Australian Government

Cotton Research and Development Corporation

Annual, Progress and Final Reports

Part 1 - Summary Details **REPORTS**

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CRDC Project Number: **DAN183**

Annual Report: ☐ Due 30-September

Progress Report: ☐ Due 31-January

Final Report: ☒ Due 30-September

(or within 3 months of completion of project)

Project Title: Travel: Julie O'Halloran, Beltwide 2006 USA

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Research Program: 1 People and Knowledge

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TRAVEL REPORTS

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

This travel was to attend the 2006 Beltwide Cotton Conference in San Antonio, Texas, USA. Two papers on work undertaken by extension officers within the Australian cotton industry were presented. The first paper outlined the extension model that exists within the Australian cotton industry and in particular the role of the Cotton Industry Development Officers. The role of the Cotton Industry Development Officers is to extend research to growers and this is partly done by adapting research to a local level. The second paper highlighted the contribution Australian cotton extension officers have in the progression of Australian cotton production through regional trials. This paper provided an example of some of the trials carried out locally by extension officers and presented results from fruit retention and compensation trials carried out in Australian cotton crops. This travel also involved meeting with researchers and extension officers and provided the opportunity to establish links for exchange of information and future possible collaborations.

2. What were the:

a) major findings and outcomes

2006 Beltwide Cotton Conference

The Beltwide cotton conference was a combination of workshops, individual presentations and seminars. There were multiple concurrent sessions. The conference attracted growers, consultants, researchers, extension and agribusiness. There seemed to be good grower involvement and attendance at this conference. Attendance at the conference also provided a great opportunity for making contacts within the US cotton industry. I met several extension officers and some researchers during the week of the conference.

I presented two papers at the 2006 Beltwide Cotton Conference. The first paper, "Delivering the goods – Extension in the Australian cotton industry" outlined the extension model that exists within the Australian cotton industry and in particular the role of the Cotton Industry Development Officers. The second paper, "Fruit retention and compensation in Australian cotton" highlighted the contribution Australian cotton extension officers have in the progression of Australian cotton production through regional trials. This paper included results from fruit retention and compensation trials carried out in Australian cotton crops and provided an example of some of the trials carried out locally by extension officers. Copies of both the papers presented are attached. There was a lot of interest from conference participants in fruiting factors following the presentation.

A large component of the insect control sessions at the Beltwide focused on secondary pest control. With the increase in genetically modified Bt cotton in the US, the US cotton industry is experiencing similar issues to the Australian cotton industry associated with secondary pest problems. Reduced pesticide use and more selective chemistry as well as boll weevil eradication has seen increased secondary pest problems with impacts on yield and quality. Several of their secondary pest species cause similar damage to the green mirid and green vegetable bug that cause problems in Australian cotton. The main pest species discussed were Lygus species (similar to mirids) and stink bugs. Other secondary pest species that were discussed include whitefly and spider mites.

Discussions of secondary pests included a range of issues including sampling methods and protocols as well as thresholds. There was discussion of area wide management for secondary pests as some pest species are starting to indicate increasing resistance to synthetic insecticides which have previously provided good control. Associated with area wide management is integrated pest management for secondary pest species. This included management options such as control of weed hosts pre season as well as the use of pathogens and biological control of some secondary pest species.

There was some discussion of variable rate technology. This included variable rate irrigation via overhead irrigation systems to account for different soil types or different crops and water use requirements. Other variable rate application technology involved fertilisers, insecticides, defoliants and growth regulators.

Monsanto tour and discussion

Monsanto in St Louis has two sites. One is the Monsanto biotechnology research facility and the other is the headquarters for Monsanto. The tour of biotechnology research facility at Monsanto Chesterfield involved an overview of the processes involved in the development of GM technology from the identification of the trait through to the development of a commercial product. This tour highlighted the time and resources required to undertake the extensive process of discovery and product testing required for each commercial GM product.

The tour of the Monsanto biotechnology research facility outlined the steps involved in the process of developing a commercial GM product. They have numerous products at different stages in the product development pathway for a range of different industries with ultimate benefits targeting farmers, processors and consumers depending on the traits. The pathway for product development involves 5 phases. The duration of each phase can be between 1 and 4 years which provides an indication of the time and resources that need to be committed before a commercial product is realised. There was some discussion of the steps involved in each of these phases as well as current Monsanto products in the pipelines and how far along this product pathway each one was.

Discussions held with Monsanto representatives at Monsanto headquarters in St Louis focused on those GM cotton products that were currently available and those that were still in the product pathway or had not even reached the first phase of this pathway yet. Roundup Ready Flex is the next GM product to be released commercially in the US and Australia. Drought tolerant cotton is still in the proof of concept phase. Plants have a number of mechanisms to respond to moisture stress and the traits currently being screened for drought tolerance involve a range of these. More efficient nitrogen utilisation in corn is currently in the proof of concept phase but if this does show promise then Monsanto will start looking at nitrogen utilisation in cotton and soybeans as well.

Discussions with extension officers

Both at the 2006 Beltwide and in the week following the conference I met with several US extension personnel (See section 3). This provided valuable insight into the role extension has in the US cotton industry. They were also extremely interested in our production system, how our extension team model worked and the activities that Australian extension officers carry out. The issues discussed included funding sources, trial work, setting priorities, researcher/extension communication, relationships/interaction with other industry personnel and day to day activities and responsibilities.

There are a variety of extension officers that service the US cotton industry. There are those that specialise in agricultural extension while others also have other roles such as youth development and other community roles. Some US extension officers service other agricultural industries in addition to cotton. US extension officers tend to be partly funded by organisations such as a university. Additional funds have to be sought to operate. In effect, extension officers are often competing against researchers for funding.

Extension officers in the US tend to have part of their time allocated to research so that extension is not their full time role. Extension officers in the US also tend to be specialised in a particular area, for example, weeds or nutrition. Generally the research conducted by the extension officer will be in this area of specialisation. The trials conducted by extension vary greatly between US extension personnel and the Australian extension network. Much of the trial work conducted by some US extension officers is focused on chemical trials or variety trials, compared to Australia where these remain the responsibility of seed and chemical companies.

Setting extension priorities has been carried out in several ways in the past. Surveys requesting feedback from growers on extension priorities have had a very low response rate. Most extension programs are based on grower feedback through grower meetings or from one- on-one interaction with growers. One-on-one client visits are actually a large time commitment and component of US extension and through this extension officers are able to obtain grower feedback.

US extension officers produce newsletters which provide similar information to what is presented in 'Cotton Tales' for the Australian cotton industry. The information in this newsletter is kept region specific eg for each county and is relevant and topical. Field days and grower updates are also a regular extension activity. Extension officers try to limit their involvement in these field days to organisation. Wherever possible they try to get a grower to chair the meeting and try to draw in grower experiences as much as possible.

There is variability in researcher/extension communication. In some areas researchers and extension seem to have close working relationships where researchers are frequently contributing at grower updates. In other areas research and extension are completely separate.

The highlight of the travel was meeting with various extension officers involved in the US cotton industry. This greatly increased my understanding of the US cotton industry and also how the US cotton extension network operates. I was able to discuss our production system and extension team model with them, as well as how we as extension officers operate. This was an extremely valuable experience for me as it gave me a greater understanding of the US cotton industry as well as new perspective on the Australian cotton industry and the role of extension within it.

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.)

Date	Person/Institution	Location	Purpose
3-6 January 2006	Beltwide Cotton Conference	San Antonio, Texas	To present two papers: one outlining the Australian extension model and one providing an overview of fruit retention and compensation in Australian cotton.
4 January 2006	Randy Coleman, *Research Entomologist*	USDA Agricultural Research Service Weslaco, Texas	Discussion of green mirid work being done in Australia and work done in the US with similar pests.
5 January 2006	Peter B Goodall, *IPM advisor and IPM Extension Coordinator*	University of California, Cooperative Extension, Statewide IPM project	To discuss Australian extension, particularly in relation to IPM.
9 January 2006	Monsanto Biotechnology Research Facility	Monsanto, Chesterfield, Missouri	Tour of biotechnology research facility
9 January 2006	Karen Marshall, *Senor Director Public Affairs* Randy Deaton, *Director, Global Cotton Business*	Monsanto, St Louis, Missouri	Discussion of US GM crops.
10 January 2006	Robert Lemon, *Professor and Extension Agronomist – Cotton* Mark McFarland, *Professor and Soil fertility Specialist*	Texas Cooperative Extension, Texas A & M University, College Station Texas	Discussion of extension models and roles, trials undertaken and the Australian and US cotton industry.
11 January 2006	Josh Byrum, *Technician* Tom Cothren, *Cotton Crop Physiologist*	Texas Agricultural Experiment Station, Texas A & M University, College Station, Texas.	Discussed current research on Roundup Ready® trials, work on testing for abiotic stress and Chaperone growth enhancer work.
12 January 2006	Steve Wright, *Cotton, small grains and weed control advisor* Robert Hutmacher, *Extension Cotton Specialist*	University of Califonia, Cooperative Extension, Tulare & Kings Counties, Tulare, California University of California, Shafter Research & Extension Center, Shafter, California	Discussion of extension models and roles, trials undertaken and the Australian and US cotton industry.

13 January 2006	Steve Wright, *Cotton, small grains and weed control advisor* Dan Munk, *Water, soils and cotton farm advisor*	University of Califonia, Cooperative Extension, Tulare and Kings Counties, Tulare, California University of California, Cooperative Extension Fresno County, Fresno, California	Discussion of extension models and roles, trials undertaken and the Australian and US cotton industry.

4. a) Are there any potential areas worth following up as a result of the travel?

This travel met its proposed outcome of developing and enhancing professional links with growers and extension officers within the US cotton industry. This travel provided an opportunity to establish contacts and links with extension personnel within the US cotton industry. Maintaining these links and continuing a relationship with these contacts would be highly beneficial. This will facilitate continued information exchange into the future as well as possible future collaborations. I have already had further discussions with some of the contacts made during this travel and will ensure that I maintain contact with these people into the future.

b) Any relevance or possible impact on the Australian Cotton Industry?

An understanding of the extension network in the US and how they work provides the opportunity to identify strengths and weaknesses in the extension model. The advantage of this is that we could potentially take on board strengths to improve the way in which the Australian extension model works or keep in mind some of the weaknesses to ensure that we avoid them in our own extension model in the future. The contacts made with extension officers in the US may prove to be beneficial for future collaborations.

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

The knowledge gained during this travel will be shared in several ways. I would expect to provide the local Gwydir Cotton Growers Association (CGA) with a report at an upcoming CGA meeting, most likely at the time of the Annual General Meeting. I would be willing to present a summary of the travel to the Extension Team, possibly at the National Extension Team workshop, depending on the agenda. A brief summary has already been distributed amongst the extension team through the newsletter 'NATCET natterings'. I have also had several discussions with other members of the extension team as well as growers in the Gwydir Valley regarding the Beltwide cotton conference and other aspects of the travel. Research presented at the conference could be shared with the Australian cotton industry through extension activities such as the 'Cotton Tales' newsletter provided it was relevant. Information gained through discussions with US extension personnel could also be utilised within the Australian cotton industry through extension activities undertaken here.