



Australian Government

**Cotton Research and
Development Corporation**

TRAVEL, CONFERENCE or SCIENTIFIC EXCHANGE REPORT 2015

Part 1 - Summary Details

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

CRDC Project Number: CSP1505

Project Title: United States to visit with Cotton Inc., Texas A&M cotton specialists, USDA crop stress laboratory Lubbock, and Valent (investigating potential growth regulators for the Australian Cotton Industry).

Project Commencement Date: 13/07/2015 **Project Completion Date:** 31/07/2015

CRDC Research Program: 1 Farmers

Part 2 – Contact Details

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Supervisor: (Name & position of senior scientist overseeing the project.)

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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.

Overall reasons for travel to the USA include: Participate in a visit to the Valent Company to investigate growth regulators for future cotton research; visit with Cotton Inc. to maintain and enhance cotton research collaborations; meet with Gaylon Morgan (Texas cotton specialist) to discuss opportunities for collaborative research; and undertake collaborative research (data analysis) with USDA crop stress laboratory colleagues in Lubbock. Michael Bange is covering his flight to and from the USA. Funds provided to the USDA (James Mahan and Paxton Payton) from Cotton Inc. are contributing to the majority of accommodation and living costs (particularly visit to Lubbock and North Carolina). Valent are covering costs to Chicago to visit with researchers and their research farm.

The request for financial assistance in this application is to specifically assist with a small trip to College Station Texas to visit with researchers at Texas A&M University. This support is not covered by the USDA support previously outlined. I am particularly interested in forging stronger collaborations with Gaylon Morgan (Texas cotton specialist). He is also very keen to collaborate more. I am also interested in meeting with new researchers in cotton at Texas A&M to understand their current research foci. This is especially important since Dr Tom Cothren passed away last year. He was our main research collaborator in physiology in Texas. Dr Cothren was previously one of Nicola Cottee's PhD Supervisor and has hosted a number of Australian researchers at College Station undertaking research.

Overall outcomes to be achieved:

1. Identify new research collaboration opportunities with Cotton Inc. in conjunction with CRDC.
2. Identify growth regulators needed for future cotton research in Australia.
3. Continue analysis of research data with USDA colleagues in the area of environmental stress on fibre quality.

Specific outcome relating to this project request is:

1. Identify new research collaboration opportunities with Texas A&M cotton research efforts.

2. What were the:

a) major findings and outcomes

Lubbock - USDA

Major activities undertaken whilst in Lubbock with James Mahan and Paxton Payton USDA included:

- Spoke at the Texas High Plains Cotton Inc. meeting on waterlogging effects on cotton growth.
- Assisted the development of an Ogallala Aquifer rain-fed cotton initiative. I have been invited to be a participant in the project. This will be useful to access any innovative research which will be specifically targeted at rain-fed cotton production.
- Developed a complementary research program that will be undertaken in the US on use of novel growth regulants. James and Paxton this season have access to some of the chemicals that I will be using in my studies. Having duplicate experiments in a different environments will give us more insights into their impacts.

- Visited two consultants/two farmer and discussed management of crops under overhead irrigation and drip irrigation with a limited water source.
- With the assistance of Paxton outlined preliminary ideas for research into climate change that will be undertaken in the glasshouses at the University of Western Sydney. We are now discussing these ideas with Katie Broughton and David Tissue.
- Meet with High Plains Monsanto representative and discussed approaches to variety evaluation. Uniquely they seek fields with maximum variation to sow genotypes and use yield monitors to assess their performance.
- Investigated and discussed the use of low cost seed germination/emergence facilities that modify temperature. James will provide me the specifications so that I may build my own.
- Planned presentations for meeting with Cotton Inc. and Valent.
- Compiled additional data for assessing relationships of canopy temperature and fibre quality.
- Inspected a round module cotton stripper.



- Inspected a new canopy temperature sensing platform that has the ability to monitor a substantial part of the field (see photo). The application of this for research is that there is no need to have many sensors in each treatment. The agronomic application is that it captures spatial variability in stress. This instrumentation is already being deployed commercially by the Smartfield Company.



College Station – Gaylon Morgan Texas A&M University

Our visit with Gaylon was a little restricted as Galyon had to deal with some family issues. Unfortunately we did not get to meet personally with the new crop physiologist. However we have agreed to meet at the American Society of Agronomy Meeting in Minneapolis in November where I will be attending a guest speaker. With Galyon we discussed:

- Involvement and potential collaboration in rain-fed cotton research and novel growth regulator research. We discussed with Galyon the opportunity to undertake on-farm research similar to what I plan to undertake in Australia.
- I also discussed the research that Gaylon was undertaking in defoliation assessments. We agreed that we will test some of the concepts that I have developed in Australia. This will help this make this science more robust for a greater range of environments.

Rayleigh North Carolina – including visit to Cotton Inc.

On the first evening in Rayleigh, Paxton James and I visited with world renowned crop physiologist Dr Tom Sinclair from North Carolina State University. We discuss challenges undertaking research into breeding for physiology traits (especially water use efficiency). He provided us with some very insightful literature on his current research into breeding water use efficient soybean cultivars. He also gave useful insights on the use of canopy temperature use in physiology studies.

Whilst at Cotton Inc. I participated in the following discussions:

- With CRDC colleagues discussed: success of current sponsored collaborative research with Paxton and James; opportunities to further collaboration; research into fibre quality.
- With Cotton Inc. we discussed: crop simulation modelling collaboration; growth regulator research; rain-fed cotton; and analysis of large complex datasets; climate change book chapter being led by myself.
- With the help of James and Paxton, we secured funding to continue collaborative research (with Australia) on water relations and irrigation. We also secured additional funding for James and Paxton to undertake growth regulator research.
- We also visited one of the North Carolina State University Farms and inspected efforts in phenotyping and genotyping cotton genotypes.
- I will meet again with Kater Hake and Ed Barnes at the American Society of Agronomy meeting.

Valent BioSciences Corporation - Chicago

James Paxton and I were hosted at the Valent Biosciences farm near Chicago. We were able to present a number of ideas to Valent. They were able to articulate a number of growth regulators that could be tested in the situations presented. Details of ideas presented are provided in the presentation given by Mike Bange that will be provided to Allan Williams.

They were most excited about the success of the anti-ethylene agent AVG that has been successfully used in Australian cotton for stress management. They have agreed to assist as best as possible in our growth regulator research for improved cotton productivity.

- 3. 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?**

