



Social Dimensions of Managing Mixed Farming Systems

Discussion Papers

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A Joint National Research Project between:

**Grains Research Development Corporation (GRDC)
Meat & Livestock Australia (MLA)
Australian Wool Innovations Ltd (AWI)
Land & Water Australia (LWA)**

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Note for readers:

The following discussion papers are produced as a result of social research carried out in the Grain & Graze project. I would like to acknowledge the input of many farmers, regional steering committee members, advisors and community that gave their time to be involved.

These papers aim to inform discussion for anyone interested in decision-making on mixed farms. A number of views are expressed as issues, or recommendations as a result of Grain & Graze social research.

Feed back on these papers is welcomed.

This series of discussion papers will expand as the research continues.

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1/06 Australian Mixed farming – A system under threat?

By Nigel McGuckian, National Social Research Project, RMCG

Australian farming is in the main a mixed farming system. There is usually a mixture of livestock and cropping enterprises, which are generally managed by the same farming family. These enterprises often, but don't always, utilise the same land in any one year. The enterprises will often complement each other, but again this is not always the case. This farming system has come about because Australian soils are of 'mixed' quality and farmers are good at managing risk. Some soils are good enough to grow crops continuously, some soils can grow crops in some years. When soils are not growing crops, they can be growing pastures with grazing animals. The proportion of the farm growing crops and livestock will depend on a range of factors including soil types, enterprise profitability, and farmer preference.

A national social research project, part of the Grain and Graze project, aims to understand the social dimensions of mixed farming systems. This paper discusses some of the issues raised from the early findings of this research.

Fifty in-depth interviews were carried out with mixed farmers throughout Australia. The interviews followed a broad structure and allowed farmers to expand on areas of interest. Qualitative information was collected as notes. Interviews were conducted in some cases with more than one family member. Each interview lasted between sixty and ninety minutes.

Typical questions raised in the interviews were – What influenced you to change your farming system? How do you evaluate the financial implications of your decisions? What social factors do you consider important in your decision making?

The value of this form of (qualitative) research is often questioned by agricultural researchers and extension workers in Australia. They question the validity of the conclusions due to selection of the sample, lack of rigorous analysis of the results and drawing conclusions from impressions. In fact, this form of research is extremely important in designing research and extension because it enables a greater depth of understanding of the farmers and their decision making. This then allows the extension and research to respond to farmers rather than requiring farmers to change once the research has come up with a promising new technology. This research is simply listening and learning.

The Grain and Graze program aims to improve farm profitability and sustainability. This raises the question – are farmers motivated by profit? The answer is of course – yes, but the next and more important question is – how much profit will farmers trade off for other (non financial) benefits?

Successful farming requires decision-making about complex matters. Mixed farming adds another layer of complexity to the decision making process because there is more than one enterprise.

When farmers were asked about financial decision making in relation to mixed farming, they found the questions difficult to answer due to the complexity and therefore difficulty of the decision making process. When asked how they decided which enterprise was more profitable, they began with – "we do the sums". When asked – which sums or exactly how do you work it out, they would often become less certain.

In many cases, farmer don't use any financial analysis to determine enterprise mix. Other factors such as soil types, labour requirements, and preference were important influences over enterprise mix.

The financial consideration was often at the level of commodity price. This is not to say the farmers are wrong. They simply believe it is too complex and there are so many non-financial influences there is no value in spending time doing a complex analysis. Often a discussion about financial decision-making would end in – “it doesn’t matter anyway – we decide on how much crop from our soil types”.

So how can Grain and Graze help farmers weigh up the trade offs?

Farming system models may be helpful but as McNeill states “due to the broad subject range of (these) variables, the producer wants decision making tools that combine scientific knowledge, historical experiences, social and cultural pressures, and the present situation to make an informed decision”. This is what farmers are doing every day. It is worth asking – Are farmers happy their decisions are sufficiently informed?

This is where Grain and Graze can make a significant contribution. Grain and Graze can inform decisions.

For example:

- What damage to soil structure is done by livestock when grazing?
- What feed value is in stubbles or grazing crops?
- What value will introducing lucerne or native species to pastures provide?
- How much is financial risk moderated by having livestock in the farming system compared to a continuous cropping system?

Many farmers in sheep growing regions were considering selling all their sheep. Although they recognise this may reduce farm profit, this was a tempting option due to the lower requirement and easier, lower stress, less frustrating lifestyle and an opportunity for holidays off the farm and lower requirement for employed labour.

Many farmers, just like the general public, are looking for ways to make life simpler and easier. Cropping systems have used innovative technologies over the last twenty years to make life simpler and easier for farmers, for example:

- larger machinery has reduced time on tractors
- reduced tillage has reduced time on tractors

Technology throughout society has delivered lifestyle benefits. Life is easier – eg. comfortable safe cars, mobile phones, computers, microwave cooking.

The sheep industry must investigate or promote ways to make running sheep simpler and easier. Some technologies have been available for many years but not adopted eg. bugle sheep yards, sheep handlers, good sheep dogs!

Farmers know there are many benefits in having sheep as part of their farming system. Many are moving to cattle because they are easier or ‘shedding’ sheep to reduce reliance on shearers. Some farmers would be happy to run sheep at a small loss if they provided a benefit to the cropping enterprise – if they could be run simply and easily.

Young people or farms often have a dislike for running sheep. They haven't learnt how to handle sheep and find them frustrating. They also require attention throughout the year, which doesn't allow a holiday.

Some research and extension aims to improve profitability by increasing the intensity of the livestock system. This research would suggest this approach doesn't fit with farmers needs, because it is more complex, and difficult. For example, increasing stocking rate is an obvious way to improve profitability. It also, however can increase risk, present animal health problems, increase input costs – i.e. increase complexity.

Simple livestock systems eg. – shedding sheep, running only wethers, ewes which are dry in dry years, buying and selling sheep, are popular because they fit in with the cropping enterprise. They contribute to the mixed system.

Technologies which reduce labour and provide simplicity require attention from grain and graze to allow a mixed farming system to be run. For example – fencing systems, handling systems, laneway systems, sheep dogs and shearing systems are vital. They may not improve profitability, but if a single enterprise cropping system is not sustainable, then farmers must have a livestock system which is simple and easy.

Grain and Graze needs to consider its research programs and ask:

- Do they make life easier for the farmer?
- Will they reduce risk?
- Do they provide information to answer questions, which are important to the farmer?

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2/06 Decision Making on Mixed Farms – Managing Complexity

Introduction

Mixed farming is the predominant farming system throughout Australia. The majority of these farms are managed by a farming family. The mixed farming enterprises are often a range of crops and one or more livestock enterprises. The land or pasture resources are often fragile or in need of repair. This is a difficult system to manage and a difficult environment in which to make decisions. This paper discusses the relevance of theories on decision making proposed by Snowden¹ to decision making on mixed farms.

Complexity of Decisions

Simple Decisions

The easiest decisions are simple. There are a few variables and there is a clear right or wrong answer. For example, deciding how much drench to give a 45kg wether may be considered a simple decision. The farmer would refer to the label recommendation and drench accordingly. Throughout the day, many simple decisions are made with little conscious thought.

Complicated decisions

When a number of variables are involved, but the relationships between variables are clear and well documented, a decision can be considered complicated. Deciding on a pest control program in a wheat crop could be considered complicated. Significant expertise and experience is required, however information on relationships and responses is available which the expert can use to make a decision. Again, many complicated decisions are required on mixed farms. For example, a range of crops are grown and different soils and paddocks have different histories and weeds. These decisions are often made by the farmer with assistance from a trained and experienced agronomist.

Complex decisions

When a number of complicated decisions come together and interact and the variables and trade offs cannot be quantified or weighed against each other, the decisions may be considered complex. For example, deciding how many livestock to run on a farm, which also has a range of crops, is a complex decision. Although a theoretical optimum number of livestock could be calculated using a modelling approach, many variables would remain unaccounted for such as the effect on the environment, the need to manage labour, the impact on recreation time, the increased risks, and long-term price forecasts. The number of variables is very high and cannot be modelled.

How can farmers make decisions in such a difficult, complex environment? The theory on decision-making suggests we can improve decision making when the decisions are complex by “story telling”. This is, of course, what farmers have been doing for many years. They like to learn by discussing options with others. The theory also proposes a set of principles or boundaries are established and decisions are made within these principles in an ongoing way. So farmers will apply a principle such as “I don’t want to put all my eggs in one basket” and then adjust the systems to suit. The theory also proposes past experience is very important in making complex decisions. This tends to make complex decision making conservative.

¹ Snowden D.J. (2003) Managing for serendipity or why we should lay off “best practice” in KM.

Social research carried out as part of the Grain and Graze project with farmers and farming families throughout Australia suggests an understanding of complex decision making could assist in learning about decision making on mixed farms.

If we recognise mixed farming decisions to be complex, then the following issues may be helpful:

- Recognise farmers have been making complex decisions for many years and have had a lot of experience. This experience needs to be recognised and advisors must acknowledge when a decision is made it is likely to be right for them. The reason it sometimes doesn't make sense to the advisor is because the advisor isn't aware of all the variables.
- Advisors and researchers can help farmers make complex decisions by asking which parts of the decision (the complicated parts) can be clarified by a greater understanding of the interaction between variables.
- Farmers may be helped in making complex decisions, by providing a forum for "story telling". This forum could be assisted with a range of information (e.g. research results, demonstrations).
- Farmers will often delegate complicated parts of the complex decisions to advisors. For example, agronomy decisions are often made by a consultant agronomist with little input from the farmer. This allows farmers to focus on the complex decisions.

Conclusions

This theory could be very useful for the Grain and Graze project as it helps to understand how mixed farmers make decisions. It is important to recognise complex decisions are made differently to complicated or simple decisions and advisors must recognise this and adapt their approach to take this into account.

3/06 Advisors – Opportunities for Grain and Graze

Introduction

Social research carried out with fifty farming families throughout Australia raised the role of advisors in decision making on mixed farming. In response to this, a series of interviews were carried out with private and public sector advisors in southern Queensland and the Victorian Mallee.

This paper presents some findings of the research and suggests approaches to working with advisors.

Approach

Semi structured interviews of around one hour were carried out with 15 advisors. The background of the advisors were:

- Private advisors charging fee for service;
- Private advisors offering advice with sales of product; and
- Public sector advisors not charging for advice.

This approach aims to understand the issues and consider lessons for Grain and Graze. These lessons need to be considered by the project and new approaches may be considered. This paper draws on findings from social research in Grain and Graze.

Issues Raised

A wide range of relevant issues were raised.

Knowledge of Grain and Graze

The level of knowledge and involvement with Grain and Graze among the private sector varied considerably but was generally low. Where people knew of the program, they were rarely actively involved and they didn't know how they could be involved. They were generally aware of the people involved.

Interest in Mixed Farming

The advisors were generally specialists in crop agronomy. Their work generally involved giving recommendations on weed control, crop rotation, and fertiliser application. They were aware of the importance of a mixed farming system and were keen to either learn more about mixed farming systems or/and work more with their clients on mixed farming systems. Some advisors who sold inputs were involved in livestock decisions.

Advisor Influence

Private sector advisors are an extremely important source of advice to farmers. They are often a key mentor, sounding board, disciplinarian, researcher and confidant. The scope of their advice may often be outside their main discipline and they often hold strong personal and professional relationships with their clients.

Most advisors would prefer to stick to their expertise but recognise the farmers need for systems advice. Some were not confident to assist with whole farm advice.

In all regions, private agronomists had an influence over management decisions for a very large proportion of crops grown in the region. Most crops in major cropping areas are influenced by a cropping agronomist.

Professional Relationship

Anecdotal evidence suggests advisors are biased by their professional relationship with their client. For example, advisors with sales targets are thought to “over sell” a product to achieve their targets. This is not supported by this research. Advisors were committed to a long-term relationship with their clients and said they aimed to help their clients make profitable decisions.

Some consultant agronomists were viewed as having a controlling relationship with their clients. This may be the case, however this is done in mutual agreement with the client and the client is delegating their decision making to the advisor because they have many decisions to make and trust the advisor.

The Public Sector Advisors

The role of the public sector advisor is uncertain due to constant change and a loose relationship with the farmer. Extension is often group based and provided to a region rather than the individual. The role of public sector extension officers is poorly defined.

It is important all advisors have close relationships with farmers to gain experience in the complexity of the decision making process on mixed farms. This is not encouraged in the public sector.

Lessons for Grain and Graze

A number of lessons are important for Grain and Graze to be successful:

- The private sector presents a very significant opportunity for Grain and Graze due to their influence, relationship with farmers and experience with a large number and range of businesses;
- Private agronomists are interested in mixed farming and are keen to improve their skills. Grain and Graze has the opportunity to work with private advisors by helping them improve their skills.
- Training or close interaction and debate with private advisors would benefit Grain and Graze.
- Some regions didn't have discretionary funds to pay advisors for their involvement.
- Extension programs in Grain and Graze have been contracted to the public sector where there is a low level of close contact with farmers. This must be addressed.

4/06 Issues from Literature review - Decision making on mixed farms

Introduction

Grain and Graze is a joint initiative of the Grains Research and Development Corporation, Meat and Livestock Australia, Australian Wool Innovation and Land and Water Australia. The program is aiming to help mixed farmers across southern Australia increase the profitability of crops, pastures and livestock while better managing soil, water and biodiversity resources.

A current national Grain and Graze project is aiming to understand the social dimensions of decision making by farming families around mixed farming. These mostly relate to the trade offs between social, financial and environmental factors affecting farmers in the current climate.

There is an enormous amount of published work trying to understand what drives farmers to adopt conservation practices, however, a search of the literature has found very little information that specifically relates to how business and other decisions are made on a mixed farm.

Farmers are always making decisions. Decisions are made every day about handling stock, for example, in relation to feeding and various other husbandry issues. More medium term issues might include pastures management and how best to improve or maintain infrastructure on the farm. Those growing crops face decisions about varieties, timeliness of sowing, soil preparation, suitable rotations and such like. Each of these types of decisions will sit on a spectrum lying somewhere between simple and complex.

In terms of delivery of advice to assist farmers in making these types of decisions, a 'Fact sheet' can provide an answer to a simple technical question or problem, whereas a conversation with an agronomist will be more likely to provide the information needed to decide about the most suitable crop rotation for a particular part of the farm that will fit in with the overall farming operation.

In a mixed farming system there are also less definable decisions to be made about a whole host of matters. Decisions relating to the most sustainable and profitable enterprise mix, for example, are complex decisions involving consideration of economic, technical or physical factors, and social (including lifestyle) factors.

Complex decisions and the best management practice approach

The best management practices (BMP) approach is widely used by researchers and advisory agents trying to assist farmers in making their operation more sustainable. Decision making at this level however, is to a large extent complex, and the BMP approach may well be ineffective.

A review of a body of literature concerning decision making in an organisational management context (Snowden 2003) would seem to have relevance to farming. Farmers face many similar issues to any other business owner.

Snowden (2003) argues that the BMP approach is suitable only when at each decision point, there is an established and repeating relationship occurring between cause and effect, for example, as in a process engineering environment. In a farming situation, where a business operator and their family are coexisting within a natural system, it would seem that the instances where rule based relationships are occurring would be the exception (rather than the norm). There are always going to be some things that arise that could never be anticipated and others that don't respond in the usual way, even if planned for.

Researchers and extension practitioners have developed many decision support tools over the past decade or so. Many of these have not been widely adopted by farmers while some have. For example, computer supported analytical tools to support decisions about what crop-livestock mix to employ tend to be rarely used (Ewing et al. 2005). Decisions at this level are complex and according to Snowden (arguing in an organisational management context), to a large extent, these will be made according to 'gut feel' and following advice from trusted networks.

Rather than always making rational decisions, humans make decisions by matching the information they are getting with their own (or collective) experience and expectations (Snowden 2003). They also do things according to habit (rather than conscious reflection), while observing and copying others, and tend to go out of their way to avoid losses without accurately assessing the probabilities and risks (NEF 2005). These ideas have relevance to farmer decision making and extension, whereby farmers rely on trusted networks for information and then reconcile this with their own experience, values, beliefs and habits. A shared context is critical (between the source of the information and the farmer) and subsequent validation will tend to occur when taken back to a trusted sounding board for confirmation. Only then will farmers have sufficient confidence to attempt practice change in response to new knowledge.

Extension programs and practice change

A review of recently published work on practice change and adoption of conservation practices brings a number of issues to the fore.

Natural resource management (NRM) and production based organisations that acknowledge that farmers learn through adapting their existing knowledge in response to their experiences with others and the world around them (local, personal and social environments) will be more likely to get their messages heard.

Farmers make many decisions based on a combination of intuitive production decisions, lifestyle and cultural factors, and their own personal or family's goals. Management changes are unlikely to be even considered unless farmers can be convinced these changes are consistent with their goals (Pannell 2005).

Furthermore, practice changes and innovations need to be 'adoptable' and past experience has shown that NRM specialists need to invest more time and resources in assessing this question prior to getting on with promoting its uptake (Pannell 2005). A Wimmera study surveying over 600 farmers found there to be significant doubts about the efficacy of many best practices for natural resource management (Curtis and Byron 2002). Once BMPs are properly trialed, farmers need to be satisfied about their merit to continue to adopt and promote these practices to others.

Being economic is a minimum requirement for a practice change to be adoptable, however, the Wimmera study also highlighted that four out of the five top issues identified by respondents were social issues (rather than economic or environmental) suggesting that focusing on primarily environmental or production benefits of remedial or preventative actions could have limited success.

A recent study in Victoria set out to explain how needs influence the actions that farmers take over their lifetime. It is intended that the learning from this project will inform policy makers on how to work with farmers to also meet societal goals around maintaining biodiversity (Farmer-Bowers 2004). The overarching theory behind the study is based on there being two semi-closed systems operating on a farm - one comprising the farm business system and the other comprising the hierarchically superior family system. Farmer's stories about 'why they use their land in the way they do' were generated by interview. Importantly, the interviews indicated that decisions on land use could come from either system.

Informing extension practice?

Taking the case study format for relating stories about good practice as an example:

The case study approach tends to hone in on telling a positive story about 'best practice', for example, increased perennality on a sheep and wheat farm. As previously noted, these types of decisions are complex in nature and rule based relationships do not always apply.

Typically, agricultural extension officers will write up one or two case studies outlining the outstanding successes of farming family A & B when adopting lucerne, for example, and tell an inspirational story about how well it is fitting into their farming system and lifestyle.

A more truthful (and therefore effective) approach would be to also provide further case studies outlining farming family C & D's spectacular failures with lucerne. These might tell an altogether different story about poor establishment (might be soil type – drainage/acidity problem, lack of rainfall that year), grazing mgt difficulties and resulting poor persistence, or how the increased stocking rate led to too many sheep to handle, resulting in difficulties in getting shearers and other labour when needed, fly-strike, inability to get away from the farm and so on.

This wider and more truthful perspective would allow farmers to better weigh up their own situation (financial, geographical/physical and human/social) by seeing both the potential pitfalls and the benefits when everything works well.

Continually bombarding farmers with only good news (and therefore only part of the story) is likely to encourage farmers to ignore 'best practice' advice. Case studies telling the whole story are likely to be more effective in bringing farmers closer to making complex decisions that will involve a practice change.

Note: This literature review will be extended throughout the Grain and Graze social research project.

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5/06 Mixed farming decisions- doing the sums

By Nigel McGuckian, National Social Research Project, RMCG

The Grain and Graze social research project aims to understand the social factors which influence decision-making in mixed farming systems.

Around fifty in depth interviews were carried out with mixed farmers and their families to discuss a broad range of issues around decision-making. These interviews used a flexible framework, which allowed issues to be explored in depth.

An area of decision-making which was explored in depth, was how farm businesses analyse decisions. People were asked a range of questions such as:

- When deciding to change your land use/system how did you work out if it would be more profitable?
- Do you think mixed farming is more/less profitable than a single enterprise system and how do you know?
- How confident are you it is more/less profitable?

These questions were often followed up by:

- What tool did you use to work it out?

This research raises a number of issues for research and extension in Grain and Graze.

Approach to 'Doing the Sums'

A range of tools were used to assist in decision making. Some farmers mentioned gross margins, benchmarking, the accountant, what the consultant says, rules of thumb. Generally there was uncertainty about the best way to analyse a decision about a change in land use.

"Gross margins are a bit dodgy"

Some people who did gross margins recognised they are of limited value. Some people thought gross margins would be useful but didn't do them.

People were pressed in the interview to say exactly how they analysed the decision. When pressed the typical responses were:

"Can't tell you exact figures but we know what is profitable."

"If we didn't have sheep over the last four years, we would have struggled – we do figures in our head per ha."

"We are confident it is the best land use. We need models to compare cattle options."

"We haven't seen anything to prove cropping is better. We are interested in the bottom line. It's what we want to do."

"We are often not comfortable about the numbers."

"Got to keep the balance – numbers don't matter so much."

"The last thing you do is the books."

"We are not confident – which makes me worried."

"Economics is important but we stopped chasing production but are trying to develop a long term ecological state."

"What we want to do influences how we do the figures."

This range of responses was consistent throughout the majority of interviews. The attitudes in these quotes could be summarised as:

- The tools to make decisions are either not well understood or aren't adequate to make complex mixed farming decisions.
- Because the decisions are complex and have many unknown variables and risks, a detailed assessment of the costs and returns is considered of little value.
- Although profitability is important, a very strong determinant of the decision is sustainable land use or preference.

Complex Decision Making

A previous paper in this series (2/06) describes Snowden's² theories on complex decision-making. Mixed farming decisions are very complex i.e. they involve many complicated systems which interact and many unknown relationships, risks and social factors.

This level of complexity cannot be modelled. Even if it could be modelled, farmers could only use the models to guide and inform their decisions.

Mixed farming decisions involve many factors which are extremely difficult to account for. For example:

- climate risk
- price risk
- variable labour requirements
- capital investment
- many people who may be involved in the decision

Farmers have been managing in this complex environment for many years. They will tend to make decisions based on past experience and use rules of thumb.

² Snowden DJ. (2003) Managing for serendipity or why lay off "best practice" in km.

It is important for Grain and Graze to consider how best to help farmers make more confident decisions in this complex environment. A number of approaches may be useful.

1. Provide simple processes for analysing parts of a decision.
 - for example : the decision to purchase livestock was often difficult and people were reluctant to buy livestock because they believed they couldn't afford livestock.
2. Recognise farmers need help with some parts of the decision. It is important to acknowledge this is only part of the decision and the farmer will account for a number of other important issues.
3. Explain the strengths and weaknesses of gross margins. Gross margins can be useful if used with some caution but again only provide part of the answer.
4. Develop ways of talking about risk. Farmers will take account of risks using subjective approaches. A simple plain language approach for discussing risk is needed.
5. Use modelling to inform decisions, but never use modelling to prove one system is better than another. Every farm is different and the farmer must gather information from many sources including past experience and make a decision which suits his own particular set of circumstances.

6/06 Mixed Farming - Labour

Broad acre agriculture has undergone very significant change in the past 30 years. The number of farmers has decreased and farm size has increased. Cropping technology has enabled farmers to efficiently grow larger areas of crop with the same or less labour.

Cropping has almost become a seasonal activity with intense periods of work at sowing and harvest.

With the recognition of the need for improved safety on farm, regulation of the work place with occupational health and safety regulation has increased.

In some regions, the availability of labour has become very limited due to declining rural population and demand for labour from other industries such as the resources industry.

The availability of labour for contracting in the sheep industry such as shearing, crutching and lamb making has also declined.

In a series of interviews for grain and graze, many issues regarding labour on mixed farms were discussed at length with mixed farmers. Although attitudes varied, some of the issues raised were:

- There is reluctance to employ labour due to the difficulty in finding skilled labour and the need to comply to OH&S regulations.
- a preference to reduce labour requirement on the farm through choice of activities which require a low labour input.
- a concern about whether employing labour will be a decision which improves profit.
- a concern about the loss of people from rural communities.

The implications of these issues on mixed farming are potentially very significant and grain and graze must develop strategies to address the issues.

It is likely that farmers will:

- reduce sheep numbers and increase cropping and in some cases sell their sheep.
- reduce sheep numbers and increase cattle numbers.

There is a large body of research and experience in labour on farms. The Avon Grain and Graze region is carrying out research on how farmers spend their time. This research is very important for Grain and Graze because labour is a very important consideration in farm decision making.

Labour should be a major focus of Grain and Graze extension programs, however in most regions it is not given any consideration.

7/06 Lessons for Extension

Introduction

The Grain and Graze national social research project aims to enhance the adoption of grain and graze project results by understanding the social dimensions of managing mixed farming systems.

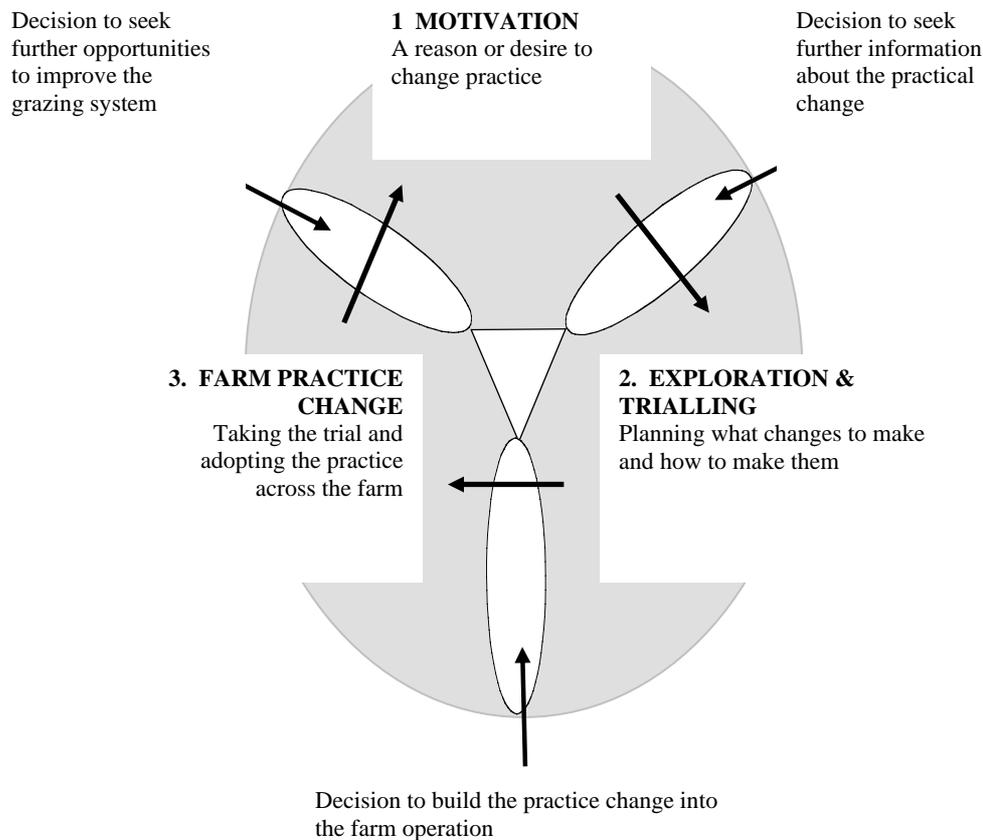
To date (10/06) the social research has involved in depth interviews of 60 farmers and 20 advisors throughout Australia. The interviews were structured but involved in depth exploration of issues in order to fully understand the issues.

It is important at this stage of the project to record some of the lessons which are relevant to extension so that all grain and graze regions can consider adapting their work to increase the effectiveness of the program.

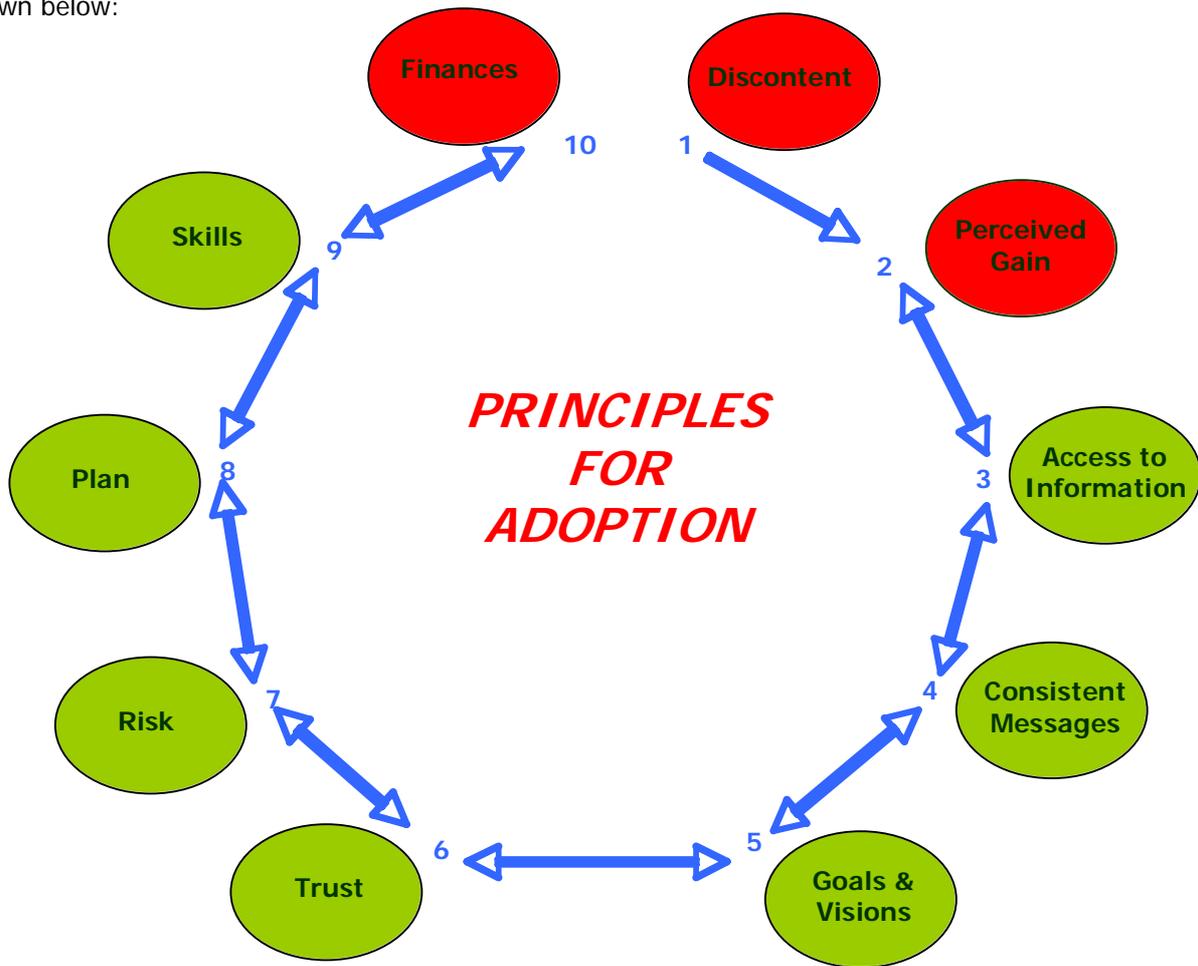
This paper provides a summary of the findings which are important for extension and suggest methods which may be useful.

Practice Change Models

The Sustainable Grazing Systems practice change model was used to guide the interviewing process. This model is shown below:



This model was used to develop the interview process. A model adapted from the SGS model by RMCG is shown below:



This model shows farmers require a range of factors to be in place to adopt. If these are not in place adoption is unlikely.

Decision Making on Mixed Farms

Grain and Graze, as a program is unique in Australian agriculture as it aims to focus on a mixed farming system rather than a crop or single enterprise. The first issue which must be acknowledged and addressed in extension activities by Grain and Graze is that mixed farming decisions are extremely complex. One of the reasons they are complex is there are many factors in the decisions which are difficult or impossible to quantify. For example, preference, time, commitment, climate and price risk, effect on soil structure are just a few. The farming family must weigh up the influence of all these factors and make a decision which achieves their goals.

It is my belief advisors often under estimate the difficulty (and complexity) of this decision making process. Because mixed farming decisions are complex:

- farmers will learn to make decisions or test out their ideas through story telling

- farmers will tend to rely on past experience and therefore tend to be conservative

Implications

When working with complex mixed farming decision making advisors must:

- recognise they are part of the decision making process and there will be many factors considered by the farmer which they aren't aware of.
- research must inform the decision not recommend 'best bet' systems.
- provide or stimulate opportunities for farmers to engage in 'in depth' discussions about their systems.

Labour on Farms

Labour on farms, (both family and employed) is a very important factor in farm decision making. Aspects of labour which were recurring in interviews were:

- Many farmers will develop a business which uses family labour and some contract labour. The step to employing labour is very significant and farmers will avoid employing labour. In some cases a reluctance to employ labour will limit the scale of the business.
- Skills in livestock management are becoming less available. This includes a range of livestock operations eg. Shearing, crutching, rouseabouts. There is strong competition for labour from the mining industry in some parts of Australia.
- Preference is very important in determining enterprises. There is a strong preference against sheep by many farmers due to finding sheep frustrating and time consuming.

Implications

The above issues lead to the following implications for extension

- extension (and research) programs must design, promote or develop systems which reduce the requirement for labour.
- Developing simpler or more streamlined systems will increase adoption.
- Projects which require an increase in stocking rate to increase profitability are likely to require increased labour. If these systems are in a region with the majority of land use is cropping, they are unlikely to be adopted, despite the financial benefits

Use of Advisors

Private sector advisors have become more common throughout rural Australia. These advisors are either private consultants or agronomists employed by input suppliers. Their focus has been cropping agronomy, but they have an increasing interest in livestock where mixed farming is practiced. In depth interviews with advisors showed:

- they often have very close relationships with their clients and their business.
- their focus, while being primarily agronomy often included livestock.
- they spend a significant amount of their time one on one with clients
- advisors were keen to be more involved in the whole system.
- They have contact with a large proportion of farms.

Implications

Private sector advisors are potentially very important for grain and graze because:

- they want to be involved
- they spend time with clients individually
- they can discuss the complexity of decision.
- Develop activities which involve the private sector in grain and graze activities.
- Work with the private sector to understand how they would like to be involved.

Technology

Farmers will consider any new technology in light of the wide range of other issues they must consider. New technology for mixed farming must:

- Have significant financial benefits and/or reduce risk to compensate for the risk or cost of the change process.
- Lead to a simpler or a more streamlined system.
- Show how a whole system works or can be improved.

Extension Approaches

Introduction

The issues raised by this social research suggest a number of approaches could be developed or utilized by Grain and Graze regions in their extension strategies. These approaches are described below.

Farmer 'Think Tanks'

Discussion groups are a commonly used tool for farmer learning in Australia. Discussion groups are likely to be very important for farmers to debate and discuss their mixed farming system, however a variation on farmer discussion groups could be a valuable tool for regions.

I suggest a discussion group is formed with the following approach:

- a small number of members (10) who are committed to (say) four meetings over a year.
- the group consists of eight farm decision makers and two advisors from the private sector.
- the meetings are held at a member's farm and the focus of the discussion is the farmer's business.
- details of financial performance are presented to the group.
- the farmer clearly states the farm goals to the group.
- the meeting is facilitated by someone with experience in mixed farming businesses.
- the advisors listen throughout the day and are to reflect on what they learnt throughout the day.
- the discussion is about trade offs, risks, decisions and future plans.

The discussion group could be used by the region to modify research and extension.

Private Advisors

A meeting with a range of private advisors could be held which:

- asks them their views on the farming system in the region.
- asks them what research is required.
- asks them how they would like to be involved in grain and graze.
- asks if grain and graze can provide any specific training.
- provides a brief summary of regional projects.

This meeting would build a team of private advisors who would work with Grain and Graze in the region.

Private advisors may be involved in farmer discussion groups or in research projects developing systems.

Labour on Farms

An extension activity around labour on farms would raise many opportunities and ideas on using labour more efficiently.

Examples include:

- Demonstration of handling equipment
- Case studies of how people have gained efficiencies in labour.
- Discussion of cost/benefit of employing labour.
- Explanation of OH & S systems.
- Discussion of time management (results from Avon region and using labour across multiple enterprises).

Research on Decision Making and Systems

A focus group of farmers for farm systems projects could be very useful. This group would be used to ensure relevance, discuss implementation and adoption and the trade offs required if the system was complemented.

Financial Decision Making

A number of issues were raised about financial decision making. Many farmers found using decision making tools confusing and because the decision was complex, no analysis was done on important decisions.

Simple approaches are required for making decisions about:

- Capital purchases
- Changing farming systems
- Sowing pastures
- Changing stocking rate
- Assessing risk.

These tools may only be a rough guide, but may be very useful.