



Australian Government

Cotton Research and  
Development Corporation

# CGA FINAL REPORT

## ***Part 1 - Summary Details***

---

Please use your TAB key to complete Parts 1 & 2.

CRDC Project Number: CGA1707

---

**Project Title:** Assessing the benefits to growers by transitioning to Controlled Traffic Farming for compaction management in a cotton rotation system.

---

**Project Commencement Date:** 1/10/2016    **Project Completion Date:** 30/06/2017

## ***Part 2 – Contact Details***

---

**Administrator:** Emma Ayliffe, R,D&E Agronomist, Elders Rural Services  
**Organisation:** Southern Valleys Cotton Growers Association/Elders Rural Services  
**Postal Address:** 11 Banna Ave. Griffith NSW 2680  
**Ph:** 0458307347    **Fax:**    **E-mail:** emma.ayliffe@elders.com.au

---

## ***Part 3 – Final Report***

---

### ***Background***

#### **1. Outline the background to the project.**

In the Murrumbidgee, with the rapid uptake of cotton production there has been a trend to continuous production systems, with some farmers doing as many as 5 consecutive cotton crops. With the intensity of production and a move to bigger machinery, particularly 40t pickers that are commonly used when the ground is damp, there is an increase in the amount of compaction. This is resulting in changes in the crop physiology as well as a tightening of irrigation intervals due to a decrease in the water holding capacity of soil and shallowing rooting depth that the plants are able to achieve.

## *Objectives*

### **2. List the project objectives (from the application) and the extent to which these have been achieved.**

This project aimed to demonstrate the differences between standard and controlled traffic practices (3m centres) and water infiltration rate and irrigation practices on farms in the Murrumbidgee catchment. As we currently have no farms moving to controlled traffic, it will be about demonstrating to the grower soil properties that are present in the continuous cropping system we currently have, as well as bringing someone with the experience of switching to controlled traffic to showcase the benefits seen on that farm. The first season of BG III will also mean reduced tillage from pupae busting enabling monitoring of expected increased infiltration from business-as-usual scenarios under BGII.

We were able to get some good data from a number of different sites that have had different management. This coupled with infield probes has resulted in some solid information as to the compaction that is happening in our region and the effects that they are having on water infiltration. We were able to engage Dr Michael Braunack from the CSIRO as part of our field day to discuss what was happening to our soil, and look at the option of controlled traffic. The information that we have been able to collect has resulted in a good base for further work in our region.

## *Methods*

### **3. Detail the methodology and justify the methodology used. Include any discoveries in methods that may benefit other related projects.**

Moisture Probes – selected a 5 year back to back cotton field in the hopes of getting the best levels of deeper compaction and hopefully more obvious results. There were two probes used, one placed in the highest trafficked row, and one in a guess row, the least trafficked. Soil moisture content was then monitored from 8 leaf through to defoliation to look at the amount of water that was able to infiltrate these rows, as well as the depth of moisture the plants were able to access.

Soil compaction measurements – fields were selected based on their history. We were looking for a cotton field that had been trafficked in the wet conditions of last winter, preferably by a picker. It took a number of samples from different fields to get a solid understanding of the data that we had, as well as to determine the best way to present that data. Once a series of fields had been mapped from cotton, Thane was then able to go and map Michael Pfitzner's controlled traffic dryland farm, which while not the same, was able to help demonstrate the damage that was being done in the cotton fields.

All of this data was then presented at the SVCGA field day, along with a soil pit in a field that was planted under wetter conditions. This allowed the damage to the soil with a crop present to be seen. The pit was dug out by Mr Michael Braunack and the differences in soil structure were able to be highlighted to growers and advisors to highlight what exactly is happening underneath the plants.

This data has been presented in a field day handout that is available on request.

## *Outcomes*

### **4. Describe how the project's outputs will contribute to the planned outcomes identified in the project application. Describe the planned outcomes achieved to date.**

The work that has been done has achieved a number of the outcomes as outlined below:

Economic – the water infiltration was assessed, and the data discussed at the field day as to the implications of the results to irrigation scheduling and farm business.

Environmental – at the field day after the data that was collected was discussed a discussion about the environmental impacts of compaction was had by both myself and Dr Michael Braunack.

Social – Results summary was provided to the attendees of the field day, as well as provide to Kieran O’Keefe to be distributed as desired. There is hope going forward that we will be able to present this information again to help keep the conversation going as well as looking at further research to build on this knowledge and look at the options to growers going forward.

## **5. Please report on any:-**

a) Feedback forms used and what the results were

There feedback that was provided verbally from the field day was that the data that was presented was well received, relevant and of value. The feedback from other researchers was that the data that we were able to collect provided a good base for the valley, particularly on the back of a wet previous year, and there is a lot of potential for there to be further work in the area.

b) The highlights for participants or key learnings achieved

Highlight was the soil pit and presentation at the Southern Valleys Cotton Growers Association Field day.

The key learning that were had was the true value of the damage to the soils when they are trafficked wet, like picking after rain last winter. The value of controlled traffic was a good comparison for a visual comparison for the Growers, Advisors and researchers who attended the day.

c) The number of people participating and any comments on level of participation

The field day was able to attract over 100 growers, advisors, researchers and students which is a great achievement considering the short notice of the field day, as well as its location, half way between Griffith and Hay. The small group work that we did around the soil pit discussing compaction, nutrients movement and water infiltration created a great discussion between the groups. After the presentation the conversation continued which is positive as the topic obviously created interest and provoked thoughts and conversations from the growers.

## ***Budget***

### **6. Describe how the project’s budget was spent in comparison with the application budget. Outline any changes and provide justification.**

The soil probes were booked out as planned and used to collect infiltration data.

The compaction data collection was valued a lot more than budgeted but Thane Pringle was happy to cap the work for us at \$1500.

The time it took to collect the data, collaborate and find a way to present was a lot more than budgeted on, but happy to cap the time and costs at \$3500. The extra time costs were absorbed by the CGA and Emma Ayliffe/Elders Rural Services.

The cost for presenters was a lot less than anticipated as they were happy to cover some or all of the costs for their time. We only had to cover the costs for accommodation for one presenter.

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

Date	Description	Amount excl GST	GST	Total
1/03/2017	C-Probes x 2	2,500.00	250.00	2,750.00
21/03/2017	Soil Compaction Testing	1,500.00	150.00	1,650.00
23/06/2017	Data collection collaboration time (Handouts, ...)	3,150.00	315.00	3,465.00
30/03/2017	Data Presentation for the field day	234.00	26.00	260.00
23/03/2017	Accommodation for presentors	98.87	9.89	108.76
				0.00
				0.00
			<b>TOTAL</b>	<b>8,233.76</b>

### *Conclusion*

#### **7. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. What are the take home messages?**

The work that we have done has allowed us to highlight the issue that we have down here with compactions, particularly with our wet winters and picking with large, heavy round module pickers. Coupling the compaction mapping with infiltration monitoring we were better able to assess what was happening in the field. The key result that was achieved was an increase in awareness in soil properties, issues and managements and the effects on the associated crops.

Particularly for the cotton industry the importance of soil moisture when performing field operations was reinforced.

#### *Extension Opportunities*

8. Detail a plan for the activities or other steps that may be taken:

(a) To tell other CGAs/growers/regions about your project.

Data shared with Kieran O'Keefe at cotton info.

(b) To keep in touch with participants.

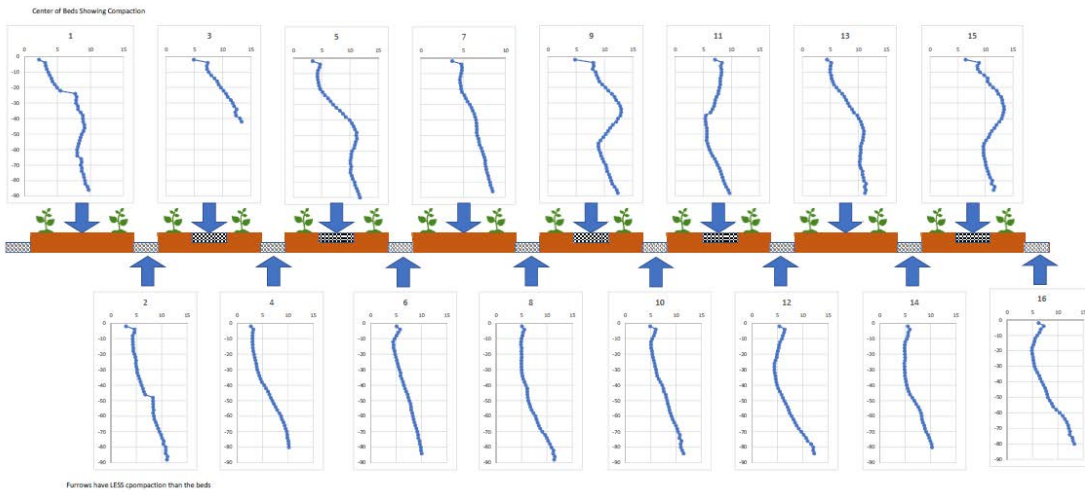
Will continue the discussion at the next CGA field days.

(c) For future projects.

Discussions with other researchers from DPI and CSIRO about the potential to take the research further and where the gaps are. The hopes are that the data can be used as a base for further research.



Photo from the field day at Auscott Cobran.



Some of the penetration data collected from a cotton field