

Back to Basics - CTF in Central West NSW

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BACKGROUND

I have had extensive experience in providing agronomy services to the growers in the central west over the past 7 years. This presentation is based on personal experiences and is directed at dry land grain growing.

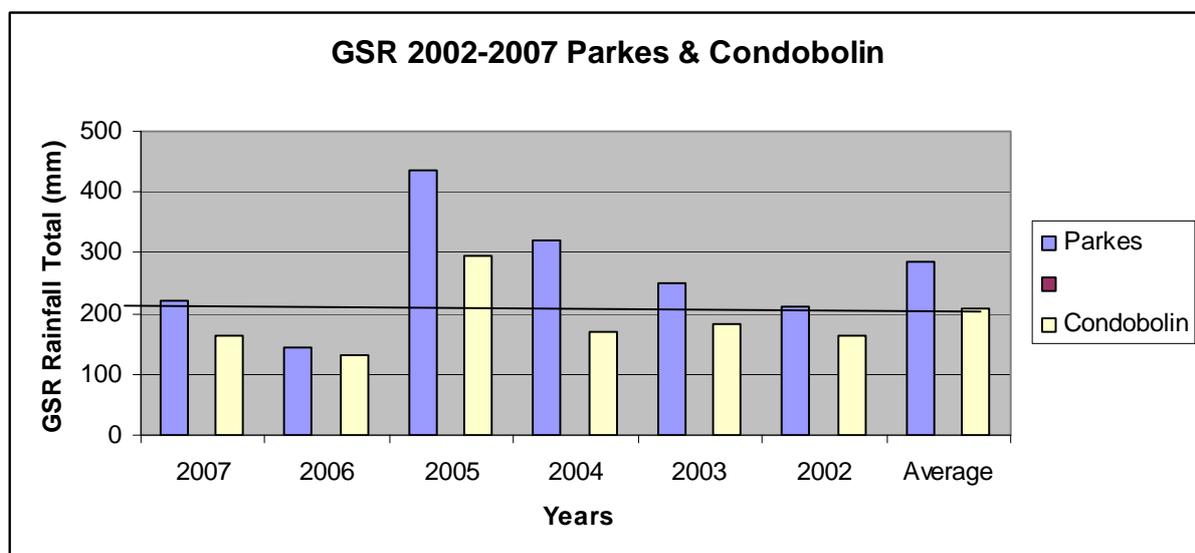
INTRODUCTION

Central West NSW is a traditional mixed farming area with wool production being the predominant up until the last ten years. Like many areas throughout Australia the Central West has moved towards grain production and is seeking more efficient methods of grain growing as costs increase and rainfall appears to have decreased. The central west grain growing region is cereal based with wheat being the dominant cereal grain grown for the high protein noodle market. Barley is also grown and has increased in recent seasons because of its reliability and relatively low cost of production, however its primary benefit is the stubble and its ability to produce large stubble providing essential ground cover. In the past 20 years break crop shave been introduced with canola being the most successful and more recently pulse crops are being used for varying reasons.

The area is divided by the Newell Highway of which differs greatly 100 kms East and West of this point. The average annual rainfall varies from 928mm in Orange to the East and 400 mm in Condobolin in the West.

The soils in the central west are predominantly red brown earths (Red Chromosols) and to lesser degree heavy clay Vertisols, which include some sodic soils. Both of these soils are fragile and in particular the red brown earths as they are not self repairing clays like some northern regions of NSW. Therefore they are more likely to be affected by compaction from both stock and machinery and possibly take a longer time to recover.

The soils are typically low in organic matter and low in most major nutrients not including Potassium, Calcium yet on a whole are reasonably adequate in trace elements.



Graph 1 – Comparison of Growing Season Rainfall in Condobolin and Parkes from 2002-2007
(Source- BOM website)

TILLAGE MANAGEMENT

The Central West like many areas in Australia has observed a rapid change in tillage management in the past ten years from full cultivation to minimum or no tillage. From a twelve month fallows to a continual cropping regime.

For many traditional farmers the compromise of a mixed farm was far too great. They have moved into a full cropping regime, or even in mixed farms have isolated cropping areas from stock, with the benefits very hard to quantify - factors such as:

- Yield increase/mm of rainfall
- Improved soil structure- moisture infiltration
- More efficient weed management
- Reduction in fuel usage
- Greater production/Ha under moisture deficient conditions
- Retaining stubble for moisture conservation

STUBBLE IS EVERYTHING

As in many areas in the dryland cropping areas of Australia ground cover is the lifeblood of our system and every effort should be made to preserve this. With drought conditions beginning in the Spring of 2001 and continuing through and including now it has never been more evident the value of stubble cover in reliable and marginal cropping areas. The challenge appears to be having the ability to start the process off and maintaining it in the initial years. In 2006 (<100mm GSR) the difference of harvesting a crop and not at all was generally directly related to stubble/ground cover.

The challenge is also highlighted under a break crop scenario such as canola or lupins, where their crop residues are so low the following crop yields can be compromised through a lack of stored soil moisture and exposed soil.

Barley stubble to date (generally) has been the most efficient stubble because of its volume and ability to break down quickly due to the favourable carbon to nitrogen ratio. Planting a break crop into a barley stubble is the preferred option of many growers (in a no till, and CTF system) because of the stubble loading effectively providing cover until the following wheat crop.

In the past five years the use of guidance technology has increased dramatically and could well be in the range of 30-40% of growers using some form of guidance. Whilst many growers do not practice Controlled traffic there is a large percentage who have matched their machinery with the ability of changing into a CTF system. The adoption of Controlled traffic may be as low as 5-10% of growers and growers become increasingly aware of technology advances practices such as controlled traffic will only increase. At this current stage the lack of independent data regarding the benefits of controlled traffic farming in the Central West is evident.

Farm sizes in the Central West on a whole would be smaller than many areas with the average cropping size being an estimated 600 Ha, with the cost of recovery of moving into a CTF system is relatively unknown in the region, we can support the concept with some good theory and provide data from other regions and soils yet don't appear to be able to support that with local data.

Change is something we do not deny in agriculture, yet the facts remain that the average age of the Australian farmer in 2001 was 58 and if you can speak to the average 58 year old and ask him to mark the AB line, check to see how many satellites are available and nudge the machine 5cm to the left, throw the data card into the control box and enter the variable rates into the computer, you could probably understand it if he looks at you a little puzzled. Another fact is that 1% of Australian farmers produce 25% of our food and fibre, which in summary means it is not a matter of how many people adopt new technology for production purposes, it is a matter of the people who adopt the technology maybe on a larger production scale than the average producer.

Many growers in the Central West and possibly in Australia would not have any idea of what CTF agriculture is, simply because they do not understand and in the local area, the lack of data or hard black and white evidence is not readily available. There are many reasons why growers in the Central West of NSW are not using Controlled Traffic Technology and they include:

- Lack of knowledge- Very little independent data and local contacts for information on the benefits of CTF.
- Cashflow- Years of drought have left people with little surplus to purchase new equipment.
- Soil Type- Soil types on the slopes in particular can vary several times in the one paddock.
- Information- Supporting data is also hard to source. For example the Impact of stock on soil structure could it be a myth? Or is it more of an issue than we really think, or how compaction affects our yield or moisture holding capability.
- Terrain- Sloping paddocks, trees and contour banks and water courses make it difficult to establish long 'runs' for machinery.
- Economic benefit relative to area- With many growers farming a small area the cost of recovery from moving to a CTF system is seen as being too great. It is very rare to find a grower farming less than 800 Ha on controlled traffic.
- Visual Issues- Like many issues if we cannot see a yield difference visually from problems such as compaction it may be considered a problem that can be dealt with in the future.

ADVANTAGES OF CONTROLLED TRAFFIC

With many people adopting at least a guidance system it is more evident that the transition into CTF will evolve quite rapidly as the advantages are too numerous to deny. Many people joked about driving a tractor from the office 10 years ago but the reality is with CTF you could be very soon. As many of my clients moved into Auto-Steer for the 2008 sowing season, I have never seen so many people so fresh at the end of a day's work. Most of the time during sowing they will ask you what the news is, now they can tell you before smoko because they have just read all of the morning papers whilst driving the tractor.

One of the biggest issues facing agriculture today is the lack of skilled labour and adding to that is the cost of that labour if you can find it. Believe it or not but technology like CTF will help many growers use unskilled labour to operate machinery, as their concentration levels are not centred on many different functions and fatigue may not become as a bigger factor as previously experienced.

As the world demands more food it seems we as an industry need to produce more food for less, under reduced moisture conditions and less land coupled with soaring input costs, the need for efficiency has never been more evident.

CTF has already shown benefits for grain growers in varying forms such as:

- Reduced overlap - lowering input costs/Ha.
- Nitrogen application - allowing for timely application of both liquid and granular products.
- Fungicide application – with increasing disease pressure and variety breakdown, late fungicide applications are becoming an annual event and the crop damage is minimised with fixed tram lines is greatly reduced making the fungicide disease strategy proactive rather than reactive.
- Herbicide application - resistant weed management allowing late herbicide applications for escape weeds or late germinating weeds, or crop topping or desiccation without compromising crop safety or yield.
- Precise seed and fertilizer placement - inter row sowing is becoming a debate within itself. Hopefully using the relevant technology to inter row sow or sow next to the previous year's fertilizer band in the case of a failed crop. Seeding is possibly the most important operation of the year and precise seed placement can mean many dollars/Ha in profit if germination is uniform and timely.

- Creating own sowing window - a term that is used currently, however can be accurate given adequate stubble cover and moisture retention. Timely sowing could possibly be the best investment growers make in a growing season. Sowing into moisture at the correct time can be very beneficial in terms of profit/Ha.
- Less compaction - compaction is one of the big drivers of CTF throughout the world. Locally the header would have to be the most responsible for creating compaction issues at harvest time. Visually it is not uncommon to see header tracks two years after a wet harvest under a non CTF farming system.
- Reduction in driver fatigue - a common comment is growers are not as tired after a day's work through simply not steering their tractor. By not steering their tractor, the operator can also be concentrating on the tool bar and monitoring any issues associated with seeding depth and machine blockages etc.

CONTROLLED TRAFFIC IN THE FUTURE

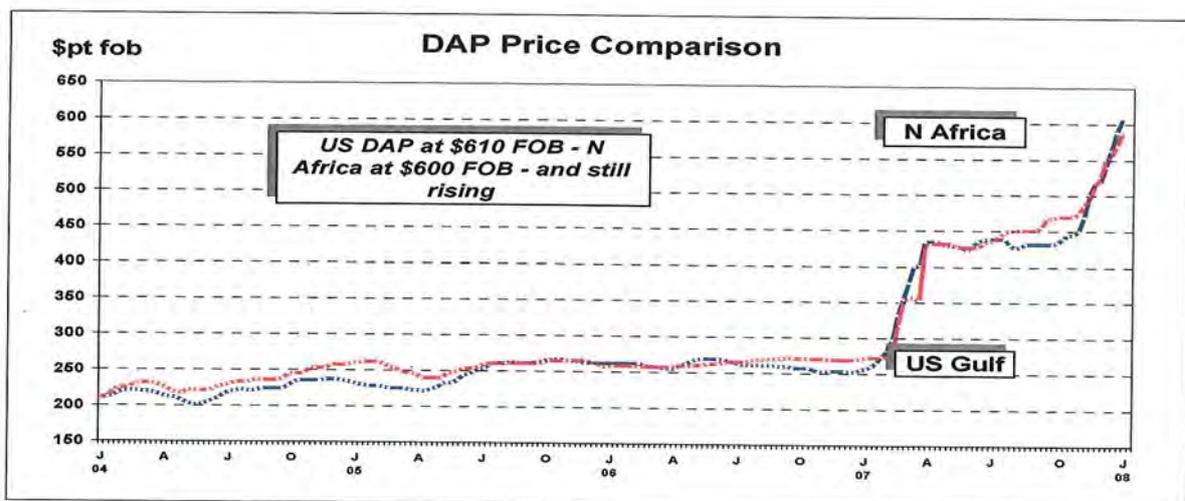
Because guidance based technology has decreased in cost in recent years, the adoption of controlled traffic will undoubtedly increase into the future. With apparent cost savings to be made, along with the many other benefits of CTF, there are many different scenarios as to why the practice will benefit not only from a soil compaction issue.

As previously mentioned, many people have their machinery ready to adopt CTF technology and with the majority using 1 m Auto steer, the jump will not be that great.

As technology advances and more local data becomes available, it will be more evident the value of CTF technology. The need to produce more yield/ha on potentially less rainfall requires a higher management skill coupled with the strategic use of inputs whilst avoiding crop and soil damage from machinery traffic.

With the cost of inputs rising so rapidly the return relative to investment has changed significantly, this places pressure on grower cash flow and a more strategic input use will be required with emphasis on applying inputs on an as needed, and a just in time basis. For example a 100kg/Ha of urea can cost anything up to \$100/Ha as opposed to less than \$50/Ha only a matter of 5 years ago.

If nutrient prices continue to hold their upward trend, many growers will be forced into seeking alternatives to current practices or refining their current application program through the use of yield and grain quality data and also variable rate sowing and application techniques.



Graph 2 – DAP Price Comparison from 2004-2008 (Source Market News April 2008)

The functions for which CTF could be used in the future in the Central West of NSW

Nutrient application - strategic macro and micro nutrient application during the growing season as yield, moisture, and nutrient measurement command a higher level of input - Paddock Monitoring and Imaging - using NDVI crop imaging to determine crop growth, stress points and areas of high yield or low yield potential to be used for variable rate nitrogen application.

Variable rate application - utilising costly inputs (fertilizer) more efficiently, obviously allocating money to areas that are consistently high profit areas and reducing inputs on areas that are consistently low performing.

Disease anagement - to help protect yield quality and promote uniform grain size the use of fungicides late in the season are becoming a standard practice in medium to high rainfall zones.

Weed resistance management - late application of herbicides for either desiccation or strategic weed management.

Weed seeking technology - the obvious savings of using weed seeking technology with Glyphosate at \$10/litre and also promoting other more expensive chemistry for summer weed control will reduce the reliance and possibly overuse of Glyphosate into the future.

CONCLUSION

With the cost of inputs rising so rapidly in recent years coupled with the variability in climatic conditions, growers are needing to focus on maximising their investment with a profitable return. CTF technology allows the decision making process to be more simplified and precise, whilst minimising the effect on soil structure.

The number of growers to adopt the technology may be minimal in the Central West currently, however it will certainly change where practical for the individual.

The benefits are obvious - it's a matter of making the cost benefit attractive enough to the smaller grower.

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