

Maximising production using climate risk information management service during 2002

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The property grows cereal, pulse and canola crops, and also grazes prime lambs, wool and cattle.

The Hill family has farmed at Tarlee since 1874. The area enjoys an average rainfall of about 450 millimetres with records going back to 1881. During that time, farming practices have changed dramatically. In the early days, the country was tilled using horses to prepare for cropping. A very wet April in 1889, with 240mm of rain, started considerable erosion in our area and other parts of the state. The following year was even wetter and the erosion from the previous year was enhanced with massive gully erosion taking place. The evidence of this can still be seen to this day in many places around South Australia and possibly other locations in Southern Australia.

Improved pastures and less cropping on our property in the 1950's and 1960's helped to stabilise and improve our farming soils. A move to stubble retention in 1969, and the burning of very few stubbles since, has led to greater increases in productivity.

Up until recent years, forward forecasting has been speculation and it is with great interest that there are many models available to assist management of intensive agriculture today. How they are interpreted and used is the next challenge.

The productivity of the property has also been steadily increasing by other means:

- The introduction of new agricultural chemicals to control weeds
- New more competitive crop varieties with increased yields
- Larger machinery

- Better fertilizer inputs
- The adoption of no till [direct drilling] since 1986
- Time of sowing crops
- Crop seeding rates
- More use of soil, deep nitrogen and leaf tissue testing information
- Post application of crop nitrogen
- Involvement with crop and livestock production groups
- Time of lambing and marketing livestock
- Time of shearing
- Increased use of production consultants
- More emphasis on seed placement and what happens behind the air-seeder
- The adoption of management decisions arising from the Climate Risk Information Trial conducted in 2001/2002.

Because of the trial work done in 2001/2002 and the pending El Niño forecast at the end of 2001, I started to put into place many strategies to help minimise risks and to maximise production using the information I had as a guide to assist my decisions. The information as it was updated during 2002 was constantly evaluated to help with my deliberations. As a result of my involvement with the CRIMES Trial 2001/2002 the property is now subscribing to the Decision Support Forecasting Service by email.

As a farmer operating in the driest state of Australia, I often wonder what it would be like to operate in an area of the world where precipitation was never lacking. I can hear you all thinking, he must be dreaming! Perhaps I am, but as a producer of food to feed Australians and others around the world, I am always striving to maximise production any way I can. Sure as the sun comes up each morning we will continue to have seasons of excess and times of drought.

Farm production has come a long way since this country was first settled, but for most producers in this country, agriculture would be impossible without water for livestock or crops. Some have an abundance for irrigation and turn it on when required, at a cost, but the vast majority of us do it *à la natural* and gamble on the heavens above, opening when the seasons permit.

Farming where our family does, one hour north of Adelaide in SA, we are probably in one of the more reliable cropping/livestock areas of SA. Once again I can hear some of you thinking, what would this bloke know about droughts! Ok, you might be right, but with 450mm average rainfall over the past 122 years, don't worry, we can have our drought times. My second to last year at secondary school 1967; we had 210mm and that year not even our seed was reaped. There again, in 1993 we had 796mm which, being double our average, was also a cropping disaster, but in hindsight could have been a bonanza if managed to greater financial advantage with better climatic information.

Most farming areas of Australia showing a hint of reliability are coming under incredible pressure to perform financially with the pressure of:

- increasing land values
- urban sprawl
- the wine industry
- Agroforestry
- the increase in land values and productivity has caused increased demand to buy or lease land.

The Tarlee area is not immune to this pressure, with land values in the \$4000-\$5000 per hectare for dry land farming .As a result of this pressure,

maximising production with what we have is always on one's mind.

When invited to take part in the climate trials in 2000, I was keenly interested to learn of any smoke and mirrors and other tricks the forecasters have at their disposal to predict climatic events which may affect my property's productivity.

These trials proceeded again into 2001 and all was going to plan with adequate rainfall and productivity at a record level for the state. Our own area had many 4-6 ton crops, with some even hitting 7 ton/ha, but towards the end of 2001 alarm bells started to ring when the trial data provided by the National Climate Centre was predicting the formation of an El Niño pattern. At this stage I instantly decided to put up my conservative barrier, to watch and listen to all predictions and to visit 'bom.gov.au' on a regular basis.

Ok, so we live in a reliable area, but with our high costs of production at about \$250 /ha for most crops and close to that figure again if you wish to lease country in this area, \$500 per ha before you start to make any profit is fairly challenging and not for the faint hearted if you want to remain profitable.

Hence, when the hint of a dry spell or drought gets mentioned, certain defence mechanisms tend to be triggered in one's mind. The first major rain for 2002 was 57mm in mid January and not knowing when the next would come, I got up at 5am from holidays and drove two hours home to get machinery ready to prepare pasture ground for canola. The following days were in the 40's so the time window for action was short for hard setting red clay soil.

April was rainless and the El Niño factor was really starting to be talked up with a very high probability of below average rainfall for the next 3 months. On April 30th we started sowing new pastures dry, with the dust so bad I had to stop frequently to find directions. I took a punt that we may get some rain sometime.

By this stage, and in consultation with my crop consultant, I decided to reduce the cost risks and reduce the average of some of the higher risk crops. Beans, with a very low tolerance to dry and windy springs, as well as a high dependence of

fungicides if winter happened to be prolonged and wetter than forecast, were decreased in acreage.

Feed barley was bought into the rotation to reduce my dependence on beans, canola and malt barley if the season turned really foul. These crops are all very profitable in a normal year, but have higher production costs than feed barley. I punted on the fact, due to the pending drought, that feed grain prices would go through the roof and they did.

As stated in my pre-conference notes, we place high importance on stubble retention and direct drilling of crops to try and maximise water use efficiency. Some paddocks in recent years had to be burnt because of snail or resistant ryegrass problems. To retain our stubble mulch, no burning was carried out and all crops were direct drilled into heavy stubbles from the previous record year. Since we started direct drilling in 1986, only 10mm narrow points are used to a depth of 30mm to avoid no more soil disturbance than necessary. A diamond patterned prickle chain (levelling device) is towed at all times to firm the soil around the seed and to conserve any moisture. Because of the climate prediction and the possibility of sowing into minimal rainfall, we also towed rubber-tyred rollers behind the airseeder to really seal the seed bed and reduce all evaporation at sowing. The whole rig is 55m long and is not designed to be transported too far on public roads.

The whole idea behind this sowing concept is to maximise seed-to-soil contact, to enable a good fast germination even in dry years. Big shears and rough seed beds are just not acceptable in a dry environment, as I saw on a trip to NSW during the drought with my cropping group.

As all of this sowing is happening, one has to be constantly following the markets and market trends domestically, as well as what is happening globally with production and grain prices. Along with the pending drought and thoughts of how accurate the climate information we were trialling was, forward selling was cautious. Seeding time saw canola contracts hovering around \$400 finishing close to \$600 at harvest, malt barley \$220-\$400, feed barley \$170-\$300, and wheat \$180-\$300. With these massive variations, and not knowing how the season was going to finish, one had to be very careful how much was

committed to contract. Failure to fill contracts can be very costly, especially last year if one had to find the physical grain as well as to wash out the contract. We did very well out of some contracts and lost money on others when compared to the actual market at harvest time. Any grain that wasn't contracted was sold for cash at harvest for some of the highest prices ever seen. Hardly any grain was put into the pools last harvest, and that earned us a considerable bonus as most of the pools closed down early, much lower than the peak prices at harvest.

Anyhow enough of marketing, but it is fair to say that one person's loss is another's gain when it comes to supply and demand, which is very relevant in a drought year.

The season for us unofficially opened about the 20th of May with 49mm over 3 days - wow! Seeding commenced in earnest and was completed by mid-June with the odd breaks for rainfall or waiting for weeds to germinate. Because of earlier decisions seeding rates were conservative as well as the amount of urea applied at seeding. With a fair dependence on Durum in our operation the use of adequate nitrogen is vital to hit the target with protein but we decided to cut back and see how the season developed. Some extra nitrogen was applied later but only half of our usual amount. In conjunction with deep nitrogen testing and leaf tissue analysis we were confident of hitting targets with a dry finish.

The season progressed reasonably well in our immediate area and a survey I had to send into the climate trial on September 30th stated that we were at about average conditions with the various crops expected to yield 2.5-5 ton/ha if we had 10-20 mm of rainfall that week. The rain didn't come and so the true potentials started to slip daily. A week later, I went for a drive west of our area and within 30 minutes of home, saw dead crops and wildlife, the closest I have ever seen to home. It made me realise how lucky we were.

October rain amounted to 30mm over 9 days, with 12mm of that falling on the 30th. The crops, big and bulky in September, somehow hung on pretty well, going on to yield about half of the September estimates. We had 250mm of growing season rainfall which we were very grateful for, considering how disastrous conditions were for the majority of Australia. Our area was one of the

most favoured in the country and other small pockets in SA fared reasonably. Total grain production was down by 60-70% on 2001 in SA.

Livestock play an important part in our operation, producing prime lambs for domestic and export markets. Last year was trying, but feed quality was very good and stock did well. We even took advantage of poorer lambs from less fortunate areas to fatten for good margins on any excess feed we had. When feed is short we are always aiming to provide the very best for our prime lambs and all dry sheep are treated as wethers in dry times. We also modified our lambing times last year when hearing of El Niño as we double mate 20% of our flock to produce milk lambs.

As I have inferred during this presentation, our area was not dealt the savage blow that much of Australia was and for this I am very thankful. But even so with our high cost of production, I was really thankful to be armed with climatic information tools to help me maximise production in an El Niño year.

Weather forecasting is still regarded with suspicion by many as to its accuracy, and for those not involved with a lifestyle based around the weather and precipitation, their biggest concern is 'What will I wear to work tomorrow?', or 'I hope it doesn't rain tomorrow as I drink champagne, dipping in my pool' and I could go on. There are times with forecasting when one wonders have the forecasters opened a window today and actually looked outside to see really what is happening? But as systems become more sophisticated, I feel more confident with forward projections, and how much trust I have in making management decisions sometimes based around spending hundreds of thousands of dollars. In saying this, one has to take into account how unpredictable weather patterns can be, even within local districts.

In conclusion, the climate information available to me last year was very valuable, but there still remains uncertainty in one's mind then and today, how watertight is this data. Predicting is a real science and it concerns me that what we have at our disposal today, may be ok for your immediate area, or say 100 km's away, which is not good enough if you miss out on rain and the neighbour doesn't. He will say the forecast was accurate and you will say it was ...!

The email service provided by Melissa Truscott for the trial and subsequently as a paying user, has been very user friendly, clear and precise. Workshops to explain the workings of the programme and how to operate have been useful. Phone contact is always available from the team for clarification of any issues.

Some of the tools available from the Climate Risk Team include:

- **SOWHAT** early season rainfall vs final wheat yield
- **STIN** yield predictor
- **SPLAT** optimum nitrogen rates for maximum yield and protein economic probabilities for 5 season types
- **PYCAL** calculates:
 - stored soil water
 - potential yield
 - accumulated rainfall
 - water use efficiency
- **FLOWERING CALCULATOR** calculates:
 - flowering dates based on sowing dates
 - frost risk windows
 - high temperature windows
- **El Niño** - the boy child [Spanish] -central and eastern Pacific Ocean warmer
- **La Niña** - the girl child -central and eastern Pacific Ocean cooler
- **AUSTRALIAN RAINMAN** calculates:
 - relationships between the SOI and rainfall
 - relationships between early season rainfall and growing season rainfall.

To get the best out of this service, one has to provide adequate, accurate data and then use all of the information as a management assistance tool. Gut feel and previous experience still are essential to running a farming business today but I feel with the improving data becoming more sophisticated, we will all be able to manage climate risks better into this century.