Improving farmer capacity to manage profitability and risk

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Take home messages

- *Profitability and risk are driven largely by a combination of soil type, associated enterprise mix, level of debt, machinery investment and land purchases.*
- *There is no best bet farming system. Successful farming depends on factors within each system such as labour, soil type, rainfall, skills etc.*

Background

Farmers have been seeking guidance for years as to how they can better fit the various components of their farm systems together to improve overall profitability and management of risk.

In the past, a great deal of attention has been given to agronomic considerations. As a result, there has been a concentration on varieties, rates, seeding dates, row spacing and similar types of work. Similarly with livestock, work has concentrated on topics such as grazing crops and animal genetics. While all of this work has a place, farmers are now seeking more advice as to how to fit the various technologies together to best improve their business. That best effect no longer means only production: profitability, reduced inputs and management of risk are increasingly recognised by farmers as major factors affecting the performance of their businesses.

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 decisions, but do not make them for the farmer or adviser.

To date these budgeting tools have not been widely used.

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

One response by GRDC has been to support a pilot project with BCG using a whole farm, case study approach which brought together past experiences and activities and involved farm business experts, consultants and farmers.

Aim

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

The pilot was conducted through BCG. The Birchip area in the southern Mallee of Victoria is characterised by a mix of heavy and light soils and had just experienced an extended period of the lowest growing season rainfalls on record.

Method

Setting up the study group

The study group consisted of six farmers and Fiona Best, (a BCG staff member with skills in farm business); John Stuchbery, (a local consultant); Bill Malcolm, (Associate Professor from the 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 sufficient).

Setting up the example Farm

The use of one actual farmer as the basis of analysis revealed itself very early as having problems, primarily related to privacy. It was therefore decided to build the case study farm by using the actual farm as the base but with input of data from the group. This gave ownership of the farm data (including both fixed and variable costs) to other members of the group and ensured that the 'farm' was representative of the district.

Deciding the land capability/soil type

In the Birchip area, there are two distinct soil types: Birchip heavy and Birchip light 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

Selecting the seasons to study

The operation of the two types of district farm was analysed for 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 five year running mean of Growing Season Rainfall (GSR) 40% below the average which is one of the highest reductions in GSR in southern Australia. 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 a five 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).

Input data was built for each of these five years i.e. price received for grain and livestock, yields, and actual input costs for both the soil types. Farmers were involved in the process of setting up appropriate farming systems. Suitable inputs were allocated. The resultant figures were as close as possible to an actual farm for the period.

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 systems must be adaptive and have the ability to capitalise on a good season.
- while optimising profit was the key objective, other issues such as sustainability and management were considered. 'Sustainability' referred to the capacity to maintain or improve the basic resource: for most farmers this is the soil. An example was with stock. Feed was allocated to the stock operation in the dry years for an appropriate time. Management (getting the job done) was also considered. The consulting farmers agreed 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 consider:

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

Matching inputs to outputs

Optimization of profit (outputs) 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
- external 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 which suggested little effect on yield with low P applications of 5 units or less
- BCG trials on similar soils, which have recorded 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 5kg of P at seeding
- all crops received 1.5kg Zinc Sulphate
- additional N in the 2005 year
- Trifluralin was applied to 42% of crops in sheep option scenario and 60% in the 100% crop option.
- all crops received broad leaf weed control
- Glyphosate 1.5L/ha was applied on all crops pre seeding
- all pastures were 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 inputted at the price paid in that year
- the sheep operation comprised of all ewes mated to crossbred rams with replacement ewes purchased each year. A separate analysis compared a self-replacing sheep system. Detail of the sheep operation also included supplementary feeding and these costs were built into each year depending on the severity of the season.

Treatment of debt

In order to show the sensitivity of various farm systems, debt was imposed on the scenarios at five 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

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 data (input costs, yields, prices).

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% was 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

Analysis - general

The financial analysis, based on current best practice from a profit point of view, is the best outcome that could be achieved for the example farms over the five year period (apart from major management issues such as ryegrass resistance.)

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

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

Outcomes

The outcomes of the project supported the earlier findings of a related study on Eyre Peninsula in South Australia. Some of these findings and the comparisons with the Birchip pilot study were:

1. There was no general best bet farming system, but a range depending on factors within each system such as labour, soil type, rainfall, skills etc.

   At Birchip, on properties with 50% heavy and 50% light soil types, little difference in returns (and risks) between total cropping and mixed cropping/livestock systems was observed, even with a run of very poor years. But on the 100% heavy soil types, the sheep enterprise was vital in preserving viability and managing risk over the recent run of very poor seasons.

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 is an important component in any new large 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 a solid financial position in the last five years.

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

   Using a combination of farmer data and management experience, and tools such as APSIM for the various soil types, the inputs required for different yields were identified. A growing season rainfall break-even analysis based on the levels of critical variables for each farm business was then calculated.

   While this approach requires further refinement, it does allow a farmer to assess the risk position of projected cash flows.

   In this way, the Birchip project demonstrated how using GSR decile break-even analysis can aid farmers in making the more risky decisions.

In summary

This pilot project explored an approach using a small group comprising farmers, consultants and a farm systems group representative 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 they could analyse their own businesses and make adjustments.

The analysis highlighted that at Birchip both profitability and risk are 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 seasonal expectations and to convert these into rules of thumb.

It is vital to recognise that this pilot project met its purpose in testing a hands-on approach and provided a number of guidelines for other groups embarking on this area of work.

The outcomes from this project are being used to develop similar approaches involving groups in the GRDC funded Low Rainfall Collaboration Project on Eyre Peninsula, Upper North of SA, the Mallee, Central West NSW and BCG.

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