

**IMPROVING FARMER CAPACITY TO  
MANAGE PROFITABILITY AND RISK**

**A CASE STUDY GROUP APPROACH AT BIRCHIP**

**FINAL REPORT 2009/2010**

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For : Grains Research and Development Corporation

Date : July 2010

**LOW RAINFALL  
COLLABORATION PROJECT**



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## Acknowledgements

The authors acknowledge the contributions by the farmers, Fiona Best and BCG staff and the consultants involved in the project; the invaluable advice provided by Associate Professor Bill Malcolm of the University of Melbourne; and the GRDC for its funding support.

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## **A CASE STUDY GROUP APPROACH at BIRCHIP**

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Geoff Thomas, Manager, Low Rainfall Collaboration Project**

### **1 EXECUTIVE SUMMARY**

Farmers have been seeking guidance for years on how they can improve their farm systems to improve profitability and manage risk.

Emphasis in the past has been on technical improvements but now farmers and consultants are both looking to build their farm business skills.

This pilot project explored an approach using a small group comprising farmers, consultants and a farm systems group person, to work with an expert facilitator to establish a case study farm and identify those elements for analysis which would be likely to have the greatest impact on the profitability and resilience of the business. Discussion of the analysis by the farmers provided a valuable learning tool as to how to analyse their own businesses and make adjustments.

The analysis highlighted that at Birchip profitability and risk are both driven largely by a combination of soil type, associated enterprise mix, level of debt, machinery investment, and land purchase.

The break-even analysis demonstrated how to develop risk management strategies for different season expectations and to convert these into rules of thumb.

Of prime importance is that this pilot project met its purpose in testing a hands-on approach and provide a number of guidelines for other groups embarking on this area of work.

### **2 BACKGROUND**

Farmers have been seeking guidance for years on how they can improve the fit of their various farm systems components to improve profitability and manage risk.

In the past a lot of attention has been placed on agronomic considerations and hence a concentration on varieties, rates, seeding dates, row spacing and similar types of work. Similarly with livestock there has been work on grazing cereals and other crops. While all of this work has a place, farmers are now seeking more advice on how to fit the various technologies together to best effect. That best effect no longer just means production - profitability, reduced inputs and management of risk are increasingly recognised by farmers as the major factors affecting the performance of the business.

While this emphasis might have emerged as a strong theme as a result of the recent poor seasons, it will continue to be important as margins of returns over costs are likely to remain tight and as seasonal variability increases.

Farm business decision making skills have improved little; some of the reasons for which are:

1. The complex nature of the farm business coupled with a lack of understanding of simple measures to allow farmers to assess the state of their current business on an annual basis.
2. Overall, advice to farmers has had a strong agronomic bias with few extension people having a sound understanding of profit, cost and risk outcomes.
3. Research is predominantly extended on an agronomic base and what financial analysis is done is usually very simplistic and often based on gross margins which only tell part of the story.

Current analysis of farm systems has also had problems. For example, often best current practice of a cropping enterprise is compared with district practice of a mixed sheep and cropping enterprise. A standardisation of approach is required where the best current practice of both systems can be validly compared.

Farmers are seeking a greater business-like approach to research and extension, including information and approaches to assist their decision making. A good example of this demand was the popularity of the Profitability/Risk Management Guides produced by GRDC for the 2008 and 2009 seasons.

Since each farmer's business is different, a one size fits all approach is not appropriate. Rather, what is required are simple budgets and guidelines which allow farmers and their advisers to feed in their own figures and ask the "what if" questions appropriate to them. These budgets inform their decisions, yet do not make them for the farmer or adviser. However these budgets are not widely used.

Demand for practical farm business management skills training is now coming from farmer groups and consultants and there is a need to respond quickly to capture this demand.

This project is a pilot using a whole farm, case study approach which brings together past experiences and activities and involves farm business experts, consultants and farmers.

The outcomes from this pilot project will be used to build a larger project involving all groups involved in the Low Rainfall Collaboration Project

### **3 AIMS**

The aim of the project was to analyse a whole case study farm to evaluate adaptive farm systems and develop simple approaches which farmers can use help their decision making, especially in the face of more uncertain seasons and profit margins.

This aim required the following outcomes to be addressed:

1. Evaluate current financial analysis (i.e. benchmarking), review the usefulness of these approaches and give direction for future approaches with other groups of farmers..
2. Analyse different cropping and livestock farming systems using 'best practice'. This included the standardisation of appropriate inputs to drive defined production outcomes.
3. Evaluate interactions between all aspects of the farm business including technical and financial.
4. Develop of simple financial methods/approaches/budgets that farmers could use on an annual basis to assess the state of their business.
5. Develop an approach to financial analysis that can be easily replicated or adapted to other mixed farming environments, especially in low rainfall areas.

6. Build the capacity of consultants, extension personnel and farmers in farm decision making.

Continuity of approach was also an underlying requirement. Bill Malcolm of the University of Melbourne was utilised to not only ensure that the financial analysis was robust but also to bring his experiences from the dairy industry.

## **4 METHODS**

### **4.1 Setting up the Group and Farm for Analysis**

#### **4.1.1 Setting up the Study Group**

The study group had 6 farmers, a BCG staff member with skills in farm business (Fiona Best), a local consultant (John Stuchbery), Bill Malcolm (University of Melbourne) and Ed Hunt (Farmer and Agricultural Consultant based on Eyre Peninsula)

The Study Group met on four occasions (although three may have been adequate)

#### **4.1.2 Setting up the Example Farm**

The use of one farmer as the basis of analysis showed up early as having problems:

- A farm is a complex interrelationship of compromises. Every farm can be broken down to its individual components, with opportunities for improvement. However seldom are these improvements viewed within the complex interactions on the farm. The compromises are frequently based on personal factors.
- To hold a farmer up as the example farm would put undue emphasis on them and their system
- Debt and core financial information is for many a private issue. Some farmers are happy to reveal this information while others are not. It was decided to look at debt as a separate issue.

It was therefore decided to build a “representative” case study farm by using the actual farm as the base but using input of data from the group. This attracted ownership of the farm data (including both fixed and variable costs) from other members of the group and ensured it was indicative of the district.

#### **4.1.3 Deciding the Land Capability/Soil Type**

In the Birchip area there are two distinct soil types – Birchip heavy soil and Birchip light soil which delivered very different yield outcomes in the previous five years. Farmers in the group had either a mixture of heavy and light soils or all heavy soils. The case study farm was treated as two scenarios:

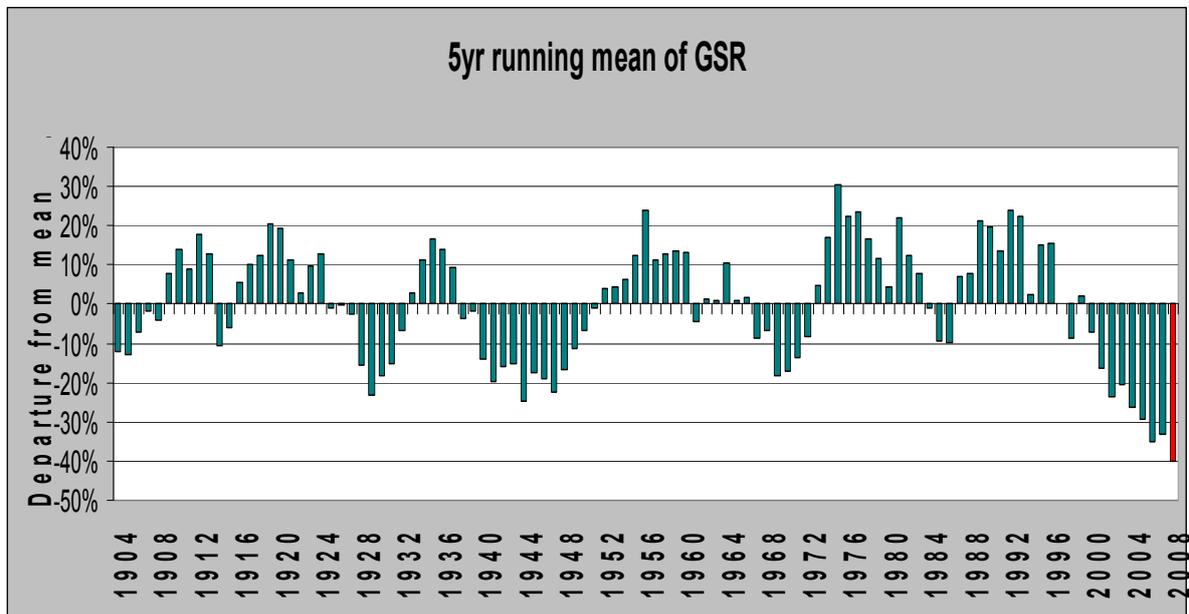
- 50% light soil type / 50% heavy soil type
- 100% heavy soil type.

#### **4.1.4 Selecting the Seasons to Study**

The operation of the two types of district farm was analysed for the rainfall, yield, and price and cost conditions that had applied for each of the previous five years 2004 to 2008 inclusive. This period had an average 5 year running mean of Growing Season Rainfall (GSR) 40% below the average which is one of the highest reductions in GSR in Southern Australia (Figure 1). This period was used because:

- This reduction in GSR is well beyond any forecast for climate change. Analysing and developing farm systems and businesses that could handle this extreme in 5 year period would provide the basis for confidence for farming in the area in the future.
- It presented a real period of yields and prices to which the farmers could relate. (The use of average years as an analysis process was not used because of the inability to pick up risk. This is indicated in the analysis).

**Figure 1 : 5 year running mean GSR for Birchip**



Input data was built for each of these 5 years, i.e. price received for grain and livestock, yields, and actual input costs for both the soil types. Farmers were involved in this process of setting up of appropriate farming systems, with allocation of appropriate inputs. This meant that the figures were as close as possible to an actual farm for the period.

#### 4.1.5 Selection of the Enterprise Mixes (“Farm Systems”) to Study

It is necessary to define the Farm Systems in terms of outcomes. The following requirements were set:

- Farming system must be adaptive and have the ability to capitalise on a good season.
- While making profit was the key objective, other issues such as sustainability and management were considered. Sustainability meant maintaining or improving the basic resource and for most farmers this is the soil. An example was with the stock. Feed was allocated to the stock operation in the dry years for an appropriate time. Management (getting the job done) was also considered. There was farmer agreement that management, especially timelines of operations such as seeding could cause at least a 10% difference in yields (This was not directly analysed but should be taken into account when farmers are looking at their own businesses).

Farmers wished to look at:

- Cropping with some stock (sheep)
- 100% cropping.

#### 4.1.6 Matching Inputs to Outputs

Maximizing profit through enterprise choice required the allocation of correct inputs to drive the system, both in the short and long term:

- Input reductions must have minimal effect on production.
- Justification of input levels was based on:
  - Farmer experience
  - Consultants experience
  - Local trial work
  - Outside trial work that can be meaningfully transferred to local area

As an example, the decision to move to a P (Phosphorus) replacement policy was based on:

- Farmer experience and observation was that there would be little effect on yield with low P applications around 5 units.
- BCG trials on similar soils have seen little or no P response above 5 units of P at seeding.

All levels of crop and sheep enterprise variable inputs were discussed and agreed upon by the group.

*Input details:*

- 4000 ha property – 2 family operation.
- P replacement policy – all crops received 5 kg of P at seeding.
- All crops received 1.5 kg Zinc Sulphate.
- Additional nitrogen (N) in the 2005 year.
- Trifluralin used on 42% of crops in sheep option scenario and 60% in the 100% crop option.
- All crops received broad leaf weed control.
- Glyphosate used at a rate of 1.5 L/ha on all crops pre seeding.
- All pastures either spray topped or grass removed.
- All break crops had grass removed
- All input pricing as it actually was for each year. i.e. fertiliser price was at the price paid in that year.
- The sheep operation comprised all ewes mated to crossbred rams with replacement ewes purchased each year. A separate analysis compared a self replacing sheep system. Profit (net cash flow) was similar, however the cost base for the self replacing system was lower and hence less risk. Detail of the sheep operation also included supplementary feeding and these costs were included each year depending on the severity of the season.

#### **4.1.7 Treatment of Debt**

In order to show the sensitivity of various farm systems, debt was imposed on the scenarios at 5 levels at the start of Year 1 (2004).

- 0 debt            97% equity
- 0.5 million      90% equity
- 1.0 million      82% equity
- 1.5 million      74% equity
- 2.0 million      65% equity

#### **4.2 Deciding the Scenarios for Analysis**

Given that farmers wanted to know the impact of heavy and light soils, and the crop and crop/livestock options, the following scenarios were selected for detailed analysis:

- Some sheep and crop, 50 % heavy soil type and 50% light soil type.
- Some sheep and crop, 100% heavy soil type.
- 100% crop on 50% heavy soil type and 50% light soil type.
- 100% crop on 100% heavy soil type.

These four scenarios were budgeted and run over the previous five seasons using actual input costs and prices, with inputs and yields as observed and agreed on by the farmers.

Proportions of crops/enterprises were based on:

- Risk
- Profit
- Sustainability
- Rotation considerations
- Management of grass weeds.

The system with sheep (Farming System 1) had:

- 30% pasture of which 60% sown for feed.
- 44% wheat and barley.
- 2.5% canola
- 10% cereal hay
- 13.5% lower input (opportunity) barley

The system with 100% Crop (Farming System 2) had:

- 46% wheat and barley
- 10% canola
- 20% peas
- 14% lower input (opportunity) barley
- 10% cereal hay

### 4.3 The Analysis - General

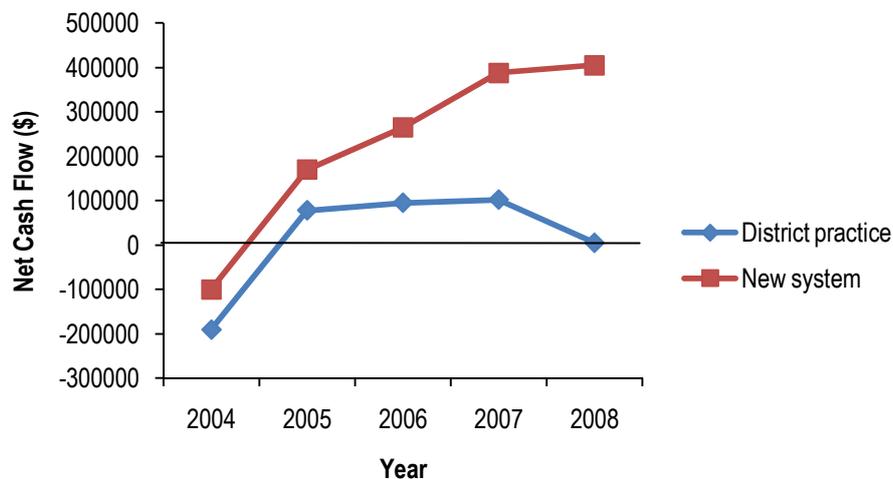
The financial analysis was based on current best practice from a profit point of view and therefore is the best outcome that could be achieved for the example farm over the 5 year period, without there being major management issues such as ryegrass resistance.

It should be understood that many farm operation decisions would not analyse their inputs to drive yield as thoroughly as was the case in this project.

This process of challenging the farm system and then allocating best practice inputs is important as major profit improvement can result from this approach alone.

This is demonstrated by the following analysis of a farm property on Eyre Peninsula over a 5 year period where a modified approach was used and then compared with normal district practice. The following graph shows the running cash flow position for an Eyre Peninsula farm at the end of each financial year.

**Figure 2 :** Analysis of Eyre Peninsula farm. Net cash flow over 5 years with starting debt of \$100,000



The \$400,000 improvement in cumulative profit over 5 years shown in Figure 2 was due to a range of changes:

1. More discretionary use of chemicals on all paddocks with some reductions in some paddocks
2. Move to a P replacement strategy without major yield impacts (this may not be sustainable in the long term)
3. Seeding rate reduction in heavy soils.
4. Enterprise mix change with more stock on the poorer cropping paddocks
5. Sown feed/opportunity crops.
6. Variable lease.

## 5 RESULTS

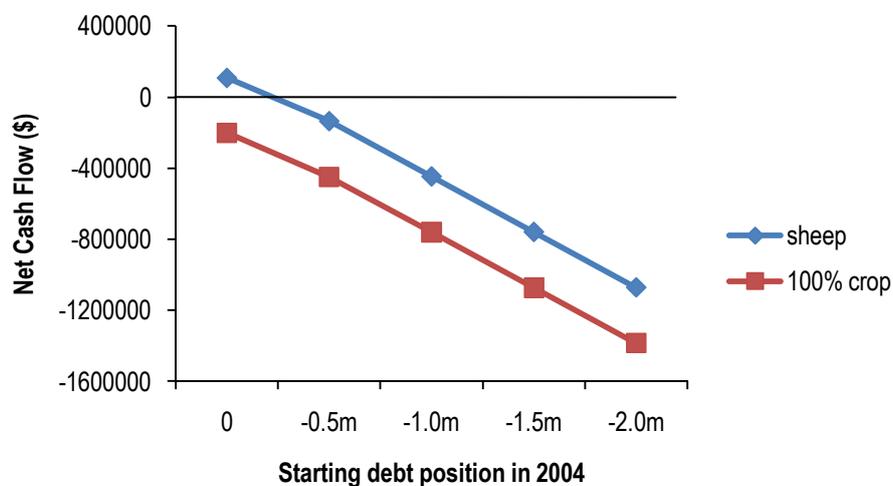
### 5.1 Farm Analysis of the Four Scenarios at Birchip (5 year period 2004-2008 inclusive)

#### 5.1.1 Farm with Heavy Ground only - 100% Crop vs. Cropping/Sheep Mix

In the last 5 seasons at Birchip (2004-2008), crop production from the heavy soil types has been very low. Under these conditions, the system that included sheep was more profitable than the 100% cropping (Figure 3). This indicates the higher risk of 100% cropping on these soil types over the five years. Over the period of 40% below average 5 year running GSR, to achieve any positive net cash flow, the business farming heavy country had to include some stock and have no or very little debt (such as owing a maximum of \$250,000 at the start, which would be 93% equity).

Debt levels have a major impact on farm profitability.

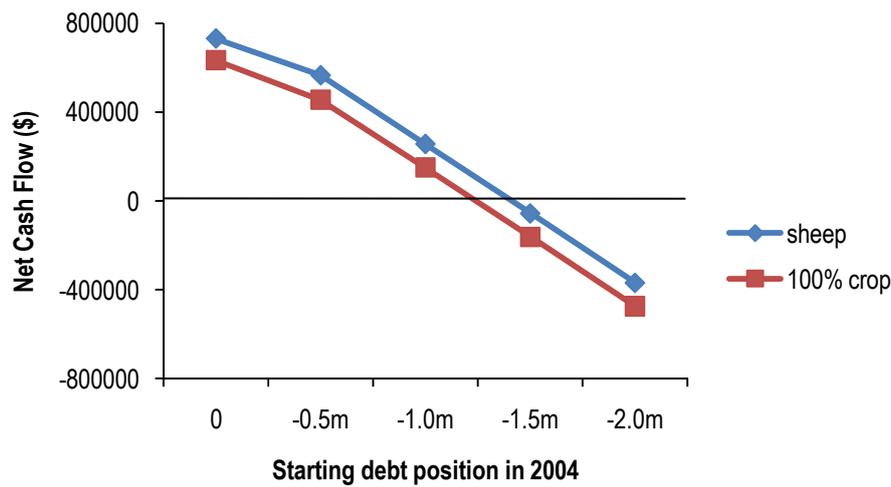
**Figure 3 :** Farm with 100% heavy soil. Cumulative net cash flow over 5 years with various starting debt levels



#### 5.1.2 Farm with 50% Heavy Soil, 50% Light Soil – 100% Crop vs. Cropping/Sheep Mix

In the case of the 50% light, 50% heavy ground there was little difference in the two farming systems (Figure 4). Positive net cash flows were achieved over the five years up to a starting debt level of \$1.5 million, which was 74% equity.

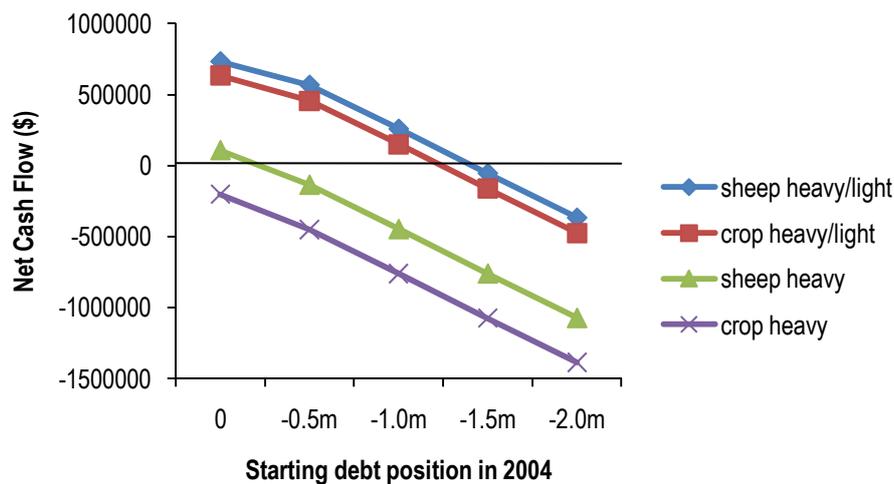
**Figure 4 :** Farm with 50% heavy soil and 50% light soil – Cumulative net cash flow over 5 years with various starting debt levels



### 5.1.3 Enterprise Mix to Soil Type

The cash performance of farm systems with all heavy ground and only cropping was by far the worst of all the systems, followed by the sheep and crop system on the heavy ground (Figure 5). There was a marked improvement in cumulative net cash flow where the farm comprised 50% light soil types and 50% heavy soil types, regardless whether this mix of soil types was 100% cropped or some sheep were included in the farm system.

**Figure 5 :** Enterprise mix on various soil types - 5 year cumulative net cash flow Combination of Figures 3 and 4.



### 5.1.4 Key findings on land capability/enterprise mix scenarios

1. On the farm with 50% light/50% heavy soils, enterprise mix had little effect on profitability.
2. On the farm with 100% heavy soils, enterprise mix was more important, having some sheep reducing risk, allowing a \$300,000 improvement in cumulative net cash flow over 5 years for all starting debt levels.

3. The difference in 5 year net cash flow between the farm with all heavy soil types and the farm with a mix of heavy and light soil types, with the same enterprise mix, was around \$1 million. In the drought years the Birchip light soils were still producing profitable yields while on Birchip heavy soils yields were very low or nil.

## 5.2 Machinery Costs and the Impact on Profitability and Risk

Because machinery is a major area of investment for cropping enterprises, the impact of the level of this investment on the 5 year net cash flow was examined

Once the farm system and performance levels had been agreed on, an appropriate machinery list was put together by the farmers. The farmers were taken through the process of allocating the plant required to run the farm efficiently. Once farmers knew the operation and understood the farm system their speed and agreement on the actual plant required was impressive.

A benchmark used as a guide to the investment in machinery on crop farms is investment in machinery per tonne of grain.

The machinery value at the start of the 5 year period in the Case Study was \$226 of machinery/tonne of grain produced.

### **Machinery example used to show the effect of different investments on overall profit**

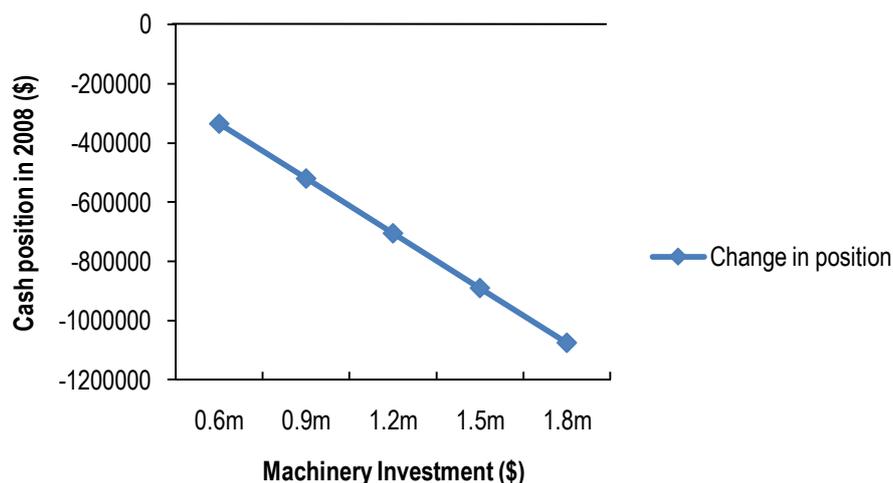
The effect on net cash flow of different machinery investment per tonne of grain produced was shown in (Table 1). Annual cost of owning machinery was 10% of the current value each year. (Ten percent depreciation of current value each year is acceptable as an average machinery depreciation for most farmers, although values can vary from 7% - 15%).

Different investment in machinery was analysed to show the effect on net cash flow.

**Table 1 :** Example of machinery value relative to machinery investment/tonne of grain. 100% crop/ heavy soil types only

Machinery Value	\$ machinery / tonne of grain
\$900,000	\$169
\$1,200,000	\$226
\$1,500,000	\$282
\$1,800,000	\$338
\$2,100,000	\$395

**Figure 6 :** Machinery ownership costs – 100% crop on heavy ground only with a starting debt of \$1.0M in 2004.



In the case study analysis, investment in plant used was \$226/t of grain, amounting to a total of \$850,000 in machinery for the sheep and crop option and \$1,200,000 in machinery for the 100% crop option. The different investments in machinery had marked effects on the finishing cash position in 2008. This is on the condition that the annual depreciation cost equates to a use of cash and that different levels of machinery did not have adverse effects on repair and maintenance costs, labour costs or on timeliness of operations.

**Table 2 :** Machinery investment and effect on net cash flow over a 5 year period

	Investment \$/ton of grain	Total Value	Finishing position after 5 years
Low to medium machinery	\$226/t	\$1,200,000	-\$848,636
Medium to high machinery	\$338/t	\$1,800,000	-\$1,219,375
<b>Difference</b>			<b>\$370,739</b>

The difference between low to medium plant investment (\$226/t grain) and medium to high plant investment (\$338/t grain) was \$370,739 over five years.

Low investment is not advantageous if efficiencies such as timeliness and quality of operation and repair and maintenance costs are adversely affected, and hence cash flow and profit are affected. Machinery investment is often traded against labour costs, but machinery investment is a critical consideration and requires a realistic approach when looking at financial comparisons between systems and farms.

### 5.3 Farm Business Resilience and Capacity to Handle Risk

The **inherent resilience of the business and the capacity of the operator to manage risks** are critical to survival and prosperity.

To assess capacity to handle risk, the case study analysis looked at the individual components that make up the farm business:

- Range of best enterprise mixes

- Allocation of variable inputs
- Farm capability (soil types and rainfall)
- Debt and its overall effect
- Machinery investment

The next step in the project was to look at different farm businesses and their ability to manage the 5 year tough period at Birchip.

Each farm business is different and trades many individual components against each other, i.e. machinery vs. labour, off farm income vs. labour, labour vs. leisure time. Whole farm business analysis must reflect the whole picture.

Two example farms (Farmer A and Farmer B) were used to show how farms that may appear similar can have different financial outcomes over the 5 year period.

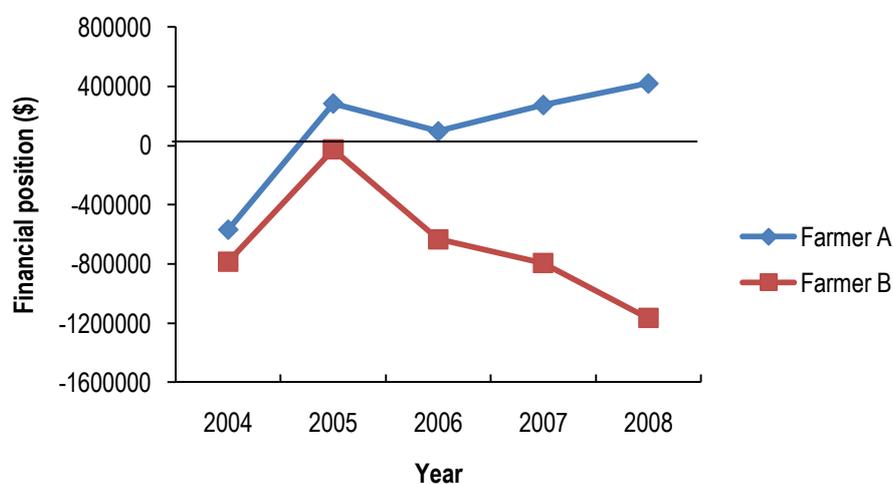
#### Farmer A

- 50% heavy, 50% light soil
- \$900,000 machinery investment
- \$48,000 off farm income
- Continuous cropping
- Debt of \$500,000 at start of 2004

#### Farmer B

- 100% heavy ground
- \$1,300,000 machinery investment
- No off farm income
- Continuous cropping
- Debt of \$500,000 at start of 2004

**Figure 7 :** Farmer A vs. Farmer B – Financial position at end of each year from 2004 to 2008.



In Figure 7 is a running cash flow for Farmer A and Farmer B over the 5 year period – 2004 to 2008. With both farmers practising best practice agronomy and both having 100% crop, the difference in net cash flow at the end of 2008 is \$1.59 million. This difference is considerable; given the only difference between the two farmers is land type, investment in machinery and \$48,000 off farm income. Their starting position in 2004 was the same at -\$500,000.

The major contributor to this difference in financial position is land type (66%), followed by off farm income (18%) and machinery investment (16%). This example was used to show that there are a number of financial aspects of the farm that build resilience. The analysis shows that just the off farm income and less machinery investment would contribute to a difference of \$540,000 in the two positions over 5 years.

In fact, the scenario of 100% crop on heavy ground was the only scenario that showed no improvement in the financial position over the 5 years even at zero debt at the start of 2004. For a business that is 100% crop on heavy soils to maintain or improve their financial position over the 5 years there would need to be some off farm income and/or a lower investment in machinery.

## 5.4 Purchasing of Land

Land purchase is usually the source of the largest borrowing that occurs, with machinery being the next highest investment. There have been some concerns that the use of current benchmarks does not pick up risk, especially those associated with large purchases such as land.

The following examples look at risk considerations and analyse the effectiveness of some current financial benchmarks. Two farm examples are used: Farmer C and Farmer D. The only difference between the two farms is Farmer C had 100% heavy land after purchase and Farmer D had 50% heavy land and 50% light land after purchase

### 5.4.1 Farmer C – 100% heavy soil

Farmer C is deciding whether to purchase land at the start of 2004 (800 ha at \$1250/ha at a cost of \$1.0 million). They currently owe \$500,000 (90% equity) prior to purchase. Debt level increases to \$1.5m after purchase.

The farmer completes a cash flow for **an average year** indicating a good net cash flow and profit.

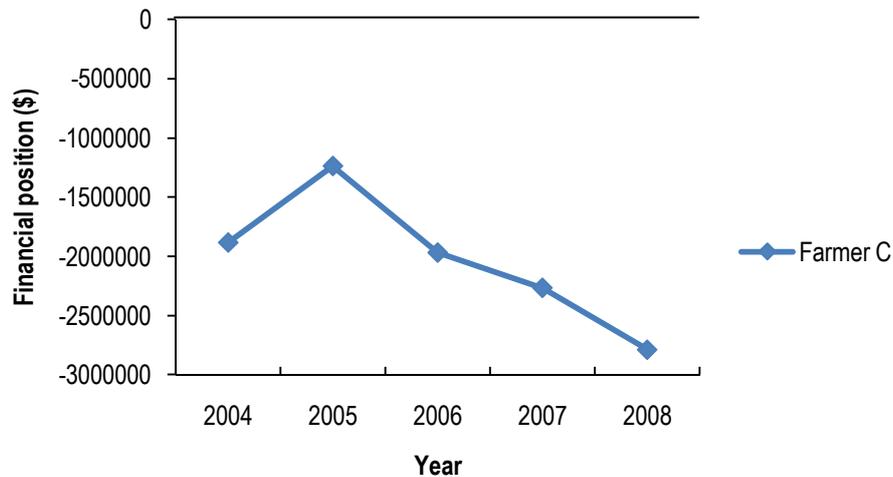
**Table 3** : Farmer C – Financial benchmarks at the start of 2004 after land purchase

Benchmark	Result after purchase 2004	Comment
Equity 90% prior to purchase	73%	
Machinery Investment	Less than \$226/ t	Good
Return on capital	7.4	Good
Peak debt/Gross income	1.32	Average
Times debt servicing	2:1	Average to good
Finance costs as % of GFI	13%	Average
Net cash flow after family drawings	23%	Very good

**Table 4 : Farmer C – Financial benchmarks at end of 2008**

Benchmark	Result after purchase 2004	Comment
Equity 90% prior to purchase	51%	Poor and needs attention
Peak debt/Gross income	2.34:1	Urgent
Times debt servicing	1.4:1	Average to poor
Finance costs as % of GFI	23%	Poor
Net cash flow after family drawings	13.5%	Average

**Figure 8 : Farmer C financial position at end of 2008**



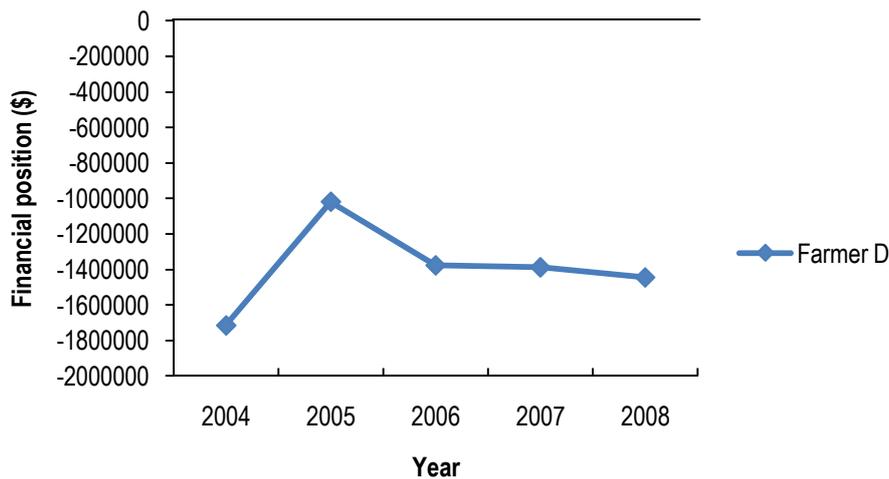
Start position 2004                   -\$1,500,000  
 Finish position end 2008       -\$2,800,000

The key benchmarks have identified a problem once the business is in trouble but did not indicate the business risks at the time of land purchase. Often when financial analysis is done average prices and yields are used. Birchip heavy ground in an “average” year is profitable but this style of analysis fails to pick the rapid reduction in yield on this soil type in below average years. This rapid reduction in yield has a major effect on profitability (and on survival).

**5.4.2 Farmer D – 50% heavy soil, 50% light soil**

In the case of Farmer D, with 50% heavy soil and 50% light soil after purchase (rather than 100% heavy soil as in the case of Farmer C) he would have maintained his position over the 5 years and been \$1.34 million in front of Farmer C although their initial benchmarks were similar at the start of 2004.

**Figure 9 : Farmer D financial position at end of 2008**



### **5.5 Using Net Cash Flow / Break - Even Analysis for Assessing Risk**

For major farm purchases the current benchmarks are not picking risk because budgets are completed on an 'average' year. Some farms are more prone to a drop below average than others as indicated when comparing Farmer C (all heavy soil) and Farmer D (50:50 heavy/light soil).

With current benchmarks not identifying risk, there is a requirement for a different approach.

This approach must achieve some basic outcomes.

1. Reflect the state of the whole farm business. Because the farm business is a complex interrelationship of compromises, it is the overall result (net cash flow) that is important.
2. Show the sensitivity of the farm business to a range of seasons to give the farmer an appreciation of risk.
3. Pick differences between enterprises and their individual sensitivity to a range of seasons relative to the soil capabilities.

To capture the above requirements it is necessary to analyse the farm business over different rainfall decile years. Each farm has different soil types that have different yield outcomes per crop at various rainfall deciles. An example is canola yield at Birchip drops more rapidly than wheat in lower decile years. This result is more pronounced on the heavy soils than the light soils. Once the farm analysis is run over a range of rainfall decile years a breakeven point can be calculated.

This analysis is done over one year and covers:

- The whole farm business (whole farm approach)
- Sensitivity to a range of seasons (deciles for GSR)

As with other complex issues it was found that example farms most easily explained this concept.

To evaluate break - even analysis, three farmer examples were used to look at the sensitivity of each farm operation to a range of below average seasons. These farmers were compared to assess decile break - even as a risk assessment tool.

### Farmer C

- 100% crop
- 100% heavy soil type
- \$1.2 million machinery investment
- \$1.5 million debt

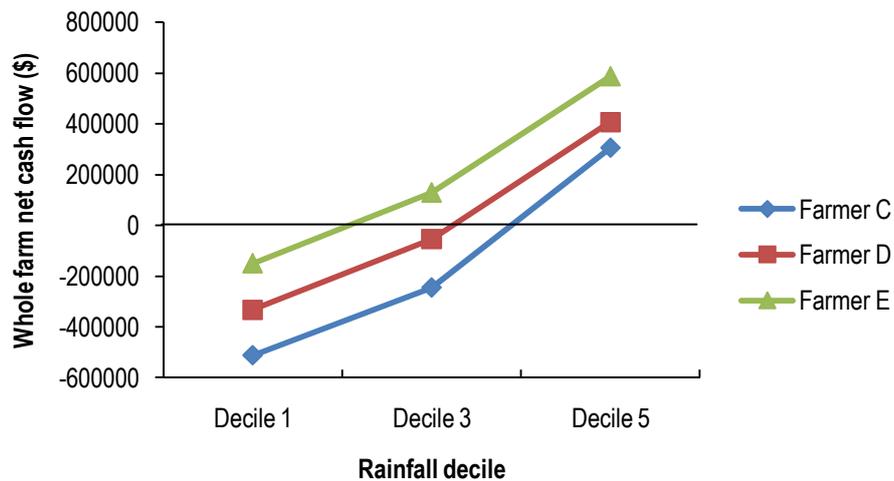
### Farmer D

- 100% crop
- 50% heavy /50% light soil type
- \$1.2 million machinery investment
- \$1.5 million debt

### Farmer E

- 100% crop
- 50% heavy/50% light soil type
- \$0.9 million machinery investment
- \$0.5 million debt

**Figure 10 :** Sensitivity of farm businesses to a range of seasons – Whole farm net cash flow over 1 year



**Table 5 :** Sensitivity of farm businesses to a range of seasons – Whole farm net cash flow over 1 year

Farmer	Farm net cash flow over 1 year			Break even
	Decile 1	Decile 3	Decile 5	
Farmer C	-512,794	-245,526	306,080	Decile 4
Farmer D	-332,692	-53,911	407,152	Decile 3.2
Farmer E	-149,859	128,922	587,681	Decile 2

The growing season rainfall (GSR) decile break - even is capturing the whole business. Birchip had an average of decile 2 over the 5 year period 2004-2008. The break - even graph indicates that Farmer E, continuously cropping with 50% heavy and 50% light soil, with low debt and lower machinery investment will maintain financial position at a decile 2. This is a resilient farm business.

Consequently each farm in each district will have a different decile break even, depending on its mix of soils, debt, investment in machinery etc. Standard benchmarks are of little value in this situation.

GSR decile break - even analysis can aid farmers in making the more risky decisions. A good example is taking on lease land. The new cash flow will incorporate all the costs of the lease. When this new scenario is run over different rainfall deciles a new graph is estimated to compare with the existing operation. If the additional lease increases the GSR decile to break even then the farmer can easily see that it is a higher risk strategy. A decrease in the GSR decile break - even indicates the lease is lowering his overall risk.

## 6 SUMMARY OF OUTCOMES

The results of this work are similar to those of a recent study on Eyre Peninsula (Doudle *et al.*, 2009).

1. *There was no general best bet farming system but a range depending on factors of each system on labour, soil type, rainfall, skills etc. (it is not just what you do but how well you do it).*

**At Birchip**, on the 50% heavy/50% light soil types, there was little difference in returns (and risks) between total cropping and mixed cropping/livestock systems. But on the 100% heavy soil types with a run of average decile 2 seasons, the sheep enterprise was important in generating returns and managing risk.

2. *Managers are progressive but intuitively know when to take measured risk and when to be conservative.*

Not all farmers have this skill or they have it to differing degrees. An example of this is the decision about the level of investment in machinery.

**At Birchip**, the level of investment in machinery was an important component of the resilience of farms during poor seasons, especially on the total cropping systems, and especially on heavy soils.

3. *Equity does not always have to be high but improved equity and business strength is necessary before major expansion and technology adoption. Strong emphasis on having cash as an important component in any new purchase. A reserve of borrowing capacity is essential.*

**At Birchip**, low debt, especially in the 100% heavy soil type scenario was the key to maintaining the financial position in the last five years.

4. *Understanding the sensitivity of changes to farm systems and investments with volatile seasons is essential to achieving profitability and managing risk. Traditional farm business analysis techniques often do not pick up risk.*

A simple GSR decile break - even can be calculated by combining well-calibrated APSIM modelling and farmer experience (including management) to set the input data for yields for each farm business to identify the levels of critical variables. A simple program would allow a farmer to assess the risk position of projected annual cash flows.

**The Birchip project** also demonstrated how using GSR decile break even analysis can aid farmers in making the more risky decisions.

5. In terms of the farmers, whilst there was no formal evaluation of learning outcomes, the feedback clearly indicates that they now have a far clearer understanding of their farm business and its drivers and will use the outcomes of the project in their farm planning in future.

## 7 FUTURE DIRECTIONS

The farmers benefited from the solid discussions on farm systems and then matching appropriate inputs. Both process and outputs were important to the farmers. In the short term there is immediate gain from this process in terms of better understanding the interrelationships in the farm business.

### 7.1 Group Structure

Farmer comment on the number of participants in workshops was ‘the smaller the better’. Six to eight farm businesses is an ideal number. **An essential issue is that the workshops run in a series and participants need to commit to attend them all.**

Each group needs a coordinator that accesses information resources where required. One coordinator should stay with a group from start to finish giving continuity.

Independent consultants are the key to driving the program. Their inclusion is important for two reasons - their validation of agronomic inputs is very important, and they are in a position to run further groups into the future. One consultant should stay with a group from start to finish giving continuity.

If the workshops can be simplified, a training session for consultants may be all that is needed and therefore only one consultant would need to be present at the workshops.

Therefore the suggested group structure is:

- Farmers 6 - 8
- Consultant (1 or 2)
- Local Extension/Research (1 )
- Co-ordinator (Champion)

### 7.2 Using a case study farm

Advantages: Very effective basis for group discussion and allows debate about farm systems and inputs to systems without becoming personal. Using a case study farm which uses an individual farm to provide the structure and financial relationships but is based on figures provided by the group rather than the individual farmer is not as confronting for that farmer or the group as a whole.

Disadvantages: Care needs to be taken that the case study farm is as close as practicably possible to an actual district situation. It must have local ownership. Taking an actual farm but rebuilding it with the group achieves both.

### **7.3 Farm Capability (Major Component of Workshop 1)**

Any financial farm systems analysis must have accurate information in this area otherwise the results will be skewed. The GRDC are investing a considerable amount of money into water characteristics for different soils. The analysis indicates the sensitivity of the farm profit to this factor alone.

Advantages: Without detailed APSIM analysis we relied on actual yields from previous seasons on actual soil types. The group agreed on yields/year/soil type. We knew the rainfall deciles for those years which gave the basis for the decile decide tool (yield component). This approach gave ownership by the group for the yields rather than based on computer modelling. While there is no reason why APSIM cannot drive yield data per crop per soil type per GSR decile year, its use is initially as a confidence building exercise for the farmers to be able to use in the future i.e. APSIM simulation is carried out and compared with actual over previous years. If APSIM is close, farmers would have confidence to use it to simulate other seasons. If it is not, then information being fed in to APSIM or APSIM itself will almost certainly need modification, or alternatively, actual data used.

Disadvantages: At Birchip, there were two distinct soil types i.e. Birchip heavy and Birchip light. This may not be as clear in other districts and hence agreement within the group by farmers may be less clear. Some thought between the soil scientists is needed to whether land capability/soils can be grouped to maybe at most 4 and hopefully 3 production zones. Although the soils are different their end result (yield) of soils in each group are often similar. Experience with yield mapping is that 3 zones are plenty to accommodate yield variation.

For example: Dune swale country 3 zones - top of sandhills, mid slope, heavy flats

The biggest problem in this area is the over complication of land capability/soil types which would restrict the effectiveness of the first workshop. Keep it simple.

### **7.4 Farm System Discussions (Major Component of Workshop 2)**

This involves making the decisions about which enterprise mixes/farm systems farmers wish to analyse.

Advantages: It was well received by the farmers with in depth thinking about the options based on such things as:

- Adaptive nature of the system. Ability to handle an above average year as well as below average years.
- What management is required including feed lotting of stock and how much feed is required on hand.
- Crop types and how to reduce the risk of crops such as canola.
- Sheep systems.

Disadvantages: Open discussion on farm systems requires a principle consultant with good practical skills in this area. There is an opportunity to bring specialized consultants in for specific workshops with either a principle consultant ensuring continuity or the coordinator taking on this role.

## **7.5 Allocation of best inputs for farming systems. (Major Component of Workshop 2)**

This involves allocating the inputs to each of the enterprise mix/farm systems selected in the previous step. Allocating the right level of inputs is an essential process in determining best farm system

Advantages: This included all inputs on the farm and allowed discussion on such things (in the case of weed management) as herbicides used, rates, sequencing, seed treatments etc – how important each is and the best products to use. It allowed farmers to get independent discussion on inputs into their current farm system and the new farm system (if required). A justification process was used to ensure input allocation was as accurate as possible. The discussions had immediate financial spin offs.

Disadvantages: This discussion needs an agronomist/consultant with local experience to run it. Individual products were discussed as was their requirements which gave farmers information they could transfer to their own farm operations. With discussions being totally independent, the deliverer of this information must also be aware of vested interests that do occur with local agronomists giving advice to farmers.

## **7.6 Financial analysis of the farm system (this occurs between Workshops 2 and 3)**

Advantages: Financial analysis of the case study farm works well – it is important for farmers to see how their decisions on the best farm systems and allocation of best inputs affects profitability. It provides demonstration and discussion on how debt has an overriding effect on the farm system.

Disadvantages: Good financial analysis requires specialized experience. Rather than finding a principle consultant that has both agronomic and financial skills it would be easier to find consultants with good agronomic skills and out source some of the financial work i.e. the data to form the basis of a case farm and or individual farms is processed at one location. This would ensure the analysis is correct and consistent across all groups. The GRDC are at present funding the development of a web - based financial tool which should be tied into the case study analysis (also to be discussed later under individual farm analysis).

## **7.7 Farmer Review of Financial Analysis (Workshop 3)**

Farmers review their financial results and are involved in discussions on what part of the business is affecting their financial and risk position the most. Plans for how the farm business is taken forward can then be developed. Some farmers will complete this without further outside help but others will need one on one advice. Farmers will need direction as to where they can obtain that competent one on one help.

Farmers are encouraged to revisit this analysis on an annual basis and use it as an opportunity to upgrade best practice. With any major changes farmers will need to revisit these each year otherwise learning is not complete. If the analysis is a simple process consultants could upgrade their clients on an annual basis.

## **7.8 Individual Farm Analysis to Build the Decile Breakeven and Rules of Thumb**

Individual farm analysis of the farmers in the group was not done but should be considered. Experience from the profitability workshops on EP was that farmers appreciated using their own figures from the farm business. Ideally the key outcome would be farmers using the

budget framework to build their own decile break - even for their business and developing their own rules of thumb.

There would be many advantages in having a centralised capacity to do this data analysis either through the GRDC web - based tool or other means such as trained consultants. It would provide:

- Consistency of approach to an accepted standard
- Highly presentable outcomes
- Collate all farm data which in itself is very useful
- More continuity where more than one consultant could work with farmers over time
- Greater adoption – history shows that without support most farmers do not use decision support tools.

Further discussion on what data is required to drive effective analysis is required. If financial analysis is left to the consultants a wide variation of financial interpretation will occur with an ongoing debate on correct process – as has happened for years. This has led to inconsistent messages to farmers and differences of opinion between consultants which have undermined the usefulness of programs. It is time to decide and act on consistency between approaches

## **8 OTHER ISSUES**

### **8.1 Rules of thumb**

Farmers break down complex decision making to simple 'rules of thumb'. These rules of thumb are used in all aspects of the farm both agronomically and financially. For example, farmers on Eyre Peninsula who have successfully managed the run of dry seasons often have a simple 'rule of thumb' for the business side of the farm. An example is one farmer who has average yields of 1.8 t/ha but prepares a cash flow using 1.2 t/ha. This rule of thumb is building a GSR decile break even into the business. There are many other scenarios which could be explored.

This area of reducing complex business decisions to a simple rule of thumb needs further development.

The GSR decile break even is a tool to aid farmers to make a 'rule of thumb' for their individual businesses. There may be more than one rule of thumb on the financial side.

It is important to realise that farmers are not required to have advanced financial skills to run a successful farm business if the appropriate rule(s) of thumb is used for each area of management decision.

### **8.2 Farmer Mentors**

The use of successful farm business managers as mentors to other farmers has also been considered. They were not used in the Birchip group but the idea of using farmer mentors is worth consideration. How farmer mentors are used is important. Holding individual farmers up as farm business mentors can have problems for they are often open to peer criticism. The better use of farm mentors is to just have them as part of the group without any official position. Their influence within the group in general discussions would still be very useful.

### **8.3 Accountants and Banks**

Accountants and bankers have long been recognised as key influencers on the farm business but little has been done to bring them into the loop. If GSR decile break - evens are determined to be an appropriate and simple tool for financial analysis then should not the concept warrants extending more broadly. Banks and accountants would need to be made aware and also look for cash flow and risk analysis as an additional information source for lending/financial advice.

This is a whole new area of activity (and challenge) which needs to be explored.

## **9 REFERENCES**

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