



TRAVEL, CONFERENCE or SCIENTIFIC EXCHANGE REPORT 2015

CRDC Project Number: CRDC1706

Project Title: Travel: Soils constraints forum

Project Commencement Date: 04/07/16

Project Completion Date: 14/07/16

CRDC Research Program: Farmers - Productive resources

Part 2 – Contact Details

Administrator: Kieran O'Keeffe

Organisation: CottonInfo

Postal Address:	64 Merrigal St Griffith NSW 2680
------------------------	----------------------------------

Ph: 0427 207 406

E-mail: kieran.okeeffe@cottoninfo.net.au

Principal Researcher: Kieran O'Keeffe

Organisation: CottonInfo

Postal Address:	As above

Date Submitted: 20th July 2016

Part 3 – Travel, Conference or Scientific Exchange Report

(Maximum two pages)

- **A brief description of the purpose of the travel** - This travel was undertaken to participate in the CRDC one day forum on Soil constraints held at Moree on the 14th July. Participants were Kieran O'Keeffe (CottonInfo REO), Richard Malone (CFM), Heath McWhiter (Elders Griffith), James Toscan (Cavaso Farming Darlington Point), Paul Cleton (Riverview farming, Hillston) and Dave Winter (Sunland Ag, Hillston). Travel was by private air charter Griffith to Moree return.

Kierans notes from the forum.

Chairperson - Alice Devlin (CottonInfo)

Facilitator - Allan Williams (Program leader CRDC)

- Compaction - how big an issue is it? The true cost is hidden. What is the \$ cost to growers from compaction? The forum is seen as the first step in setting the research direction.
 - Popcorn session - My big three issues
 - 1. Compaction - how can we minimise the impact. 2. Sodic soils - how can we maximise production from this constraint. 3. The lure of more back to back cotton and potential for disease constraints such as Black Root Rot.
 - Comment from Bill Back Auscott - follow a 1in/1out rotation to minimise compaction. No 3 year Back to Back. Using Safflower to biologically rip open soil.
 - True CTF not possible due to 2 m centres of pickers.
 - Brendan Griffiths - intergating soil probe data from Goanna telemetry. Looking at the effects of irrigation schedules on root architecture and soil structural integrity. Shorter irrigation intervals practice is sound. Different soil types seem to handle this regime. Some soils are more fragile due to sodium levels.
 - John Bennett - compaction occurring to 80 cm and no going back! CTF verses standard picker configuration results in extra 250 m³/ha compacted. If possible allow soils to dry to PWP before picking. Compaction resulting in loss of soil volume (20cm) that can be accessed by plant roots. Irrigated systems are more prone to compaction. Soil is compressed downwards and sideways. Dual wheels result in 54% of the field trafficked while single wheels 18%. Growers are reluctant to void warranties with changed configuration.
 - Grower comments Mike Stone/Jamie Grant - The true cost is hidden and we cant just ignore the problem. Attitudes need to shift to minimise degregation of soil structure.
 - Auscott - converting pickers to 3 m centres with 4 heads to fit 60 inch spacing. Initially comes at a major yield decrease of 20 % but now closer to 10 %. Last season 60 inch averaged 13b/ha.
 - The hidden cost of compaction needs to be explained in \$ lost over time.
-
- Comments here from Heath McWhitter

From discussions it seemed like there were two lines of thinking:

- 1) Best practice - Avoid back to back and get land prep done over the summer when soil is dry. This is giving better seed bed, better soil structure, more prolific root system, ability to store more plant available water, larger irrigation deficits, less disease and higher yield potential.
- 2) Compromise - In compacted/sodic/B2B fields the plants have a shallow root system which needs to be managed differently to the fallow using more passes to get seed bed tilth creating more compaction, reducing irrigation deficits, increasing fertiliser inputs, increasing sowing rates, increased disease and typically, but not always the case, lower yield potential.

For the southern growers partially in the MIA & CIA the challenge is the intensive cotton rotation that is limiting yield and sustainability. As we know cotton is more profitable than other broad acre crops and the capital cost in land forming and machinery creates more pressure on the rotation to meet debt obligations.

There has been a lot of work done but we need to be on the front foot with the compaction/sodicity/disease issues. If we have a series of years with cold starts it is going to limit yield in the southern valleys and hinder the expansion of the southern industry. The best way to

bring about change of practices is extension and demonstrating the economic impact of compaction in \$/ha.

- Comments here from Dave Winter

1. A need to highlight the link between compaction and poor plant root nutrient/ water uptake. Although an ideal, as I commented on Jamie Grants practice (grow more with less) are there local examples of this in the south here in irrigation ? And if not , there are definitely our dryland wheat neighbours using CTF that have been excelling in this for some time now. It would be great to see maybe some funds spent on a southern half day here and there show casing this perhaps.
2. With our wettest winter for some time this year if compaction isn't on everyones mind now it certainly will be in the next couple of seasons! Of course this is unavoidable this year in an attempt to get crop in. The consultants in this region will be calling for caution in running in fields to early for this springs crop prep . However it will be hard to meet Monsantos pupae bust extension of 31st August and achieve both goals.
3. One thing I struggle with is the fact we have all adapted the 12 row configuration which while increasing machine productivity has lead to greater combined machine weight with a need for duals etc on 2m centres . It was a revelation to hear that 54% of area is trafficked at 2m centres and duals and only 18% by singles at 3m. I have been on 3m singles before with 30" sweetcorn and whilst not impossible it is more challenging turning in smaller flood fields as opposed to large dry area spreads.

Anyway plenty of questions for us to think over and try the " low hanging fruit" first such as no cross working and a discipline to contain traffic where possible to some sort of CTF.

It was a good day up there and it is nice to be able to high light that we are not all land rich and water poor with long fallows , and I think Jamie Grants efforts are outstanding .

I must add the most important point which is harvest timeliness.

In a CTF 3m system not being able to source another picker to bring in the crop is a real constraint until there is wider adoption of this practice. So 500 ha for 1 *JD7760 on 3m is the limit for any grower is the reality. Solution ? Maybe a partial farm unit on CTF who have more than one picker?

- Comments from Richard Malone

The take homes for me were that in a majority of years there is no doubt that we are going to suffer some form of compaction from ground prep to picking. The number of passes that we have less than 24% moisture content in the soil is almost nil. With this we need to understand the impacts and how long it is sustainable, what sort of cost is associated in nutrient uptake/loss, poor infiltration and reduced rooting depth.

Going on from this we need to understand the interaction of nutrients, timing, placement and uptake in more hostile subsoils. Perhaps we can save on inputs, and improve uptake and yield by fine tuning the fundamentals of nutrient management.

You know my thoughts around disease risk and as you've eluded too remains a key risk for the south. It has been confirmed with me a 1-2 bale/ha penalty in the Hillston area and 3-4 in Darlington Point crops infected this season with BRR.

Comment from Paul Cleton. I would also like to thank yourself CottonInfo and the CRDC for the opportunity on being part of the day. I agree on what Heath and Dave have said. I also think we need to see some numbers on what compaction is costing us on our systems down here on our soils. I think we all know it comes as a cost but how much is the big question.

a) Are there any potential areas worth following up as a result of the travel? It would be good to have the presentatons as a resource for growers/consultants to review.

- **Any relevance or possible impact on the Australian Cotton Industry?**
- Compaction is an important key area for the industry to focus on. An on-going long term research and extension plan is needed to increase awareness and mitigate long term production losses.
- **How do you intend to share the knowledge you have gained with other people in the cotton industry?** I am planning a research update meeting for growers/consultants later in August where soil constraints will be included. An extension publication is also being put together.

6. Please list expenditure incurred. (*Double click inside the table to enter the data*)

Please email your report 30 days after travel/conference to: research@crdc.com.au