

A farmer's perspective - Farming in an uncertain climate

Andrew Polkinghorne

Lock, South Australia

Abstract

Management strategies for farming in an uncertain climate are discussed for a mixed farming enterprise on the Eyre Peninsula in South Australia

Background

We farm 3,080 arable hectares at Lock on central Eyre Peninsula in South Australia. Lock is located approximately 600 kilometres north west of Adelaide by road – somewhat less by air. The farm was established as a partly cleared 310 hectare holding in 1966 and it has expanded and developed from there. Our annual average rainfall is 340 mm and the average growing season rainfall from April to October is 255mm (see Figure 1). Summer is normally hot and dry and the winters are mild, although there can be some frost, especially in dry years. In recent years there has nearly always been some frost damage to crops in late spring, especially to peas.

Soils are mostly grey calcareous sands (see Figure 2) with some limestone outcrops and the pH is 8.7 in water and with up to 60% free lime soil acidity is not likely to be a problem! There is some dune swale system with red mallee soils and siliceous sand over clay on the rises. The dune swale system represents about 20 % of the farm soil types

Currently 83% of the farm is in crop, mostly with cereals, 15% is annual medic based pasture and 2% perennial pasture in the form of winter active lucerne. One third of the medic based pasture is sown with oats or cereal rye that can be either pasture or opportunity crop. Crop yields range from 0.3 t/ha through to 3.8 t/ha for wheat and barley with the average being 1.6t/ha. Mostly the yields are in the 1.0 to 2.2 t/ha range.

400 merino ewes and their following stock are run, which means that there are usually 8-900 sheep on the place. They are run as a self replacing merino flock and occasionally a prime lamb sire is used.

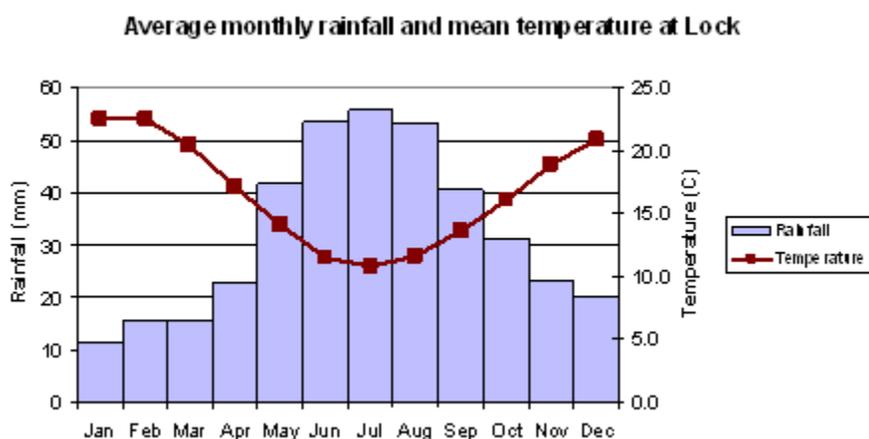


Figure 1. Average monthly rainfall (mm) and mean temperature (°C) at Lock, Eyre Peninsula, SA, 1900-2007.

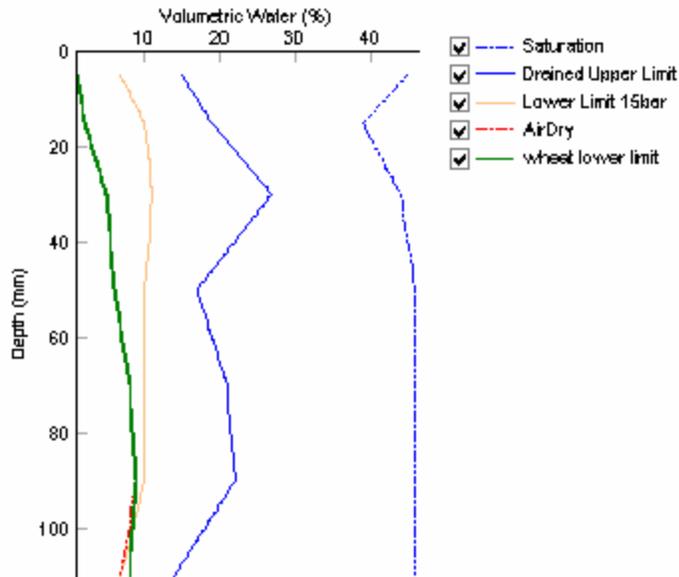


Figure 2. Soil profile for a typical grey calcareous loamy sand at Lock, Eyre Peninsula, SA. Plant available water capacity is 123mm.

Current Management Strategy

The main aim has been to maximise profit and to grow the business. This has led to an enterprise mix of intensive cropping and a small livestock enterprise. This enterprise mix has been reasonably successful until 2005, but still characterised by profits in average and better years and significant losses in the poor rainfall years. In 2005, even though wheat yields were relatively high at 2t/ha for the farm average, prices were less than \$150 per tonne and hence a lot of grain was produced for less than the cost of production (including overheads). In 2006 and 2007 we had our lowest and second lowest growing season rainfall on our records of 106 and 139 mm.

Yields in 2006 averaged 0.6 t/ha on cereals and in 2007 1.0t/ha. Peas and canola were poor at 0.1 and 0.2 t/ha. Were it not for summer rain in these years, the results would have been significantly worse. Compounded by some poor marketing decisions (in hindsight) in 2007, some significant losses have been incurred. This sequence of events has sharpened our focus on risk and significantly increased our understanding of risk. In addition, the current huge increases in input costs will change the way we farm in the future because our up front intrinsic risk of growing a crop has increased, even though the same or better gross margins are achievable.

The ratio of variable costs against equity is becoming very important because if one is borrowing working capital in a low land value area it is easy to lose enough equity in one or two poor years to find the banks aren't interested in taking on further risk. As input costs rises, this becomes a bigger issue. Banks lend to farmers with more emphasis on the strength of their balance sheet than on potential cash flow. As working capital becomes a higher proportion of total borrowings, the business is placed in a more risky position. In farming, the risk of losing working capital is much greater than the risk of losing capital that is invested in assets such as land. This means that farming businesses that operate in a variable climate and rely on borrowing to fund working capital are at greater risk. To demonstrate how that works, consider the following:

Land Value per hectare

\$850

Core Debt at say 80% equity

170

Working Capital at

160

At peak debt the equity may fall to 61%. If that working capital is lost due to a poor season it is possible that the business may drop equity to 43% at peak seasonal debt after only one very poor year. This is why increasing up front input costs are risky.

Future Management Strategies

Our aim will be modified to optimise profit by reducing exposure to seasonal risk and still to grow the business.

We will do the simple things:

- Grow cereals, sow early using press wheels and knife points. In the past, the second week of May was considered early, we now will sow after ANZAC day on 25th April, but realise that this is increasing frost risk.
- Plant more lucerne to utilise out of season rainfall, to provide nitrogen, to provide a break crop and possibly and to run more sheep.
- Use the drought tolerant seed varieties where available, manage nitrogen application as the season unfolds, use variable rate fertiliser and seed applications, and will continue to maximise stubble retention within the limitations of having a livestock enterprise.
- Develop more passive income by increasing off farm investment and we will reduce our reliance on borrowed money. This will mean a reduced rate of growth.
- We have had a policy of using fixed interest rate products and we will continue to do so.
- Reduce cropping intensity because as cropping intensity rises, variable costs per hectare of crop tend to rise due to increased numbers of hard to control weeds and more crop nutrition is required. This is because herbicide resistance becomes more of an issue and we have to move to chemicals and combinations of chemicals that cost more. Also in crop nitrogen requirements rise. Remember that we have limited break crop options that may allow better weed control through crop rotation
- Recognise that the best agronomic practice is not necessarily the least risk option.
- Refine our decision making models, eg nitrogen and phosphorous application, sowing times, area of crop sown, confinement feeding of sheep, stubble cover and carbon retention.
- Ignore seasonal forecasts until their accuracy significantly improves.

Table 1 is an example from our farm of how one can compare farm enterprise mix and adjust the outcome for risk by attaching a probability to the reliability of the result. Wheat following a break crop has the highest Gross Margin (\$185/ha) and a high chance of reaching this outcome (85%). However a break crop has the lowest gross margin (\$80/ha) only a 50% chance of achieving this and the highest costs (\$160/ha). Sheep have the second lowest GM (\$91/ha) but a 95% chance of achieving this and low costs.

The summary clearly shows that in 2006 the best potential result in the options considered was half pasture and half crop. Importantly the cost to achieve that result was much lower than the other options.

There are many conflicts between sheep and cropping and when they are run together, compromises are often made that mean a less than optimal result for both enterprises. We have shifted to phased cropping and phased pastures. This allows us to utilise the benefits of a mixed enterprise farm without the disadvantages. We have less compaction and wind erosion in the cropping paddocks and we can control the grazing and wind erosion better in the pasture paddocks. Early feed production is much better which means that we can be more flexible about the paddocks that are cropped and if it is opportune to graze stubbles for weed control or clean up of grain residues then that can be done.

The same exercise for this current season (Table 2) shows a different result because the relative returns from cereals and sheep have changed.

Summary

- Climate variability makes us more conservative in our decision making.
- Research and Development has a key role to play in identifying the way forward.
- Technology has kept us in the game to this point and it will be a necessary part of adapting to the future.
- The ability to be flexible and consider all options in the farm enterprise mix will be important to provide the robustness of the business.
- Off farm investment will play a key role in moderating the direct effects of the on farm impact of climate variability.

Table 1. Example of risk management for a farming property at Lock, SA.

Evaluation of Enterprise Mix and Risk

| | | | | | | | |
|--------------------------|-----------|---------------------|--------------------|------------------------------|---------------------|-----------------|----------------------|
| Area of farm | 3080 | | | | | | |
| Year | 2006 | | | | | | |
| Current Rotation | GM | Enterprise % | Weighted GM | Probability of Result | Risk Free GM | Costs/ha | Weighted Cost |
| Wheat on break crop | 185 | 12.5% | 23 | 0.85 | 20 | 138 | 17 |
| Wheat on pasture | 157 | 12.5% | 20 | 0.8 | 16 | 131 | 16 |
| Wheat on stubble | 120 | 16.0% | 19 | 0.7 | 13 | 150 | 24 |
| Barley | 126 | 24.0% | 30 | 0.8 | 24 | 144 | 35 |
| Break Crop | 80 | 19.0% | 15 | 0.5 | 8 | 160 | 30 |
| Sheep | 91 | 16.0% | 15 | 0.95 | 14 | 55 | 9 |
| | | 100.0% | 122 | | 94 | | 131 |
| Total Crop Option | | | | | | | |
| Wheat on break crop | 185 | 20.0% | 37 | 0.85 | 31 | 138 | 28 |

| | | | | | | | |
|------------------|-----|--------|-----|------|----|-----|-----|
| Wheat on pasture | 157 | 0.0% | 0 | 0.8 | 0 | 131 | 0 |
| Wheat on stubble | 120 | 30.0% | 36 | 0.7 | 25 | 150 | 45 |
| Barley | 126 | 30.0% | 38 | 0.8 | 30 | 144 | 43 |
| Break Crop | 80 | 20.0% | 16 | 0.5 | 8 | 160 | 32 |
| Sheep | 91 | 0.0% | 0 | 0.95 | 0 | 55 | 0 |
| | | 100.0% | 127 | | 95 | | 148 |

Half Crop Half Pasture

| | | | | | | | |
|---------------------|-----|--------|-----|------|----|-----|----|
| Wheat on break crop | 185 | 0.0% | 0 | 0.85 | 0 | 138 | 0 |
| Wheat on pasture | 157 | 25.0% | 39 | 0.8 | 31 | 131 | 33 |
| Wheat on stubble | 120 | 12.5% | 15 | 0.7 | 11 | 150 | 19 |
| Barley | 126 | 12.5% | 16 | 0.8 | 13 | 144 | 18 |
| Break Crop | 80 | 0.0% | 0 | 0.5 | 0 | 160 | 0 |
| Sheep | 91 | 50.0% | 46 | 0.95 | 43 | 55 | 28 |
| | | 100.0% | 116 | | 98 | | 97 |

Summary

Area of farm 3080

| | | | | | | | |
|------------------|------|------------------------------|---------------------|----------------------|------------------------------|-------------------------|---------------------------------|
| Year | 2006 | Weighted Gross Margin | Risk free GM | Weighted Cost | Return on \$ invested | Total Var. Costs | Total Farm GM after risk |
| Current Rotation | | 122 | 94 | 131 | 72% | \$404,666 | \$290,814 |

| | | | | | | |
|------------------------|-----|----|-----|------|-----------|-----------|
| Total Crop Option | 127 | 95 | 148 | 64% | \$455,224 | \$292,261 |
| Half Crop Half Pasture | 116 | 98 | 97 | 101% | \$298,760 | \$300,993 |

Table 2. Example of a risk summary for 2008 for a farming property at Lock, SA.

| | | | | | | | |
|------------------------|------|--------------------------------------|-------------------------|--------------------------|----------------------------------|-----------------------------|---|
| Area of farm | 3080 | | | | | | |
| Year | 2008 | Weighted Gross Margin | Risk free GM | Weighted Cost | Return on \$ invested | Total Var. Costs | Total Farm GM after risk |
| Current Rotation | | 218 | 170 | 159 | 107% | \$489,997 | \$525,123 |
| Total Crop Option | | 239 | 179 | 176 | 102% | \$543,312 | \$552,398 |
| Half Crop Half Pasture | | 185 | 155 | 114 | 136% | \$350,350 | \$476,900 |