientific, commercial, economic and adaptive competencies. These views were supported by other educators (Nalson, 1965; Trotman, 1965; Schapper, 1968). Campbell also stressed the importance of ‘education for agriculture’ rather than ‘agricultural education’ (1968, p. 3). In addition he commented (1968, p. 9):

>I hope that we can soon move to the situation where the community expects the majority of the farmers and graziers of this country to have a tertiary education.

Factors recognised at the outset of the study by Hawkins et al. (1974) included:

- Agricultural College education was only one of the options available to farmers and future farmers.
- Some colleges no longer regarded themselves as being in the business of farmer education.
- The views of agricultural college staff would most likely reflect the views of other professionals and technologists working in agricultural education.
- There had been a significant call for change to existing approaches to farmer education. (The following authors were cited: Farquhar (1966), Butler (1969), May (1972), Black (1973), and Nalson et al. (1973)).
- The impetus for change came from educationalists, and there was little evidence of farmers wishing to change the status quo.
After the face-to-face interviews, a follow-up mail questionnaire provided a summary of the views expressed by farmers and repeated the question: ‘What sort of things do you think a person starting farming today would need to know?’ The second set of answers significantly changed the order of items in the list, compared with the initial survey. Hawkins et al. state that it is more likely that this second set of rankings is the more valid one.

Farmers’ ranking of knowledge needed to start farming today:
1. Local conditions
2. Finance
3. Personal qualities
4. Knowledge of stock
5. Practical ability
6. Pastures
7. Machinery.

College staff, however, did not have an accurate picture of what farmers think they need to know to start farming (Hawkins et al., p. 21).

College staff thought farmers would rank topics as follows:
1. Practical ability
2. Finance
3. Pastures
4. Knowledge of stock
5. Personal qualities
6. Machinery
7. Local conditions.

(Adapted from Hawkins et al., 1974, Table 5).

The second part of the study looked at the methods which farmers thought were the most effective for learning about farming. The methods identified as being the most effective were ranked as follows:

1. practical experience;
2. ideas and advice from other farmers;
3. ideas and advice from professionals;
4. ideas and advice from reading;
5. formal education (full-time study in accredited courses and short courses).

It was found that educators had an accurate picture of the ways farmers learn about farming. The following findings are pertinent to this project, despite the elapsed time:

- There was a broad spectrum of education resources available to farmers and prospective farmers.
- Perspectives of agricultural educators were not always closely in tune with farmers’ perspectives on the value and content of post-secondary education.
- Farmers emphasised the importance of specific locality knowledge whereas educators emphasised the importance of general principles.
• Educators’ emphasis on general principles affected farmers’ perception of the relevance of courses offered.
• There was a need to develop courses from relevant local problems and concrete situations, progressing to the lesser known areas of general principles, theories and relationships. (This finding also emerged from discussions held with farmers in the course of this project).
• In an analysis of general values, farmers appeared to be more socially aware than initially perceived by educators and technologists. Technical competence was rated lower by farmers than concern for honesty, hard work and care for one’s family.
• Practical experience on the farm was regarded by farmers as the best preparation for the occupation of farming. There was agreement between farmers and college staff on the need to understand financial processes and, to a lesser degree, on the need for detailed knowledge of livestock management.
• There was a need to recognise the importance of minimising jargon.
• There was a need to assess possible differences in language use and cognitive styles between country people and their urban counterparts.
• There was a need for further research into developing appropriate teaching methods for farmers.

Although this study was carried out twenty years ago, many issues raised are still pertinent. Considering the significant changes experienced in the agricultural sector over this period, it is also interesting to note that farmers interviewed in the course of this project reinforced the perception that local knowledge, financial (including business) expertise, and personal characteristics are the most important areas of competence necessary for a farmer today. More recent studies continue to reiterate these points.

A study which identified some of the economic adjustment factors affecting future educational needs of farmers and graziers was undertaken by Salmon, Fountain and Hawkins (1973). A pilot study was initially carried out to assess the feasibility of a national survey. A response rate of 67 per cent was encouraging and a mail return questionnaire was subsequently sent to 80,000 Australian farmers and graziers. The response rate was over 60 per cent and over 1,000 personal letters accompanied the returned questionnaires. Letters contained criticism, useful information and details of financial, economic and personal problems being experienced by respondents. The survey questions were asked within the context of three aspects of the Rural Reconstruction Scheme:

• farm amalgamation (purchasing extra land);
• debt reconstruction (long-term loans at low interest);
• retraining for an occupation outside farming.

Data was also collected on the relationships between farmers’ future intentions to farm, retention of farms within families, and interest in farm management training. It was argued that there could be a marked change in rural social structure in the next two generations which would see a shift in the farming population from small enterprises into much larger ones. A major finding was that interest in farm management and training varied with enterprise structure and operator’s age. There was a high correlation between the two variables.

Of the farmers who intended staying in farming, and who saw their children staying, there was less interest in management training than the group who intended staying, but who predicted that their
children might not stay on the farm or may only work part-time on the farm. From this result it was hypothesised that, if the farm is not affected by inheritance factors, the farmer may be more interested in running it as an agricultural business. However, the researchers felt that this was an hypothesis that needed more research before it was definitively interpreted.

Other issues raised by the study include:

- the need for new directions in agricultural education if projected demographic changes in rural population continue;
- the need for restructuring of courses to cater for non-rural occupational training with a focus on allied rural industry needs;
- the need for institutions to re-orientate their courses to adult agricultural education needs.

The following comment summed up the conclusions (Salmon et al., 1973):

> If industry structure is changing, as suggested, then the operator will probably need more assistance in learning to adapt to larger farms and properties, more complex forms of agriculture, increased technology and marketing, and the mysteries of management, which attend this restructuring.

The authors qualify this, however, by emphasising that consideration will have to be given to the ‘human and social values inherent in the present system,’ which militate against a traditional re-education program (p. 57). This study is interesting, as the issues raised twenty years ago are still relevant today and there seems to be little progress in their resolution.

Ways in which formal agricultural education could be modified to meet changing conditions include:

- agricultural educators taking the initiative to market their product more effectively with regard to assessing and meeting client needs in content and form of delivery, and also in terms of demonstrating the value of education to farmers;
- farmers taking the initiative to indicate their needs with regard to course content and their preferences in delivery modes;
- through dialogue between the two groups, for example through arrangements such as course advisory committees.

**The Need for Lifelong Learning Skills**

As the farming environment has become more turbulent and subject to an increasing rate of change, there has been a corresponding need for farmers to be more responsive and adaptive. Crellin (1994) has stated that the rural community has been even more affected than other sectors of society, despite some opinions to the contrary. The McColl Report (1991) on agricultural and related education and the more recent Karpin Report (1994) on management both emphasise the need for increased focus on adaptability and responsiveness.

Candy (1995) and others argue that, although tertiary qualifications are no guarantee of success in managing change, there is concern that people with tertiary qualifications are under-represented in the agricultural industry. There is also current concern that agriculture does not attract enough high quality students. Field (1995) views this partly as a result of an image problem in the agricultural industry, and these issues are addressed in more detail in the section on ‘Raising Professional Standards in Agriculture.’

Candy (1995) argues, however, that attracting and retaining students in agriculture with flexible courses is only one approach to the problem. He regards the provision of education which encourages
flexibility and the development of lifelong learning skills in the graduate as being of paramount importance. He argues that there is a need to re-emphasise the development of lifelong learning skills rather than short-term technical and vocational skills which can quickly become outdated.

Candy, Crebert and O’Leary (1994) have identified factors indicating the increasing need for lifelong learning skills:

- a continuing shift to an information society;
- competing influences of specialisation and generalisation;
- increasing internationalisation;
- an explosion of knowledge and technology;
- micro-economic reform and the changing workplace;
- emergence of new occupations and careers.

Four categories of learning were also identified:

- workplace-based learning;
- continuing professional development;
- formal study;
- self-directed learning.

The identified skills and attributes required by people to be able to cope with a range of learning contexts and challenges were distilled into six main qualities:

- an enquiring mind;
- ‘helicopter vision’;
- information literacy;
- self-direction in learning;
- a repertoire of learning skills; and
- interpersonal skills and group membership (Candy, 1995).

Although universities profess their commitment to the development of lifelong learning skills in their students, Candy (1995) argues that it needs to be a central core of undergraduate studies. He asserts that, in order to produce lifelong learners, undergraduate programs should provide:

- a systematic and integrated introduction to the field of study;
- a comparative or contextualised framework for understanding the field;
- an opportunity to broaden the student and develop generic skills;
- appropriate freedom of choice and flexibility in structure; and
- provision for the incremental development of self-directed learning.

Candy also maintains that several factors affect lifelong learning skills: teaching approaches and assessment strategies; student support services; and the degree to which the student is exposed to a climate of intellectual enquiry. It is also interesting to note that ‘a climate of intellectual inquiry’ stood out in a survey of graduates as the most important and most widely recognised factor affecting lifelong learning.

Candy’s observations are also reflected in farmers’ comments when they talk about their ability to learn and change. This was continually cited as the most important generic competency for farmers to
possess in today’s farming environment. This ability was regarded as particularly important for information gathering, and for assessment and adoption of new technology in a constantly changing operating environment.

**Informal Agricultural Education**

**Information Sources**

Although there is an extensive literature supporting the view that farmers learn from a wide variety of sources combined with ‘learning by doing,’ there is little documentation on the most appropriate sources of specific types of information or skill development. Such information would add valuable insight into how farmers learn and would benefit farmers as well as providers of information and training.

Dr Jill Kerby’s work in this area sheds some light on the matter, and a report, ‘Information Exchange,’ prepared by Gatton College in 1993, also contributes to the further understanding of farmers’ information management (Kerby, 1994; Woods et al., 1993).

The informal education approach taken by farmers is often based on seeking relevant information to solve current problems in areas of farm production and management. Neil Clark has commented that people obtain information from a variety of sources and by a variety of modes. Common sources used by farmers include:

- peer groups;
- experts/consultants;
- specialised groups;
- radio;
- courses;
- videos;
- television;
- journals;
- books;
- technical demonstrations;
- research projects;
- computer data bases;
- experience (learning by doing).

A report commissioned by the Grains Research and Development Corporation in 1993 showed that 80 per cent of leading farmers ranked private consultants as a very important source of information. The Report also recognised that there was a poor understanding of how farmers learn. Research was cited indicating that while the majority of farmers may have little formal tertiary education they tend to follow fairly conventional adult learning practices when seeking information. Information is sought from a variety of sources to meet different needs. Their learning approach is essentially pragmatic, i.e. directed to solving problems (Myers Strategy Group, 1993).
There is no shortage of information, but getting the ‘right’ information for a particular person and purpose is often a problem. The Kondinin Group was formed to service farmers’ information needs and it provides a widely used service. Developments include the use of facsimile transmission and the Internet. Farmers are also proactive in improving their information sources and gathering techniques. However, the seeking, finding, processing and storing of information at the farm level needs further improvement.

Agricultural Extension

Agricultural extension programs have long been a source of informal farmer education. This approach to farmer education is said to have had its beginnings in the activities of British universities in the nineteenth century in their attempts to disseminate the findings of research activity (van den Ban & Hawkins, 1988, p. 2). In later years the approach was taken up by government departments of agriculture in an attempt to encourage farmers to adopt new practices based on the findings of research, often undertaken by government-sponsored research organisations. The use of extension programs became particularly popular in Australia through the departments of agriculture in each state.

From the above description it can be seen that these approaches to agricultural extension were of the type referred to as ‘top down’ extension. These assumed that the direction of the flow of information was one way, from universities, government research agencies and departments of agriculture to farmers and that farmers needed to be encouraged to adopt ‘progressive farming practices.’ However, it was later realised that the flow of information in the extension process also needed to occur in the opposite direction, that is, a ‘bottom up’ approach (Dunn, 1993; Fliegel & van Es, 1983). In this approach, farmers reported their experiences and findings and provided input into the agenda for research to ensure that research programs were relevant to the needs of farmers. This process has gained momentum and in the past ten years the following trends have been noticed:

- clients have become more demanding;
- more ‘private’ extension occurs;
- there is less government funding and involvement in extension;
- issues/messages are more complex;
- there is a greater need to demonstrate the effectiveness of new ideas.

McGuckian (1994) argues that effective extension programs are characterised by the following:

- active participatory learning;
- response to client needs and demands;
- commercial basis (linking information to benefits);
- the inclusion of complex messages;
- recognition of the whole farm system and the whole agri-business chain;
- risk taking and covering new ground;
- efficiency (time vs benefit considerations).

Farmer-Directed Groups

Many farmer groups have been established for a particular purpose but have broadened their agenda to other issues. Leading farmers are frequently members or instigators of these groups. Landcare groups
are interesting because they have the potential to enhance attitudinal and behavioural change in rural communities. About a quarter of rural landowners are involved and there is already evidence that knowledge and attitudes have diffused from within groups to those outside (Kerby, 1994). The 1993 Australian Pacific Extension Conference emphasised the importance of groups in extension activities. The principles underlying group formation and dynamics were recognised to be diverse. Many factors affecting the success of groups were also discussed (Kerby, 1994).

Initiatives are being taken by farmers to organise groups and to develop analytical tools to assist in production and business management. Some of these groups set up research projects, trials and demonstration sites relevant to their local areas. Many such projects are making significant contributions to current information on farm business management practices and are helping to develop useful benchmarks and analytical tools (Chamala & Mortiss, 1990). Groups can also be seen as a form of farmer education which, if nurtured, could bring significant improvements to farm management.

The draft Report of Dryland Farming Training Skills Assessment, prepared by Sloane Cook and King Pty Ltd (1995) for the Wimmera Rural Training Advisory Committee, provides a comprehensive summary of recently established farmer directed education activities. Focus groups established as part of this study emphasised the need for information which could be applied to ongoing farm management problems. Members also recognised the need to upgrade their skills in a number of areas, especially in information management. Acknowledged also, but not so widely, was the need to learn problem-solving skills as an integral part of being able to cope with information and change.

The Report strongly supported the view that leading farmers were proactive in self help, information provision and information receipt. An increasing trend for farmers, particularly leading farmers, to rely on other people to gather information for them was also identified in the Dryland Farming Training Skills Assessment Report (1995, p. 48). The expanding activities of the Kondinin Group, including their Farmline service, further testifies to this.

The DFTSA Report also found that groups tended to be composed of leading farmers and that it was often a new experience for participants to be in a group learning situation. Reasons cited for formation of such groups included:

- leading farmers are comfortable in this situation due to their confidence and willingness to be compared with others in performance measurement;
- farmers have control over the format, pace and content of the skills learning;
- farmers want tight focus on the problems at hand;
- groups are structured in a comfortable social environment in which all farm members are welcomed.

Additional factors identified in a study on the exchange of information as it affects the success of ongoing groups include:

- a focus on activities which can be implemented and achieve results;
- adequate financial, technical and human resources, especially with regard to group leadership and/or facilitation;
- the development of mutual trust amongst members;
continuing evaluation of goals, direction and effectiveness (Woods et al., 1993).

There are many examples of farmer directed education groups. Woods et al. (1993, p. 61) list and describe the large range of groups operating in Australia, most of which have been formed in the past ten years, varying from small local groups to the national landcare movement. The agenda and structure of groups varies. Information exchange, skills development, problem solving and combinations of these are commonly cited as reasons for group formation. Examples of farmer education groups mentioned in this study include:

- Farm Advance - aims to take a stronger role in the direction and implementation of technology transfer and industry development;
- FarmSmart - focuses on planning and developing the farm;
- Farm Management 500 - a flow-on from Farmfacts with a focus on farm management;
- MEY Check (maximum economic yield check) - aims to provide farmers with accurate information on their crops as well as training them in crop production and husbandry and identification of limiting factors to crop production/management;
- Birchip Cropping Demonstration Sites - trials which aim to improve the adoption of proven practices by growers leading to increased productivity and profitability;
- Wool and Rural Industries Skill Training Centre - was formed on the premise that farmers are keen learners but that the formal education system was not meeting their needs;
- finally, a number of farmer initiated co-operatives have been formed for buying and marketing, but their activities are also invariably educational (see case study of the Shepherds Producers Co-operative Ltd in Appendix 6).

Additional examples of innovation in extension and farmer education schemes include (McGuckian, 1994; Woods et al., 1993):

- Working in Groups (WIGs) - a project funded by the MRC (two day courses in group skills for farmers);
- Landcare;
- Salinity Management Plans;
- Target 10 - Groups of dairy farmers;
- Farm Business Planning - NAB funded;
- The Rural Counselling Program - financial counsellors aiming to improve business decision making;
- Local Consensus Data (LCD)groups - needs analysis groups for cattle producers in Queensland;
- Potter Farmland Plan - demonstration farms focusing on improved land management;
- Skills Evaluation and Education Kit - a skills audit for farmers funded by the Rural Finance Corporation.

**Education and Training Preferences of Farmers**

It has often been asserted that the principles and methods of adult learning apply closely to farmers. This has resulted in the view that education programs for farmers should begin with local issues and then lead into unknown territory (Hawkins et al., 1974; McGuckian, 1994; Knowles, 1984). Furthermore, farmers need to be assured of the short term benefits of a course before they will commit themselves to it. It is also important to ensure that courses fit in with local farming activities (i.e., not
in sowing or harvest time in cropping districts). Finally, short courses are preferred to reduce the
impact of extended absence from the day-to-day operations of the farm.

Recent research has been conducted on farmers’ participation in formal training, on preferences in the
areas of delivery, teaching (methods), content and evaluation of courses (Rural Training Council of
New South Wales, 1995). Key characteristics of quality training were identified as follows:

- training meets well determined learner and industry needs and increases knowledge and skills
  relevant to present or future workplace;
- training is offered in a manner which encourages participation and promotes the acquisition of
  needed skills and competencies;
- training outcomes can be measured;
- training influences change in behaviour and practice and contributes to increased profitability.

The preferences of farmers in training delivery were identified in the report as follows:

- local delivery;
- short courses;
- relevant training;
- hands-on training, apart from some areas of management training, but preference still expressed for
  case study method rather than lecture format;
- flexibility to accommodate seasonal work demands;
- provision of child-minding;
- home study;
- home study plus teacher support (preferred by women in particular);
- provision for social interaction;
- certificate level training.

The criteria identified by farmers for training and information seeking were as follows:

- enjoyment/networking/socialising;
- knowledge acquisition;
- behaviour/profitability - resulting in changed practice, increased profitability and improved farm
  management.

Although the report stressed course delivery issues, farmers also mentioned content deficiencies in
certain subject areas, namely:

- marketing - for specific regional products;
- business management - for specific farming enterprises;
- business risk analysis - capital investment analysis, alternative enterprise analysis;
- landcare and sustainability;
- computing - at all levels;
- financial management (although this area was felt to be more adequately addressed);
- landforming in irrigation areas;
- drought management in drought-affected areas.
Napier and Scott (1994) in their study on recognised prior learning identified the following preferences of farmers with regard to agricultural and related courses:

- short courses;
- a choice of times for residential schools or block release to allow for seasonal commitments;
- flexible completion times for units/modules;
- project based/applied/action learning;
- modularised courses with the option to do only those modules in which participants are interested;
- local support for external courses.

Many of these findings have been further supported in the recently-conducted study, *Farmers and Learning*, by Johnson, Bone and Knight (1996).

**Summary**

The main aim of this chapter was to review the literature on farmer education to see if it confirmed the view that higher levels of farmer education result in better farm management evidenced by higher levels of agricultural productivity. Other aims included identifying trends in the level of education of Australian farmers and identifying trends in farmer attitudes and preferences towards both formal and informal education.

The literature reflected little conclusive evidence of a strong relationship between levels of formal farmer education and agricultural productivity and, in turn, good farm management. While writers such as Wharton (1963) identified positive benefits of education in general, and Lockheed, Jamison and Lau (1980) claimed to have measured improvement in productivity in developing countries resulting from increased years of schooling, others such as Stayner (1969) and Phillips (1994) argued that, in Australia, factors in the external environment may have a greater effect on farm income than the level of farmers’ education. Buggie (1977a), in particular, argued that farmers’ intelligence, knowledge and self-awareness are more significant factors for farm management performance.

In relation to the level of education of farmers, it was found that some of the statistics are incomplete as they have not included the education levels of women and other family members involved in the operation of the farm. It was also argued that formal educational attainment is an inadequate measure of the level of farmer education in general as farmers educate themselves in a wide variety of informal ways which are difficult to measure. However, there is evidence that the levels of formal education of farmers are rising, particularly amongst younger farmers and women farmers.

A review of current approaches to formal agricultural education identified a wide range of findings. The *McCcoll Report* (1991) on the content and effectiveness of tertiary agricultural education looked at the impact of sectoral changes on the nature of future agricultural education. Key recommendations included the need to:

- obtain input from a broad range of disciplines;
- develop skills in integrating and applying knowledge from these disciplines;
- facilitate access by rural people to formal education through non-standard and special entry, articulation with TAFE courses and credit transfer.

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In relation to farmer attitudes towards formal agricultural education and their level of participation in the system, the literature revealed concerns about the perceived low participation rates of farmers. Studies have identified a wide range of factors influencing farmer attitudes:

- the practicality and applicability of courses to farmers’ individual situations and local conditions;
- the availability of appropriate information about the content of courses and the teaching approaches used;
- delivery modes and assessment strategies making allowances for the seasonality of farm work and farm commitments.

While there was some common ground between farmers and educationists as to preferred content and delivery methods of courses, significant differences were also identified. Other factors affecting current approaches to formal agricultural education include the need:

- to attract more high quality students;
- to encourage the development of lifelong learning skills including self-directed learning, information handling and managing change;
- to expose students to a climate of intellectual inquiry and broad vision.

A review of the literature indicated that farmers learn from a wide variety of informal sources combined with ‘learning by doing.’ Within this approach, a wide range of information sources is being used, both spoken and written, recent developments being in the area of computer data bases and the Internet, and an increasing use of specialist advisers.

The other major development has been the increased use of farmer-directed groups. Advantages of these groups include:

- sharing of knowledge and information;
- identification of information needs;
- identification of farm management problems;
- recognition by members of the need to upgrade their skills in particular areas;
- realisation of the need to learn problem-solving skills to cope with change;
- ability to set the agenda in line with group needs.

Observation of these groups has helped to clarify how farmers learn and their preferences in approaches to learning. Comprehensive lists of these preferences have been provided in the literature. These preferences can be summed up as follows:

- content - meeting specific needs for knowledge and skills relevant to current and future developments, including learning skills;
- approach - short, modularised courses encouraging participation, project-based learning, developing competencies, practical, measurable outcomes;
- delivery - flexibility to accommodate seasonal work demands, home study plus local support where possible, provision for some social interaction.
The literature reviewed had little to say about measuring the levels of farmer education in its broader sense. Years of schooling is used as a measure in some of the economics-oriented literature, particularly in relation to developing countries. Census data from the Australian Bureau of Statistics focuses on ‘highest level of qualification attained’ as a measure which takes account of formal education only. Measurement of informal education may require a new approach with emphasis on competencies. This is discussed further in Chapter 6 in relation to competency-based learning and recognition of prior learning.
Chapter 4: Farm Management as an Academic Discipline

The Development of Farm Management as an Academic Discipline

Changes in the meaning and practice of farm management have come from its underpinning disciplines and from its use on farms. The number of disciplines contributing to farm management is a strength and a problem. The strength is the range of ideas contributed while problems arise from the resulting complexity of conflicting concepts. In the 1940s the emphasis was technical, focusing on farm practice. Bookkeeping and arithmetic were the main tools of financial analysis. Budgeting is still the essential tool in good farm management. Its form varies from simple calculations to computer applications, but in all cases it is essentially a tool for planning, decision-making and monitoring the business.

According to Makeham (1978), the science and art of farm management has been studied in depth since the late 1940s. The basic disciplines contributing to its development were economics, mathematics and social psychology. Production economics was studied intensively at the University of New England (and others) during the 1950s and 1960s, and spawned many refinements to budgeting such as the gross margin and linear programming. The former along with cash flow budgeting form the main basis of annual production planning. Production economics has fallen from favour due to its failure to incorporate many essential components of farm operations such as the human element, the risk factors, the dynamics and the time factor. However, the concept of ‘gross margin’ developed in this period remains a widely used tool for analysing and comparing profitability of farm enterprises.

Campbell (1957) was critical of the contribution of research based on agricultural economics as it was lacking in analytical orientation. He felt that many of the studies undertaken were too descriptive of specific regions and reinforced the truisms of agriculture and economics. He saw farm management as an important field of study but said that real progress depended on farmers getting individual advice on their particular operation from management consultants in the private or education sectors. He argued that public agencies could not afford to provide the highly specialised attention required by individual farm businesses for effective farm management.

Critics of the production economics approach and its limited view of farm management, advocated a ‘whole farm’ approach with emphasis on management and the human factor in decision making. This approach emphasised the multi-disciplinary nature of farm management. It also emphasised the role of the farmer as part of the dynamic system and recognised the effects of the broader environment in which a farm operates. However, attempts to realistically model on-farm complexities to analyse decisions and assist the management process at farm level have been intractable (Dent, 1975). The major contribution of the modelling approach is the recognition of the extreme complexity and dynamic nature of farm management.

Systems theorists emphasise that farm managers should have sufficient depth of knowledge in the broad range of disciplines affecting their operations. Conway (1986) puts the case for a multi-disciplinary approach to the research and development of agriculture and land resources. In the
concept ‘agroecosystem’ he emphasises the importance of appreciating the agro-socio-economic-ecological system.

The advent of computer technology has had a major impact on the farm management discipline, with the subsequent development of a variety of analytical management tools and data processing techniques. The use of technology in gaining up-to-date marketing and technical information has also been significant as farmers move into the more turbulent environment of the 1990s. The potential impact of computer and information technology on farming operations is enormous, with a conservatively estimated 12 per cent of Australian farmers already using a computer to assist in the management of their operations (Pratley, 1995).

Musgrave (1976) supports many others in stating that the academic discipline of farm management has made its main contribution by providing a conceptual framework for analysis rather than by raising farm productivity. He says that the long search for appropriate theories and models of farm management have reinforced budgeting as the most appropriate and practical technique used in the process. The focus on the role of uncertainty in decision making is a reflection of the recognition of the significance of intuition in farm management. He also observed a general belief that the problems in developing appropriate theories and models of farm management were too great and the rewards too few for a more analytical approach to replace or support the current inductive, intuitive approach.

Menz and Longworth (1976) observed that the range of farm management models developed in the discipline from the 1950s to the mid 1970s were rarely used by commercial farmers. They considered that the inability of models to represent the major decision problems facing farmers was the main reason for their lack of adoption. The need by managers to constantly adjust operations as conditions in the dynamic system changed was regarded as essential in any farm management model. Menz and Longworth referred to the ability of the farmer to adjust as ‘allocative ability’ and implied that the academic discipline of farm management needed to incorporate this concept into its model building.

Dean (1968), the foundation Principal of Marcus Oldham College, stated that the subject of farm management was a much misunderstood one which seemed difficult to define. He felt it was perhaps more of a philosophy or a way of thinking than a traditional academic discipline. He cited the commonly held descriptions of farm management as:

- whole farm approach - accurate but not clearly defined;
- science and business of farming - incomplete due to social and various financial aspects being overlooked;
- farm business management - too narrow a view;
- agricultural economics - too narrow a view;
- production economics - too narrow a view;
- farm management accounting - too narrow a view;
- integrated husbandry approach - too narrow a view.

Dean argued that farm management was a broad-based discipline which could not be defined by any one of the above approaches. He endorsed the definition offered by Schapper.

Farm Management is the integration of the physical and financial resources of a farm with the inputs of techniques of production in such a manner as will achieve desired income and other objectives. It is the decision making and action taking involved in the integration and co-ordination of farm resources, inputs, techniques and skills within a marketing situation.

Schapper (1966) argued that the components of farm management include:
• **Technical Components.** Climate, soil, plants, machinery, tools and skills which should be regarded in the ecological sense. (Ecology here being the more conventional concept of the biological ecosystem.) This can be extended to the total ecosystem including financial, social and any other environments - which make it farm management.

• **Financial Components.** Economics, finance, taxation, estate planning, systems analysis, methods study.

• **Sociological and Psychological Components.** The farmer - his aims, skills, education, financial situation, assets and liabilities, equity situation, social attitudes and his own psychology. Political considerations and the impact of people associated with the farm business - bankers, accountants, stock and station agents, agricultural service companies, consultants, extension workers and educational institutions.

Schapper's definition takes into account the total environment of the farmer - the social, financial and physical environments, and the personal aims of the farmer. It is a discipline as demanding as any other but the opposite to a research discipline which concentrates on a subject in depth over a narrow field. Farm management requires breadth and integrative skills.

Buggie (1981) identified some key areas of research direction which need attention in order to provide a more comprehensive view of the farm as a socio-technical system:

• the inclusion of the influence of family members on farm decisions - particularly the role of women in decision making and farm performance;
• the inclusion of other basic attributes of the decision makers such as motivation, self-awareness, age and health;
• the inclusion of broader socio-economic factors affecting farm decision making (e.g. extension services, regulations, production and input uses, government policies);
• identification of other dimensions of complexity of the farm business (e.g. diversification, debt levels);
• determination of the relationship between the above factors and farm business performance.

In addition, Buggie outlined a number of implications for biological, economic and social research in terms of their impact on farm management. These include the following:

In relation to biological research -
• a certain amount will only be relevant to more developed farms;
• a cost-benefit analysis may not provide an adequate way of determining the appropriateness of biological research.

In relation to economic research -
• there is a need to view the manager as an integral part of the farm management process rather than as an ‘allocator’ of resources.

In relation to social research -
• there is a need to consider correlations between information gathering behaviour and farm performance in the light of a farmer’s capacity to assimilate the information.

Buggie does not claim to have developed a new theory of farm management. He recognises that many of his arguments have been inferred rather than proven. He does, however, provide a conceptual framework for understanding farm systems and the behaviour of farm decision makers. The most
significant feature of his perspective is the recognition of the farming system as the integration of human, biological and economic elements. He also argues that farm management requires a multi-disciplinary approach and that the reason this has not progressed is the lack of co-operation between related disciplines.

Thus farm management as an academic discipline is seen as encompassing the biological and physical sciences, the social sciences, economics and increasingly the more recently defined discipline of information science. The increasing role which information science is playing in current farm management requires its inclusion into this body of foundation disciplines. It is multi-faceted in the way in which it affects information provision, information analysis and the integration of information for decision making.

Strengths of Farm Management as an Academic Discipline

The following points summarise the main strengths of farm management as an academic discipline.

- The development of theory and tools into a coherent set of processes which underpin farm management education and application at the farm level.
- The multi-disciplinary nature of farm management incorporating the biology, physics, business and mathematics disciplines with the potential to accommodate social and psychological components.
- Recognition of the dynamic nature of farm management (Wright, 1983; Williams, 1958; Makeham & Malcolm, 1993; Dean, 1968; and others).
- An appreciation of the limitations of the farm operating environment on the effectiveness of planning. The long time frames involved in many farm enterprises, the evolving nature of biological systems and the impact of weather exacerbate barriers to effective planning.
- An appreciation of technical skills, information management, a sound equity base and risk management which are important in long term planning and decision making.
- An awareness of the limitations of the discipline in contributing to the process of farm management, triggering continued intellectual inquiry (Makeham & Malcolm, 1993).
- The emphasis on a whole farm approach, drawing attention to the breadth and depth of knowledge required by farmers as well as the ability to integrate and apply it.
- The recognition that farm management is closely aligned to the principles of business management but with added complexity in the form of variable weather and markets, dependence on a biological system, and fragile resource base, together with an often complex set of family relationships.

Limitations of Farm Management as an Academic Discipline

Despite these strengths, the farm management discipline also has problems accommodating the following:

- Farm management emphasises profitability, for without this, other individual goals (such as lifestyle) will not be achieved in the long run. However, the long lead times in getting financial feedback and information complicates analysis of profitability. The development of analytical tools and models for use by farmers and an increasing use of external expertise may assist this process. However, the time frames for most farming operations are long term, and variability over the medium term is difficult to accommodate.
• It is difficult to build into the study of farm management the slow adjustment process for farmers whose long term viability is often questionable. Unlike many other small owner operated businesses, there is often a larger amount of capital involved and the decline and adjustment is often inter-generational. The ability of many farming families to survive in adverse situations further complicates this process.

• The significance and role of human and social factors further complicates the discipline. The influence of the family life cycle and other human factors such as health, age and disability of family members can be major limiting factors in farm productivity and viability.

• Farmers’ goals are not always profit driven. This behaviour undermines the assumptions in many of the models developed in the past, particularly those based on the economic concept of rational decision making (Drinan, 1991).

• It is possible that rational economic behaviour may be limited by a low intelligence base in the farming community due to practices of inter-generational transfer of farms to the ‘practical’ rather than the intellectual members of the family. This is exacerbated by opportunities provided off-farm for higher salaries.

• The rate of change in the environment in which farming systems operate has created a new set of pressures and problems for farmers and the discipline of farm management. Key examples of the changing environment are open market economies, sustainability issues and information overload.

• Farm management may have to adopt a new paradigm to meet the needs of current and future farm managers.

• There is a perceived problem that the agricultural industry lacks professionalism and is having difficulty attracting high calibre students to agriculturally-related disciplines. The recent conference, *Bright Stars for New Horizons*, run by the Australian Institute of Agricultural Science and a meeting of the Australian Association of Agricultural Deans in November 1995 addressed these issues. The poor image of the industry was cited as a major impediment to its growth and development. The complexity, breadth and changing nature of the industry and its multi-disciplinary structure contributes to the difficulty of defining an ‘image.’

• The long lead times in research and current technical information may hinder the development of the discipline. This is partly due to the very nature of agricultural research but also to the fact that dissemination of results is slow and that most research results must then be adapted to the local situation.

• Feedback of financial and business information is critical for farm management, but can be slow.

Pollard (1992) argues that the most important considerations affecting farm management principles and practices include the following:

• the global nature of agriculture;
• marketing;
• agribusiness;
• new technology;
• time management;
• ‘booms and busts’;
• technical efficiency;
• financial management;
• societal expectations;
• policy and industry development;
• community development;
• human resources.

Pollard also emphasised the breadth and depth of knowledge required by farmers today, specifically emphasising the importance of a broad exposure for sound decision making and a basis for further
learning. He argues that educational institutions teaching farm management have the responsibility to introduce students to principles and practices of farm management to broaden their perspective on agriculture generally and introduce them to important trends and issues in the wider community. A positive attitude to further learning is regarded by Pollard as imperative in the current and future agricultural climate.

The Impact of the Discipline on Course Content

The developments in farm management as an academic discipline have been reflected in the content of courses offered in a range of institutions involved in agricultural education. The most noticeable trend has been the broadening of focus from courses based on the management of agricultural production and on agricultural economics through the ‘whole farm’ approach to multi-disciplinary approaches incorporating technical, financial, sociological, psychological and informational ‘components.’ At the same time there have also been developments where these ‘components’ have been expanded to form individual courses in their own right.

This latter trend reflects similar developments in the fields of business management and public administration. Farm management faces the same problem faced by these disciplines, that of finding a way to integrate these separate areas. The approach that has been taken has been to offer advanced ‘capstone’ courses towards the end of a program, often titled corporate/business policy, strategic planning or public policy.

An example of an attempt to provide a text for a single integrated farm management course based on a multi-disciplinary approach is the 1993 text by Makeham and Malcolm titled *The Farming Game Now*. In their preface to the text the authors comment on how different this text is from their previous text of 1981, *The Farming Game*, which was subtitled ‘a farm management text for the 1980s.’ They comment:

*The Farming Game Now* is a text for those people aiming to be involved in farming into the 21st century. It is a markedly different book because the world has changed and we have learnt a great deal. Different areas of farm management are given more emphasis, particularly financial management; new issues are dealt with; and the analytical techniques used are more reliable than they were in the past (Preface, p. x).

The following are the main areas covered in the text:

- The farm business
- Financial management
- Animal farm management
- Crop farm management
- Buying and leasing farm land
- Risk
- Analysis and planning for change
- Farm management history.

A new text by Malcolm, Sale and Egan, titled *Agriculture in Australia: An Introduction* (1996), is another integrative text showing evidence of further developments since 1993. Additional material is included in the areas of farm profitability, agribusiness marketing, sustainable agriculture, as well as material on research, change and improving productivity. The chapter titles and some of the key subsections are as follows:
Chapter 1: Introduction (including material on management productivity and resource degradation).

Chapter 2: Agriculture in Australia (including resources, production, determinants of farming locations and success, the economic system and growth, the farm family and change).

Chapter 3: Processes of Plant Production (including soil fertility, plant growth and management requirements).

Chapter 4: Processes of Animal Production (including animal growth and genetics, pasture and stocking rate management).

Chapter 5: Economic Principles of Profitable Production (including technical and economic principles of resource use, concepts of costs, returns and farm profit).

Chapter 6: Agribusiness Management (including activity analysis, whole-farm financial management, change and risk).

Chapter 7: Agribusiness Marketing (including world demand and supply for food and agricultural products, prices, the production and marketing chain, marketing margins and issues).

Chapter 8: Sustaining Agriculture (including resource degradation, towards more sustainable farming systems, resource issues, benefits and costs of using public resources).

Chapter 9: Improving Agriculture (including improving productivity of dryland cropping, grazing and intensive plant production, improving farm viability, productivity and research).

As well as providing integrative courses on farm management using texts such as the ones outlined above, there has also been a trend to provide narrower discipline-based courses in areas such as financial management and marketing. In some cases small business texts in Financial Management are used with supplementary material relating the concepts and practices to farm management. For example, at Charles Sturt University - Riverina the text, *Financial Management for Small Business*, by Richard McMahon (2nd edition, 1995) is used (Glastonbury, pers. comm.). The main areas covered by this text include the following:

- About Small Business and Financial Management
- Managing the Working Capital and Long-Lived Assets
- Sources of Finance for Small Business
- Planning the Business’s Financial Structure
- Analysis and Interpretation of Financial Statements
- Budgeting - Using and Preparing a Budget
- Costs, Volume and Profits

While the contents of this finance-focussed text show that it is, on the whole, relevant for farm management, other more general texts on small business management are less relevant because of a tendency to place an emphasis on small retail businesses.

Other examples of narrowly-focussed courses in farm management include subjects offered through the New South Wales Agriculture and Fisheries Home Study Program by institutions such as the C.B. Alexander Agricultural College and the Murrumbidgee College of Agriculture. These include subjects such as:

- Cash Flow Budgeting
- Using the Cashbook
Borrowing Money

In addition, the Minister for Agriculture in New South Wales recently announced the introduction of a new diploma course in ‘rural business management’ which is to be offered through these colleges. The program will use ‘nationally-prepared learning materials’ and will be ‘broad-based.’ The program is described as being flexible and involving practical farm skills training as well as rural business management training. The program has also been designed to enable students to progress to diploma and advanced diploma levels, leading to opportunities to enrol in university degree-level courses (Rural News, 14 June 1996).

In Chapter 3, agricultural extension was discussed as a source of informal farmer education because farmers generally gain knowledge from extension processes outside the formal education system. However, it has also been taught as a university subject where it has been seen as a discipline in its own right or part of farm management. The two areas are often located in the same section or department.

Extension as an academic discipline in agricultural course curricula generally includes a theoretical underpinning in perception and learning theory, communication and information diffusion as well as change in rural social systems. At the practical level it usually includes training in communication skills and extension methods (van den Ban & Hawkins, 1988). Terms such as ‘technology transfer’ and ‘barriers to adoption,’ which imply a top-down approach to information diffusion, have been used extensively (Fliegel & Van Es, 1983; Rogers & Shoemaker, 1970).

Alternative paradigms of change have been used with greater frequency in recent years incorporating approaches such as ‘farmer participation’ in research projects and information diffusion, a ‘bottom up’ flow of information and initiation of research agendas and ‘putting people first’ which turns the focus onto farmers’ needs in research strategies (Dunn, 1993; Röling, 1988). The practical training within this paradigm often extends to the development of knowledge and skills in the organisation and management of voluntary groups such as farmer-directed organisations (Chamala & Mortiss, 1990).

An example of a text produced for the study of Agricultural Extension at the tertiary level is one of that title by van den Ban & Hawkins (1996). Key areas covered include the following:

- Extension - concept and role
- Theoretical underpinning
- Extension methods
- Planning, evaluating and monitoring extension programs
- Participation of farmers in extension programs
- Management of extension organisations
- The role of agricultural extension

In another text titled Extension Science: Information Systems in Agricultural Development, the author Niels Röling seeks to update the image of the discipline by giving it a scientific and information systems orientation (Röling, 1988). While covering many of the same areas as the above text, a feel for his approach can be gained from his key chapter headings. These include:

- Changing issues in extension science
- The logic of extension as an instrument for inducing voluntary change
- Diffusion research and the use of target categories in research
- Targetting the agricultural information system
- Five essentials for the creation of active utiliser systems
- Agricultural information systems

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A key area of overlap between agricultural extension and farm management in terms of farmer education is that of managing information in the farm context. Another significant link between agricultural extension and informal farmer education is the focus in the discipline on the role and management of farmer directed groups which the literature indicates are playing an increasingly important part in farmer education. However, an important difference in extension studies compared to farm management is the appreciation given to non-economic social sciences such as sociology and communication theory.

Summary

The review of the literature has shown that the academic discipline of farm management has changed significantly over a number of years, influencing the content of courses in this area of study. The early emphasis on farm production economics covered areas such as budgeting (including the gross margin and cash flow budgeting) and production planning. Production economics came to be seen as too limiting and its critics advocated a ‘whole farm’ approach emphasising the multidisciplinary nature of farm management. Dean (1968) argued that this approach was generally accurate but was not clearly defined.

Other approaches included farm business management, agricultural economics, farm management accounting and the integrated husbandry approach. Dean considered all of these to have ‘too narrow a view.’ An additional approach, referred to as ‘the science and business of farming,’ was regarded by Dean as being incomplete due to various social and financial aspects being overlooked.

Further contributions to the academic discipline from systems theory, the social sciences, business management and information science have broadened farm management into a multidisciplinary field of study. Schapper (1966) provided a clearer definition of the discipline and argued that it comprised technical, financial, sociological and psychological components. Buggie’s research (1981) confirmed this and identified key areas which needed further research to provide a more comprehensive view of the farm as a socio-technical system. He argues that lack of co-operation between contributing disciplines has impeded the development of farm management as an integrated academic discipline.

The chapter continued with an overview of the strengths and limitations of farm management as an academic discipline followed by a discussion of how changes in the discipline have been reflected in the content of courses. In general, broader, more integrative courses are being offered covering the range of ‘components’ identified by Schapper, Buggie and others. At the same time, contributing disciplines have provided more narrowly-focussed courses in areas such as farm financial management and agricultural marketing.

However, while farm management has incorporated ideas from other disciplines, there is still a tendency for the input from the social sciences, other than economics, to be limited. Scrutiny of courses often reveals a lack of appreciation of the complex interactions between people on and off the farm - forces which provide the farming enterprise with its purpose and goals. Such processes, where addressed, tend to be included in subjects in the extension area.
Chapter 5: Good Farm Management

Introduction

In this chapter the literature is reviewed with the aim of looking to see if there is some general consensus as to what constitutes good farm management. In order to do this from as broad a perspective as possible, the literature in a number of associated areas is reviewed, starting with a general overview of current economic forces impacting on farm management that a good farm manager must cope with successfully. This is followed by a discussion of the literature dealing with criticisms of current approaches to farm management in Australia. This is included as it begins to suggest what farmers need to do to overcome these criticisms and become good farm managers.

This leads to the key section of the chapter which seeks to distil from the literature the major characteristics and competencies considered to constitute good farm management. For comparative purposes some of the general business management literature is reviewed to outline the key competencies for good management identified for that area, followed by some comments on the relevance of this literature for good farm management. The chapter concludes with a major section on measuring good farm management as the issues arising from this process help to extend our understanding of what constitutes good farm management, as well as highlighting the difficulties in measuring this concept.

Economic Influences on Farm Management

Historically, farm management was production orientated emphasising hands-on skills and commitment to the land. It was learnt through family farm experience or the jackaroo system on larger holdings. Up to the late 1960s farm managers were able to maintain economic viability through conservative, low-risk management practices. Since then there has been a gradual increase in the spread of financial performance levels between the top 20 per cent of farm managers and the remaining 80 per cent (Peterson, 1994).

Today, a variety of factors, many of which are external to the farm, threaten the viability of many farms. These factors include:

- the higher level of skills required to operate a successful farm business (Hely, 1985);
- structural adjustment is reducing the number of primary producers but is providing opportunities for some farmers to diversify (IRC, 1984);
- a gradual decline in the terms of trade for agriculture relative to other sectors (Peterson, 1994, p. 4);
- the effects of deregulation in marketing and finance on the risks in agriculture (ABARE, 1993);
- developments in global agricultural trade influencing international quality standards;
- general community concern about the environmental sustainability of agriculture and the expectation that farmers will use environmentally responsible production systems.

Henry (1995) comments that the main point to note in considering these factors is that farmers have less control over their economic and social destiny than they did twenty five years ago. They have less political influence, less market protection and a lower level of investment and taxation subsidies. Traditional low risk conservative methods of surviving ‘bad times’ so that the profits of good years could maintain viability have been undermined by the ‘cost-price squeeze’ and the steady decline in the value of agricultural commodity prices in real terms.
Henry believes the agricultural industry’s management practices are lagging in achieving world best practice. The cotton and dairy industries, however, are cited as demonstrating the ability to successfully adapt to change and achieve farm business profit by adopting sophisticated and comprehensive decision making processes. Advances in production, marketing and financial systems have been widely adopted.

Criticisms of Current Approaches to Farm Management in Australia

McKinna (1993) expressed the view that Australian agriculture has untold potential but the industry has failed to recognise and respond to fundamental shifts in the world commercial environment. He argues that the agricultural sector’s economic and political influence is on the decline, and that opportunities are being lost to serve the rapidly growing Asian markets. The advantages we should build on include:

- temperate and tropical climates;
- long seasons;
- versatility;
- natural productivity;
- southern hemisphere location;
- proximity to Asia.

McKinna also argues that there is a need to recognise and adjust to changes in the commercial environment. These include:

- a global rather than local view;
- deregulation and free markets (with some notable exceptions);
- increased and brutal competition;
- less government intervention;
- influential trading blocs.

McKinna points out that marketing needs to be more effective and that farmers need to deal with the following problems:

- a production instead of a market-orientated outlook;
- inadequate market intelligence;
- failure to specialise and target niche markets for higher values;
- bulk commodity rather than individual product focus - failure to value add;
- problems in statutory authorities;
- government constraints;
- high political interference and accountability;
- quality of directors;
- industry politics;
- lack of long term planning;
- lack of development of branding strategies;
- failure to enter into strategic alliances with processors and marketers;
- reactionary rather than proactive;
- failure to attract good marketers and managers.

Measures that farmers can take include developing close relationships with agricultural processing companies (e.g., Shepherds Producers has developed marketing linkages with Goodman Fielder and
Westons) and the development of strategic alliances to take advantage of marketing opportunities. Other suggested changes include:

- the need to focus on strategic management to reduce risks associated with farming cycles and the need to focus on issues where farmers can have some control;
- the need to adopt approaches such as being market driven, specialising in areas of comparative advantage, striving for world’s best practice, adopting total quality management, and forming strategic alliances to increase long term competitiveness;
- the need to recognise some of the ‘myths’ in agriculture and to embrace a more commercial approach;
- the need to recognise the long lead time in market development and the importance this places on planning and being in close touch with markets;
- the need to manage internal conflicts where family members are actively involved.

To sum up, there is a need for farmers to reassess their attitudes, addressing the fact that they are primarily running a business. Farmers need to better manage the human resources available to the farming enterprise, to take advantage of marketing and diversification opportunities, and to embrace changing circumstances pro-actively. (McKinna, 1993; Agrimark, 1989).

Defining Good Farm Management

In the process of analysing good farm management, writers have identified a number of characteristics considered desirable or necessary for good farm managers. Some of these prescriptions are based on analysis of successful operators. Other work is less empirical and is based on analysing the roles farmers must perform in this operating environment. Whichever approach is taken, writers generally find it necessary to focus on processes and competencies in order to define good farm management.

Lees and Reeve (1991) argue that farmers must be business people first and farmers second. This highlights the need to incorporate concepts of business management into farm management. Martin et al. (1990) define strategic management as ‘... the way in which managers formulate and implement strategies which achieve the goals of their respective businesses.’ They further suggest that this process has five essential elements:

- setting enterprise goals;
- evaluating the threats and opportunities in the operating environment;
- diagnosing enterprise strengths and weaknesses;
- considering alternative strategies; and
- choosing the most appropriate strategy (Lees & Reeve, 1991, pp. 6-7).

Lees and Reeve (1991) in their literature review did not clearly identify the competencies required to undertake the strategic management of a farm business. This reflects the more recent emphasis on this area and the failure of the academic discipline in the past to embrace a ‘business’ view of farming. Olsson (1988) reinforces the need for strategic management in his work on identifying the characteristics of four main types of farm manager amongst Swedish farmers. These are described as:

- purposeful strategists;
- gamblers;
- cautious strategists;
- defensive strategists.
Insulander et al. (1986) tabulated the characteristics of ‘entrepreneurs’ and ‘cautious strategists’ for comparative purposes, and Lees and Reeve make the point that courses in farm management should develop student competencies in line with those of ‘the purposeful strategist.’ They also argue that the characteristics displayed in the model of ‘cautious strategists’ are reflected in many successful farmers of the past. However, in the rapidly changing environment in which farmers operate today, the management tactics which were successful in the past may no longer be appropriate, as they may not be conducive to survival and growth in the future (Lees & Reeve, 1991).

Makeham and Malcolm (1993) claim that the essence of good farm management decision making is having the appropriate breadth of scope and the appropriate depth of detailed analysis to focus on the critical aspects of the problem. It is widely recognised that this is not easy, as it is complicated by the sound judgement required to identify the problem and to time the response appropriately. They further argue that it is for this reason that people have attempted to focus on particular parts of the discipline at the expense of treating the farm operation as a whole.

Wright (1983) argues that farmers have little scope for control over outcomes, making planning and decision-making relatively less important than a number of other management processes. The complexity of each farm business means that planning has to be both general and specific, built on broad approximations (Makeham & Malcolm, 1993). Although initial planning decisions are considered important, the ensuing action to make the decision work is thought to be a key area of farm management.

Menz and Longworth (1976) argue that in the Australian context the climatic, disease, price and political uncertainty and instability in which farmers operate emphasise the importance of allocative ability (i.e., the ability to adjust). It follows that in many farming situations timely short-term adjustments are likely to be more important influences on profitability than the general farming system employed.

By definition, allocative ability is linked closely to information processing. Although all managers have problems with information processing, in agriculture the problem is further complicated by the many roles the farmer must perform. Menz and Longworth argue that there has been a tendency for farmers to emphasise the physical roles at the expense of the administrative or entrepreneurial roles. The traditional approach to farm management information processing has stressed record keeping as an end in itself rather than as an aid to decision making and planning.

Buggie (1977a, 1981) responded to the Menz and Longworth view by arguing that allocative ability was possibly a matter of an individual’s information processing ability. He agreed that there was a need to develop farm planning and management models more relevant to farmers, but argued that there was a need to have a range of models in line with the intellectual capacities of different farmers. The work of Menz, Longworth and Buggie, amongst other writers, raises the two viewpoints about managerial skills:

- that they can be improved by education through knowledge and skills development;
- that they are, in part, determined by intelligence or personality factors.

The work of Buggie implies that good farm management involves the farm manager recognising the constraints imposed by inherent abilities and the availability of time. The increasing complexity of the operating environment requires a degree of knowledge and skill not likely to be found in one person or family. The farm manager therefore needs to have an appropriate level of knowledge of out-sourced advice or information and to be able to assess its quality and applicability.
A study of management competencies of farmers running businesses judged to be in the top 20 per cent of rural clients was undertaken by the National Australia Bank in 1991. Findings of the study included:

- 62 per cent of the top performers used forward planning and budgeting compared to 54 per cent in the average group;
- 32 per cent used an agricultural consultant;
- high rates of computer ownership were exhibited, with 30 per cent using computers in their day-to-day business operations, mainly for business and information management (these figures would be significantly higher today);
- the top operators had more contact with their professional advisers (bank manager, accountant, etc.) than those in the average group.

The survey also included comments on the personal characteristics of good farm managers. These included:

- having clear personal goals and standards;
- being honest and straightforward in dealings with others;
- not being easily deflected from the main mission;
- possessing a realistic appreciation of their skills and being prepared to employ specialists to supplement their knowledge;
- being comfortable with management work which often involves tasks that are interrupted and brief;
- avoiding excessive risks and living within appropriate means;
- being adaptable and responsive to changing circumstances;
- being market-orientated and seeking to produce what the market needs (Shearer, 1994).

Interestingly, these competencies are commonly put forward as being appropriate for managers in any business situation. These generic components of management were highlighted in discussions with ‘leading farmers’ and leaders in agricultural education.

In a United States study by Ashby (in Henry, 1995) on the characteristics of farm managers who were successful in spite of the recession, the following competencies were identified by practising farmers as helping them to be more professional:

- good communication;
- timeliness in operational practices;
- good marketing skills;
- quality production control;
- ability to work hard for long periods;
- possession of good practical skills;
- maintenance of management information systems;
- ability to work with others as information sources;
- motivated to achieve predetermined objectives (Henry, 1995, p. 6).

These reinforce many of those identified in the 1991 National Australia Bank survey. It is also interesting that as early as 1958 Williams drew attention to a range of managerial and socio-economic factors influencing farm management expertise. These included ability to access capital, goal-setting abilities, ability to plan risk management strategies and manage change, decision-making skills, and ability to adopt new technology effectively, together with the farmer’s level of motivation. His approach focussed on the human behaviour element in farm management at a time when this aspect was generally neglected.
To sum up, the descriptions and discussion above, together with supporting material in earlier chapters, goes some way towards defining good farm management. A range of competencies is listed below, grouped under the following key headings:

- Management of Technical Aspects of Farming
- Decision-Making and Planning
- Financial Management
- Marketing Management
- Integrative Skills
- Personal Psychological and Social Characteristics.

The following more detailed information provides a comprehensive but not exhaustive description of good farm management as depicted in the literature.

**Management of Technical Aspects of Farming**

Farm management, more than many other fields of management, requires the manager to have an extensive knowledge and range of competencies in the technical aspects of the business because of the generally small number of people involved and the limited scope for specialisation of management functions amongst the farm’s human resources. Some examples in this area include:

- knowledge and skills of crop production methods;
- knowledge and skills in animal husbandry;
- knowledge of soils, fertilisers and related areas;
- competency in the knowledge and use of sprays, chemicals, etc.
- competencies related to the choice and use of agricultural machinery and equipment;
- competency in knowing how to gain access to technical information when required.

**Decision Making and Planning**

The literature clearly expresses the importance of decision-making skills and the ability to undertake comprehensive planning to achieve good farm management. The study of Swedish farmers by Olsson (1988) emphasises their need to be strategists and Lees and Reeve (1991) take up this point to argue that courses in farm management in Australia should seek to develop the competencies of ‘the purposeful strategist.’ Similarly, research by the National Australia Bank (1991) and Ashby (1995) emphasise the importance of sound decision-making and planning for good farm management. Some of the key competencies identified in this area include the following:

- having the appropriate breadth and scope of knowledge to focus on and analyse the critical aspects of problems as the essence of good decision making (Makeham & Malcolm, 1993, p. 36);
- the ability to use modern information management systems for sourcing information to assist in decision-making;
- the ability to analyse the economic environment and to plan in a way that responds to shifts in the environment;
- the ability to analyse the results of research programs and to apply these ideas appropriately in decisions and plans;
- the ability to make decisions and plans for the optimum use of the human resources available to the farm;
- the ability to make decisions and plans which cope with external factors such as market deregulation, increased competition and lower levels of government support;
- the ability to take a pro-active rather than re-active approach to decision-making and planning, including action to reduce the risks associated with economic and farming cycles;
- the ability to plan an appropriate enterprise mix for the farm business, including the ability to recognise and plan for the long lead times sometimes required for changing the enterprise mix;
the ability to assess out-sourced expertise and apply the information appropriately in decisions and plans.

Financial Management

There is an overlap between planning and financial management as the planning process requires the formulation of financial plans such as budgets. For convenience, these aspects of planning have been included in this section on financial management. The link between financial management and good farm management is clearly summed up on the point made by Lees and Reeve (1991) that farmers must be business people first and farmers second. Some of the key financial management competencies that have been identified include the following:

the ability to embrace a commercial approach to farming and achieve a profitable outcome for the enterprise;
the ability to place the farming enterprise in a sound financial position in terms of debt management, capital outlays, maintenance and replacement of assets, risk management and taxation and estate planning issues;
the ability to undertake financial planning including budgeting either personally or with out-sourced advice and assistance;
the ability to minimise operating costs in a range of areas such as fertiliser, sprays, fuel, machinery repairs, while maintaining farm sustainability;
the ability to achieve appropriate financial ratios in a range of measures such as:
  - operating costs to income
  - variable costs to income
  - farm operating surplus per hectare
  - return on farm assets
  - return on equity.

Marketing

Writers such as Ashby (1995) emphasised the importance of marketing skills for good farm management. Marketing skills mentioned in the literature include the following:

the ability to access market intelligence in a timely approach and to use it appropriately;
the ability to recognise market opportunities including niche markets and the supply of specialised rather than bulk products (i.e. produce which the market wants);
the ability to use quality control and best practice techniques as part of a product marketing strategy;
awareness and use of product branding as a marketing strategy where appropriate;
the ability to form strategic alliances with processors and marketing specialists.

Integrative Skills

Both the farmer education and farm management literature frequently refer to the importance of integrative skills for good farm management, generally inferring that this is the key competency for success because it involves the bringing together of a number of competencies. Integrative skills identified in the literature include the following:

the ability to use a ‘whole farm’ approach to farm management which integrates the physical, financial and human resources of the farm;
the ability to use the above approach to achieve the optimum productivity from the farm;
the ability to ensure the sustainability of the farm through practices which achieve profitability while maintaining the health of the soil, vegetation and water resources of the farm.
The personal psychological and social characteristics most commonly cited as major contributors to successful farm management include the following:

- self-motivation, clear goals and standards;
- ability to change and adapt to new situations;
- ability to learn and be inventive/innovative;
- ability to gather and assess information and advice;
- good judgement;
- interpersonal and communication skills;
- self-awareness of strengths and weaknesses;
- honest and ethical dealings with others;
- ability to work hard and for long hours when necessary;
- ability to manage time effectively - being well organised;
- determination and persistence in the face of difficulties and adversity;
- ability to recognise and avoid excessive risk.

Managerial Competencies in the General Management Literature

Managerial competencies are defined as the basic levels of knowledge, skills and abilities required for managing. A survey by Cunningham and Trevor-Roberts (1984) of fifty chief executive officers (CEOs) of ‘Australia’s better run organisations’ identified some two hundred competencies required for senior management. These were then clustered into five broad groups:

- the ability to relate to people (e.g., empathy, leadership, team development);
- the ability to get things done (e.g., self-motivation, bias for action, ambitious, market-oriented);
- the ability to see the big picture (e.g., political skills, public relations skills, able to read the economic climate, the ‘helicopter’ factor);
- the ability to think clearly (e.g., innovative, analytical, able to assess facts, sense of reality);
- personal maturity (e.g., understanding own strengths and weaknesses, professionalism, handling stress, commitment).

(Cunningham & Trevor-Roberts, 1988, p. 40).

Hayward (1992) comments, however, that any list of managerial competencies will be affected by the model or perspective used. He also emphasises that differences in managerial jobs require different emphases among the various competencies. He asserts that, based on analysis of the nature of managerial work, effective managers have the following competencies:

- skill in the political and symbolic repertoires associated with setting agendas and managing meaning;
- a clear communicable and achievable sense of direction (or vision) for his/her area of responsibility;
- a good knowledge of the technical components of his or her job and a good knowledge of organisational rules and systems, both types of knowledge being important sources of power;
- an ability to recognise and acquire power and use it discreetly;
- the capacity to recognise the consequences of his or her own actions and also the consequences of organisational processes;
- effective techniques for dealing with work pressures, e.g., time management, decision methodologies, work prioritising, delegation and subordinate empowerment;
- good negotiation and bargaining skills;
• a critical understanding of management techniques and languages;
• an appreciation of the capacity of information processing technologies to improve work processes and outcomes and free human potential;
• a capacity for creativity and intuitive thinking;
• a strong need for achievement backed by a need for power;
• an ability to facilitate ‘cross boundary’ transactions through skills in liaison, networking, negotiating and ‘committeeing’;
• an appreciation of the operation of political, economic and market forces (especially relevant for senior management).

Hayward follows up this list with the conclusion that, whilst much can be done to educate people for management, competence, intelligence, experience and personality clearly play an important part in management effectiveness.

Peter Saul and Roger Collins have developed a software package, Management Competencies Development Program (MCD), to enable managers to assess their general management competencies. This is done by means of self-profile and a profile based on their colleagues’ perceptions of their performance. Individual managers are able to compare their results with norms generated for Australian managers as an industry group.

The main benefit perceived by users to date has been its use as a diagnostic tool for managers to assess their development needs. It has also been a means to more open communication between management and their staff and peers. Users to date have commented on the greater value provided by the exercise compared to general training courses. While the value of the development of Australian management norms is widely regarded as being limited, programs such as MCD may have longer term effects on personal awareness and management development needs than originally thought and may provide the basis for further developments in this area.

Kanter (1989) makes the point that managers in the future will have to develop their political competence in order to respond to the trends towards internal synergies, the development of strategic alliances and the push for development of new ventures. She further emphasises the growing need to bargain, negotiate and sell rather than making unilateral decisions and issuing commands. Carroll (1988) further supports these projected changes and speculates that the emphasis on strategic planning will increase as the environment becomes increasingly turbulent and risky, the marketing arena widens and the amount of information available increases.

The Industry Task Force on Leadership and Management (Karpin Report, 1994) emphasised the importance of the role management will play in Australian business in the next ten to twenty years. It argues that the emphasis will be on management and organisational capability rather than the more traditional reliance on Australia’s endowments to maintain its position in a deregulated economy. The report also provides an analysis of the characteristics required by managers to operate successfully in the current and future business environment. The core messages of the Karpin Report emphasised that Australian managers must develop an outward focus, all Australian enterprises must deliver quality goods and services to customers, and, in order to export effectively, Australia must be internationally competitive.

Although their projected profile of the manager of 2010 may not be directly applicable to the farming manager as their focus was on large organisations, there are implications for farmers having to reassess their management abilities and strategies as they are possibly one of the first industries to be challenged by the eroding natural resources in the country and also by the deregulated economy. The report also identified the perceived strengths and weaknesses of Australian managers. Although referring to the management population at large in Australia, it is relevant to consider these findings in
These strengths and weaknesses include:

**Strengths** (ranked order):
- hard working
- flexible and adaptable
- innovative/inventive
- technically sound
- egalitarian
- independent thinkers
- open, genuine and direct
- honest and ethical

**Weaknesses** (ranked order):
- short-term view
- lack of strategic perspective
- inflexible/rigid
- complacency
- poor at team work and empowerment
- inability to cope with differences
- poor ‘people skills’

The ideal Australian manager is said to require the following characteristics in order to meet the managerial requirements of the future:

- ‘people skills’
- strategic thinking
- vision
- flexibility and adaptability to change
- self management
- team play
- ability to solve complex problems and make decisions
- ethical/high personal standards

It is also interesting to consider Karpin’s more detailed analysis of projected profiles for frontline and senior management. Both profiles have relevance for farm managers depending on the type and scale of operation conducted. It is not unreasonable to predict that there will be an increasing number of farmers running highly complex, large scale operations which incorporate activities ranging from production through to direct marketing of an end product on an international arena. There are many examples of this occurring now. Tumut River Orchard Estate provides an interesting case study to illustrate this development (Appendix 6).

On the other hand, if the scale of operation is smaller, the profile of the ‘frontline manager’ may be more applicable to consider as a model for the key proprietor, bearing in mind the proprietor’s additional responsibility to strategically plan, operate and control his business as well as to focus on production activities. In view of this, both profiles are relevant for consideration as models:

**Frontline Manager in the Year 2010**
- male or female;
Senior Management Profile in the Year 2010

- male or female;
- wide range of ethnicities, citizenship;
- graduate (probably postgraduate qualifications), wide ranging career (many placements), product of major development program (including placements);
- global focus, travels regularly, has lived in two or more countries;
- manages in both regulated and deregulated countries;
- manages workforce in several countries, shares information and delegates heavily;
- environment typified by rapid change, limited term appointment, high pressure, results driven.

The question remains, however, as to how prescriptive lists of management characteristics such as these can be used to develop these skills and qualities in current and future farm managers. Are they useful for individuals with regard to analysing what they perceive as their own skills and capabilities? How are perceived inadequacies to be rectified? Should they become the basis for designing farm management courses?

Relevance of General Management for Farm Management

Given the current emphasis on management competence in the successful operation of a farm business, there is a case for reviewing the literature to determine which of the competencies prescribed for general business management are likely to be significant for farm managers. As indicated above, factors which affect the operating environment of the farmer (such as enterprise type, scale, structure and ownership of the business) have to be considered.

Literature on owner-operated businesses may be the most relevant in this regard, as the management specialisation which occurs in larger organisations is not characteristic of the majority of current farming operations. Trends towards this specialisation may be occurring with respect to larger scale operations or those with significant diversification or value adding enterprises, but the focus on integrative skills required by the majority of farmers is not significantly addressed.

The other significant difference is related to the depth and breadth of knowledge from many disciplines required by farmers. Out-sourcing specialised expertise is an increasing trend in farming in both technical and business management areas. This requires farmers to have some knowledge of the relevant area to be able to assess the out-sourced expertise and to apply the information and manage the system.

Literature from the management discipline is varied in its potential use. Much of the writing is highly generalised and lacking in specific guidance. Financial management is generally given only brief attention in the general management literature as it is regarded as a separate, specialised discipline with its own literature. On the other hand, the small enterprise management literature devotes a considerable amount of attention to financial management issues. Poor financial management has been identified as a major cause of small business failure. Much of this literature would be relevant to
farming enterprises. The interviews undertaken in the course of this project illustrate the importance farmers place on financial analysis in decision making.

There is potential, however, to analyse facets of the general management literature on strategic planning, marketing, information management, leadership and communication - areas emphasised as important for good farm management but not always included in the traditional view of farm management.

**Measuring Good Farm Management**

*Problems of Measuring Management Ability*

Work on measuring good farm management is limited by the lack of empirical studies on key contributing factors. This is relevant when considering generic capabilities such as integrative skills, ability to source, assess and apply information effectively, and sound decision making, which are frequently cited as being essential to good farm management.

To illustrate this point, assessment of a farmer’s ability to record and analyse financial information may be straightforward. The difficulty arises, however, in attempting to assess the farmer’s ability to use this information effectively. The significance of the individual circumstances in which a decision is made cannot be underrated. Many aspects of farm decision making are complicated by varying personal goals of family participants. While there may be a strong argument for family farming operations to be more ‘business like,’ methods for evaluating this are complicated by ‘invisible’ family dynamics.

There is evidence of much decision making being primarily focused on relatively short term cost management in some farming situations and on a longer term cost-benefit basis in other situations. Measuring farmer competence in decision making for the long term viability of a farm operation is difficult because of the long time spans involved. There is also evidence of the focus of farmers’ decision-making changing from a ‘positive’ orientation to a more ‘negative,’ cost management focus when returns are failing to achieve desired results. This re-orientation has been seen in situations of expansion where farmers’ managerial competence has not been strong enough to meet the needs of a more complex operation. It can also be observed in situations of diminishing returns when expansion has not been a factor. Confidence is considered to be a significant factor in altering the focus of decision making (Paton & Nowlan, pers. comm.).

The long term effects of a strong focus on short term cost management at the expense of long term strategic planning are generally negative. There are some examples of farmers who have expanded and, recognising this, have subsequently simplified or reduced their operation to a more manageable scale. Whether these farmers are viable in the longer term remains to be seen. Rural counsellors have observed that there may be a need to employ strategies to boost family income if the farm is to be retained (Paton, pers. comm.). Determining and measuring what is good farm management in these different situations is often difficult.

There has been some development, however, in identifying financial indicators that are affected by management capabilities. The banks have been proactive in this area to improve their own risk
management in financing farmers. Accountants have also been working in this area. Projects like ‘FAST’ (Farm Management and Sustainable Technology) are also developing financial indicators and benchmarks to assist farmers to analyse their businesses and identify their comparative strengths and weaknesses. Some of these indicators are discussed in more detail in the following sections.

**Measuring Farm Management Performance by Size/Output Categories**

A strong case exists in Australia to analyse farms by size/output categories to establish meaningful analysis of farm operations (ABARE, 1995b). Many farmers put forward the view that ideally farms should be categorised by locality, rainfall, soil type and landform, as these factors are significant determinants of land use and ultimately determine the limits of productivity.

ABARE has presented a case for measuring farm performance by size/output to overcome the limitations of analysing the total sector due to significant variations between farm businesses based on size and output. For instance, around 70 per cent of the total value of broad-acre production is produced by one-third of the population of broad-acre farms. Analysis of the financial performance of the broad-acre sector by output categories may add to the understanding of many rural issues such as the impact of interest rate changes, commodity price changes and farm adjustment. There were approximately the same number of farms in each of the three groups identified by ABARE (1995b).

The three broad groups proposed by ABARE to shed light on the structure and performance of Australian agriculture are:

**Group One**
- Average area of holdings is 923 ha.
- Mainly small livestock producers with farm cash incomes averaging $1,556.
- Group produces 8 per cent of total broad-acre sector output.
- Heavy reliance on off-farm income (average off-farm income was $19,558 per farm).
- Although many farms in the group have very high farm debt (too high to service with the low levels of farm cash income), 35 per cent of these farms have little or no debt (compared to national average of 22 per cent).
- Rates of return for the group were very low, averaging -4.3 per cent in 1992/93.

Results indicate that in this group there is high reliance on off-farm income to support farm families and possibly to subsidise the farm operation.

**Group Two**
- Average farms in this group were twice the physical size of Group One farms but only one quarter of the size of Group Three farms.
- The group produces 22 per cent of total broad-acre sector output.
- Total farm capital is approximately half of that of Group Three.
- Farm enterprises varied in this group with 32 per cent being mixed livestock/crop producers.
- Average farm cash income of $22,443 per farm.
- Average return on capital for the group of -1.5 per cent for 1992/93.
- Non-farm income relatively low at $9,994 per farm.
- Average total farm debt for the group was $101,969, and approximately 32 per cent of net income was required to service interest payments in 1992/93.
Figures suggest that many farms in this group earn insufficient income to meet debt commitments, capital investment and living expenses.

**Group Three**

- Average area of holdings is 7,145 ha.
- Comprise about one third of broad-acre farms and produce 70 per cent of the sector’s output.
- All broad-acre industries are represented in the group and most wheat and crop farms.
- Average farm cash income for the group was $75,730 in 1992/93 with farm business profit averaging $6,964.
- Average rate of return on capital was 2.4 per cent in 1992/93. This was the only positive ROC (Return on Capital) recorded out of the three groups in a year of generally depressed agricultural returns.
- Debt levels were large, averaging $281,072 per farm, with the proportion of farms with no debt being only 12 per cent in 1992/93.
- 26 per cent of net income was required to service interest repayments in 1992/93.
- Relatively low equity levels, with 15 per cent of farms having less than 60 per cent equity.
- Off-farm income generally generated by investments, rather than wage and salary earnings, and small relative to farm receipts.

This sector appears to be able to service debt due to its higher level of return to capital. ABARE uses these three distinct groups of farmers to provide a more meaningful framework for measuring farm financial performance which can also be extended to measuring farm management practices and farmer competence. It can be argued that all farmers need general business management skills, but technical and other competencies relating to individual situations vary greatly. The complexity of operations also varies from group to group and affects the competence required for decision making, communication, leadership, information management and other generic management skills.

There is general agreement that the size of farms is a significant factor affecting profitability and the ability of farmers to generate an adequate level of disposable income to sustain their business. Discussion on farm size must take into account the productivity of the land. Many analyses of farm operations now recognise the importance of situational features such as whether farmers are part or full-time. Different measures of good farm management are required for each category.

The most obvious way to remain in full-time farming is to increase scale of operations. This may entail such strategies as buying more land, introducing an intensive industry or setting up a value-adding business. Farmers who attempt this need to develop strategies to ensure that their business meets the criteria required for successful business expansion. Furthermore, the attitudes, skills and knowledge required will be affected by the increasing complexity of their operations. The competencies required by ‘full-time’ farmers will be different from those who pursue ‘part-time’ farming.

Many farming enterprises face a major problem when full-time farming fails to generate sufficient income to support a family. Farmers need to review their management strategies in order to solve this problem. Obtaining income through off-farm employment as employees is one option sought by members of some farming families. Other options include contracting or developing small businesses. The availability of these options often depends on the level of economic development in the surrounding area. This needs to be strong enough to provide other income-producing opportunities. Retention of the farm in these circumstances requires specific strategies such as ensuring that labour is available at critical times to ensure continuity in farming operations. Where no opportunities are available locally to obtain off-farm income, a move to another locality or a move out of farming may be the only alternative.
Barr and Almond (1981), in a study of commercial part-time farming in Victoria, concluded that part-time farming was a permanent feature of many districts. They comment that part-time farming is seen as a viable dual occupation for many farm families on smaller holdings. It is seen as an option for farm families wanting to preserve a particular lifestyle. They argue that motivation is a significant factor in classifying the many types of part-time farmers identified in their study. They also comment that the differences among the seven types of part-time farmers identified in their research are significant (ranging from people adjusting into farming to people reluctantly adjusting out of farming) and that it is inappropriate to classify part-time farmers as an homogeneous group.

The changes and adjustments involved in moving from full-time to part-time farming may necessitate a different set of competencies for the part-time farmer. There is a growing body of literature in this area. Publications such as There is Life After Farming (McGuckian et al., 1995), and work by Napier et al. (1994) and Gray et al. (1993) in researching rural adjustment in agriculture, are examples of this. This is an internationally occurring trend and is especially visible in North America and Europe. There is, however, strong regional development in these areas which allows the ‘part-time’ farmers access to sustainable employment and education opportunities to retrain for other occupations. In Australia the greater distances between growing regional centres make access to these centres more difficult.

There is a need to recognise these two distinctive types of farmers in establishing different measures of good farm management. ABARE has already recognised the value of a separate analysis of full-time and part-time farming in their Farm Survey Reports. However, both types have to meet some common profit criteria to be sustainable in the long term. Therefore there will be overall business indicators which will be common to both operations (Lees & Reeve, 1991; ABARE, 1995b; Shearer, pers. comm.). In line with this, there will be competencies which will be common to both full-time and part-time operators but also many which will differ. The differences relate to the level of technical competence required as well as the level of generic competence required for the complexity of the business operation.

**Benchmarking as an Aid to Measuring Good Farm Management**

Benchmarking is defined in Business Management as a method used to improve performance by comparing an enterprise’s achievements with those of an organisation regarded as a leader in its field. However there has been a tendency for the term to be used more loosely in the sense of seeking to reach a clearly defined standard such as quality or level of profitability. The concept is being adapted for use in agricultural enterprises, examples including the FAST Project being conducted by Farm Management 500 (FM500), a project by Michael Boyce and Associates involving the comparative analysis of grazing businesses in the Monaro District, and work by the National Australia Bank.

O’Keefe argues in an article in The Australian Farm Manager (Vol. 5, Nov.) that benchmarking and best practice programs have the potential to be used as management tools in assisting firms to identify their stage of development and to identify areas of potential improvement. The Agricultural Research Unit at Monash University has found that benchmarking and best practice can either lead to an outward looking market focus for a product or commodity or it can lead to an inward looking production orientation. It is argued that the former orientation is required if value is to be added to a commodity or product. O’Keefe comments that three dimensions need to be addressed in a successful benchmarking project:

- an analysis of how well the business carries out the processes and activities that drive profits;
- an analysis of the value customers place on the product(s) of the business;
- an analysis of how to anticipate future market demands.

He argues that, in addressing the second level of competitiveness (aligning the system to meet the needs of customers), the largest gains can be made in the shortest time.
Although some farmer-directed groups are attempting to employ the basic concept of benchmarking by using a number of business ratios and other measures (see below), it can be argued that there is scope to develop this through closer assessment of marketing and business strategies and in turn the identification of key profit drivers in those strategies. The second area for potential improvement is in the identification of benchmarking partners. Farmers need to look to other types of businesses for benchmarking partners. Bonlac Foods, a Melbourne based marketing co-operative, has been suggested as an example of a company with a successful quality payment system and an excellent record in managing relationships with primary producers. Farmers could consider such firms for benchmarking customer relations and quality standards rather than groups of farmers from local or other areas.

The FAST Systems Economic Analysis is a research project linking ‘science with practice and profit with sustainability’ (Clark, 1994). It focuses on evaluating the financial performance of whole farming systems by analysing the links between paddock history, financial data and the adoption of sustainable farming practices. Profitability is also measured. It has been found that while sustainable systems are working for some farmers on better soils, others are struggling. It has also been recognised that one farmer’s successful approach cannot be automatically transposed to another farm. The FAST project has analysed data from 78 grain farm businesses in Victoria, using averages from a five year period 1987/88 to 1993/94. A further 80 farms were incorporated into the research in 1995/96. A series of business indicators has been used and benchmarks have been developed through comparison of similar types of operations. Disposable income per family is the starting point for the analysis. This is defined as farm operating surplus plus off-farm income minus depreciation and minus interest and lease payments, divided by the number of families on the farm.

Factors affecting Disposable Income per Family include:

- productivity;
- size and value of land;
- borrowing costs;
- number of families dependent on the farm;
- off-farm income;
- machinery investment.

Factors affecting Productivity include:

- enterprise mix;
- level of farm inputs;
- rainfall and location;
- soil type;
- level of assets.

Business Indicators used in the analysis include:

- effective land area per family;
- disposable income;
- return on capital;
- equity;
- variable costs/income;
- operating costs/income;
- cropping intensity;
- gross income;
- overhead costs;
- fertiliser costs;
• spray costs;
• fuel costs;
• operating costs;
• operating surplus;
• machinery value;
• machinery repair costs.

Benchmarks developed to date include:

• Operating surplus should be 14 per cent of the value of land area used in the farm operation (including leased land).
• Machinery value should be equal to total average income.
• Debt should be no more than 70 per cent of average annual income.
• Variable costs should be less than 30 per cent of total income for pastoral enterprises, and less than 40 per cent of total income for cropping enterprises.
• Land value should equate to seven times the operating surplus.

The analysis has already isolated many factors contributing to farm performance and profitability. Evidence to date, however, shows that the wide variation in performance is linked to management. Key management factors will be identified and incorporated into the overall analysis (Rendell et al., 1996).

Further benchmarking studies have been undertaken through a comparative analysis of grazing operations in the Monaro District of New South Wales. This was carried out in 1992 by Michael Boyce & Company, a private accountancy firm based in Cooma, as a service to clients. Work on developing appropriate indicators commenced in 1985 and the process of refining these continues. Due to the expense of the project and the potential benefits which may flow on to the grazing industry at large, it was funded by the Rural Adjustment Scheme Advisory Council in 1993. The main aims of the study were twofold: to establish benchmarks for the grazing industry based on the top farms of the Monaro; and to debate and standardise the method of accounting for profitability.

The main findings emerging from the study are that, to be profitable, a grazing operation must be efficient, with efficiency being defined as optimising long term production per hectare at the lowest possible cost. The most efficient graziers achieve consistently high gross incomes per hectare with comparatively low costs. The least efficient operators achieve poor gross income with high costs, some operations recording cost of production in excess of gross income per hectare. Key indicators used include:

• land productivity;
• labour productivity;
• livestock productivity.

A number of benchmarks have already been developed from this study. They focus on stocking rates, stock numbers per unit of labour, enterprise mix, and livestock husbandry practices. The study emphasises that management ability is the primary determinant of farm performance and profitability. A wide range in performance between operators was found to exist. Marketing strategies were also found to significantly impact on the financial performance of properties in the study. The need to continually reassess and adapt management practices to changing situations was also recognised. Although the study analysed the components of production and management in some detail, it did not account for the family unit, off-farm income or tax paid. No details have been gathered to date on education levels of producers participating in this study.
Financial institutions regard the measurement of good farm management as necessary in order to assess and manage their risks in lending to farm businesses and in turn to reward good managers with recognition in the form of reduced interest rates on borrowings. Traditional assessment by many financial institutions comprises a visit to the farm for visual assessment of management practices, combined with varying degrees of financial analysis of the business operation. Although the visual component of this may have been satisfactory in the past, it is increasingly inadequate in the current operating environment and has obvious shortcomings with recently purchased farms and its reliance on such subjective judgement of management skills.

Many institutions are working to develop more refined ways to assess their risk in rural lending and in the process, are contributing to the development of more objective and refined indicators of good farm management. The National Australia Bank’s work in this area is an example. It has recognised the significance of managerial ability in overall farm performance and has contributed significantly to the development of indicators to measure this. As a major rural financier, the bank is naturally motivated to develop strategies for their own risk management as lenders. These include:

- the development of financial indicators which provide a more meaningful assessment of farm business performance than those commonly used in the past;
- attention to whole farm financial performance and the comparison of this performance over time (past, current and projected) with similar farming enterprises in the same district or region;
- a proactive role in educating farmers in the analysis of their business operations through advisory services, presentation of seminars, co-sponsorship of projects such as FM500, publications such as ‘Rural Focus’ and the development and distribution of a number of management tools (particularly in the area of planning);
- instigation of a system which rewards farmers with reduced interest rates on borrowings if they can demonstrate profitability, high management performance and sound risk management strategies (at present only about 30 per cent of farmer clients provide cash flow figures);
- development work on a set of indicators to measure and monitor land ‘health’ and incorporate the assessment of this into land valuing (NAB & CSIRO, 1995).

The types of financial indicators being used include:

- **Farm operating costs as a percentage of farm income.** This is used as a measure of how efficiently a farmer is producing income.
- **Farm operating surplus per hectare (FOS/ha).** This is the difference between the farm income generated and farm operating costs (total costs less depreciation and interest) and drawings/living expenses on a per hectare basis. When this measure is used as a comparative performance statistic within a particular district, it can be an indicator of business management skills. A high FOS/ha in this situation suggests a farm manager who is a better business manager.
- **Return on farm assets (ROA).** This is used as an indication of how efficiently the farm asset base is used.
- **Return on farm equity (ROE).** This is a measure of the return being generated on equity in the business. This figure may be used in comparisons with the rate of return from alternative investments (Shearer, pers. comm.; Coleman, 1995).

Utilisation of measures such as these requires farmers to provide lenders with an increasing amount of detailed financial information. The maintenance of sufficiently detailed and accurate records is necessary for any measurement of farm performance and management. It is also important for the farmer to be able to measure what the farm enterprises are earning and whether decisions have resulted in an increase in net farm income. As a result of these developments, banks are actively encouraging
farmers to develop their management skills in these areas. At the same time, they are helping the farmer develop new ways of measuring farm management practices. This will also help demonstrate the advantages of good farm management to other farmers.

Measures to assess and monitor the impact of farm practices on the sustainability of physical resources are also being developed and used by farmers. Indicators used in the FAST Project include:
- water use efficiency;
- nutrient audits;
- herbicide resistance and chemical control of ‘difficult weeds’;
- disease risk;
- soil health.

The development of benchmarks in these areas may assist farmers in the long term maintenance of their physical resources.

Summary

The aim for this chapter was to review the literature to see if there was a consensus as to what constitutes good farm management. This began with an overview of the economic forces impacting on farm management that must be dealt with to achieve good farm management. Such economic forces were found to include structural adjustment, the decline in the terms of trade for agricultural commodities, the effects of deregulation, developments in globalised agricultural trade such as quality standards, and issues of sustainability.

Criticisms of current approaches to farm management in Australia were reviewed as these are useful in suggesting what needs to be done to improve the standard of farm management. While many of the criticisms related to weaknesses identified in marketing, other areas of criticism related to inadequacies in long term planning, political and industry impediments and the need for more progressive attitudes.

These areas were followed by the central theme of the chapter, identifying what constitutes good farm management. There is general consensus in the literature on an extensive listing of the competencies required for good farm management and these were summed up in the following broad categories:
- management of the technical aspects of farming;
- decision-making and planning;
- financial management;
- marketing management;
- human and physical resource management;
- integrative skills;
- personal attributes.

This was followed, for comparative purposes, with a review of the key competencies for good management identified in the general business management literature. It was found that while there are many managerial competencies common to both areas of management there are also significant differences mainly related to variations in the size of organisations, the scale and breadth of operations, the human resource element and differences in financial management.

The chapter concluded with a detailed review of the literature on measuring good farm management. This included material on the problems of measuring management ability, using size and output categories as measures, and using various benchmarks to measure good farm management.
Chapter 6: Competency-Based Training in Farm Management

The Training Reform Agenda and its Relevance for Agriculture

The Training Reform Agenda is an umbrella term comprising a range of initiatives which include the development of national competency standards for particular industries, the assessment and recognition of individual competencies including the recognition of prior learning, competency-based training established on industry standards, a flexible approach to the provision of training, accreditation of training providers and the courses offered, and the articulation or linking of courses including transfer of credit between courses and institutions.

The Training Reform Agenda appears to have emerged from growing concerns in the late 1980s with Australia’s fragmented and inadequate approaches to vocational training and the findings of three major reports undertaken for the Commonwealth Government. These were:


The main focus of the Finn Report was the retention of youth in the education and training system until Year 12 or equivalent as well as emphasising the importance of giving more attention to the development of vocational competencies. The Mayer Report took the idea of key competencies further, while the Carmichael Report advocated the introduction of an Australian Vocational Certificate Training System using a competency-based training approach.

Not all the recommendations in these reports were implemented, but they have influenced the various components of the Training Reform Agenda outlined above. Since the release of the reports there have been significant developments in vocational training, with some industries making greater progress than others. Developments and recommendations in agricultural vocational training are outlined in a 1994 report by the Employment and Skills Formation Council titled *Cultivating the Human Factor: Employment and Skills in Australia’s Rural Industries*.

On the other hand there has been significant criticism of the Training Reform Agenda, and the associated input of resources, with regard to its actual effectiveness. This has been widespread across many industries (Curtain, 1994). There appears, however, to have been little feedback from the agricultural industry on the Agenda’s impact on improving agricultural productivity through training. This may be a result of the fragmented nature of the industry, the limited participation of its members in formal training schemes, and the recognition of factors other than training which affect farm business results.

A number of points relevant to this project were raised by the Curtain study (1994). First, for the training reforms to work effectively in the workplace, business needs to have a greater capacity to influence how resources are allocated as well as a greater say in how the overall framework should...
work. Second, causes of the problems are numerous and include the competition between the various tiers of government training, disputes about the basic premises of competency-based training, an inadequate institutional framework to recognise training, and an inefficient training delivery system (Free, 1993).

Overall, the lack of ownership by employees of the reforms and how they are to be implemented is identified as a major factor in explaining why, in many instances, the Training Reform Agenda is not working. A survey of major users of the training system revealed the following:

- development of training modules to back up the competency standards is lagging;
- progress is much slower than anticipated;
- emergence of a qualifications-based labour market has been gradual;
- there is a need to develop ‘a training culture’;
- there are deficiencies in the demand from employees and individuals for training.

Criticisms of the Australian Standards Framework include:

- the framework reflects a professional and/or education perspective and often does not account for efficiency and work value;
- the framework runs counter to enterprise-based work arrangements;
- national standards could lead to more emphasis on formal course completion rather than to use of a wide range of learning opportunities (Perrin, in Curtain, 1994).

In addition, the following difficulties in implementing the Training Reform Agenda were identified:

- lack of general consensus on what is happening or what is planned;
- lack of models to clearly demonstrate advantages to industry;
- apathy towards a national system;
- absence of suitable quality assurance and assessment procedure;
- difficulty in integrating on- and off-the-job training.

Other general criticisms of the Training Reform Agenda include:

- the process has become too bureaucratic;
- the process has failed to capture the enthusiasm and commitment of the major stakeholders;
- the top-down approach is inappropriate;
- it is slow to produce any results (Sweet, in Curtain, 1994);
- there is a focus on achieving national consistency of training arrangements at the expense of other features, such as making it client focused (Sweet, in Curtain, 1994);
- dominance of the reform agenda by training providers rather than clients.

In summary, industry should first accept the need to train its workforce to world best practice standards. The initiative is then required to shape the training market and its regulatory framework to achieve those standards (Curtain, 1994).

The farming industry is characterised by many factors which would appear to reduce the impact of the Training Reform Agenda. These include:

- the fragmented nature of the industry;
- the geographical spread of clients - often distant from regional centres;
• the need for local knowledge especially with regard to technical production;
• the informal learning practices of farmers;
• the predominance of sole operators with varying training needs in terms of level and content;
• the lack of assessment of farmers’ current competence levels;
• the wide range of competencies required by farmers and the rate of change and adjustment occurring in the industry;
• wage structures supporting competency-based training are not relevant for self-employed operators;
• current provision of formal training by educational institutions is not perceived as relevant or accessible by current farmers;
• costs of further training are often seen to outweigh the benefits;
• personal goals of operators will affect perception of training needs.

The Employment and Skills Formation Council, in its 1994 Report on vocational training in agriculture, recognised many of these problems and made recommendations to overcome a number of them. Some of the key recommendations included (Employment and Skills Formation Council, 1994, pp. xiii-xiv):

• that funds be made available to agricultural industry bodies to develop training programs;
• that cost-effective approaches to RPL be developed with government support where necessary;
• that farm management courses be developed with appropriate and adequate coverage of information technology and environmental conservation;
• that a strategic plan be formulated to develop an interactive, multi-media approach to agricultural training.

Raising Professional Standards in Agriculture

As a response to changes in the operating environment of farmers, Henry (1995) and others are calling for professionalisation of farm management and the adoption of a generic set of standards as a base for improved management performance and industry status. Professional associations active in this pursuit include AIAS, AAAD, AFMS.

The characteristics of a profession are outlined by Little (1993) as:

• based on a body of systematic, theoretical knowledge;
• recognised and acknowledged by its clientele;
• legitimised by broader community sanction and approval;
• possessing a code of ethics and regulation of the relationships of professional persons and clients and colleagues;
• sustained by a formal professional association which maintains and transmits its culture.

Although the response of many sectors of the industry may be positive, not all farmers perceive a need for professional accreditation. However, the increasing responsibility for farmers in marketing their product and the associated emphasis on quality control, combined with a growing quest for premium commodity prices, are affecting change in these attitudes. The development of a process to achieve professional recognition will be determined by the perceived needs of farm managers.

There are several bodies attempting to promote agriculture, including farming, as a profession. Field (1995) has been active in his call for increased professionalism across the agricultural industry. Factors identified as contributing to the current state of the industry include the segmentation, the lack of strong leadership and vision in the education sector, and the past reliance by producers on technical proficiency to ensure the best possible financial return. There is a view that the industry has focused too narrowly on production and research, losing sight of ‘our position in society which was previously
looked after by the massive (relative) economic contribution agriculture made’ (Field, 1995, p. 5). He outlines a number of strategies to enhance professionalism in the industry and improve its competitiveness within Australia and overseas. These include:

- promoting the industry as part of the food-agriculture-environment relationship;
- recruiting dynamic leadership to universities and the education sector generally;
- creating a new image of agriculture as dynamic, profitable, clean and green;
- developing strong, cohesive and effective representation of the industry;
- encouraging professional commitment to increasing competence and education;
- reallocating government resources from the least efficient side of the industry to the cutting edge in areas of education, research, marketing and innovation.

Underlying these strategies is the need for improved economic performance. It is argued that increased commitment to professional standards will have an impact on this. As farmers move beyond the farm gate to market their products and exercise influence in areas of their operating environment over which they have some control, there will be a growing need for farmers to seek some form of professional accreditation.

One example of how farmers could achieve accreditation is through membership of professional associations such as the Australian Institute of Agricultural Science (AIAS) which currently offers professional accreditation to people in rural industries. The CPAg (Certified Practising Agriculturalist) operates in a way similar to systems used by other professions, such as the accountants’ CPA (Certified Practising Accountant) scheme.

In order to enhance professional development in the industry, the AIAS has developed a set of standards. These identify the core competencies required by the broad range of people working in areas of agriculture relating to science, economics, communication, education, business and management. Examples of this work include:

- providing agricultural products and services of appropriate quality to consumers;
- promoting the economic viability and effective marketing of agricultural products and services;
- improving physical, biological, social and financial sustainability;
- improving the quality of the environment and increasing and promoting the understanding of agricultural and related natural resource systems in the wider community.

This has involved the development of definitions of professional standards, the provision of competency guidelines for evaluation, the assessment and certification of professional agriculturalists, the review and refinement of the competency standards, and the development of additional standards. The consultants employed to design and facilitate the process adopted a participatory approach involving agriculturalists from around Australia to ensure the standards properly reflected the views of the profession. The standards identified and defined include the following:

Professional Practice Values
- observes social and ethical responsibility
- pursues continuing professional development
- assumes personal responsibility for own actions
- fosters rural social and environmental sustainability

Communication
- communicates with a variety of audiences
- prepares and presents talks and papers
- uses various media for communication
- uses electronic communication tools
disseminates technical information
- disseminates information to the wider community
- provides advice to the agricultural community or agri-industries

**Management**
- plans projects and work programs
- makes management decisions
- manages human resources
- manages physical resources
- manages quality assurance
- manages agri-industry operations
- manages farming operations
- complies with legal and regulatory requirements

**Knowledge**
- applies theoretical knowledge in an area of expertise
- pursues continuing extension of knowledge
- accesses knowledge and expertise

**Agricultural Practice**
- conducts and leads work in agricultural science, agri-industrial developments and technology
- provides education, advisory or extension services
- investigates farm and agri-industry problems and systems
- conducts scientific and technological research into agricultural and agri-industrial problems and developments
- develops products or services in agricultural and agri-industrial science and technology or business management
- operates and manages specialised equipment
- conducts and leads work in agricultural and agri-industrial business management
- investigates and researches business issues and opportunities
- carries out business planning and appraisals
- carries out marketing activities
- conducts and leads work in agricultural economics
- investigates and researches economic issues and opportunities
- recommends on agricultural and agri-industrial economic policies
- applies computer science knowledge and skills

Accreditation of farmers who do not have formal qualifications is also being addressed. It is significant that some of the professional bodies (for example, the Australian Farm Management Society and the Australian Institute of Agricultural Science) recognise that many farmers meet their education and professional practice needs through informal education. The accreditation process practised by some of these organisations offers farmers an opportunity to assess their capability against professional standards, and may serve as a trigger for further education. This was observed to occur after RPL (Recognised Prior Learning) assessments in the pilot study run by Napier and Scott (1994). The AIAS, in a joint venture with the AFMS, is starting to offer an accreditation process specifically for professional farm managers. The AIAS, CPAg accreditation will be available to professional farm managers as CPAg (FM).

The Council for Professional Standards in Agri-industry is currently attempting to benchmark the two-year diploma at Orange Agricultural College, the Bachelor of Applied Science at the University of Melbourne, and the Bachelor of Applied Science in Agriculture at VCAH Dookie, to assess their products in terms of the fit with the Australian Institute of Agricultural Science’s professional
standards (Wolfe, pers. comm.). (The Council for Professional Standards in Agri-industry comprises representatives from the AIAS Professional Standards and Accreditation Committee, the Agri-business Association of Australia, the Association of Professional Engineers, Scientists and Managers, Australia (APESMA), the National Farmers’ Federation, the Rural Training Council of Australia, and others).

Professional accreditation of farmers could also be achieved through a series of short courses. The professional accountants’ associations have done this for many years with university courses in accountancy across Australia, using completion of accredited courses as membership requirements for their associations. In addition, members are required to show evidence of attending courses to update their knowledge. The AIAS system of CPag status operates on a similar basis.

Development of National Competency Standards in Farm Business Management

The development of National Competency Standards in Farm Business Management was initiated by the Rural Training Council of Australia (RTCA). The Steering Group formed by the RTCA was given the brief of enhancing the business management skills within Australian agriculture in the following way:

- by confirming the role which improved farm business management will play in the long term viability of the farming enterprise;
- by determining the competencies required by participants in farm business management to facilitate the desired improvement - this activity will include input from work currently in progress;
- by developing a strategy to implement: (i) national competency standards in farm business management; and (ii) education and training programs based on those competency standards (RTCA, 1993).

The Steering Group recommended that the RTCA engage a consultant to develop a draft set of competencies for farm financial management, and invite representatives of the industry, the unions and training providers to a workshop in Canberra to discuss the draft competencies and related matters. Each State and Territory was asked to take part and to stimulate interest within their industry and their own State or Territory.

The consultation process in the formation of the standards comprised nine focus groups conducted with over ninety farm managers, and two meetings with industry, unions and training providers in Canberra during 1991. Farmers invited to be part of the initial discussion were purposefully chosen on the basis of being perceived (by a leading farmer) to be effective operators and that they were interested and able to participate. Specifications called for a mix in gender in group composition, but not husband and wife teams, as they were regarded as being part of one unit. The number of members with formal qualifications was limited to two or three out of twelve, to avoid provision of information based on their education experience rather than that of being a farmer. The age spectrum of group members was given to be between 25 and 55 years of age (Lees & Reeve, 1991).

In 1992, the input group was extended to over 200 people who were the interested parties. The emphasis of this process was to seek approval from farm managers for the final recommendations. In 1993 validation meetings were held in all States.

The National Competency Standards in Farm Business Management comprise ten units, each with a number of subsections and accompanying notes on a range of points associated with each of the subsections. The ten units within the standards include the following:
1. Review the strategic directions of the business.
3. Administer the business.
4. Develop, implement and review a business plan.
5. Manage business capital.
6. Manage the production of pastures and crops.
7. Manage livestock production.
8. Manage the production system.
9. Manage physical and natural resources.
10. Organise and manage human resources.

Units 2, 3, 9 and 10 are placed as level 5 on the Australian Standards Framework (ASF) as they are related to the management of production and marketing and the human and physical resources associated with this. These activities are viewed to be the initial employment bases for farm managers.

Units 1, 4, 5 and 8 are placed at level 6 on the ASF as they are viewed as more complex and responsible duties associated with strategic planning, financial management and the integration of the physical and financial aspects of arming systems. These activities are viewed as being carried out by financial consultants, boards of directors, or owners of the farm assets.

Units 6 and 7 are placed at either level 5 or 6 on the ASF, depending on the particular farm enterprises undertaken by individual businesses.

A Critique of the National Competency Standards

The following points outline possible shortcomings in the application of the National Competency Standards for Farm Business Management developed for the RTCA (1993).

- There is a problem with the initial brief of ‘confirming the role which improved farm business management will play in the long term viability of the farming enterprise.’ It would appear that there have been many assumptions made about the role of formal education in good farm management. There is little concrete evidence to support the strength of the relationship between formal education and good farm management. Little attention was given to this section of the brief. There is a need to establish the nature of the relationship between farmer education and good farm management as a basis for effectively marketing management courses.

- Changes in the operating environment of farmers are not easily incorporated into the standards (for example, useful procedures for analysing, assessing and managing risks affected by changes in weather, international markets, and government policy).

- Performance indicators for competencies are not sufficiently detailed to be useful in many cases. This may deter farmers from participation in education programs as financial benefits are hard to assess.

- Perceived standards of performance may be below the ‘ideal’ level. There is a need to consider how mediocrity can be avoided and also how to set the ‘ideal’ level. Lees and Reeve (1991) suggest that we need to be able to identify a standard of performance which is above the average operating level but perceived as achievable. This is further complicated by the degree of complexity of farming enterprises, and the variation in skills and knowledge required for different businesses.
• The competency profiles currently being developed by farmers focus on the present. In a rapidly changing environment, consideration needs to be given to the short and long term. This is especially relevant, considering the necessary lag time in curriculum development and training (Lees & Reeve, 1991, p. 58).

• How can the competencies be tested for completeness? Attempts have been made to overcome this problem with the extensive exposure of the standards to a large number of people in the review process. However, there is still a degree of subjectivity involved.

• How can the standards be tested for correctness, applicability and for their relationship with good farm management?

• Although farmers have agreed on the standards adopted, the problem of how the farmer is to be educated in good farm management has not been solved. Some evidence exists to suggest that future farmers and younger farmers exhibit more interest in formal education but many current farmers’ learning patterns are characterised by informal approaches (RTC NSW, 1995; Kondinin, 1995; Johnson et al., 1996).

• There is a lack of attention to standards in the higher level competencies and personal characteristics frequently identified for good farm management (Henry, 1995; Candy et al., 1994; McColl, 1991; Shearer, 1994). Communication skills, leadership, motivation, decision making ability, willingness and ability to learn and change, and professionalism are examples of these.

In view of past criticism of the lack of educators’ appreciation of the views of farmers with regard to farm management, the participatory process employed in developing the national competency standards is commendable. It remains to be seen whether this results in farmers perceiving the content of farm management courses based on these standards to be more relevant with, in turn, increased participation rates in these courses.

Assessment of Farmer Competencies and Recognised Prior Learning

In Chapter 3, it was shown that no comprehensive definition or measurement of farmers’ education has been formulated in Australia. Measurement has been limited to levels of formal education attained. When considering the broader view of farmer education, the level of formal education is an inadequate measure.

When it comes to the assessment of farmers’ competencies, this is found to be difficult because the competencies appropriate in one farming situation may not be appropriate in another. In addition, many of the higher order and perhaps increasingly more important competencies are difficult to measure. Also, a broadened definition of what constitutes the appropriate farmer competencies required by farmers today will pose added difficulties for assessment.

The process of assessing the competencies of farmers needs to involve looking at farmers in different situations. Current farmers, future farmers, farmers with viable farming operations, farmers adjusting out of farming, part-time farmers with viable operations, farming families and professional farm managers exemplify some of these categories. Competencies also need to be considered in situations where the leasing of farms occurs.
Current thought on farm management emphasises the need for farmers and their families and staff to undertake regular assessments of their strengths and weaknesses and plan to address identified deficiencies by appropriate education, training or out-sourced expertise. The problem increases if one does not know what one ‘has to know’ to be a good farmer! According to Stromback and May (in Boot, 1992), the alleged deficiency in farmers’ education in Australia is based on remarkably little hard evidence. This leads to the need for an audit of the existing competencies of farmers in order for them to assess their education needs. The problem of participation in such an audit has not been addressed. Initial findings in the Horsham study of dryland farmers’ training needs suggest that attitudes of farmers will affect their commitment to participation in any skills audit, let alone their commitment to further training as a result of the audit (Sloane, Cook & King, 1995). Other studies have suggested that farmers view courses of a general nature as being too theoretical, impractical and irrelevant to their actual work (Hawkins et al., 1974; Rural Training Council of New South Wales, 1995).

Tools to carry out this audit work already exist, such as the Skills Evaluation and Education Kit prepared by Stephens and McGuckian and their respective associates in conjunction with FM 500. Similar packages have also been developed for general business management. Whether farmers will use these tools is not clear, but unless audit and assessment of skills occurs, any attempt to provide training in these areas may be ineffective.

Assessment of lower order competencies (e.g. taking a soil sample for testing) can be achieved through demonstration and observation. A problem in assessing these arises when a large number of competencies is required in an occupation. In some cases the methodology itself may collapse as it did in the USA (Bowden & Masters, 1993). While it is possible to assess technical competencies, there is also a need to assess the operator’s capability to co-ordinate or apply these skills in a timely and effective manner. The possession of technical skills alone has limited effectiveness.

Assessment of higher order competencies traditionally associated with the professions (e.g., communication, decision-making, information assessment and application) is more difficult. Current literature stresses the importance of these higher order skills, particularly integrative skills, as the essence of good farm management. Napier and Scott comment on competency-based training and higher order competencies, saying that the acid test for any competency is how helpful it is to document it for purposes of defining best practice. Furthermore, such documentation is helpful in conducting assessments for professional accreditation purposes (Napier & Scott, 1994).

As farmers have traditionally educated themselves in an informal fashion, there has been a call to develop methods to assess farmers’ competence in order to ascertain an appropriate level of entry into the formal education system. An approach which has been considered in recent years is Recognised Prior Learning (RPL). It has been developed to formally assess knowledge, skills and organising ability gained through work and life experience. Recognised prior learning assessment strategies, although sound in theory, have not proven to be cost effective due to the time and individual focus involved (Napier & Scott, 1994).

In terms of the implementation of the National Training Reform Agenda, other methods (based on the recognition of industry and enterprise training programs by educational institutions unencumbered by the costs and difficulties of individual assessment) are viewed as more expedient for the majority of
the workforce. The self employed, amongst whom farmers are prominent, are disadvantaged by this. The work to date in this area, however, has contributed to a better understanding of issues affecting farmer competence and pursuit of formal education.

A project on recognised prior learning was undertaken by Napier and Scott in 1994 under the direction of the Regional Employment Education Committee on the assumption that farmers need to undertake higher levels of formal education and training in order to cope with the changed circumstances of the industry. Many farmers are now seeking off-farm employment, developing contracting or supplementary businesses, or embarking on new enterprises, and recognise the need to have new or formally recognised qualifications. These were judged to be some of the motivating factors affecting the participation of farmers in the RPL process. Napier and Scott (1994) made the following comments on the completion of the project:

- The national training agenda has supported the development of RPL to try to achieve more cost-effective training and ultimately a more flexible and productive workforce. However, RPL may not be the only means of attaining these goals.
- Other options to enhance the flexibility of training provision and credit transfer arrangements may well be more cost effective on a national basis.
- The self employed, amongst whom farmers are prominent, may well be excluded from the benefits of accreditation and post-school credit transfer without some process of recognition of prior learning being instigated.
- There may be a significant attitudinal problem in participation in a skills’ assessment as well as the significant cost in putting a ‘recognition of prior learning program’ into practice.
- The agenda for RPL has come from ‘the top down.’ It has not been initiated by the clients it is intended to serve. This difference in perception may also inhibit participation and potential gain from such a program.
- There was more commitment to the program by agricultural employees and part-time farmers compared to full-time farmers, due to the potential advantages the former groups perceived in terms of increased earnings or employment opportunities off-farm.
- In terms of the project’s impact on the future education of farmers, it appears that RPL, in the absence of Government subsidy, will not be cost effective.

Other observations from the process of the study were pertinent to the issue of farmer education. The project recognised three categories of farmers with regard to their motivation to learn new skills or have current skills recognised:

- those who wished to upgrade their skills in a formal course in order to enable them to enter the service sector;
- those who wished to gain accreditation for existing skills to enable them to pursue part-time or contractual work in the farm sector;
- those who wished to improve their skills to assist them achieve improved economic performance from their farming ventures, e.g. marketing or leading edge technology.
The first two of these groups view the gaining of ‘formal qualifications’ as advantageous to their future employment activities, whilst the latter group is primarily pursuing knowledge or skills with less importance placed on formal certification. (Many employed professional farm managers interviewed in the course of this project have indicated high motivation to achieve formal certification to enhance their career prospects).

Further observations from the study by Napier and Scott reinforce the findings of Hawkins et al. in 1974 in relation to the cognitive learning styles of farmers. During the RPL assessment process, the advantage of ‘working backwards’ from the candidate’s experience to the underlying principles was recognised. This is opposite to the way students are usually taught and may have implications for the development of more appropriate approaches to teaching and learning.

Second, farmers who underwent RPL assessment generally performed beyond their own expectations. All indicated an intention to undertake further studies to gain formal accreditation. This reaction was also observed in the Westpac Bank management training program. Confidence was a key factor in this regard.

Third, the degree of regional development and its effect on employment and educational opportunities appeared to have a significant impact on farmers’ motivation to participate in the assessment. Motivation was higher if there were opportunities to study or gain employment within the region.

On the other hand, given a policy of active support for regional development, RPL was recognised as a potentially cost-effective way of auditing the human resources within rural industry in the interests of regional development. It was viewed as an initial step in recognising the human resources available in rural areas which may attract or sustain development.

**Articulation and Credit Transfer**

There is a move to encourage more participation in formal education and the development of lifelong learning in agriculture by provision of paths of progression between the various levels of formal education. There are currently two main approaches to formal institutionalised education: the vocational approach, based on documented accreditation and competency; and the university approach, based on general education, disciplinary scholarship and ‘professional credentials.’

There is a need to assess the formal courses currently being offered in view of allowing credit transfer between different institutions. A number of courses are currently being assessed for this purpose and some institutions have already accepted articulation between short courses, vocational courses, TAFE and higher education courses.

The Australian Credit Transfer Agency (ACTA), which is owned and operated by the Australian Vice-Chancellors’ Committee (AVCC) and jointly funded by the Commonwealth Department of Employment, Education and Training and AVCC, has been established to provide an education assessment service for prospective students. Assessment is made on credentialled and uncredentialled qualifications, and learning through experience.
There are potential advantages for farmers, as initial education may be taken at the vocational level and credit transfer may facilitate the progression to higher levels of study. Credit may also be awarded in recognition of learning through experience. The awarding of credit can also provide savings in higher education costs. The point remains, however, that the farmer needs to perceive benefits from formal education. Effective marketing of the benefits of credit transfer and recognised prior learning needs to include the benefits that can be gained from formal education (Wolfe, pers. comm.; Falvey, 1995).

**Competency Based Training in Management - A Case Study**

The use of competency requirements has become popular in Australia (Hager & Gonczi, 1991); however, the derivation of worthwhile models for managerial assessment and development requires substantial effort (McKinnon & Cherry, 1992). The significant time lag in developing suitable curriculum and delivery processes further delays an evaluation of the effectiveness of competency-based training.

The initiative of the Westpac Banking Corporation in instigating the Westpac Management Diploma offers an interesting case study in the implementation of competency-based training in management. Significant changes in the operating environment of the banking industry offer some parallels to those being experienced in agriculture and, although the case study described below focuses on a single enterprise, there are some interesting results which reinforce some of the findings of studies mentioned earlier in this report.

Deregulation of financial markets has had a major impact on the Australian banking industry, resulting in structural change and an increasingly competitive operating environment. Uncertain economic conditions and increasing government scrutiny put further pressure on the quality of managerial decisions. In recognition of the requirement to develop their managerial staff, Westpac initiated a course of study in conjunction with a number of universities, but tailored to the needs of the industry.

The Westpac Management Diploma (WMD) aims to assist managers with no prior tertiary qualification to develop managerial competence. Within Westpac, the competencies defined for management education purposes are conceptual ability, analytical thinking, creativity, communication and personal effectiveness. The course also aims to encourage managers to complete formal tertiary qualifications after WMD studies.

Westpac has embarked on extensive job analysis to refine managerial competency profiles since the initial program commenced (Saul, 1989). The core competencies identified by Westpac are commonly ascribed to effective managers but do not necessarily define effective managerial practice. Competency may not equate with performance, since work performance is contingent upon factors other than competency *per se* (e.g., motivation, opportunity) (Hager & Gonczi, 1991).

Of the Westpac employees who undertook the Westpac Management Diploma, 87.1 per cent believed that it was effective in introducing and encouraging further study. The reasons cited were:

- the opportunity to be tested intellectually and personally created enough confidence to continue their study;
- the platform provided (e.g., credit, entry) motivated people to convert their qualification into ‘formal’ terms;
- the financial and administrative support provided by Westpac and the university staff encouraged people to continue their studies (Deves & Yeow, 1993).
Case studies such as this are interesting to analyse with regard to competency-based training in farm management. Factors relevant to farm management include the following:

- financial and administrative support for participants was a significant incentive;
- increased confidence and motivation to further their studies was gained by those completing the course;
- the course is tailored to fit the particular organisation;
- participants reported significant improvement in core competency areas and ensuing work performance;
- immediate advantages in career progress were not linked with completion of the course;
- emphasis was placed on the long term career benefits rather than short term or immediate ones.

As company support may not be relevant in a farm management situation, the study indicates the need to identify the benefits of participation in education for farm managers. Motivation to organise and participate in appropriate training will have to come from farmers themselves. The inculcation of a formal learning culture into such a diverse industry of individual operators will be a very different process to that developed within an organisation.

Toohey (1995) makes some useful comments on competency-based training in management, based on the results of her study of New South Wales Technical and Further Education Colleges. General comments include:

- competency-based approaches to management training are more likely to be useful in large, bureaucratic or mechanistic organisations than in smaller more turbulent organisations (Canning, 1990);
- an assessment of how rapidly the environment of the organisation is likely to change should be made prior to embarking on major training projects (Gonczi, Hager & Oliver, 1990);
- competency statements for managers are better done in-house, so they are organisation specific (Canning, 1990);
- competency standards have many potential uses, viz. a basis for training curricula, as a self assessment and development tool, as a tool for staff selection and organisational design, and as the basis for performance appraisal. The more uses that can be planned the more worthwhile the investment;
- the costs of such a program are significant;
- a ‘training needs analysis’ can be more simply and cost effectively carried out using other methods;
- competency descriptions can be a powerful development tool if they are endorsed by organisation leaders and are aligned with practitioners’ perceptions of the job;
- sophisticated assessment techniques are required.

The overall comment was that faster and more flexible ways to respond to management development needs may be required in the present turbulent management environment.

**Competency-Based Training in Agriculture**

Farm business management courses based on the endorsed national competency standards will be introduced by TAFE in 1997. Although the standards were endorsed in 1994, the delay in the introduction of courses is due to the time involved in the process of all states endorsing the standards and the time taken to develop a teaching curriculum based on the standards. Development of the TAFE courses involves a committee comprising practising farmers, representatives from the Industry Training Advisory Board and the New South Wales Farmers Association, and a TAFE Project Team. The following comments have been made about the national competency standards (Porter, pers. comm. 1996):
• An increased awareness of training has arisen from the process of developing the standards.
• The standards are an attempt to define what farmers perceive they need to be good farmers.
• Curricula based on the standards will focus on teaching farmers how to do this.

Farm business management courses will start at ASF level 4 and progress through to level 6. Courses at the Advanced Diploma level (level 6) will focus on a case study approach. Students will be encouraged to use their own farm or similar farms in the district to apply principles, theory and practices introduced in the course of study.

TAFE is currently offering courses in Rural Office Practice at equivalent ASF level 3 through to Associate Diploma level courses at equivalent ASF level 5. Arrangements are in place for courses to be presented within an articulated framework facilitating the movement of students between courses. A joint venture between TAFE and Southern Cross University will combine the Bachelor of Business Studies currently offered by the university with higher level courses in agriculture offered by TAFE to service the agri-business market.

While rural student enrolments in TAFE agricultural or business courses in the period from 1992 to 1996 increased, an evaluation of enrolment numbers is difficult due to an increase in the use of short, industry-driven courses. Other factors affecting recent enrolments include the drought, current low farm incomes and the launch of the TASK courses. TASK is NFF funded and TAFE is one provider of these courses. Courses include Clip Care, Farm Chemical Course, and Cattle Care.

In addition to the competency-based training courses being developed at certificate and diploma level by organisations such as TAFE, the National Farmers Federation and the Industry Training Advisory Board for Agriculture, CBT is also being considered for the development of university-level courses in agriculture. Jackson (1995) has argued that the concept of competency-based training is elastic enough to be incorporated into the higher cognitive development areas of university education. For him, education is about developing a critical attitude with the ability to see the differences in and make judgments on alternatives and to be able to act on those judgments. He sees this as more important than developing an encyclopaedic memory for facts. He argues that there are seven generic competencies which encapsulate the essence of education. These include:

• the ability to access existing knowledge;
• the ability to gain a command of existing knowledge;
• the ability to criticise existing knowledge;
• the ability to explore issues within existing knowledge;
• the ability to create new knowledge;
• the ability to identify the ethical dimensions of a problem or issue;
• the ability to engage in teamwork with peers to achieve objectives.

He also outlines three general principles which he believes apply to his list of generic competencies:

• competencies are appropriate to any undergraduate degree (or for education at any level);
• competencies develop simultaneously;
• in any discipline, while the nomenclature may differ and emphasis may vary, it will be possible to identify a range of competencies.

Jackson concludes that changes in teaching approaches may be necessary if such a framework is adopted. Lees and Reeve (1991) support this view and outline a conceptual framework developed by Stark and others which addresses the range of competencies required in professional practice. Lees and Reeve argue that these competencies are relevant to good farm management and should be considered in course development. The framework includes the following competencies (Stark et al., 1986 in Lees & Reeve, 1991, p. 65):
• conceptual competence;
• technical competence;
• integrative competence;
• contextual competence;
• adaptive competence.

Summary

This chapter reviewed the literature on competency-based training in agriculture. There has been an increased interest in vocational education in recent years, including governmental legislation and policies on industry training. Related developments have become known as the Training Reform Agenda and include areas such as national competency standards, the assessment of competencies for various industries, recognised prior learning, credit transfer, course articulation and competency-based training.

Various groups in the agricultural industry have recognised the need to raise the standards of training and have sought to develop national competency standards for different sections of the industry. Professional associations in agriculture have been active in these developments, one example being the Australian Institute of Agricultural Science (AIAS) which offers professional accreditation to people in rural industries through its CPAg program (Certified Practising Agriculturalist).

Following consultation within the industry across Australia, the Rural Training Council of Australia (RTCA) formulated national competency standards in ten major areas. While the proponents comment enthusiastically on the benefits of using these standards as the basis for assessing competencies and for developing training programs, potential shortcomings have also been identified in their application to farm management. These were outlined in the chapter.

The assessment or auditing of farmers’ competencies was seen to be important in determining the training and education needs of farmers. While basic competencies can be easily assessed, it is more difficult to assess higher-order competencies such as decision-making, processing information, and co-ordinating a number of activities. Despite the difficulties, tools have been devised, such as the Skills Evaluation and Education Kit prepared by Stephens, McGuckian and associates, to assist in the process of assessment and auditing.

Recognised prior learning (RPL) has been developed as a means of formally assessing knowledge and skills gained through work and life experience. It is seen as especially useful for assessing farmer competencies gained through informal education. However, further work is said to be needed to make RPL more cost-effective. Other methods being used to reduce training costs and open up opportunities include credit transfer (i.e. recognition of previous formal education with exemption from part of a proposed course) and course articulation, where further formal study can be added to formal study completed at a lower level.

A case study of competency-based training within the Westpac Banking Corporation was provided for comparative purposes, followed by an overview of some examples of competency-based training in agriculture. These include current and proposed TAFE courses in farm business management, a course linking TAFE studies with the Bachelor of Business at Southern Cross University and courses offered through the combined efforts of the National Farmers’ Federation, TAFE and the Industry Training Advisory Board for Agriculture. Jackson (1995) has argued that competency-based training can be incorporated into the higher cognitive development areas included in university courses.
Chapter 7: The Farmer Interviews - Methodology and Findings

PART A: METHODOLOGY

Aim of the Survey

The general aim of the survey was to interview farmers in the Coolamon District to obtain data on their learning experiences and attitudes towards farmer education, as well as their views on what constitutes good farm management.

More specifically, the survey sought to obtain information on farmers’ perceptions of the following:

- how they had learnt to be farmers;
- how they update their knowledge and education;
- their learning processes;
- education for future farmers;
- key issues in farm management;
- triggers for change in farm management practices;
- what farm management entails;
- competencies required for farm management;
- what constitutes ‘good farm management’;
- characteristics exhibited by ‘good farm managers.’

Justification for the Methodology

Because the survey was to be a pilot study and exploratory in nature, it was limited to a small number of in-depth interviews. A semi-structured questioning technique appeared to be the most appropriate methodology. The literature review being undertaken prior to the commencement of the survey (and which continued during the survey) revealed that a wide range of issues needed to be considered to gain a good understanding of the project topic.

While it was realised that it would not be possible to cover the full range of issues in the limited time available, it was felt that a limited number of in-depth interviews would provide considerably more data and a better understanding of farmers’ perceptions than a larger number of responses to a structured questionnaire. This proved to be a successful approach, the interviewees being willing to answer the questions in considerable detail with further discussion occurring well beyond the ‘formal’ interview.

This methodology was also chosen because it was felt that it would indicate the degree to which farmers were aware of the key issues surrounding the topic, their level of interest in the issues, their degree of understanding of inter-relationships and their attitudes and values in relation to these issues. The responses obtained showed that the methodology was appropriate in achieving these objectives.
Criteria for Selection and Number of Interviewees

Coolamon Shire was chosen as the location for the selection of interviewees because the area contained a reasonable diversity of farmers appropriate for a qualitative study, because the area was well known to the researchers, and because of its convenience in terms of travel and communication. A short profile of the Shire is provided in Appendix 4.

As this was a pilot study, a group of farmers was purposefully selected to include a range of farm sizes and management competencies. Key informants who knew the district and its farmers supplied names of potential interviewees who were selected on the basis of diversity rather than representativeness, in line with the qualitative approach being taken (Patton, 1992). These people were then approached to determine their willingness to participate.

The number of farmers interviewed was determined using guidelines from the literature on qualitative methodology and considering the time and resources available. There are varying arguments about the ideal number of cases that should be used in such a study. While some researchers argue that a minimum of two interviewees is necessary, four to six works well, and over fifteen is too many, others argue that the number and range of cases depends on context, purpose of the research, the use of the findings, and the resources available (Perry & Coote, 1994). Similarly, Patton (in Perry & Coote, 1994, p. 12) has argued:

The validity, meaningfulness and insights generated from qualitative inquiry have more to do with the information-richness of the cases selected and the observational/analytical capabilities of the researcher than with sample size.

Farmers on nine farms were interviewed (two farmers declined to be interviewed with no reasons given; one farmer declined to be interviewed as his wife was ill in Sydney). In seven cases husband and wife were present. The two other male interviewees were unmarried. The high level of complementarity of data across the nine cases seems to indicate that additional interviews would not have contributed to more insights or provided different findings.

Interview Procedures

The farmers were approached by telephone to introduce the interviewer and the project, and to ascertain their willingness to participate. A letter was then sent to confirm the general topic, the purpose of the discussion and the meeting time, and to provide assurance of confidentiality (Appendix 1).

Interviews were conducted in the homes of the farmers, generally around the kitchen table. The times of interviews ranged from early morning to evening, depending on the farmers’ preference. Rapport was established with each interviewee in accord with the research protocol. The interviewer had prior experience in a range of interviewing situations and had the additional advantage of being a farmer. An open, friendly approach was taken and the hospitality and openness experienced indicated that successful rapport was established. In many cases, the interviewees extended the conversation after the conclusion of the interview. How the data was to be used was explained and the confidentiality and depersonalisation of data gathered was described. Notes were taken by the interviewer with an emphasis on direct quotation. Tapes were used in some interviews to check the notes afterwards. Notes were typed up on computer immediately after each interview for subsequent analysis.
**Interview Protocol**

A protocol was developed to ensure a standard approach was used for each interview. This provided a clear set of procedures and a standardised set of questions which also allowed flow to occur where unexpected information was proffered. This is the advantage of the semi-structured interview. The protocol also included an explanation of who was undertaking and sponsoring the research as well as the overall purpose of the project and reporting plans.

A set of questions was developed, based on ideas from the literature and from discussions with farmers, researchers, training providers and a range of people in the agricultural industry. The questions were tested by informal discussions with farmers in another district, enabling refinement of them and ensuring that the key areas of interest were covered. Each topic was introduced using an open-ended question which generally started a conversation. Using appropriate cues (verbal and non-verbal) the conversation was steered in the desired direction - this being described as ‘active listening.’ Whenever topics of interest were mentioned, the interviewer could probe for further information by saying: ‘You mentioned ... such and such ... could you explain a bit more about that ...? In this fashion a plan or sequence of questions was followed in each interview, but opportunities to ‘go with the conversational flow’ were also possible - especially where interesting and unexpected information was volunteered. Hence the interview was ‘structured’ only to maintain control, direction and relevance to the research topic. The interviews overall were ‘in-depth’ to the extent that all relevant avenues and opportunities were explored (Minichiello *et al.*, 1995) (see Appendix 1).

**Pilot Studies**

Discussions were held with many people prior to the interviews (see Appendix 2). This provided assistance in the development of the interview questions and also provided case study material to illustrate some of the concepts discussed in the literature review.

**Data Analysis**

The data gathered from the interviews is qualitative data which cannot be analysed statistically because of its descriptive nature. A large amount of the data gathered was recorded in the actual words of the farmers. This provides a true reflection of farmers’ knowledge, behaviour and perceptions.

The data was assembled and analysed under a series of headings or key themes, some of which emerged from the interviews. While the themes reflect the questions asked, the order in which they are presented has generally been chosen to match the order of the themes in the literature review rather than the order in which the questions were asked. The key themes of the data analysis include the following:

- influences on farmer education;
- sources of current information and learning;
- the learning processes in farmer education;
- farmer education in the future;
- issues in farm management;
- changes in farm management practices;
- defining farm management;
- farm management competencies;
- perceptions of ‘good farm managers’;
- measuring ‘good farm management.’
Preliminary Impressions

In addition to data obtained from the interviews, general impressions were recorded after each interview. These constructions of the interviewer provided a separate set of data in their own right which were used to aid the analysis of the full set of data. They also provide extra insights and richness to the results but are not used in the general discussion (see Appendix 3).

Advantages of the Methodology

- Emphasis is placed on the social (family), spatial and temporal (farm, locality and history) contexts as they relate to the research question.
- The exploratory nature of the study is maximised to provide richness of data and the development of insights into and understanding of local knowledge and experience.
- Farm family perceptions, knowledge and experience were valued above all.
- A high level of rapport was possible via the conversational style of depth-interviewing which also minimised response bias.
- As far as possible farmers were made to feel they were co-researchers in the project.

Limitations of Research Methodology

- Limits to the number of questions to avoid the interviews becoming too lengthy and intrusive (this turned out not to be a problem as interviewees were generous with their time).
- The qualitative nature of the interview data makes it difficult to quantify and analyse it statistically.
PART B: FINDINGS

Introduction

Part B outlines the findings of the interviews in two distinct areas: farmer education and farm management. In the first, farmers were asked about the major influences on their previous farming education, their current sources of information and education, the learning processes they used and their thoughts on future approaches to farmer education. In seeking their views on what constitutes good farm management, farmers were firstly asked general background questions on the following: what they thought were key issues in farm management; triggers for changes in their farm management practices; and examples of changes they had implemented. These were preliminary to the key questions in which farmers were asked for their definitions of farm management, the competencies they thought were needed for good farm management and how they measured the effectiveness of their management practices.

Influences on Farmer Education

Initial Responses

Farmers were asked a question about how they had learnt to be farmers. In general, their responses emphasised experience, learning by doing and learning from others. The role of mentors and specific learning situations were also mentioned. Formal education was discussed by some farmers and others indicated their attitudes to education and learning. The learning process came up in discussion with some farmers viewing experience as the main source of learning. Others discussed the value of formal education in learning to learn. Many stressed the importance of continual learning and the variety of sources for learning.

The range of farmers’ initial responses to this question include:

Through the family ... growing up on a farm ... and our own experiences farming.
It’s a continual process ... you never stop learning. As a child on a farm you learn a lot of the practical skills, then you learn by experience and from other people.
Inherited the basics from my father ... its an evolving knowledge. Experience is the best teacher ... and other peoples’ experience.
Being brought up on a farm and went to farming school. You have to be motivated. You have to want to be successful.
An apprenticeship on the farm since a child.
Bachelor of Ag Economics and an ongoing education now ... being brought up on a farm.
Learning from a variety of sources - from formal education to personal communication.

The Influence of Family

Being brought up on a farm was viewed by most of the farmers interviewed as a part of their basic learning about farming. It was referred to in terms of an introduction to farming, an ‘apprenticeship,’ or as an acquisition of basic skills. These comments were often qualified with discussion of the ongoing nature of learning about farming and the role of experience. Some farmers identified positive
influences of their family in developing particular skills, interests or attitudes. Other farmers commented on negative experiences as triggers for learning.

One farmer referred to his father’s ability in the production area, his own similarities, but also his deficiencies in financial management. This imbalance was rectified when more land was purchased and the debt almost cost them the farm. He and his wife classed this as a major learning experience. Another woman said:

My parents were goers, always changing and experimenting.

Yet another said she had learnt to do the books by having them:

... dumped on the doorstep by my father-in-law.

Other farmers openly discussed negative influences. One farmer said that his father had never really delegated any responsibility to him. He saw this as a factor affecting his ability ‘to try new things.’ He also said that he thought this was a result of the farm being too small and his father’s attitude that they couldn’t afford any risks.

**The Experience of Farming**

Although a variety of influences on their learning emerged and the on-going nature of learning was emphasised, the *experience* of farming was seen as a very significant part of learning by many of the farmers interviewed - their own experience as well as the experience of others.

**The Influence of Mentors and Specific Experiences**

A few farmers analysed the role of specific people or experiences in their education. Many of these experiences were also linked to families in some way. One farmer commented that his opportunity to work with extremely innovative farmers in his youth had influenced his attitudes to change, experimentation and marketing practices. His own family was very traditional. He spoke about his experience as the eldest son, included in the partnership but not as a landholder and sent away to boarding school for a few years to enhance his education. The family expectation was that he would be able to obtain work elsewhere as the youngest son would inherit the farm.

He said that the experience with his neighbours, combined with his strong desire to be a farmer, and his subsequent purchasing of land was ‘the best learning experience he had had.’ Particular reference was made to financial management skills and also to ensuring equity and communication in their current family partnership. Other farmers mentioned experiences such as moving to a new area and travel. Capabilities and interests were often related to the influence of a particular person.

My father was always a farmer who tried new things and experimented. He wasn’t frightened by change.

Another farmer spoke of his father’s ability in the technical aspects of cropping. Two farmers spoke about the help they had had from people they knew well in business and marketing ‘in the city.’
The Influence of Formal Education

The role of formal education in learning to be a farmer was discussed by some of the interviewees. One said:

I can’t relate anything to school now. School’s different today though.

Other farmers regarded agricultural school, agricultural college and university as being a good preparation for farming. One farming couple who had attended university said:

Doing a degree teaches you how to learn, adapt to new situations and cope with change ... being open to change and able to adapt ... a broader view.

Another farmer commented on formal education in relation to learning how to analyse things. A few farmers commented on boarding school as a broadening experience.

Farmers who had received formal education in farm management said it was helpful. One farmer with a degree had also just updated his wool classing qualifications at TAFE. He commented favourably on the course and said he had learned a lot as things had changed so much since he first did it.

In summary, it was interesting that many farmers analysed how they learnt to learn as a response to the question about how they learnt to be farmers. In some cases formal education was seen as an advantage in learning to learn.

Sources of Current Information and Learning

Range of Sources

Following the discussion of how farmers had learnt to be farmers they were asked how they kept up with everything they needed to know. All the farmers interviewed cited a number of sources for information and learning. Some of the farmers were using a greater variety of sources than others. Many comments were made about the time spent learning. Some farmers commented on ‘sorting information’ and others on the difficulty they had in applying the information. There were a few comments made about the difficulties in gaining access to information about marketing. Information and learning sources cited by farmers included:

- farmer/grower meetings;
- farm walk groups with local DA and local agribusiness proprietor;
- casual interaction with other farmers;
- specific meetings with other farmers;
- market reports on the radio;
- seeking information using fax lines;
- learning from other people;
- Westpac Agribusiness group;
- Landcare groups;
- field days and conferences;
- reading;
- advisors - accountants, bank managers, solicitors, farm consultants, financial investment advisors, agronomists (public and private);
- local agricultural supply merchants - sprays and fertilisers and associated agronomists;
short courses - woolclassing, computing, farm chemicals, farm safety, whole farm planning, CALM assessor;
- grain dealers;
- Kondinin Group;
- NSW Farmers Association;
- Canola Association;
- FM 500;
- active roles in local organisations and groups, e.g. fire brigade, Landcare;
- family members or friends in other businesses.

Obtaining information and learning from people was cited as the preferred option from the farmers spoken to. Some farmers were very specific about the sources of information and learning they used for particular aspects of their farm’s management which suggests that efficiency of learning was important.

Throughout the discussions in this area, there were two main sub-themes. One was about sources of information and learning and the other about relevance and application. It seemed that gathering information depended on time available and cost. The larger farm enterprises appeared to be flexible enough to find the time and pay the costs.

**Technical Information and Advice**

Group walks were regarded as particularly helpful for anticipating and solving technical problems as they utilised local knowledge and enlisted the participation of all attending. Comments were made about the relevance of their agendas.

Farm walks ... it’s the best way to learn ... everyone has similar problems ... everyone has an input and you always learn something. You can’t go to everything that’s on; that’s why the farm walks are good. They’re more relevant.

Landcare groups were discussed in a similar way. Although focusing on production issues and relevance within the local catchment, there were comments about new ways of thinking about things, whole farm planning concepts and the interrelationships between farms based on resource management. Some comment was made about the broadening influence of Landcare in the way it encouraged farmers to co-ordinate their efforts in the management of recharge areas.

Technical information was gained from: other farmers, private agronomy services, the district agronomist, reading and field days. Spray and fertiliser information was gained from merchants as well as experienced farmers. Advice in this area is considered specialised. Due to the proactive role of the local spray merchant all farmers in the sample had completed the farm chemical course. Comments were all positive and many farmers mentioned improvement in learning how to use and assess chemicals. Greater awareness of health and safety issues was also mentioned as an outcome of involvement in the farm chemical course.

**Financial Information and Advice**

Financial information and advice was commonly gained from a variety of professional advisors. Skills in financial analysis and computing were often developed in off-farm work situations and short courses. A few of the farmers commented on their increasing use of specialist advice in this area. All farmers in the sample used or were setting up computerised financial records. Advantages of computers were seen to be time saving in the long run and allowing more sophisticated and timely financial analysis.
Marketing Sources

Many farmers expressed concern about marketing. Problems mentioned were in the areas of information sources, application of information and sources for learning about marketing. One farmer said, ‘Marketing information is not as easy as it should be.’ Another farmer said, ‘The information is there but sometimes it is hard to put into practice.’ Another farmer said that marketing was a more difficult area to learn about. Marketing practices varied from direct marketing to specific end users, to traditional practices like use of the sale yards. Grain and lamb marketing were the main areas of marketing mentioned. No farmers in the sample were involved in co-operative marketing arrangements.

On the other hand, two of the farmers who were more proactive in marketing mentioned that they had other family members in business in the city. This may account for their different perspective. Other marketing information was sourced through farm women who had previously worked in business or who were from business families. One of these women was privately marketing eggs but not involved in other farm produce. It would appear that family background and circle of friends and acquaintances has some impact on farmers’ sources of informal learning on marketing.

Business Management Sources

There was a wide variation in farmers’ approach to obtaining information on business management matters such as superannuation, retirement and estate planning, off-farm asset management and other planning. Interviewees commented on the need for an awareness of the impact of these factors on the farm business and the need to plan for and exercise control over them. Accountants and farm consultants were seen as important sources of information and advice in farm business management, one commenting: ‘the farm consultant is good value for money.’ Farm and business management journals were also discussed.

Two references were made to FM500 in the context of the general management of the farm business rather than in relation to specific technical or production issues. One of the farmers was a member and commented that it was ‘excellent.’ Another farmer mentioned that friends of theirs were in FM500 and that he had learnt quite a bit from them about farm business management.

Farmer-Directed Groups

In addition to the reference to FM500 discussed above, farmer-directed groups were seen as sources of new ideas and as sources of personal development. Farmers who participated in groups which were ‘less locally based’ or who interacted with people in other industries appeared to have a broader outlook. They also appeared to be more pro-active in marketing. Other farmers mentioned involvement in community and industry affairs and spoke of leadership, communication, teamwork and learning skills gained through these groups. These farmers often had leadership roles in organisations.

The Learning Processes in Farmer Education

Range of Learning Processes

In the course of discussion farmers described the range of processes in their learning. These included:

- continual gathering of information and advice from a variety of sources;
- sorting information;
- analysing information;
- assessing the competence of advisors;
- assessing applicability to a specific farm situation;
- analysing the costs and benefits - both short and long term;
- applying the change or strategy;
- assessing the change or strategy in practice;
- adapting or fine tuning strategies to changing situations.

Many processes were discussed in terms of the costs and benefits involved. Points raised in this regard were: time spent on gathering information and learning, the timing of learning and of the implementation of change, personal goals, personal interests and attributes, and analytical competence. There was considerable variation in the level of difficulty perceived in these processes with some farmers seeking assistance and others not. Farmers varied in their ability to assess their own competence and although not always describing the process as outlined above, most described a series of steps.

**Triggers for Learning**

Although some farmers in the survey cited specific triggers for learning, in general the discussion was about the continuing process of assessing opportunities and solving problems. The following comments by one farmer reflected the opinions of most of the farmers interviewed:

Farmers have to learn all the time. There are continual changes. You are learning all the time. Opportunities and problems trigger learning but you have to anticipate change and directions and be pro-active.

Attendance at short courses was given as an example of the types of opportunities mentioned. Involvement in Landcare was an example of a pro-active response to resource management problems. Increased efficiency, specific opportunities, specific problems, ‘something you see over the fence’ and ‘just for knowledge’ were also mentioned as triggers to learning.

In the course of this discussion, most of the farmers expressed concern about analysing and implementing changes rather than concern about the learning process. One farmer said: ‘You make a change if it benefits you.’ Another said: ‘It depends on whether it’s going to be viable or not. You can’t dive in. You’ve got to just wait.’ Differences in farmers’ ability to analyse the benefits of potential changes on their farms were apparent although all farmers emphasised the importance of this in terms of their individual farm situations.

Triggers for learning focused on problem-solving and also on opportunities. The ongoing nature of learning was emphasised. Concern was expressed about the ability of farmers to apply information and to assess its applicability in terms of resources available in individual farm situations.

**Lifelong Learning**

Most farmers interviewed commented that learning from family, other farmers and personal experience would continue an essential part of farmers’ education and training. All farmers saw lifelong learning as an essential part of farm management currently and in the future. Some farmers saw lifelong learning as an important strategy for managing ‘continual change.’
Farmer Education in the Future

A question about farmer education in the future generated discussion on perceived changes in farmer education and perceived changes in farming.

Higher Levels of Formal Education

The discussion indicated that higher levels of formal education would assist future farmers in their ongoing education and their ability to change. Other benefits seen in higher levels of formal education included its ability to assist farmers to be more aware of external factors affecting farm management including: regulation, market forces, changes in technology, and broader industry issues. A few farmers referred to specialised courses such as production technology, computing and advanced technical monitoring systems. Courses in marketing were also mentioned. One farmer said, ‘Farmers in the future will be able to organise their own education because they’ll be better educated to start with.’

Attitudes Towards Education of Future Farmers

One farming partner who teaches at a local school mentioned changing expectations of children. She had observed distinct changes in local children’s attitudes to school work over recent time. She felt that many children from farms used to be totally disinterested in school as they didn’t see that it was relevant to their returning to the farm. The expectation was now that they would get a job when they left school and that this had had a positive effect on their attitude to school work. Many farmers said they actively encourage their children’s achievement at school. School achievement was also a prerequisite to being a good farmer. Furthermore, some of the farmers who hoped their children might become farmers, wanted them to have a choice and valued education as a means of providing this flexibility.

Accreditation

Accreditation was mentioned by a few of the farmers. Participation in the farm chemical course was commonly cited as an example of accreditation and as a response to regulation and occupational health and safety issues. Farmers attending courses in these areas saw cost efficiencies as the primary advantage of attendance, for example, more efficient use of sprays, reduced rates for worker’s compensation insurance. They also mentioned the importance of increased general knowledge, safety and health. One farmer showed me his certificate for the farm chemical course. He said his family has teased him about it being his first ‘qualification’!

Other farmers raised the issue of accreditation in terms of developing new businesses, provision of specialised services for other farmers and for marketing purposes. Accreditation was seen in terms of the increasing participation of farmers in the off-farm business environment. It was also seen as a proactive response to further regulation.

Changes in the Industry Impacting on Farmer Education

A few of the farmers commented that changes in the structure of the industry would impact on farmers’ future education needs. Family farms on a larger scale and smaller farms with off-farm income or associated businesses were mentioned. Reference was made to ‘different types of farmers,’ having different education needs.

Increased use of technology and increasing rates of change in technology were mentioned as affecting farmer education in future. Farmers were dependent on technology for ongoing improvements in farm production and farm management. Some felt that change and technology made farming more difficult
while others saw it positively as a way of gathering and analysing information. Overall, the view was that technology had an impact on technical production, management and learning - the latter being an integral part of the continual evaluation and adjustment of their farm management.

**Industry Politics and Education**

Some of the comments implied that education in the future needed to prepare farmers for involvement in industry politics. The comment was made that farmers were not being represented by the most experienced and successful farmers. One farmer said that the dynamic, full-time farmers who produce the major proportion of agricultural production were small in numbers and were totally committed to their farm businesses due to their limited financial returns. Their ability to be actively involved in industry politics was therefore limited. The few farmers who raised this issue felt that the ‘good farmers’ were not well represented in industry politics but they could not see a clear solution to the problem in the short term. They implied that, in the long term, education would be needed to prepare more of the ‘good’ farmers to become involved in this area.

**Issues in Farm Management**

In response to the question ‘What do you find difficult about managing your farm these days?’ a variety of issues were raised by farmers. The problems discussed in relation to farm management could be categorised as follows:

**Capital and Farm Business Structure**

The importance of having adequate capital was mentioned by many of the farmers, especially in the context of long-term farm development. One farmer said:

> You’ve got to have enough finance, but people who borrow too heavily get into trouble. People on farms have a lot of debt - 90 per cent of the farming community is in debt. You’ve got to balance it. We have a good relationship with the bank.

Another commented:

> Bigger operators can afford to own their own equipment and do the work themselves but the smaller operators need to use contractors ... has to be assessed on a time and money basis.

**Cost Management and Decision-making**

All farmers interviewed in the sample mentioned costs of inputs. Some related it to their capital availability or debt situation, and others in relation to managing and analysing costs and the effect of cost management on decision-making. ‘Knowing when to stop with expenses’ summed up many farmers’ attitudes to cost management. There were many examples cited about the difficulties experienced in analysing the level of inputs for the farming system to ensure long-term productivity of the land and adequate short-term income.

Decision-making was regarded as ‘difficult with increasing costs,’ one farmer said. This feeling was shared by many. One farmer related cost management to his age.

> When you’re young you probably do things to save money that you mightn’t do when you’re older.
Time Management

Time management was regarded as a central part of farm operation. The problem of prioritising was raised, particularly in relation to important activities. It was often difficult to tell if the benefits warranted the amount of time required. This was commonly seen as a problem in ‘marketing and keeping up with all the information you have to have.’

It was also a problem in relation to labour availability: ‘Balancing the time spent learning against the time required for technically running the farm.’ Some farmers commented that they were addressing this issue by employing contract labour and/or out-sourced advisors. There was emphasis on assessing the cost, quality and availability of these options. Individual skills and interests of the farmer also had to be taken into account.

In relation to prioritising, one farmer said: ‘Cost problems are bigger than information problems, but time management is the biggest thing.’ ‘Time for farm development’ was a problem mentioned by another farmer in relation to the physical activities associated with tree planting, re-fencing and longer term resource management strategies.

Information Management and Learning

There were many comments about ‘sorting information,’ ‘keeping up with everything’ and time spent learning. Farmers were less concerned with access to information than with time spent learning and sorting information. There was also comment on the time spent making decisions and the increasing number of alternatives needing evaluation in terms of cost and short and long-term benefits. The increasing complexity of analysis and decision-making was the main point here. In summary, the main focus was ‘time’ rather than availability of information or resources. This forced some farmers to use specialist services.

Marketing

Farmers spoke about problems in finding sufficient time for marketing and dealing with market uncertainty and regulation. Some farmers perceived that they had no control over prices gained whilst others were concerned about overseas influences on grain prices and government deregulation. They also spoke about the necessity to focus on aspects of marketing where they could make some difference.

One farmer described how a recent change in government regulation caused his long standing marketing arrangement in prime lambs to collapse because it required the slaughter of the lambs at an abattoir closest to the market, rather than an abattoir close to him. In essence this removed his control over quality. He could no longer guarantee his product and he felt that the changes showed the government’s failure to understand the producers’ situation.

Government Policies Affecting Farmers

A few comments were made about increasing government controls over farm matters and the broader effects of government policies on the farming community. These policies were seen as a reflection of a lack of understanding and support for farmers on the part of government.

The importance of government policies was summarised by the comment of one farmer that: ‘In future there will be more political impact - you have to be aware of it all - increasing government control.’ Other farmers saw producers as having little control over these matters but felt it was important to be aware of policy changes.
**Personal Goals and Family**

The increasing pressure on the farm’s capital structure was discussed. This was raised in relation to family members’ individual needs and goals especially retiring parents. Options open to children in the family were also mentioned.

Health and age were mentioned in relation to the physical requirements of farming. A few discussed the strain and constant pressure associated with being in debt. One woman also commented on the strain of travel. ‘Living out of town’s not easy ... all the miles you’ve got to travel.’ Communication was discussed in relation to extended family relationships. Problems cited were often related to decision-making, strategic planning and the management of the overall farm business.

**Technology**

All farmers mentioned that they used chemical weed control methods but expressed concerns about costs and weed resistance to the chemicals. They were also worried about agronomic problems and the long-term health of the land, especially in relation to balancing short-term profitability with long-term resource management. The time taken to address the complexity of the resistance problem was also a concern.

**Farm Transfer to Children**

Farmers were asked to discuss whether they thought their children would be farmers and whether this affected their management. Many responses centred on looking after the land. Some farmers felt that planting trees and other aspects of long-term land management were affected by the possibility that their children would inherit the land. Most of these comments were qualified by saying that their present income was also dependent on them looking after the land.

Farmers are the best conservationists as they depend on their land.

Other farmers said that looking after their land was important and that their farm management practices were not affected by what their children might do. A few farmers mentioned care of the land as an ethical consideration, for example, ‘We are only managing this land - we don’t own it.’ Another farmer said that ignorance may be a factor in some farmers’ attitudes to not looking after the land.

It was noted that speculator type farmers were ‘mining’ the land without long-term commitment although it was felt this may have an effect on the sale price of the land. Speculation, exacerbated by proximity to a regional centre and development potential was discussed as a factor affecting responsible land management practice.

It was interesting to note that the farmers who said that growth of the farm was affected by the possibility that their children would return to the land, also said that growth was necessary for their present farm performance. Growth of the farm was seen to enhance economies of scale, effective rotations and efficient use of machinery and labour.

Problems of scale were raised by a farmer with a small landholding in his comment on larger landholders: ‘They’ve got the freedom ....’ Although he felt the size of the farm did not affect his farm management practices, he also said: ‘The place isn’t big enough for any more people. It’s not really big enough for us.’

Some of the farmers actively encourage their children’s interest in the land by allocating farm jobs or projects for the children in relation to their individual interests and expertise. There was recognition that holdings would often only support one of their children. Others said that it would be entirely their children’s choice. Other farmers commented that they encourage their children’s interest but ‘we keep
emphasising how important it is to do their school work.’ A few farmers said that if their son was to return to the farm he would also have to complete a farm management course before he returned. (None of the farmers interviewed alluded to daughters returning to the farm). All the farmers who encouraged their children to be farmers said that their children would have a choice as to whether they farmed or pursued another job or career. Qualifications were seen by some to provide ‘flexibility and alternatives.’

An observation by one of the farm women who was a full time teacher was that children who were sons or daughters of farmers were now applying themselves more at school, as there was no longer the expectation that they would automatically return to the farm after minimum schooling. There was, she said, a definite expectation that they would have to pursue a vocation outside farming and this had a significant effect on their application to schoolwork.

Another farming family talked about the purchase of a neighbouring property when their son was in Year 11. Although ‘bright,’ the son was not interested in school and was committed to farming. After family discussions, the property was purchased and the son returned to the farm on the understanding that he would have to face ‘hard work and subsistence pay in the short term.’ They said that opportunities for the son to pursue further education and gather relevant information have been encouraged alongside the practical work involved. Open communication and successful goal achievement were two characteristics observed in this family business. Furthermore, despite an apparently difficult capital situation, this farming family has met their goals of long-term viability and sustainability. There were also indications that this family provided strong leadership in local farmer education and were proactive in Landcare developments and marketing initiatives.

In summary, most farmers interviewed placed significant importance on care of their resources balanced against short-term economic viability. Comments were made about speculators and ‘miners’ of the land. Growth and scale of operations were significant when farmers considered their children returning to the land. There was also evidence that farmers valued children’s formal education as a prerequisite to farming in the future. The benefits of children’s formal education were also discussed in terms of families adjusting out of agriculture.

Changes in Farm Management Practices

Introduction

Survey participants were asked to identify a recent major change they had made on their farm. After citing the change, they were asked what triggered it and how they learnt about it.

Responses to what triggered a change fell into two main categories and all responses were related to profitability in some way. Some farmers cited a change as a response to an opportunity and others cited a change made to arrest or deal with a problem. Many farmers commented on the relationship between these factors in view of their overall focus on profitability, short and long term. The observation here was that perception and timing of the change varied between farmers with a variety of reasons for the individual differences. These included: age, stage of business development, capital, family attitudes, labour availability and prioritising needs. In analysing the underlying reasons for the change and the benefits perceived, there was little variation in farmers’ responses.

Some farmers cited one major change, others two or three. Canola growing was cited by six out of the nine farmers as being the most high impact change made on their farms in the short to medium term.
The farmers who did not cite canola as a major change had all been growing it for over ten years. One farmer had been growing it for twenty seven years. Other changes cited were:

- lucerne establishment;
- liming;
- the use of Roundup;
- changed practices in sheep lambing times;
- changed practices in marketing;
- the introduction of direct drilling, stubble retention and minimum tillage practices;
- use of the computer.

It is interesting to note that nearly all changes cited as a response to this question were technical.

**Canola**

The farmers who had been growing canola for over ten years said that it was adopted to increase short-term profitability. A few of these farmers said that the value of the crop agronomically was discovered later. These farmers also commented on the technical difficulties experienced in the early stages of canola growing like: varieties, disease and harvesting techniques.

Other farmers who saw canola growing as the most significant recent change made on their farms said that they were attracted primarily by the agronomic benefits but that it was also financially viable. The local district agronomist and a well known farmer in the district were influential in the farmers adopting canola. Some of the more recent adopters commented on the expertise and new equipment necessary to harvest canola.

One of these farmers said that canola was financially comparable to a good wheat crop but spoke of the long-term agronomic benefits of canola:

> Canola ... probably the biggest change in farming ... it can break the disease cycle in the root system. Control of barley grass too ... There are longer term benefits for the soil and your farm management as well, less chemicals, less workings. The soil tests have shown the benefits of canola.

One farmer in this group commented on the difficulty he had had in convincing other family members that they should try canola. There was great effort invested to adapt their header at the minimum expense. The effect of capital availability on decision-making and adoption of change is exemplified. In the case mentioned, short-term cost control was of primary concern. It was weighed against long-term benefits. In his words, they were ‘not big risk takers.’

**Direct Drilling, Stubble Retention and Minimum Tillage**

Another farmer indicated that direct drilling, stubble retention and minimum tillage was probably the most major change.

> It was probably triggered by the need for more stringent cost and time management .... I’m still not sure if it’s really the way to go .... I’m still questioning it, but we’re moving that way in the short term ... mainly for cost control.

The farmer explained that he saw it in Victoria on a field trip and had an opportunity to buy the equipment at a reasonable price. This case illustrated the process of experimentation and continual assessment of change in farm management.
**Lucerne and Liming**

Another major topic was lucerne growing and liming. The triggers for this were mainly agronomic and comments were made about the long-term advantages compared with cropping which was seen to be more profitable in the short term. A well known local farmer was cited as the pioneer of lucerne in the district and responsible for many farmers adopting the practice. Some farmers made comments about the value of lucerne in the drought.

People who had lucerne made money in the drought. The drought was a big turnaround for us, we reduced our debt to 73 per cent (equity). The highest we’d been was 61 per cent. We made money in the drought.

Other farmers made comments like: ‘You have to have lucerne now.’

**Computers**

Use of the computer was another major change cited by some farmers. ‘There is a lot of value in computer analysis for management systems. It will be big in the future. It’s very exciting.’ Computer technology was discussed in relation to general business management, particularly in relation to integrating physical and financial data. It was seen by some farmers to have potential in assisting in more complex analysis.

**Environmental Management Techniques**

Visible salinity problems in discharge areas (i.e. high water tables) had also triggered changes in management practices. These practices had been instigated to address environmental problems such as saline discharge. ‘Wet areas’ and ‘reduced barley yields’ were symptoms mentioned. Liming, top dressing, lucerne and tree planting were cited as examples of strategies employed to arrest these problems. Some farmers also discussed the instigation of Landcare groups as a response to these problems. Information and advice on landcare came from various sources, such as the district agronomist, other farmers and Landcare personnel.

**Marketing**

Marketing was mentioned by two farmers in relation to change. One farmer said: ‘There’s been a lot of change in marketing too. I’ve always been a great promoter of direct marketing. We sell a lot of our stock on the computer - that was the reason for getting one in the first place. There are big changes in marketing these days.’ Another farmer described how he had staggered his lambing times to assist cash flow and reduce risk associated with marketing all produce in one season. He also said he was forward selling canola and contract growing wheat to specifications. A local grain merchant’s advice was cited as the trigger for the latter changes.

Farmers who mentioned change consistently linked it to profitability. Many of the reasons for change were related to the long-term health of the land and its sustainability. Other farmers discussed change in relation to opportunities to improve short-term profitability. Many changes were analysed in terms of benefits for both short and long-term profitability, problem solving and problem prevention.

When farmers were asked to describe how they learnt about new practices, it is interesting to note that no comments were made about difficulty experienced in seeking information or technical advice, apart from the farmers who adopted canola over ten years ago who mentioned a few early technical problems. The influence of one well known farmer in the district was noticeable and he was often cited as the trigger for change as well as the main source of information. Farmers discussed a variety of sources of information and advice. Some farmers commented on the need to adapt advice to their own situation. Early adopters of canola and lucerne cited other farmers as their trigger for change and
information source. Later adopters mentioned other farmers, district agronomists and agricultural merchants.

**Defining Farm Management**

**Introduction**

In asking farmers what they understood by the term ‘farm management,’ a wide range of responses was elicited. The question generated a lot of discussion which is reflected in a list of thirty eight key factors associated with farm management (see Appendix 1). These words were used in the data analysis and they indicate the wide range of meanings and practices that farmers associate with the concept of ‘farm management.’ For instance, some farmers encapsulated it as a process and provided a ‘definition.’ Other farmers responded with a series of key words. These ranged from personal attributes such as: ‘positive attitude, hard work and age and the stage you’re at’; physical aspects of the farm, like ‘soil type and health of the land’; business aspects of the farm, like ‘financial management, capital availability, marketing and decision-making’; and ways of dealing with ‘change.’

One of the farmers who defined farm management said:

Farm management is using all available means to manage all aspects of the farm, from physical to financial, to come up with a plan to hopefully be profitable in the short and long term.

He qualified this statement with a further comment on ‘capital’: ‘You have to have capital for any long-term development.’ This was also supported by other farmers.

The data reflected farmers’ appreciation of the diversity of factors encompassed by the term ‘farm management.’ They emphasised physical, technical, financial and business aspects of management, and the need to integrate these. Local knowledge was emphasised. Marketing was highlighted - often related to risk management. Planning was also emphasised. Many attitudes and personal attributes affecting farm management were identified, namely: positive attitude, motivation, drive, flexibility, ability and willingness to change and experiment, and thinking in new ways.

The data has been analysed under seven sub-themes which express farmers’ knowledge, experience and perception of problems in farm management:

- decision-making;
- financial management;
- technical aspects and local knowledge;
- marketing;
- managing change;
- family relations and farm business structure;
- personal attributes.

**Decision-Making**

Decision-making was an activity which some of the farmers felt was becoming increasingly difficult. Concern revolved around the impact of change and the increasingly complex information required, combined with the need for short and long-term farm profitability in a situation of rising costs and reduced margins. The increasing number of factors affecting decision-making was commonly mentioned. The increasing trend for farmers to seek expert advice in particular areas was a response to this concern, in the process of sorting information, analysing options and relating it to the farm
situation and goals. Different strategies were exhibited by individual farms in this regard. Factors seen to affect this were confidence, areas of expertise, past experience and current financial situation.

Decision-making was generally perceived as the basis of the farm’s business management and was viewed as the process of integration. Farmers generally commented on the importance and increasing complexity of decision-making. One farmer said:

Decision-making is very important - knowing what enterprise mix is the best for the land and most profitable. It’s a lot wider - decision-making these days; there are so many options. You’ve got to be aware of all your options so you can mix that package together and do what suits you and what you’re best equipped to do.

Decision-making was commonly raised in relation to planning, with emphasis placed on both the short and long term. It was often in this context that factors affecting decision-making were raised. A wide range of factors was mentioned. All interviewees discussed the effect of capital availability on decision-making, particularly in relation to the long-term strategic management of farm businesses. The following comments illustrate this.

One farmer viewed insufficient capital as affecting his ability to plan ahead and ensure long-term viability. Another farmer placed emphasis on planning and capital.

You’ve got to keep looking ahead ... enough capital is also important ... you’ve got to have a good relationship with your bank .... Capital is important for good farm management as well as growth and the long-term viability of the place.

A wide range of other factors was also mentioned as affecting decision-making including: change, communication, technology, markets and personal attributes such as a positive state of mind and ability to learn.

Problems in the process of decision-making were raised by some of the farmers. Concern was expressed by many about the increasing complexity of the process. Different facets of the process were perceived as problematic by different farmers. Some farmers commented on information gathering and awareness of options while other farmers spoke of the analysis being more difficult. Other farmers commented on the difficulty of assessing and applying information to the individual farm situation. A range of practices in decision-making to overcome some of these problems was mentioned, self-awareness and time-management being two general approaches used.

Other aids to decision-making mentioned included increasing reliance on out-sourced advice, particularly in relation to financial analysis. Some farmers used specific information services and advisors for technical input and production matters, and focused their time on financial and business analysis. Many comments were made on the importance of assessing advisors. One farmer talked about the need to have the ability to assess advisors. Another mentioned a situation where his inability to adequately assess the quality of out-sourced financial advice had serious ramifications for the viability of the business.

Past experience was perceived by many farmers as being important in decision-making, but there was also constant emphasis placed on learning. Learning was linked to farmers’ views on the necessity of change. Flexibility, adaptability and responsiveness were also mentioned. One farmer summed up his comments on decision-making by saying:

Successful farmers’ percentage of wrong decisions is less than others.
In summary, decision-making was seen to be the basis of the farm management process. The increasing complexity of decision-making is evident as farmers place more emphasis on business management. The strategies employed in decision-making vary in relation to the structure and capital base of individual farm operations, and the experience, competence and interests of individual farmers. Self awareness and the extent of experience appear to be crucial to the process of decision-making.

Financial Management

Financial management was raised as an important issue by each farmer in the survey. Some farmers raised it in relation to long-term planning, long and short-term resource management and business management issues. Other farmers emphasised cost management:

Financial management ... you need it for everything.

A broad range of skills and practices is evident in this area. The degree of sophistication employed in financial management also varied. Some farmers had sophisticated computerised systems to analyse physical data against financial data, while other farmers were embarking on the establishment of a computerised system and had no current manual system apart from bank statements. Many women had specialist roles in this area but this also varied and was dependent on individual situations, experience and interest. The work experience of women and the development of their computing skills were cited as factors affecting this.

All the interviewees were using out-sourced expertise in their financial management. The extent and type of service used varied between farms. Many comments were made about relationships with the bank and accountants, and the effectiveness of their services:

I have my own accountant for advice and I get on with him well. The partnership has another accountant, but I don’t use him for advice.

Another farmer changed accountants when they took over the farm as they felt the family accountant ‘wasn’t good enough ... we use the accountant all the time.’

Other farmers made the following comments about their use of accountants:

Mainly for taxation, some general advice and advice for specific purposes.
Financial investment advice.
We speak a fair bit lately ... things are getting more complicated.

Another farmer said his accountant wasn’t good enough, but that he takes full responsibility for this and does not want to change at this stage due to a long-term family relationship. He uses an agricultural consultant for business management advice and financial planning.

In the course of discussions with farmers on their perception of financial management, two main categories of responses were evident. Some farmers discussed financial management with a relatively short-term focus on cost control, whilst the other group referred to short and long-term financial management and often referred to the difficulty of maximising short-term returns without affecting the long-term management of the resource base. Comments were made by farmers with high debt levels that the banks had generally been aware and supportive of the inputs required for long-term land management. The farmers who had the experience of borrowing money appeared more confident in
their analysis of financial management. One farmer commented that going into debt had been his

**Technical Aspects and Local Knowledge**

The technical aspects of farming impinging on farm management were also raised. Comments were made in relation to resource management, information management, time management, planning, cost management and local knowledge.

A few farmers commented that soil type was a major factor affecting farm management. One farmer said:

> It is probably the main thing that makes all farms different ... (but) the age and stage you’re at affects what you do as well.

Many comments were made on the value of local knowledge in technical farm management:

> We could have moved away to buy a bigger place but we knew all this area well and I knew the neighbouring place from working there so wanted to stay in this district. Local knowledge is very important ... the conditions the paddocks are in.

Another farmer commented about the time spent learning about the district and finding new resource people after they had moved from another area.

Many comments were made about the necessity to keep up with technological changes and to assess their applicability to individual farm situations.

> Sorting information is important. You have to keep learning. Technology and all the new fangle dangle stuff you have to know about.

Comments on decision-making were often raised in this context as well.

> You’ve got to be aware of all your options so you can mix the package together and do what suits you and what you’re best equipped to do.

Looking after the land was raised as an issue by every farmer interviewed. It was related to short-term and long-term management and often in relation to profitability and capital availability. Concern was commonly expressed about the short-term costs involved in the long-term management of the land and the difficulties caused in this process by tight margins.

> The long-term health of the land is probably number one though.

Other comments were illustrated with specific examples like liming and fertilising practices, lucerne establishment, canola production, water use efficiency, whole farm planning and enterprise mix.

In summary, technical information was actively pursued by farmers. Great emphasis was placed on this area in relation to the physical management and production aspects of farm management. Local knowledge was regarded as the interface between technology and individual farm operations. The structure and goals of the farm business and the physical aspects of the land were commonly mentioned as factors affecting the adoption of technology.

Computers were also seen as increasingly important for gathering information, nad for analysis and decision-making. Some of the problems cited in relation to this were the cost and time spent learning
and, generally, the increasing complexity of information and analysis required. Farmers commented on the need for relevance of technical information to local conditions. Farm walks with the local agronomist and other farmers were commonly cited as beneficial and a cost- and time-effective method of learning.

**Marketing**

Marketing was discussed as a means of increasing profitability and control over prices, as well as improving financial and general risk management. Many farmers commented on the increasing importance of marketing and the changes occurring. A range of understanding and awareness of marketing was exhibited amongst the farmers. Some embraced marketing as an integral part of their business and appeared confident and innovative in this area. Other farmers cited changes in marketing strategies as a result of being approached by marketing agencies and appeared more reliant on agents’ advice.

A few farmers spoke of marketing in terms of setting target prices and marketing to that. Other farmers felt they had no control over the prices gained. This was referred to particularly by farmers who were using the saleyard system to market lambs. Some were aware of other options but continued using the sales.

We take them to Wagga, mostly a hundred at a time and hope for the best.

Other farmers were proactive in their marketing and spoke about the need to know costs of production for marketing and ‘the need to set a target profit and market to that.’

I’m always working on marketing - (you need to use) direct marketing so you know where you’re up to ... that was why we bought our first computer - about fifteen years ago.

Another farmer was forward selling contracts for grain and selling most of the lambs in the paddock ‘to improve control of the sale price ... you don’t know what you’ll get at the sales.’

Other comments on marketing were related to decision-making:

With marketing for instance - there are so many choices - you haven’t got control over a lot of things, grain marketing for instance, but you’ve got a lot of control over stock marketing now, so you’ve just got to exercise the control when you have it.

Many comments were made about time spent on marketing. One farmer had employed an agronomist to allow him more time for marketing and financial management.

Marketing was seen as an increasingly important aspect of farm management. Concern was expressed by many farmers with regard to assessing the options available and learning about marketing. Although farmers were generally aware of marketing options, there was a great variation in practices employed. Farmers used many information sources for market prices and analysis and often commented on consumer preferences. There were varied comments on agents’ services and the trend to direct marketing. Direct marketing was often perceived as difficult, but many farmers embraced the principles. Comments were made about the need to learn about the process of marketing, but concern was expressed by some farmers on how to go about this.
Managing Change

Managing change was an issue discussed by all farmers. Comments were made on the necessity for change and experiment, as well as the need to keep up with technology even though this was often difficult. One farmer commented that in his emphasis on long-term planning there was ‘... continual re-adjusting and adaptation of plans as circumstances changed.’ Other farmers also remarked on the need for flexibility in their management and planning. Comments included:

You’ve got to think in different ways to the past.
Not all the decisions you make will be the right ones but you just have to make an educated decision and do what you think is best at the time.
You have to do what suits your situation.

In summary, change was generally regarded as an integral and inevitable part of farming - the basis for improving production and management. Although it was difficult, the ability to change was regarded as important.

Family Relationships, Farm Business Structure and Personal Goals

The significance of family relationships and family farm business structure was especially mentioned by farm women. Many comments were based on negative experiences to do with inequity, lack of communication and the limited choices available. Other comments were positive and family partnerships were seen as an advantage to farm management.

One family had recently left their extended family partnership. The woman said it was more motivating for the family to be on their own as they viewed their attitudes to farming as more progressive than the family partners they had left.

Another woman discussed their experience in a farming family business which was:

... so inequitable and has made us aware of the importance of this and we are not going to let it happen in our family.

They said they place great emphasis on:

... open communication and making sure everyone is clear about their expectations and plans for the future.

Harmony in the family was considered to be an important aspect of their farm management. Other farmers made comments on this issue like:

Family set-ups are a worry - depending on the situation.

Some farmers viewed extended family businesses as an advantage. Shared expertise and experience, specialisation, flexibility, more effective use of machinery, scale of operations and trust were identified as advantages to this structure.

Personal goals were seen as a factor affecting differences in farm management - especially in terms of growth and investment strategies and long-term planning. They were also seen to affect farm business structure. Differences in personal goals were seen as causes of conflict in some farm situations. One farmer said: ‘The age and stage you’re at affects what you do as well.’
Communication and definition of people’s roles on the farm were raised more often by women than men in the interviews. It appeared that many of the farm women were more open in talking about problems in family farm structures and were active in initiating strategies to prevent problems in their situation. Communication, clarity of expectations, planning for the future, long-term viability of the farm, personal relations, health and personal options were raised in relation to this. There was wide recognition that these factors affected farm management. Some farmers placed greater importance on these issues in discussing farm business management than others. Some farmers felt they had little control over family matters and spoke of the difficulty in resolving problems they had with extended families due to financial restrictions and their wish to care for ageing parents.

Comments on the degree of responsibility given to sons who farm with their fathers were also made. One farmer said that his father had always encouraged him to make decisions independently and that this had helped him learn. Another farmer, in his fifties, spoke of manipulating his decisions and ideas to make them appear as though they were his father’s.

Women also commented on the lack of recognition of their role on the farm, particularly in the context of older farming parents. However, they often commented that it was not the case in the immediate family. Changes in attitude about women’s roles in farm management and changes in the skills and involvement of women on farms were apparent. Women’s involvement in financial management and off-farm employment were stressed by some of the men. Women working off-farm was seen to broaden the circle of friends and acquaintances, which was seen by some farmers as an advantage in their farm management - helping them learn and broadening their horizons.

**Personal Attributes**

Personal attributes such as ‘ethics and honesty,’ and ‘trust and openness’ were mentioned, and came up in the context of family partnerships, marketing, machinery syndication, share-farming, general business transactions and the gathering and sharing of advice and information. Hard work, motivation and drive, and the ability to work alone for extended periods were other attributes mentioned. Positive attitudes and the ability to learn and change were also discussed.

Farmers placed great importance on certain personal attributes and attitudes in their discussion of farm management. A positive attitude for decision-making and the ability to learn and change for the ongoing development of the farm business were widely regarded as essential to farm management.

**Farm Management Competencies**

Farmers were asked to identify the things they needed to know about and the attributes they required to be a good farmer these days. Each individual described between five and twenty competencies which they felt were important for their farm’s management. Most competencies mentioned were the current focus of their attention or newly acquired. Other competencies which were inferred included: mechanical skills, fencing, general maintenance, animal husbandry and basic agronomic skills.

One farmer in this category, when asked to comment on financial management which (judging from previous comments) he considered central to his farm management practices, stated:

> We’ve been through the period when financial management was the buzzword. Financial management isn’t really a problem. There were changes a few years ago but it’s pretty straightforward.

This comment reinforces the importance of individual differences and needs at a particular time. Recently acquired technical skills used in crop monitoring and input assessments were also mentioned by this farmer although basic technical skills traditionally related to farming were not discussed.
The following competencies (unranked order) were mentioned:

- marketing skills
- assessing soil fertility
- mechanical knowledge
- bookkeeping skills
- communication skills
- ability to locate information - technical, marketing
- analysis of information
- ability to use and synthesise knowledge and information
- managing change
- financial management
- focus on keeping in touch
- dedication
- love of the land and what you’re doing
- being prepared to work hard
- flexibility and openness to change
- time management
- monitoring productivity and keeping up with capital improvements
- awareness of change
- keep updating
- prioritising
- acceptance of your environment
- being able to work long hours by yourself
- self motivation
- knowing about your land
- ability to stay awake long hours at night
- being productive
- ability to care for the land and prevent problems
- planning skills
- ability to assess appropriateness of technology for your farm
- ability to work hard
- determination
- confidence and positive attitude
- ability to learn
- ability to update your skills
- ability to analyse alternatives
- ability to develop local knowledge
- ability to formulate goals.

For the purpose of analysis, the competencies identified can be classified into the following broad areas:

- **personal attributes** with regard to motivation and drive, positive outlook, confidence, commitment to the industry, ability and willingness to work hard, communication skills;
- **lifelong learning skills** with regard to effective information gathering on local knowledge, new technology, resource management, business management, marketing and information management and application;
• *the ability to change* and experiment and be flexible;
• *effective decision-making* ability (analytical skills and business management skills) with regard to assessment and application of advice and information;
• *marketing* ability emphasising the production of what is wanted and methods of selling;
• *financial management* skills;
• *local knowledge*, resource management skills and commitment to the land;
• *technical skills*;
• *business management* skills including ability to plan, communicate and manage time.

In summary, the competencies identified by farmers were consistent with their views on the definition of farm management. Personal attributes, learning and decision-making were emphasised. The ability to adapt to changing circumstances was also emphasised as were the increasing complexity of decision-making and the importance of marketing. The large range of skills and attributes needed to farm was apparent.

**Perceptions of Good Farm Managers**

Three questions were used in this section of the interview. Farmers were initially asked whether they could identify five good farmers in their district. They were then asked why they had chosen them. Finally, they were asked to identify their characteristics.

All the interviewees were able to identify five people they considered to be good farmers. Some, however, made the point that these were not from their surrounding district. The reasons given for their choices included the following:

• success in the long run;
• high quality crops, pastures;
• good stock;
• good farm presentation - fences, trees;
• the visible things about land health;
• sustainable lifestyle.

Comments expanding on the reasons for these choices included:

Many of them have overcome huge problems and are still viable.

Reinvestment of capital into plant and machinery and inputs like super and lime.

But lifestyle is not always a true reflection of the state of the business ... you have to consider the long-term situation.

Lifestyle is some indication but not very reliable because sometimes the money is spent on lifestyle rather than on the farm. Quite a few people around here have left their farms because of this.

One farmer commented that farm expansion used to be a way of assessing farm success but it was more appropriate to assess the productivity of a farm. He also commented on the need to consider the age and personal goals of the farmer as these affected the stage the farm’s development. Another farmer linked farm success to adequate inherited capital. He said that this affected a farmer’s ability to try new things as they could afford to make mistakes. Another farmer also commented on ‘adequate capital’ as a basis for identifying successful farmers.
In general, the interviewees emphasised technical and production aspects of management as reasons for their choice of five good farmers. They recognised that skills in financial and business management were important but generally felt that these abilities could only be judged over a long period.

In the third part of the question interviewees were asked to identify the characteristics of the five good farmers they had selected. The characteristics fell into two main categories - one relating to personal characteristics and the other to skills. The difficulty in analysing these ‘characteristics’ is due to the relationship between the two and the effect that personal attributes have on the acquisition of further skills. Some characteristics mentioned are also difficult to categorise. For example, some farmers felt that the ability and willingness to try new things was affected by capital considerations. Other farmers considered it as a necessity in successful farming. The structure and capital base of the farm operation was also seen to have an impact on farmer competence.

The following characteristics were identified as the traits of good farm managers:

- positive attitude;
- confidence;
- motivation, the will to succeed, aggressive drive;
- willingness to work hard, self motivation;
- commitment to goals, dedication;
- intelligence;
- high ethics;
- ability and willingness to learn;
- ability and willingness to try new things, lateral thinking, experimentation;
- ability and willingness to change, adaptability;
- communication skills (particularly in terms of family relations);
- commitment to looking after the land;
- sound decision-making ability (particularly in relation to links between short and long-term effects);
- business management skills;
- good technical knowledge;
- good time management;
- recognition and use of individual skills and interests available and the recognition of weaknesses;
- marketing skills;
- ability to assess and utilise the situation at hand;
- strategic planning;
- financial management.

**Measuring Good Farm Management**

*Introduction*

In order to ascertain how farmers measure the success or progress of their farm businesses they were asked the question: ‘How do you tell how your business is going?’ Points mentioned included: financial monitoring, technical monitoring, benchmarking and obtaining out-sourced advice and expertise. Comments were also made on the use of computers in financial analysis and the development and use of more sophisticated forms of technical monitoring in production and resource management.
A general comment summed up the view of many farmers.

To make a go of it you’ve got to keep track of things and think of it as a business.

**Financial Monitoring**

Wide variation was apparent in the sophistication of financial monitoring processes used. All farmers interviewed emphasised the importance of financial management. Many farmers also commented on the importance of a good relationship with their accountant and bank manager.

Budgets, cash flows and gross margins were cited as the basic financial management tools used. Many farmers discussed the need for long-term planning and flexibility when analysing short-term financial statements and preparing budgets. The difficulty in achieving a balance between short-term cost management and long-term resource management was also mentioned.

You have to keep the long term in view when you analyse some of these things though of course ... like weed control and the effect of crop rotations on the soil, liming programs and things like that.

Another farmer, after making similar comments, said: ‘It all comes back to financial though.’

Some farmers said that gross margins were helpful in analysing enterprises and assisting in production decisions. Comments on the use of gross margins were often accompanied by remarks about cash flows and long-term planning. One farmer said: ‘It’s a blend because the relationships between different crops and your stock is symbiotic.’ He went on to say that ‘the importance of rotations is for soil health, disease control and resulting profitability’ and that enterprise mix decisions required ‘sound long-term planning.’ Other farmers emphasised the balance of short and long-term effects of the enterprise mix. This reflected the need to integrate financial analysis with the technical aspects of management.

Financial management was also mentioned in relation to marketing.

You need to know your costs of production for marketing ... you need to set a target profit and market to that.

Two farmers commented that being in debt, or having made land purchases, had made them better financial managers.

Because we’ve always had to manage a big debt, we’ve had to be good at it ... you see so many who don’t make it.

Another farmer made the comment:

The bank was a trigger in learning to assess the financial side of our business more effectively.

In this particular case the farmers had been in financial difficulty after expansion, and in hindsight blamed the bank for negligence in the structuring of their loans. They said, however, that they had not known enough to assess the situation at the time. They have subsequently changed banks and now always take an outside advisor with them to re-negotiate loans.

Other farmers commented positively on the role of banks in providing financial management services. Reference to specialised agri-business services provided by one of the banks was made by several farmers.
Technical Monitoring

Technical monitoring was seen as an important activity and many techniques were mentioned. Skills and techniques used in this area varied amongst the farmers interviewed. Some farmers mentioned highly technical developments such as sensor equipment and global positioning systems (GPS). All farmers interviewed used soil tests, often adopted after experience growing canola and applying lime. Technical monitoring was commonly seen as an aid to cost management and decision-making in production and resource management. It was also mentioned in relation to marketing.

Soil and paddock analysis is linked with the financial results of the paddock [sometimes on the computer] - but financial analysis has to be balanced with what the soil type will handle.

One farmer who had been using nitrogen probes for about twelve years said, ‘It helps make decisions about where you spend your money,’ and, ‘We’ve been liming now for about five years.’

Some farmers are also using technical monitoring as an aid to marketing and more accurately assessing potential yields for forward contracts. A farmer commented:

‘Yields are also analysed - we set targets for each year depending on the budget for inputs.’

One farmer now employs an agronomist to assess all technical aspects of the cropping enterprise. The advantages of this were: provision of agronomic advice, cost savings in efficient use of inputs, efficient use of time for other facets of the farm’s management, provision of methodical, and regular crop monitoring. It is interesting to note that this farmer considered his technical farming ability to be his strength, but due to the recent purchase of more land and complicated circumstances surrounding the repayment of debt, more time was focussed on financial and business management. His technical abilities, however, ensure his confidence in assessing the expertise of his employed adviser.

Skills in use and application of new methods of technical monitoring were acquired in various ways. One farmer commented that ‘one of my neighbours is pretty switched on with some of these things,’ and that the neighbour had been coming over to help and show them how to prepare for NIR testing (for assessing nitrogen and fructans levels in plants). Other farmers, agronomists, counsellors and government and private services were used. Conferences, field days, reading and farmer groups were mentioned as sources of information about trends and new developments in technical monitoring, such as GPS.

Benchmarking

Benchmarking was mentioned by one farmer in relation to monitoring the overall business performance. The FAST economic analysis was mentioned by this farming family as ‘a great opportunity to benchmark your farm with others in a similar situation and location.’ These farmers said they had some prior experience with benchmarks set by their bank in terms of cost management. They went on to say that the standards set ‘were too easily met’ and ‘standards were not very useful if this was the case.’ Other comments made about FAST included ‘the feedback will be terrific’ and ‘its a great opportunity.’
It is interesting to note the reaction of some other farmers spoken to in the course of the study who had an opportunity through membership of FM500 to become involved in the FAST project. A few felt that the effort required to prepare data was too onerous in terms of the benefits received. (The adequacy of historical physical data required for the analysis may have been a consideration here, however). Other farmers viewed it as an opportunity to benchmark their businesses against a variety of others in a similar location. This, they said, increased the value of comparative analysis of soil types, rainfall, proximity to markets and other local factors. Many farmers also explained that the process of data collection and analysis was a learning experience which enhanced their understanding of effective financial and technical monitoring for long-term sustainability.

Some farmers whose farms were small (and/or perhaps less productive) placed more emphasis on the constraints of limited capital on long-term development strategies and decisions on enterprise mix and cropping strategies. Short-term survival was the focus, as well as awareness of the long term. One farmer in this situation said that the income from his wife’s off-farm business was becoming increasingly important.

In summary, farmers placed great importance on monitoring and evaluating their operations. Many were continually refining the methods they employed and there was evidence of out-sourced expertise being increasingly sought. Variations in methods employed in financial monitoring and technical monitoring were recorded and many farmers emphasised the relationship between them. Comments made by farmers about their monitoring and evaluation practices indicated significant differences in ability to integrate the financial and technical aspects.

Concern was commonly expressed about the difficulty of weighing up short-term and long-term considerations with regard to costs and benefits. The increasing trend for more sophisticated monitoring appeared to be related to the narrowing of margins in farming businesses and the need for tighter and more responsive control mechanisms. There was criticism of traditional tools, like gross margins, for enterprise decisions. This was because the gross margin did not account for long-term, resource-based costs which impinge on the sustainability of the farm system. This was also an area where farmers emphasised the individuality of their businesses and the necessity to analyse their particular situation.

Summary

This chapter was divided into two parts: Part A described the methodology used and Part B outlined the findings from the farmer interviews. Part A began with the main aims of the survey which were to interview farmers in the Coolamon district to obtain data on their previous learning experiences and their current approaches to farmer education as well as their views on what constitutes good farm management.

The methodology involved a series of in-depth interviews of sixteen farmers (seven couples and two single farmers) based on a semi-structured interviewing technique. Because of its exploratory nature, this approach was thought to provide a better understanding of farmers’ views than responses to a written questionnaire. The responses indicated that the methodology was appropriate. Part A also included an outline of the criteria for the number and selection of interviewees as well as the interview procedures and protocol. Approaches to analysing the data were discussed and the advantages and limitations of the methodology were listed.
Part B outlined the findings of the interviews, first outlining farmers’ previous learning experiences and their current approaches to learning, and second, discussing their views of what constitutes good farm management. Responses about previous formal education varied from those who felt it had not been relevant for their farming career to those who commented that agricultural college or university had been a good preparation for farming. The main advantages of previous formal education were said to be learning how to learn. In discussing current learning, formal education was mentioned infrequently - generally short courses to obtain specific knowledge and skills needed.

Responses about previous informal education indicated that it often began with growing up on a family farm and developed through learning by experience in working on a farm. Family members, neighbours and friends were mentioned as important influences. Current informal education sources included other farmers, family and friends in other businesses, visits to other farms, organised field days, agricultural suppliers and service providers, agricultural consultants, seminars and conferences, farmer associations and farmer-directed groups, as well as media including newspapers, journals, radio and television.

Those interviewed saw education as a life-long process of information gathering, sorting, analysing and evaluation. The main triggers for learning mentioned were solving specific problems, pursuing opportunities, learning about changes in the farming environment and implementing change. Most commented that they expected future farmers to obtain a higher level of formal education, including an understanding of external factors affecting the management of the farm as well as the technical and management aspects. Most of the farming families interviewed were encouraging their children to extend their formal education.

Accreditation was identified as likely to influence farmer education in the future, some seeing its potential for providing expertise and formal qualifications which would be useful for new farm enterprises or off-farm business ventures. Other expected influences included structural change affecting the scale of farming operations and the increasing rate of change in the use of technology. Mention was made of the need to improve the image of farming as a career, to bolster morale to encourage farmers to undertake further education, and to attract capable people into farming.

In seeking their views on what constituted good farm management, key areas of questioning included areas such as changes in farm management practices, definitions of farm management, the competencies required for farm management, their perceptions of good farm managers and measuring good farm management.

Respondents were asked what they thought were the key factors that had triggered changes in their farm management practices and to give examples of changes they had introduced. Some commented that changes had been triggered by emerging opportunities or by problems requiring attention, both being related to farm profitability. The changes ranged from production management such as the introduction of canola, the use of new techniques such as direct drilling, stubble retention and minimum tillage to business management factors such as the use of computers and changes in approaches to marketing.

In defining farm management, a long list of factors emerged which can be summed up in the following areas: decision-making, financial management, technical aspects and local knowledge, marketing, risk management, planning and managing change, establishing an appropriate farm business structure and handling family relationships. Respondents also frequently included personal attributes and the need to integrate the various components.
Responses on farm management competencies can be grouped into the following areas: effective decision-making ability, financial management skills, technical skills, local knowledge and resource management skills, marketing ability, ability to experiment and change, business management skills, lifelong learning skills and a range of personal attributes. The competencies identified were consistent with general definitions of farm management and emphasised the large range of skills required.

The main ways of measuring good farm management mentioned were financial monitoring, technical monitoring and obtaining feedback from out-sourced expertise. While different practices emerged, all farmers commented on the importance of monitoring and evaluating.
Chapter 8: Conclusions and Recommendations

Background to the Project

The main aim of Chapter 8 is to sum up the findings of the literature review and the farmer interviews in relation to the objectives set for the project, to outline any findings additional to those emerging from the objectives, and to list some recommendations. The modified objectives which were set out in the introduction include the following:

- to determine adequate operational definitions of farmer education and good farm management;
- to describe the nature and sources of farmer education;
- to comment on any initial findings regarding the relationship between farmer education and good farm management;
- to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management.

The following material will address these objectives in the order outlined with the exception that the findings on the nature and sources of farmer education will be combined with the discussion of definitions of farmer education. Also, additional findings on particular topics will be discussed at the same time as the objective relating to that topic is discussed.

Nature and Sources of Farmer Education

The literature review and the interviews undertaken for the project indicate that while there has been a trend for farmers to gain more of their initial education from formal sources, the previous practice in which farmers gained most of their learning from informal sources has continued, even amongst younger farmers. The interviews revealed a wide range of opinions of farmers on the significance of their formal education, from those who considered that it had not been particularly relevant, to those who had found it useful, particularly in relation to ‘learning how to learn.’ However, for most farmers, formal education after completing school, college or university is generally restricted to short courses.

Chapter 4 showed that the content of formal farmer education, particularly in relation to farm management has changed significantly over the years as a result of changes in the academic discipline. Earlier approaches based on farm production economics gradually changed as a result of influences from areas such as ‘the whole farm’ approach, agricultural economics, business management, systems theory, the social sciences and information science. Current approaches to the content of farm management are generally broad, multi-disciplinary and integrative in nature, viewing the farm as a socio-technical system. In addition, the broad view of farm management has been sub-divided into more specialised components such as marketing, finance and extension.

The literature reviewed in Chapter 6 showed that recent developments referred to as the Training Reform Agenda including areas such as national competency standards, recognised prior learning, credit transfer, course articulation and competency-based training are beginning to have an impact on
formal farmer courses offered by TAFE, colleges of agriculture and industry groups and associations. Comment has also been made on its potential for use in university courses.

In both the literature review and the farmer interviews it emerged that for most farmers, informal education was a very significant influence on the nature and source of their learning. Information from the interviews matched quite closely with that from the literature. Informal education was reported to come from a wide range of sources. For many farmers it began with growing up on a family farm, followed by learning by experience while working on a farm. Subsequent sources included other farmers, visits to other farms, organised field days, agricultural suppliers, service providers, consultants, seminars and conferences, farmer associations and farmer-directed groups, family and friends in other businesses as well as media including newspapers, journals, radio and television. A noticeable development is the increased significance of farmer-directed groups such as Landcare and Farm Management 500 as sources of information and education. The advantages of groups such as these were outlined in Chapter 3. The main ‘triggers’ for informal learning included seeking information on specific problems and opportunities, learning about changes in the farming environment, and implementing change to improve profitability and resource management.

The content of informal education was found to be very broad. While the ‘depth’ of knowledge and skills required has increased with increases in the levels of complexity of farming, it is the breadth that particularly characterises informal farmer education. The main areas of informal education identified included: technical knowledge and skills associated with production; finance; marketing; business planning including areas such as superannuation, retirement and estate planning; and information management. Back-up for informal learning is increasingly being sought through the specialised knowledge of consultants.

Another factor emerging from the interviews relating to the nature of farmer education was the learning processes used. These were outlined in Chapter 7 and can be summed up in the broad areas of information gathering, sorting, analysing and evaluation. Farmers also said that they saw education as a continuing life-long process.

It also emerged that in terms of approaches to learning farmers’ preferences were for approaches involving participation, project-based learning, the development of competencies and outcomes leading to measurable financial advantage. Courses were seen as a potential means of learning where they were short and practical, or, if longer, flexible enough to accommodate seasonal work demands and providing for home study backed up with support through local interaction with teachers and other students. At the same time there has been a recognition in the literature that formal approaches to farmer education can make a significant contribution in the area of generic skills such as learning how to learn.

**Recommendation 1**

- Greater use should be made of farmer-directed groups as providers of farmer education, with government support to assist them in this role where requested.

**Recommendation 2**

- Providers of formal education need to design courses to accommodate farmers’ learning preferences, including approaches involving student participation, project-based learning, the development of competencies, measurable financial benefits, flexible delivery allowing for seasonal work demands and distance education supported by local interaction with teachers and other students.
Defining Farmer Education

From the above discussion, it is clear that an operational definition of farmer education needs to include both formal and informal components to be comprehensive. This raises the problem of measurement. While formal education can be measured using number of years of formal education completed or level of highest qualification, it is difficult to measure informal education. Measurement is important in an operational definition where quantitative research is being undertaken to determine if there is a direct relationship between farmers’ levels of education and their success as farmers.

A possible approach to measuring the total education of farmers, both formal and informal, emerges from the literature on national competency standards and the recognition of prior learning. As part of the training reform agenda, competencies have been identified to establish national competency standards in ten major areas of agriculture and to provide a basis for competency-based training. As part of this process, training levels have been identified in a system known as the Australian Standards Framework (ASF).

Potential shortcomings in the use of national standards as the basis for assessing competencies in farm management have been identified. In addition, other problems have been identified in measuring the totality of farmer education. The education of women and other members of family farms is not fully recognised and included in the statistics. However, the use of the national standards and ASF levels combined with the process of recognising prior learning offer improved opportunities for measuring levels of farmers’ education. Recognised prior learning (RPL) has been developed as a means of formally assessing knowledge and skills gained through work and life experiences. However, further work is said to be needed to make RPL more cost effective. Despite this the ASF levels have been defined and appear to offer a standardised method of measuring farmer education. These, combined with the national competency standards provide a potential basis for operational definitions of farmer education for research purposes.

Recommendation 3

- It is recommended that for operational purposes farmer education be defined as the body of knowledge and skills developed from formal and informal sources of education as well as learning gained from experience in farming. It is also recommended that ASF levels and national competency standards be investigated for their potential to provide operational/measurable definitions of farmer education.

Recommendation 4

- Organisations publishing statistics on levels of farmer education should be asked to develop measurements which take account of the informal education of farmers, e.g. equivalent ASF competency levels or equivalents to formal qualifications.

Recommendation 5

- Additional work needs to be carried out on developing approaches to recognised prior learning (RPL), making them more cost effective and encouraging educational institutions and farmers to make use of them as a basis for further learning and to facilitate entry into formal courses.
Defining Good Farm Management

The objective of determining an adequate operational definition of good farm management was met through a review of the literature and through interviews with farmers. The findings in both areas were generally very similar. The objective comprises two components. First it involves identifying what constitutes the field of farm management, that is, deciding what is included in its boundaries. The second, in seeking to identify what sets good farm management apart from farm management in general, implies the need for some form of measurement.

Both the review of the literature and the views of farmers in the interviews resulted in a consensus that farm management is broad in scope. In both areas there was a common approach in describing this scope in terms of competencies. While the lists of competencies outlined in the literature and by the interviewees were extensive, they can be summed up in the following broad categories:

- financial viability skills;
- technical skills;
- business management skills (including marketing);
- human and resource management skills;
- integrative skills;
- personal attributes.

In comparison with the material in the literature, the response of farmers interviewed tended to place more emphasis on managing family relationships in terms of the farm business structure, personal attributes and the importance of a sound capital base for the farming enterprise. A definition from one of the interviewees generally summed up farmers’ views on the nature of farm management.

Farm management is using all available means to manage all aspects of the farm, from physical to financial, to come up with a plan to hopefully be profitable in the short and long term.

The literature on farm management as an academic discipline also had much in common with the above views on what constitutes farm management. However, it did not place the same emphasis on identifying competencies as a means of defining the area. The academic discipline took a more multi-disciplinary approach and viewed farm management as a socio-technical system. This recognises the breadth of scope of farm management identified in other literature and by farmers themselves.

A comparison of farm management competencies with general business management competencies found that while there are many similarities there are also some significant differences resulting from the smaller scale of farming enterprises, the broader range of competencies required of the limited number of personnel and differences in financial management. Restrictions in the range of personnel available on most farms have resulted in farm managers having to make use of outsourced expertise. Another characteristic of farm management is its increasing dependence on family members for expertise, with women taking on additional managerial functions. This has increased the complexity of interpersonal relationships and the structure of farming enterprises, adding a further dimension to the nature of farm management.
The breadth of scope of farm management makes it difficult to construct precise measures of good farm management. The initial response to questions on what is good farm management was for respondents to comment that farm managers need to have a high level of ability in all the competencies identified or have access to outsourced expertise in those competencies not available within the farming enterprise. One point mentioned by most of the farmers interviewed was that a long-term perspective was needed in seeking to identify good farm management. For example it is inappropriate to focus on success in areas such as output and profitability over a short period if unsustainable farming practices are being employed. On the other hand, world’s best practice in sustainable agriculture will not counteract inadequate financial management in ensuring the success of the enterprise.

It is clear that good farm management requires a range of competencies in critical areas. Identifying these critical areas and determining ways of measuring them is therefore important in determining an adequate operational definition of farm management for research purposes. The literature contained a considerable amount of discussion on ways of measuring good farm management. This is outlined in some detail in Chapter 5 and covers issues such as the problems of measuring good farm management, the use of size and output categories, and the use of various forms of benchmarking as a means of measuring good farm management.

In relation to the problems of measuring good farm management, attention was drawn to the ‘invisible’ dynamics of the family relationships frequently involved in the management of a farming enterprise and the difficulty in devising means of measuring how well this aspect of farm management is handled. Another difficulty pointed out is devising a form of measurement which differentiates between those managers who focus on short-term cost management and those who engage in long-term strategic management.

At the macro level, ABARE has put forward a case for measuring farm performance by size/output categories to overcome the limitations of analysing the total sector with its significant variations based on size and output. The three broad groups are described in some detail in Chapter 5. ABARE uses these three groups to provide a more meaningful framework for measuring farm financial performance. Other factors seen as impacting on the measurement of farm management performance include the size of the farming enterprise and whether farmers operate their enterprises on a part-time or full-time basis. Different measures of good farm management are required for each category. ABARE has recognised the value of separating full-time and part-time farming in their Farm Survey Reports.

Despite the problems of measuring good farm management there have been some promising developments in identifying financial indicators which reflect management ability. Significant progress has been made in the process of benchmarking. Chapter 5 provides details of a project being undertaken in this area and the range of measurements being used. Many benchmarks have a financial bias and include adaptations of ratios used in other business enterprises. However, the broad range of factors influencing farm management has been recognised and there have been significant advances in developing measurements for these factors. These measures, together with the farm categories devised by ABARE and the distinction between part-time and full-time farmers, provide the potential for operational definitions of good farm management.

Farmers were asked how they measured the success of their enterprises to determine what they saw as ways of measuring good farm management. Their responses can be grouped into the following broad
categories: financial monitoring; technical monitoring; benchmarking; and obtaining out-sourced advice. Examples of financial measurement included the use of balance sheets, gross margins, cash flows and budgets as well as advice from banks. In relation to technical monitoring, some of the many forms of measurement used to assess soils and paddocks include testing the efficiency of nitrogen and water use. Benchmarking was mentioned by several of the farmers interviewed, though only one was actively involved in the process through the FAST Program. Its value was seen as a means of measuring the farm’s results in comparison with other farms in similar locations and, in addition, the process of data collection and analysis was seen as a valuable learning experience. Some farmers indicated that they sought off-farm expertise such as agronomists to assist in measuring farm enterprise results.

What emerges from the literature review and the farmer interviews is that past approaches have been generally subjective and that more objective approaches are still in the process of development. However, that process appears to have made substantial progress in recent times through schemes such as the FAST Project. Recent publication of some results from the project show its potential and indicate that the measurements used may assist in providing a basis for an operational definition of good farm management for further research.

**Recommendation 6**

- It is recommended that good farm management be defined as a set of competencies covering a broad range of management knowledge and skills in areas including the technical aspects of farming, decision-making, planning and managing change, financial and marketing management, as well as the integration of the technical, managerial and social components of the farming enterprise and the development of a range of personal attributes held by successful farm managers.

**Recommendation 7**

- To develop a more operational/measurable definition of good farm management, it is recommended that groups currently involved in developing measures be encouraged and supported to further develop a range of measures and benchmarks appropriate to farming enterprises.

**Recommendation 8**

- ABARE should be encouraged to further develop its work on measuring farm performance by size and output categories and whether a farm is operated on a full-time or part-time basis, to overcome the limitations of analysing the sector as an homogeneous entity.

**Recommendation 9**

- Where governmental agencies publish statistics seeking to measure the relationship between farmer education and good farm management, they should be requested to use measures of good farm management reflecting a wide range of variables rather than the narrow areas of farm outputs and productivity.
The Relationship between Farmer Education and Good Farm Management

One of the objectives set for this project was to provide some comments on the relationship between farmer education and good farm management. However, these were to be only preliminary comments as a key objective was to determine operational definitions for a comprehensive and subsequent investigation into the relationship.

Chapter 3 outlined some of the key issues in the literature on this topic. The interest in the link between the level of Australian farmers’ education and their farm management abilities appears to have its origins in the hypothesis that the poor economic performance of some farmers is a result of their low levels of formal education compared with their counterparts in similar countries. This view has some parallels in the literature on Australian small businesses. Writers have argued that the high failure rate of small businesses, especially within the first few years of their commencement, can be attributed to poor management. While this literature does not focus on the formal education levels of the owners, it invariably recommends measures to provide additional education and training in small business management for owners of small businesses. Governments have accepted these views and have implemented policies to provide support and education for small businesses through departmental organisations such as Offices of Small Business and Business Enterprise Centres.

Although Chapter 5 reflects little conclusive evidence on the precise nature of the relationship between farmer education and good farm management, the general consensus in the literature is that there is a close relationship between the two areas and that the complexity of its nature reinforces the difficulties in measuring its strength.

The review of the literature showed that there are several arguments against the hypothesis mentioned above. First, it has been argued that Australian farmers are not as poorly educated in general terms as the statistics on their formal education would seem to suggest. It is pointed out that much of farmers’ education is obtained informally by learning on the job and through a wide range of sources. These were discussed in detail in Chapter 3. Second, it has been argued that in Australia factors in the external environment may have a greater impact on farm income than the level of farmers’ education. Third, there is the argument outlined by Buggie that farmers’ intelligence, knowledge and self awareness are more significant for farm performance than levels of formal education.

As the review in Chapter 3 showed, much of the literature which discusses the significance of farmer education tends to focus on its relationship with agricultural productivity rather than with the broader concept of good farm management. This is because much of the literature relates to economic development in developing countries where agricultural productivity has been a major concern. The emphasis has been on increasing the output of food to sustain growing populations and to attempt to alleviate poverty where per capita incomes have been low by world standards. However, research findings that productivity has increased significantly following improvements in the levels of farmers’ education from a low base are not particularly transferable to the Australian context. Australian farms already have a high level of productivity per unit of labour input.

The farmer interviews indicated that farmers see a significant relationship between their education and good farm management. When they spoke of their education, however, they were referring to both formal and informal learning with the emphasis on the informal. They commented on the very broad scope of farm management and the wide range of knowledge and skills required from a variety of
areas. While they tended to show more confidence about their knowledge and skills in the technical aspects of farming, they also commented that rapid technological change meant that they needed to continually update their learning in this area. While variations were noticed in the levels of confidence and understanding of the financial aspects of farm management, several commented that they found marketing a difficult area, one in which they would like to gain further knowledge and skills. They made similar comments about information management - the basis of their current informal learning. Lack of time and information management skills were seen as problems rather than a lack of information.

The common theme in the discussions with farmers was the need for continuing life-long learning, and the constant search for information to help with day-to-day problems and emerging opportunities. While there were no signs of antagonism towards formal education amongst those interviewed, the constant focus on informal sources of education indicated that farmers did not generally see formal education as the main means of meeting their needs for additional knowledge and skills.

It also emerged from the interviews that farmers were prepared to undertake short formal courses where these were relevant to their particular needs. Positive comments were made in relation to farm chemical courses and TAFE courses which some of the interviewees had attended. On the other hand, feedback from some other farmers indicated a reluctance to engage in a farm chemical course that was seen to be pitched at a level well below their current level of knowledge in the area.

Although not seen as appropriate to their own particular needs, the farmers interviewed generally held positive views about formal education. They commented that future farmers would need higher levels of formal education and there was evidence that farmers were encouraging their children to stay at school longer and to undertake tertiary studies. Most of the farmers interviewed tended to see general education providing generic skills as more important for their children than vocational education providing technical skills. On the other hand, it appeared that current farmers may consider undertaking formal courses which meet very specific needs, are short, and are delivered in flexible ways convenient to patterns of farm work.

To sum up, the views expressed by farmers in the interviews indicated that they saw a relationship between their education and being able to manage a farm effectively. They were fully aware of the complexities and difficulties in achieving successful outcomes for their farm enterprises and recognised that additional learning on a continuing basis was necessary to meet the challenges. However, most saw this learning coming from informal rather than formal sources.

**Recommendation 10**

- Further research into the relationship between farmer education and good farm management needs to include a closer examination of the impact of informal education on farm management ability and to identify additional sources of informal education which could be used by farmers.

**Recommendation 11**

- In recognising that farmers are aware of the relationship between their education and good farm management, organisations and institutions involved in farmer education and agricultural extension need to seek advice from farmers on their needs for information and education.

**Recommendation 12**

- The tendency for good farm management to depend on a process of life-long informal learning needs to be taken into consideration in assisting farmers to gain access to
education appropriate to the stage of their career and the stage of development of their farming enterprises.

**Subsequent Investigation**

The final objective set down for this project was to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management. This section reviews that objective.

The literature review has been more comprehensive than originally intended and the amount of information obtained from the interviews has been greater than expected, due to the support of those interviewed and their willingness to give so much of their time. In addition, many other informal interviews were carried out with a wide range of people either involved in or associated with rural industry. These contributions provided further insights.

The findings of this project indicate a general consensus on the existence of a strong relationship between farmer education and good farm management. Future investigations need to go beyond simply confirming this relationship. The project has shown that farmer education needs to be defined broadly to include informal education and that there is a need for a closer examination of the key factors of good farm management contributing to farm viability and profitability. We therefore recommend these areas be the main focus for subsequent investigation. The following material discusses this recommendation in more detail.

Turning first to good farm management, if a long-term objective of research is to improve the profitability of farming enterprises, the research needs to identify the factors which make the greatest contribution. While it is generally agreed that good management contributes significantly to farm profitability, there is a need to determine how this interacts with other variables such as farm size, type of farming enterprise and farm capital structure. One area of potential investigation is to focus on case studies of successful farming enterprises to identify the factors contributing most to the success of the enterprise.

The enterprises identified as successful by the FAST Project could be a starting point and the measurements developed could be analysed and refined if necessary. Inclusion of additional measurements of farmer competence might help raise farmers’ awareness of the key competencies required for good farm management. Research could then be undertaken to see if these measurements could be used by farmers to indicate changes they need to make to their management practices, enterprise mix, capital structure, size of property or other factors in order to improve profitability.

The literature review showed that there is scope for further investigation of distinct areas within farm management such as finance, marketing, information management and the integration of these areas. The farmer interviews also indicate that these are important areas for further attention, but some of the areas seen as particularly important by farmers include the capital base for farming enterprises, family relationships within farm business structures, and personal attributes. The main attributes mentioned included an interest in learning new ideas, being prepared to change, self-awareness and self-confidence.

Both the literature reviewed and the women farmers interviewed indicated that, while there was an increased awareness of the significance of the role of women in farm management, further work was
needed to show how this could be ‘translated’ into better integration of women’s knowledge and skills into the mainstream of farm management.

The literature also shows that, while a great deal of progress has been made in defining farm management competencies and grading them according to levels of difficulty, continuing research is needed to update previous work. This is necessary as environmental changes will put pressure on farmers to develop new or modified management competencies. Because of the difficulty faced by farmers in developing the full range of competencies required for farm management, there is also scope for investigating the existing and potential use of out-sourced expertise and advice, including consultants, extension services and farmer groups such as Kondinin and FM500.

The literature review and farmer interviews also drew attention to potential areas for further investigation into the relationship of farmer education to good farm management. The project has shown the importance of the informal component of farmer education and the need to include this in operational definitions of farmer education. This led to the suggestion that, in order to be able to measure the totality of farmer education, measures need to be devised for the informal component to complement existing measurements of formal education. This suggests there is potential for research into measures such as ASF levels in conjunction with national competency standards. There is also scope for further investigation to identify additional sources of farmers’ informal education and to investigate how these could be used more effectively by farmers.

The interviews also identified a number of techniques used by farmers in the way they learn as well as their preferred approaches to learning and their attitudes towards formal education. Other researchers have made similar findings indicating that future investigations need to look at how these techniques can be used more effectively by farmers and how they might be adapted for use in more formal learning contexts. Those offering formal courses need to investigate how they can accommodate farmers’ learning preferences and modify formal courses to meet farmers’ needs.

Linkages can be made between the findings on good farm management and farmer education in the area of content of farmer education. Material outlined earlier in this discussion paper indicated the breadth of the area covered by farm management and programs such as FAST are indicating the key success areas. Programs like this may provide the basis for further research into both clarifying key success areas and identifying gaps in farmers’ knowledge. This suggests that there is scope for future investigation into how the findings from such projects can be incorporated into the content of formal and informal farmer education. Participation in these programs can itself play an important educative role for farmers.

Another area of potential investigation into the content of farmer education would be to interview farmers to ascertain the areas where farmers feel they need additional knowledge and skills. Two areas frequently mentioned in the interviews were marketing and information management. This information would be useful to providers of formal education for farmers as well as indicating the type of information which could be provided through the Internet.

**Recommendation 13**

- It is recommended that the framework for subsequent investigation of the relationship between farmer education and good farm management focus firstly on further clarification of what constitutes good farm management and secondly on the type of education that is needed to achieve the levels of good farm management identified.

**Recommendation 14**
In clarifying what constitutes good farm management, it is recommended that further investigation be carried out into distinct areas within farm management such as finance (including the capital base of farming enterprises), marketing, information management, family relationships within farm enterprise structures, the significance of personal attributes and the integration of all these areas.

**Recommendation 15**

- It is recommended that further research be undertaken into how programs such as the FAST Project can identify key success areas for farming enterprises and also gaps in farmers’ knowledge and skills. There is also a need to determine how these findings can be incorporated into farmer education.

**Recommendation 16**

- Further research is needed into maintaining the vitality of farmer groups and promoting their broader use as a means of identifying farm management competencies, raising farmers’ awareness of these competencies, and providing avenues for the development of knowledge and skills in good farm management.

**Recommendation 17**

- Strategies are needed to help integrate the knowledge and skills of women into the mainstream of farm management and to assist in their further development.

**Recommendation 18**

- There is a potential value in further investigation of the learning techniques used by farmers in their informal education and how these techniques might be adapted for use in more formal learning contexts as well as in the provision of information on the Internet.

**Recommendation 19**

- Continuing research is needed in identifying and clarifying farm management competencies to update previous work in this area and to link these findings to competency based training at all educational levels.

**Recommendation 20**

- Research is also needed into how findings on farm management competencies, recognised prior learning and competency-based training can be communicated to farmers, especially those facing problems of farm viability.

**Summary**

The main aim of Chapter 8 was to sum up the findings of the literature review and the farmer interviews in relation to the project objectives, to outline any additional findings and to list some recommendations.

In relation to the objective of describing the nature and sources of farmer education, it was found that while some farmers are obtaining their initial farmer education through formal sources, there are many who obtain most of their education in farm management from informal sources and learning on the
job. Changes in the content of formal education in farm management have reflected changes in approaches within the academic discipline with a trend towards approaches which are multidisciplinary and integrative in nature.

Informal education was found to come from a very wide range of sources with an increasing significance in the role of farmer-directed groups. Farmers were found to often engage in a style of learning associated with information gathering and sorting to deal with specific problems and opportunities. Their preferred approaches to learning have implications for organisations involved in farmer education.

In relation to the objective of determining an operational definition of farmer education, it was found that the definition needs to include both formal and informal components. Measurement was found to be difficult in that while traditional measures such as highest qualification achieved can be used for formal education, measures for informal education have not been available. Use of the Australian Standards Framework (ASF) system, together with national competency standards, was discussed as a potential approach to help determine an operational definition.

Similarly, it was found that there are difficulties in defining the broad area of farm management and in measuring how well it is practised. It was found that farm management was generally defined in terms of competencies, summed up in the following broad categories:

- financial viability skills;
- technical skills;
- business management skills;
- human and physical resource management skills;
- personal attributes.

The literature on farm management as an academic discipline was found to have much in common with the above broad categories though with less emphasis on competencies and the social aspects of farm management. A comparison of farm management competencies with general business management competencies found that while there are many similarities, there are also some significant differences.

Key points from a detailed discussion on the difficulties in constructing precise measures of good farm management focused on the need to take a long-term approach, the need to make allowances for different categories of farms (e.g. size, full or part-time operation, etc.) and the need to identify critical areas for success. Reference was made to recent developments in these areas in programs such as the FAST Project where key financial indicators have been identified and have been applied in benchmarking systems.

In meeting the objective of commenting on any initial findings on the relationship between farmer education and good farm management, it was found that there is little conclusive evidence of the relationship in measurable terms. However, there is a general consensus in the literature and amongst farmers interviewed that a strong relationship exists.

It appears that Australian farmers are not as poorly educated as statistics on their formal education suggest because of their practice of gaining much of their education informally. Approaches seeking to measure the relationship in terms of productivity outputs were generally seen as unsatisfactory in
the Australian context, especially where attempts were made to make comparisons with other countries. Evidence of the importance placed on education by farmers was seen in their comments that it was a life-long process, their views that future farmers would need higher levels of formal education, and the trend for them to encourage their children to undertake additional formal education.

The final objective for the project was to establish a framework for a comprehensive and subsequent investigation into the relationship between farmer education and good farm management. It was argued that if a long-term objective is to improve profitability and viability of farming enterprises, future research needs to focus on those factors which make the greatest contribution. A series of investigations into related areas may be more appropriate than a single investigation into the relationship between farmer education and good farm management.

One approach identified as having potential is for a study of enterprises recognised as being successful by the FAST Project to identify the success factors. Farmer education could then be designed to enable farmers to learn about these successful approaches to farm management. It was also suggested that because of the wide scope of farm management, a better understanding of it could be achieved by research into its various components such as finance, marketing, etc. Other areas of farm management suggested for further research include:

- further identification and clarification of farm management competencies and updating previous work in this area;
- developing strategies to help integrate the knowledge and skills of women into the mainstream of farm management and to assist in their further development;
- investigating the existing and potential use of out-sourced expertise and advice in farm management.

As well as investigating how the success factors in farm management could be linked to the content of farmer education, other suggestions for further investigation included the following areas:

- the contribution of informal education to farm management ability and potential additional sources of informal education;
- how the concept of life-long learning by farmers can be incorporated into access to and provision of farmer education appropriate to the various stages of a their career and the stage of development of their farming enterprises;
- the learning techniques used by farmers in their informal education and how these techniques might be adapted for use in formal learning contexts and in the provision of information on the Internet;
- the use of farmer groups as a means of raising farmers’ awareness of farm management competencies and providing an avenue for learning in this area.
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Napier, R., & Scott, M. (1994). Recognition of Experience and Prior Learning in Rural Industry. A project managed by Orange Agricultural College, University of Sydney, under the direction of the Regional Employment Education Committee (June).


**Personal Communication**

Austin, Julie, National Farmers’ Federation, Canberra.

Clark, Neil, Agricultural Consultant, Bendigo.

Condon, Tim, Agronomist, Manager, Higginsons IAMA, Junee.

Derrick, Eileen, Farmer, Temora.

Dore, John, Agricultural Consultant, Wagga Wagga.

Field, Simon, Executive Director, Australian Institute of Agricultural Science, Melbourne.

Glastonbury, David, Senior Lecturer, School of Agriculture, Charles Sturt University - Riverina, Wagga Wagga.

Green, Dick, Regional Manager, Greening Australia, Wagga Wagga.

Hart, Bernard, Director, Bahart Pty Ltd, & Farmer, Old Junee.


Hutchings, Tim, Farmer/Farm Consultant, Yerong Creek.

Martin, Pam, Farmer, Borambola, via Wagga Wagga.

Nowlan, Sally, Freelance Agricultural Radio Journalist, New South Wales.

O’Callaghan, Philip, Agricultural Consultant, Bendigo.

Paton, Tony, Rural Financial Counsellor., NE Riverina Counselling Services, Wagga Wagga.

Pearce, Jock, Proprietor, Marrar Agricultural Centre, Marrar.

Pitson, Geoff, Agronomist, Cootamundra.

Porter, Barry, Assistant Director, Rural & Mining Industry Training Division, Western Institute of TAFE, Orange.

Shearer, Chris, former Manager, Rural Advisory Services, National Australia Bank, Melbourne.

Sinderberry, Vivien, Farmer and former Chairperson, Rural Training Council of Australia, Junee.

Sutherland, Steve, District Agronomist, Wagga Wagga, NSW Agriculture, Wagga Wagga.

Wolfe, Ted, Head, School of Agriculture, Charles Sturt University - Riverina, Wagga Wagga.
APPENDICES
Appendix 1: Interview Questions

1. Can you tell me a bit about your farm - how long you’ve been here - the structure of the business?

2. Does everyone have their own area of responsibility? How is this determined?

3. There is a lot of talk about farm management at the moment. What does farm management mean to you?

4. How do you tell how your business is going?

5. Can you tell me about a recent major change that has been made on the farm? What triggered it? How did you did you get the information about it - or how to go about it?

6. What would you consider to be the main problems in your current farm management?

7. (a) Do you think your children will be farmers?  
(b) Does this affect how you manage your farm?

8. What are the things a farmer has to know about - or be like - to be a good farmer these days?

9. How have you learnt to be a farmer?

10. How do you keep up with everything you need to know?

11. What about farmers in the future?

12. What sort of things would make you go out and learn something new about farming?

13. You don’t have to name them, but could you identify five good farmers in the local district?

14. Why have you identified them as good farmers?

15. What characteristics do they have in common?
LETTER CONFIRMING TIME, DATE AND PURPOSE OF INTERVIEW

Dear .................,

Further to my telephone conversation with you, I am writing to thank you for agreeing to participate in the series of discussions I am having with some of the farmers in our district.

As I briefly explained, the purpose of the meetings is to obtain some information from farmers on their farm management practices and on what farmers need to know about these days in order to run their farming business.

The information gathered from these discussions will be used in a project investigating the relationships between farm management and farmer education. It has been funded by the Rural Industries Research and Development Corporation and is being supervised by the School of Management at Charles Sturt University. Many current research projects are attempting to isolate the factors affecting the successful management of farm businesses and the pilot study being currently undertaken will hopefully add further insight into the analysis.

It is recognised that farm management is affected by a broad range of factors, both on and off the farm, and that because of this the operating environment of farmers is becoming increasingly more complex.

As farmers’ individual businesses are so diverse and there is little research on how farmers actually run their farms, the information gathered from farmers is central to any genuine understanding of the subject. When key factors affecting the success or otherwise of farming operations are more fully understood, it is hoped that this information will benefit all interested farmers.

Thanks again for agreeing to talk about your farm operation with me and I shall look forward to meeting you at (time and date).

Yours sincerely,

Annette Lamont
(telephone: 246434)
Appendix 2: People Consulted During The Course Of The Study

Farmers
Onsellers, merchants
Agricultural consultants
Marketing agents
RAS counsellors
Landcare co-ordinators
Educators and training providers
Training authorities
Researchers
Banks
Accountants
NFF
Professional bodies
Department of Agriculture
Rural media
Appendix 3: Initial Impressions From The Data

- There is a great deal of interest in the subject area - not only from farmers but also from people servicing the agricultural industry or living in rural areas.
- Farmers participating in the survey extended discussions to levels beyond expectations both in terms of time allocated and also in terms of the depth of information provided. They were extremely willing to share information.
- There is strong commitment to family farming.
- There is an enormous knowledge base in the farming community.
- There is a feeling that the future of agriculture is going to require more direct political input from “good farmers” and that current agri-politicians and farmer representatives are not representative of the farmers who contribute the most to agricultural production. Concern was expressed by many of these full-time farmers about them not having time and resources to be involved in broader industry issues.
- Farmer groups and individual information gathering techniques are the basis of current farmer education.
- Information gathering and sorting is a big issue.
- Marketing techniques employed could possibly form the basis of benchmarking current farmers’ responsiveness to change.
- There is evidence of increasing use of outsourced expertise and specialisation depending on the skills and interests of individual farmers.
- Local knowledge is highly valued.
- The verbal communication skills of women were often better than the men’s.
- Current farm women are actively involved in farm management although their roles vary widely.
- Farm women often commented that they felt their role in farm management went unrecognised or was undervalued. An undercurrent of strain was perceived in many households.
- Farm women communicated openly about the effect of extended family relationships. They were often instigators of family communication and planning for the future.
- Farmers information and education needs are extremely diverse.
- Farmers recognise the constraints capital availability places on farming.
- The effect of family environment and social experience on farm management is significant and is linked closely to education.
- Many farmers want their children to have a choice as to whether they farm and are conscious of not creating false expectations.
- Farmers felt responsible for their own destiny and were not seeking assistance from government.
- There was no evidence of ‘whinging farmers.’
Appendix 4: A Profile of the Coolamon Shire

Location and Size

The Shire of Coolamon covers an area of 2424 square kilometres (equivalent to 50 kilometres by 50 kilometres) in south-western New South Wales, surrounded by the Shires of Temora, Junee, Narrandera and the City of Wagga Wagga. Coolamon, the main town of the Shire, is approximately 480 kilometres south-west of Sydney, 470 kilometres north of Melbourne and 41 kilometres north of Wagga Wagga. It is on the Junee to Griffith rail line, close to the main Sydney to Melbourne rail line which passes through Junee. The Shire has road links to the north and south by the Olympic Way while Ardlethan, in the north of the Shire, is on the Newell Highway, a national link between Brisbane and Melbourne. There are links to the nearby Hume and Sturt Highways.

Population

Coolamon’s population, like several other local government areas in the Riverina Region declined in the 1970s and 1980s. The population recorded at the 1991 Census was 3760, a decrease from 3890 in the 1986 Census. However, in 1994 the estimated population was 4050, indicating an average annual increase of 2.5 per cent since 1991.

Agricultural and Pastoral Establishments

The main agriculture of the Shire is sheep and winter crops. Of the Shire’s total area of 242,423 hectares, pastures make up 83,124 hectares and field crops 79,041 hectares. The total number of agricultural establishments recorded in 1992-93 was 267, covering a total area of 206,887 hectares. The average size of establishments in the Shire in 1991-1992 was 760 hectares.

TABLE 1 Agricultural Establishments & Land Utilisation, Riverina Region 1992-93

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<tr>
<th>Statistical Area</th>
<th>Total Area (hectares)</th>
<th>Agricultural Establishments</th>
<th>Area (hectares)</th>
<th>Pastures</th>
<th>Field Crops</th>
<th>Fruit &amp; Nuts incl Grapes</th>
<th>Vegetables</th>
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<td></td>
<td></td>
<td>Number</td>
<td>Area (hectares)</td>
<td>Pastures</td>
<td>Field Crops</td>
<td>Fruit &amp; Nuts incl Grapes</td>
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<tr>
<td><strong>Total for Region</strong></td>
<td><strong>6,352,197</strong></td>
<td><strong>4,294</strong></td>
<td><strong>5,367,448</strong></td>
<td><strong>2,163,802</strong></td>
<td><strong>716,870</strong></td>
<td><strong>14,653</strong></td>
<td><strong>5,334</strong></td>
</tr>
</tbody>
</table>

Source: ABS-Agricultural Statistics - Selected Small Area Data, NSW. 1992-93 (Cat. No. 7120.1)
In terms of areas covered, the main crops grown in the Shire in 1992-1993 were 31,961 hectares for wheat, 24,989 hectares of other cereals for grain, 7673 hectares of legumes for grain, 5113 hectares of crops for hay and green fodder and 9448 hectares for other field crops. The actual production of grain in 1993-1994 totalled almost 200,000 tonnes, the main contributors being wheat (113,769 tonnes), barley (34,435 tonnes), canola (21,512 tonnes) and lupins (12,694 tonnes). Other crops with small but significant yields include oats, field peas and triticale.

<table>
<thead>
<tr>
<th>Statistical Area</th>
<th>Cereals for Grain</th>
<th>Legumes for Grain</th>
<th>Crops for Hay &amp; Green Fodder</th>
<th>Other Field Crops</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolamon</td>
<td>24,989</td>
<td>7,673</td>
<td>5,113</td>
<td>9,448</td>
<td>31,961</td>
</tr>
<tr>
<td>Coolamunda</td>
<td>11,065</td>
<td>3,162</td>
<td>779</td>
<td>1,664</td>
<td>9,330</td>
</tr>
<tr>
<td>Gundagai</td>
<td>5,024</td>
<td>331</td>
<td>1,311</td>
<td>238</td>
<td>1,592</td>
</tr>
<tr>
<td>Junee</td>
<td>17,586</td>
<td>3,689</td>
<td>1,361</td>
<td>4,787</td>
<td>16,411</td>
</tr>
<tr>
<td>Lockhart</td>
<td>31,043</td>
<td>12,390</td>
<td>2,830</td>
<td>3,768</td>
<td>33,209</td>
</tr>
<tr>
<td>Narrandra</td>
<td>34,967</td>
<td>10,133</td>
<td>3,316</td>
<td>4,192</td>
<td>46,347</td>
</tr>
<tr>
<td>Temora</td>
<td>23,063</td>
<td>6,226</td>
<td>2,649</td>
<td>4,831</td>
<td>33,416</td>
</tr>
<tr>
<td>Tumut</td>
<td>175</td>
<td>—</td>
<td>359</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Wagga Wagga</td>
<td>26,553</td>
<td>5,642</td>
<td>5,803</td>
<td>3,730</td>
<td>20,848</td>
</tr>
<tr>
<td>Carrathool</td>
<td>67,662</td>
<td>11,597</td>
<td>2,238</td>
<td>1,853</td>
<td>68,752</td>
</tr>
<tr>
<td>Griffith</td>
<td>29,054</td>
<td>1,647</td>
<td>929</td>
<td>694</td>
<td>12,043</td>
</tr>
<tr>
<td>Hay</td>
<td>4,119</td>
<td>410</td>
<td>1,065</td>
<td>904</td>
<td>2,152</td>
</tr>
<tr>
<td>Leeton</td>
<td>14,728</td>
<td>523</td>
<td>620</td>
<td>668</td>
<td>4,091</td>
</tr>
<tr>
<td>Murrumbidgee</td>
<td>16,050</td>
<td>641</td>
<td>425</td>
<td>1,974</td>
<td>4,598</td>
</tr>
<tr>
<td>Total for Region</td>
<td>306,078</td>
<td>64,062</td>
<td>28,797</td>
<td>38,801</td>
<td>284,769</td>
</tr>
</tbody>
</table>

Source: ABS-Agricultural Statistics - Selected Small Area Data, NSW, 1992-93 (Cat. No. 7120.1)

In the five-year period 1989-90 to 1993-94 grain production has fluctuated as a result of weather conditions but the overall trend has been for output to increase. While wheat and barley increased significantly over the period, oats declined substantially in the fifth year after four years of steady output. The most significant growth area has been canola with output increasing from 6621 tonnes in 1989-90 to 21,512 tonnes in 1993-94.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>82385</td>
<td>90325</td>
<td>56959</td>
<td>111836</td>
<td>113769</td>
</tr>
<tr>
<td>Barley</td>
<td>27456</td>
<td>28246</td>
<td>37086</td>
<td>40613</td>
<td>37435</td>
</tr>
<tr>
<td>Oats</td>
<td>12234</td>
<td>12995</td>
<td>13133</td>
<td>14466</td>
<td>8786</td>
</tr>
<tr>
<td>Triticale</td>
<td>781</td>
<td>1218</td>
<td>788</td>
<td>1832</td>
<td>1779</td>
</tr>
<tr>
<td>Chick Peas</td>
<td>442</td>
<td>662</td>
<td>668</td>
<td>56</td>
<td>83</td>
</tr>
<tr>
<td>Faba Beans</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Field Peas</td>
<td>1664</td>
<td>1584</td>
<td>1136</td>
<td>1109</td>
<td>1887</td>
</tr>
<tr>
<td>Lupins</td>
<td>4057</td>
<td>4444</td>
<td>4842</td>
<td>16652</td>
<td>12694</td>
</tr>
<tr>
<td>Canola</td>
<td>6621</td>
<td>11038</td>
<td>12012</td>
<td>17877</td>
<td>21512</td>
</tr>
<tr>
<td>Linseed</td>
<td>98</td>
<td>0</td>
<td>0</td>
<td>470</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>135738</td>
<td>150512</td>
<td>126628</td>
<td>204911</td>
<td>198045</td>
</tr>
</tbody>
</table>

Source: Wagga Wagga Agricultural Research Institute
Other agricultural outputs of the Shire include fruit and honey. Although not recognised as a major fruit growing and honey production area, a small number of establishments operating in these areas are beginning to produce a significant output. In 1993-94 the Shire produced 10,000 kilograms of peaches, 2000 kilograms of apricots, 600 kilograms of plums together with 12,300 kilograms of honey.

### TABLE 4 Production of Fruit and Honey in the Coolamon Shire 1993-94 (Kilograms)

<table>
<thead>
<tr>
<th>Fruit / Honey</th>
<th>Kilograms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apricots</td>
<td>2,000</td>
</tr>
<tr>
<td>Peaches</td>
<td>10,000</td>
</tr>
<tr>
<td>Plums</td>
<td>600</td>
</tr>
<tr>
<td>Honey</td>
<td>12,300</td>
</tr>
</tbody>
</table>

Source: ABS 1993/94 Agricultural Census Data

### Pastoral Industry

The significance of the grazing industry in the Shire is shown by the number of livestock recorded in 1993. These included 7058 meat cattle, 299,699 sheep, 80,544 lambs and 2203 pigs.

### TABLE 5 Livestock Numbers in the Riverina Region at 31 March 1993

<table>
<thead>
<tr>
<th>Statistical Area</th>
<th>Number at 31 March 1993</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meat Cattle</td>
</tr>
<tr>
<td>Coolamon</td>
<td>7,058</td>
</tr>
<tr>
<td>Cootamundra</td>
<td>28,636</td>
</tr>
<tr>
<td>Gundagai</td>
<td>64,869</td>
</tr>
<tr>
<td>Junee</td>
<td>22,044</td>
</tr>
<tr>
<td>Lockhart</td>
<td>13,943</td>
</tr>
<tr>
<td>Narrandera</td>
<td>21,639</td>
</tr>
<tr>
<td>Temora</td>
<td>14,133</td>
</tr>
<tr>
<td>Tumut</td>
<td>56,783</td>
</tr>
<tr>
<td>Wagga Wagga</td>
<td>103,641</td>
</tr>
<tr>
<td>Carrathool</td>
<td>52,848</td>
</tr>
<tr>
<td>Griffith</td>
<td>19,286</td>
</tr>
<tr>
<td>Hay</td>
<td>45,995</td>
</tr>
<tr>
<td>Leeton</td>
<td>27,415</td>
</tr>
<tr>
<td>Murrumbidgee</td>
<td>14,241</td>
</tr>
<tr>
<td>Total for Region</td>
<td>492,531</td>
</tr>
</tbody>
</table>

Source: ABS-Agricultural Statistics - Selected Small Area Data, NSW, 1992-93 (Cat. No. 7120.1)

While sheep are produced mainly for meat, wool production is also significant. Output in 1993-94 totalled 1757 tonnes comprising 1527 tonnes of sheep wool, 181 tonnes of lambs wool and 49 tonnes of crutchings.
**Business Activity and Employment**

With agriculture and grazing being the main industries, the 267 establishments recorded in 1992-93 dominate the business activity and employment of the Shire. Although the actual number employed in agriculture is not currently available, the Census figures for 1991 showed that the proportion of the population recorded as self-employed was approximately 35 per cent, most of this percentage being in the agricultural sector. This is well above the regional average of 15.5 per cent and the New South Wales average of 10.1 per cent. This is the second highest percentage of local government areas in the Riverina Region.

In contrast, public sector employment in the Shire at 15.5 per cent is considerably below the regional average of 25.9 per cent and the State average of 21.4 per cent. Similarly, manufacturing which is not a major industry in the Shire, provides a limited number of employment opportunities. Manufacturing contributes about 7 per cent to Coolamon’s employment. A 1992 survey listed three manufacturing establishments in the Shire employing 23 people, one in food processing and two in the category of ‘other machinery and equipment.’

The retail industry also provides some employment opportunities in the Shire. In 1991-92 there were 30 retail establishments employing 80 people. These businesses paid wages and salaries of $454,000 in the year and had a turnover of almost $7 million.

**TABLE 6 Retail Statistics in the Riverina Region 1991-92**

<table>
<thead>
<tr>
<th>Statistical Local Area</th>
<th>Locations at 30 June No.</th>
<th>Persons Employed No.</th>
<th>Wages &amp; Salaries $'000</th>
<th>Turnover $'000</th>
<th>Floorspace '000 sq.m.</th>
<th>Turnover/ Person Employed $/person</th>
<th>Turnover/Floorspace $/sq.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolamon</td>
<td>30</td>
<td>80</td>
<td>454</td>
<td>6,781</td>
<td>5</td>
<td>84,759</td>
<td>1,445</td>
</tr>
<tr>
<td>Cootamundra</td>
<td>90</td>
<td>438</td>
<td>4,391</td>
<td>43,144</td>
<td>18</td>
<td>98,502</td>
<td>2,412</td>
</tr>
<tr>
<td>Gundagai</td>
<td>44</td>
<td>184</td>
<td>1,740</td>
<td>13,233</td>
<td>7</td>
<td>71,920</td>
<td>1,814</td>
</tr>
<tr>
<td>Junee</td>
<td>43</td>
<td>147</td>
<td>1,274</td>
<td>12,804</td>
<td>8</td>
<td>87,105</td>
<td>1,703</td>
</tr>
<tr>
<td>Lockhart</td>
<td>30</td>
<td>97</td>
<td>691</td>
<td>4,995</td>
<td>5</td>
<td>51,492</td>
<td>960</td>
</tr>
<tr>
<td>Narrandera</td>
<td>80</td>
<td>329</td>
<td>2,691</td>
<td>25,368</td>
<td>14</td>
<td>77,106</td>
<td>1,802</td>
</tr>
<tr>
<td>Temora</td>
<td>77</td>
<td>282</td>
<td>2,713</td>
<td>24,733</td>
<td>11</td>
<td>87,705</td>
<td>2,233</td>
</tr>
<tr>
<td>Tumut</td>
<td>125</td>
<td>577</td>
<td>5,704</td>
<td>47,872</td>
<td>23</td>
<td>82,967</td>
<td>2,063</td>
</tr>
<tr>
<td>Wagga Wagga</td>
<td>565</td>
<td>3,772</td>
<td>40,291</td>
<td>354,414</td>
<td>135</td>
<td>93,959</td>
<td>2,617</td>
</tr>
<tr>
<td>Carrathool</td>
<td>23</td>
<td>68</td>
<td>380</td>
<td>5,665</td>
<td>4</td>
<td>83,306</td>
<td>1,316</td>
</tr>
<tr>
<td>Griffith</td>
<td>220</td>
<td>1,494</td>
<td>15,402</td>
<td>138,432</td>
<td>54</td>
<td>92,659</td>
<td>2,550</td>
</tr>
<tr>
<td>Hay</td>
<td>43</td>
<td>193</td>
<td>1,583</td>
<td>16,397</td>
<td>9</td>
<td>84,957</td>
<td>1,757</td>
</tr>
<tr>
<td>Leeton</td>
<td>112</td>
<td>419</td>
<td>3,666</td>
<td>37,902</td>
<td>23</td>
<td>90,459</td>
<td>1,655</td>
</tr>
<tr>
<td>Murrumbidgee</td>
<td>19</td>
<td>49</td>
<td>336</td>
<td>3,995</td>
<td>3</td>
<td>81,527</td>
<td>1,363</td>
</tr>
<tr>
<td><strong>Total for Region</strong></td>
<td><strong>1,501</strong></td>
<td><strong>8,129</strong></td>
<td><strong>81,215</strong></td>
<td><strong>735,734</strong></td>
<td><strong>320</strong></td>
<td><strong>90,507</strong></td>
<td><strong>2,298</strong></td>
</tr>
</tbody>
</table>

Source: *ABS-Agricultural Statistics - Selected Small Area Data, NSW, 1992-93* (Cat. No. 7120.1)
Appendix 5: Land and Water Management Plan in the Murrumbidgee Irrigation Area a Study in Best Practice - 1995

A survey was recently carried out by Charles Sturt University to ascertain the number of farmers adopting best management practices on their irrigation farms in the Murrumbidgee Irrigation Area and to gather their input into formation of a Land and Water Management Plan.

Points of interest arising from the study:

- Farmers were pleased to have the opportunity to have input into the plan.
- The survey served an educational purpose in informing farmers of the plan.
- There was little existing information from farmers in the district.
- A large number of farmers were already implementing sections of the plan without necessarily identifying their management practices as options contained in the plan.
- There was recognition that, by talking to farmers individually, valuable information could be gained about management practices and about the views held by farmers on the implications of these practices for future viability.

(Rural News, 11 August 1995).

A further report on the study also raises some interesting points:

- The farmers are willing to adopt BMP provided they are economically viable and are not imposed on them.
- Adoption would be taken on in degrees.
- A sponsored financial incentive may increase adoption in the short term.
- Adoption of BMP to date have not been great.
- Farmers were significantly aware of the problematic issues within the MIA and of the impacts the MIA has on downstream communities.
- Salinity and rising water tables were not nominated as major problems.
- Laser levelling and landforming (50 per cent), recycling (30 per cent), and tree planting (18 per cent) were nominated as the main developments likely on their own farms.
- Concern about the value and benefits of conversion to drip irrigation was expressed.
- More than 90 per cent of farmers wished to be more involved in the development of the RLWDP.
- Preference for one-to-one interaction was preferred to group meetings.

(Rural News, 11 August 1995).
Appendix 6: Shepherd’s Producers

SHEPHERDS PRODUCERS CO-OPERATIVE LIMITED
A case study in marketing and farmer directed education

Shepherds Producers was formed in April 1990 in response to very low grain prices received from the Australian Wheat Board in the 1989-90 harvest period.

The first stage of the formation was a meeting of local farmers called to discuss the situation. A steering committee was formed and they called a public meeting at which a brain storming session was held to discuss the perceived problems and possible solutions. Over forty farmers attended.

Following this, a delegation went to Canberra to speak to politicians from all parties. No solution appeared to be forthcoming from this exercise and the growers decided to assume a pro-active role in the market situation and form their own marketing organisation. A co-operative structure was regarded to be the most appropriate for the organisation at the time.

There were sixty five initial members of the co-operative, not all reliant on grain production as their major enterprise. Some members have dropped out since inception but other farmers have joined and current membership stands at sixty farmers.

The co-operative has traded successfully for five harvests and has generally been able to obtain higher prices for grain than delivery to the Australian Wheat Board pools. Turnover has been about $3 million annually.

As well as performing a marketing function, the members regard the development of the co-operative as a very significant learning experience. This is particularly so for the Board members who have major responsibility for the management and direction of the co-operative. Valuable experience and knowledge has been gained, particularly in the areas of marketing, communication and production to meet market demands or requirements. Extensive contacts in the industry have been developed.

The co-operative is now entering a new phase of its development and appointed a full-time manager prior to the 1995-96 harvest. The manager will carry out most of the marketing activities subject to direction from the board and grain sub-committees and will be responsible for the day to day management of the business. Board and committee members, however, continue to work long hours for the co-operative. These are all elected positions and they attract no remuneration.

An annual seminar is combined with a post harvest meeting early each year. This was initiated by the founding Chairman of the Board and further enhances the members’ opportunity to gain valuable information, contacts and experience in the marketing of their products.

The development of organisations such as these is a reflection of the initiative and responsiveness to change exhibited by progressive farmers.
Appendix 7: Tumut River Orchard Management Ltd

This case study illustrates the development of a family farm business into a large-scale, vertically-integrated, horticultural production and export business as a response to local and Asian market opportunities.

In 1973, a Tumut grazing property was made drought-proof with the purchase of some river country and installation of irrigation. This also enabled possible diversification into horticulture, with the local Batlow fruit cannery as a market.

In 1975, a butchery outlet was purchased to overcome some of the effects of the cattle market crash at that time. In 1983, a detailed reappraisal of the business led to the decision to develop a horticultural enterprise. Scale of operations had to be increased to justify professional market development and maintenance. External venture capital was required for this. The proprietor’s brother, who was qualified in marketing and commerce, joined the venture at this stage. The first prospectus was launched and sufficient capital was attracted to establish the initial stage of the development plan near Tumut.

Over 300,000 stonefruit trees have now been established in three different climatic zones of Eastern Australia, harvesting occurring over a seven-month period. Competitive advantage is considered to be supply to the developing export market, with complete quality assurance in production, packing, transport and continuity of supply.

In 1993/94, California exported three and a half million trays of stonefruit to Hong Kong and Taiwan. Tumut River Orchard Estate produced over two million trays in this period, with 65 per cent of produce directed overseas. Over $3,000,000 has been spent in developing the Coonabarabran site in northern New South Wales. In the period 1992 to 1995, over $800,000 was paid in wages. In full production, there will be employment for 30 full-time staff, 100 casual orchard staff for approximately eight months per year, and a further 100 casual staff for fruit packing for four to five months per year.