Australian Government
Cotton Research and Development Corporation

TRAVEL, CONFERENCE or SCIENTIFIC EXCHANGE REPORT 2016

Part 1 - Summary Details

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

CRDC Project Number: CSP1605

Project Title: The World Cotton Conference 6 – Goiania Brazil 2016

Project Commencement Date: 2 May 2016 **Project Completion Date:** 7 May 2016

CRDC Research Program: 4 People

Part 2 – Contact Details

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Signature of Research Provider Representative: _____

Date Submitted: _____

Part 3 – Travel, Conference or Scientific Exchange Report

(Maximum two pages)

1. A brief description of the purpose of the travel.

To attend & present a paper on the effect of picker traffic on soil compaction at the World Cotton Research Conference-6, Goiania, Brazil 2-7 May 2016. Provide an opportunity to interact with cotton researchers from many other countries to exchange ideas relevant to the Australian industry, specifically in adoption of new harvesting technology and management and mitigation of soil degradation. World experience in minimum tillage for planting cotton and seedling establishment will be gained to potentially incorporate into projects for the Australian industry. Opportunities for using surface mulch to improve crop establishment and crop water use efficiency will be investigated.

2. What were the:

a) major findings and outcomes

b) other highlights

The Chinese use relay cropping to maximise land use and productivity: wheat-cotton and garlic-cotton are two common combinations. Row spacing is adjusted to suit the particular crops. Cotton is transplanted into wheat stubble in small clay pots, this is gradually being mechanised. Land holdings are small and innovative machinery is being developed to gradually mechanise the cotton industry: a limitation with cotton is the lack of a suitable mechanical harvester. This may be a benefit to the Chinese industry as it minimises soil degradation issues. Plastic mulch is extensively used in China to conserve water, harvest water and enable crop growth on saline soils. Drip irrigation is utilised under the plastic film. Interestingly they do not utilise degradable plastic film and subsequently have issues with disposal and pollution. This potentially provides an opportunity for spray-on biodegradable film.

Cotton yield in strip tilled and stale seedbeds was similar to conventionally tilled cotton although soil strength was greater in the no-till seedbeds and subsoiled plots had similar soil strength to conventionally tilled plots after two seasons. This suggests that traffic during and after cotton was not managed resulting in similar soil conditions after two seasons.

An interesting concept in small land holder farming in Paraguay was the use of cotton to restore soil degradation as a result of being able to direct seed cotton into the soil, along with using lime, fertiliser and green manure crops. It would be interesting to see if the same concept could be used on a large scale to restore degraded soil.

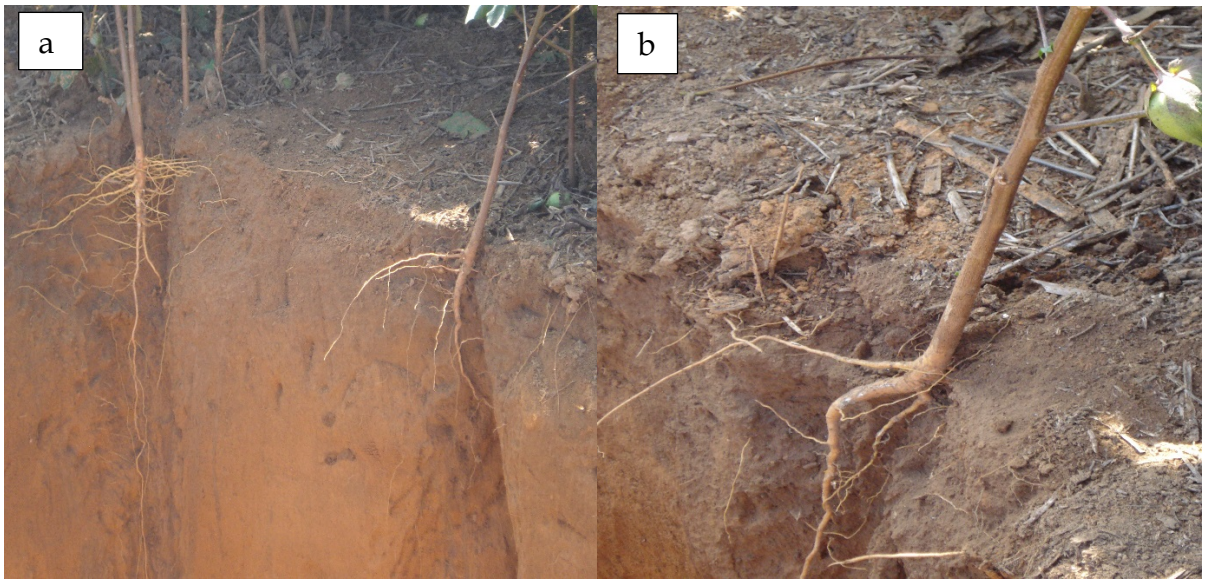
The benefits of soil biology have been recognised for some time; as a benefit of no-till on soil OM, soil structure PAW and their impact on yield. Soil microbiome management and maintenance is becoming a reality with new techniques available from medical science providing insight. Can soil manipulation affect soil biology for benefit? Differences in Arbuscular Mycorrhizal Fungi exist under min-till & conventional till which affect uptake of nutrients. Differences exist between bare and stubble covered soil: bacterial v fungal dominant populations, respectively. Can microbiology associated with wild cotton confer drought tolerance to cultivated cotton? Is it possible to push the system to far one way? This needs to be followed.

Cotton Inc. developing a web based system for delivery of cotton information. Information is region specific or users can access all information that may be appropriate for their area. Researchers involved in webcasts to disseminate specific topical information. This concept may be applicable to Australian cotton industry when topical issues need to be addressed on an industry wide basis.

An interesting comment relating to smallholder cotton farmers was the issue of soil compaction when using oxen for min-till operations, how can we develop a CTF system for Cattle?

The harvesting & post-harvest technologies session, for me was the most logical and connected of the conference: it looked at pickers in the field, tracking round modules from the field to post ginning, development of a small bench delinter and work on the pre-cleaner on the new stripper for dryland cotton harvest.

The field trip to a corporate farm (SLC Agricola) was of interest particularly from the scale of operation: 25 round module pickers and few reported soil compaction issues. At the farm their gin was inspected and then a cotton field which was sprinkler irrigated: cotton was 1.4 m tall and roots down to 1.8 m. Due to sprinkler irrigation the majority of roots occurred in the top 20-30 cm, with one long thin tap root to 1.8 m (Photo a). It was admitted that soil compaction was an issue on another farm in the group. Compaction may not be as a limitation to growth since most cotton is grown as rain-fed and sprinkler irrigation only wets the immediate surface, limiting transfer of stress down into the subsoil. There was evidence of surface soil compaction with the characteristic right angle root syndrome (Photo b).



3. Detail the persons and institutions visited, giving full title, position details, location, duration of visit and purpose of visit to these people/places. (NB:- Please provide full names of institutions, not just acronyms.)

Only attended the conference in Goiania

4. a) Are there any potential areas worth following up as a result of the travel?
b) Any relevance or possible impact on the Australian Cotton Industry?

Follow-up of the work examining the effect of tillage/min-till on soil microbiology with Cotton Incorporated will benefit the Australian industry in mitigating/managing soil degradation (khake@.cottoninc.com)

Follow-up of the use of plastic mulch in China will benefit Australian growers with salinity issues given the initial improvement in crop establishment experienced by the work conducted in China (donghz@saas.ac.cn)

5. How do you intend to share the knowledge you have gained with other people in the cotton industry?

An article in Spotlight & discussion with other researchers & growers

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

Please email your report by 21 June 2016 to: research@crdc.com.au