Cotton Systems – "Keytah" (Moree)

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INTRODUCTION

The brief given for this presentation is to relate what we have done within our specific cotton farming system to address issues and problems. The following list broadly covers the direction given for this presentation:

1. The original system and it's problems
2. What has been changed within this system and why
3. The outcome: costs and benefits, successes and benefits.
4. Reflections
5. Where to next?

A quick history of the farm and me. I have been associated with "Keytah" for eleven years and have been the general manager for the past eight. The property now comprises 26,300 hectares and produces a variety of winter and summer crops as well as up to 6,000 feeder cattle per year. Irrigated cotton has been grown since 1988. There is 10,500 hectares of irrigation area. The largest area of cotton grown in one season was 7,500 hectares producing 72,000 bales of cotton.

THE ORIGINAL SYSTEM AND ITS PROBLEMS

The catalyst to look into the farming system we were running was economic viability. Both the farm and the district were averaging less than 7 Bales per Ha on a long term basis. With increasing costs these yield levels were not economically sustainable. We began by identifying the poor areas of production and the causes of these production losses and then set about correcting the problems in both the short and long term. This was done on a large scale, initially, and resulted in an immediate number of changes to the farming system that yielded some very pleasing results. The critical issues that were discovered were:

1. Severe compaction and hard pans in particular areas (caused from past practices of irrigating pastures for cattle).
2. Nutritional problems identified through soil testing (extremely low zinc levels and concerns with phosphate levels)
3. Poor irrigation design in particular areas (again caused from original irrigation design criteria developed for pasture irrigation).
4. Poor irrigation scheduling and timing of irrigations became a function of the problems listed above.

CORRECTING THE PROBLEMS – SHORT TERM

A number of management decisions were made immediately to help lessen the impact of the problems discovered.

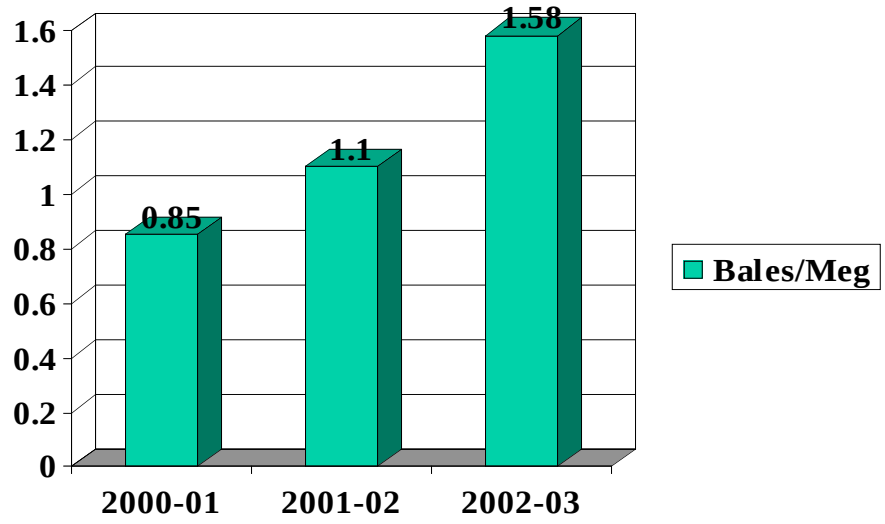
1. Indeterminate varieties were selected for the identified problem areas. These varieties were not as susceptible to stresses imposed through the poor function of the overall system.
2. Irrigation intervals were shortened and we started looking for better tools to assist us with irrigation scheduling that could become paddock specific.
3. Once the worst of the compaction zones were identified, the immediate remedy was to deep rip those areas with a dozer and apply gypsum to them.

The first year results showed a definite move in the right direction. The historically poorest yielding areas of the farm were brought up to the average of the better areas and the overall farm average was taken from below 7 Bales per Ha to 7.83 Bales per Ha in one season.

CORRECTING THE PROBLEMS – LONG TERM

Additional management decisions were made to help correct some of the problems discovered over the longer term. These included:

1. A long term nutrition plan that attempted to increase, rather than just maintain, both zinc and phosphate levels. The development of liquid zinc products allowed for this to be achieved simply and economically in the one pass.
2. A re lasering plan was organised that would, in time, allow for most fields to be re surveyed, re designed and re lasered to ensure a better and more even field was able to be irrigated with ease and efficiency.
3. Many of the older fields were designed originally for large through the bank pipes and had very little slope (1 in 2,000) and were also over a kilometre in length. All of these fields were split into two and the slope increased to an average level of 1 in 1,200.
4. Plans were also developed to rotate the fields to cereal crops (mainly wheat) on a more regular basis. This has continued over the past five years from a point of two years cotton and one year of wheat to a 'one in one out' scenario now.
5. A conscious effort was made to research new and better ways of irrigation scheduling. Through this process we ended up trialling and then purchasing a number of capacitance probes (C Probes) and went about the process of learning the intricacies of using them.
6. An additional benefit that came with the C Probes was the ability to begin to make some crude measurements of water use efficiency. Once we could measure it we were able to concentrate on developing ways of improving it. Ultimately we learnt that improving water use efficiency actually produced two massive benefits for the farm. Firstly, we used less water per hectare per season and, therefore, had more water for following crops and seasons. Secondly, and surprisingly, we found we grew **more cotton** because we used **less water**. A win win that deserves continued focus in the future.



WHERE TO NEXT?

Water: As mentioned above, water use efficiency is worth spending more time on to further enhance both productivity gains and natural resource sustainability. We are only just starting to look at ways in which we can begin to mitigate the losses from our water delivery and storage systems. The technology is available to both measure and manage these sources of water loss.

Yield: It was once mentioned to me that *"Yield is King"*, and in terms of increasing the returns to the bottom line, it still is (although water is quickly catching up!). A comment extracted from The Boyce and Co & CRDC Comparative Analysis – "*Extra Yield Costs Very Little To Produce"* is very true and is fundamental to our approach. We have had many areas within fields producing in excess of 17 Bales per hectare (almost 7 Bales per acre); it should not be seen as ridiculous to assume that we can get the whole farm to these levels in the near future.

Farming Systems: New technologies are allowing greater flexibility in how we operate the farming system that we control. GMO technology, for example, could soon allow us the possibility of no till (or extremely minimum till) irrigated cotton. With the development of Roundup Ready Flex and new and improved ways of supplying nutrition to irrigated crops we have the ability to follow a wheat crop with a cotton crop and only traffic the fields to plant and harvest! In today's world of increased fuel prices and difficulties in finding labour as well as the known benefits of controlled traffic and minimum till these systems need to continue to be developed.

Technology: Is something that has become fundamental in the farming environment in order to remain economically viable. Its adoption and use has become as fundamental as applying fertiliser or monitoring crop growth! The new technological tools that are available to us in the farming environment can be mind numbing in both number and variety. Some can be simple and easily adopted and used, whilst others can be sophisticated, hard to understand and almost scary! One thing is almost guaranteed (besides death and taxes!), and that is that technology will continue to develop and advance at an astonishing rate. Consider a statement made by Ray Kurzweil – "*we won't experience 100 years of progress in the 21st century it will be more like 20,000 years of progress (at today's rate)"*. The difficult thing about the continued development of technology is trying to filter out the best items to adopt to gain the greatest benefit. We need to do everything possible to stay in touch with new developments. Run trials, talk to neighbours, utilise extension staff, attend field days, come to events like this one, etc, etc, as it will become a necessity to continue to adopt new technologies to stay economically viable.

IN CONCLUSION

In his address to OUTLOOK 2004, Dan Banfield noted: *The world is increasingly becoming one market, which is receptive to innovative and differentiated products delivered through effective supply chains. It's a market also driven by the pursuit of reduced costs and competitiveness.*

This can be interpreted to indicate the need for Australian farmers to continue to be world leaders in innovation not just consumers of other people's technology. Efficiencies in our production system will be key to our competitiveness and we will need to innovate throughout the chain from production to product. Australia has a unique cropping environment which offers unique opportunities and sensitivities. We must manipulate these to our greatest advantage to build our competitiveness through production efficiencies, environmental responsibilities and differentiated products.