



TRAVEL, CONFERENCE or SCIENTIFIC EXCHANGE REPORT 2016

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

CRDC Project Number: CSP1605

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

Project Commencement Date: 29/4/2016 **Project Completion Date:** 10/5/2016

CRDC Research Program: 4 People

Part 2 – Contact Details

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Date Submitted: _____

Part 3 – Travel, Conference or Scientific Exchange Report

(Maximum two pages)

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

The primary reason for this travel was to network and present at The World Cotton Congress.

Since we identified *Helicoverpa armigera* in Brazil in 2013, Sharon Downes, Tek Tay and I (all from CSIRO) developed potential collaborations with Brazilian researchers around resistance management of this pest. Tom and Tek Tay have had three Brazilian undergraduates in the lab and hosted a Brazilian PhD student working on *Helicoverpa spp.* from Brazil. I have hosted two Brazilian undergraduates in the lab and was invited to present at the Brazil Cotton Conference in 2013.

Tom Walsh, Tek Tay and I planned to attend the World Cotton Congress; for unforeseen reasons Tek was unable to travel but Tom Walsh and I attended. Together we represent a diverse cross-section of expertise relating to pest management in the Australian agroecosystem. We planned to take advantage of the location of the conference to not only network with existing and potential collaborators in Brazil during the conference itself but also to travel to significant facilities.

Since this conference attracts world class researchers from many locations, it was also an ideal setting to consider synergies among research organisations. This networking would include discussions about the willingness of various agencies to contribute to CRDC's concept of a global pool of resources to address questions around pest resistance that have relevance in multiple countries.

2. What were the:

a) major findings and outcomes

The conference was a wide ranging discussion of all aspects of cotton research. In particular this gathering was also a meeting of the cotton genome consortium and there were a number of presentations showing the progress that has been made in this area and the potential into the future. Given the recent arrival of *H. armigera* in South America, there was lots of research devoted to managing *H. armigera* in Brazil in particular and also in other South American countries. Pink bollworm in India was also identified as a risk and resistance appears to have developed to both Cry1Ac and Cry2Ab and Dr Keshev Kranthi suspects that *H. armigera* may well be next.

b) other highlights

Outside of the main conference times Tom and I were hosted by students from Dr. Cecelia Czepak's laboratory at the University of Goias. Dr Czepak has sent field material to CSIRO for molecular identification of species and has expressed interest in further developing our collaboration. More details about these interactions are provided below.

We were able to gather video footage of many of the key insect pests of cotton in Brazil, including boll weevil, for Dr Paul Grundy who is compiling educational videos of key biosecurity risks for the Australian cotton industry.

Dr Sharon Downes and Dr Tom Walsh held discussions with Dr Keshev Kranthi from the Indian Cotton Research Institute about the issues of Bt resistance in Pink Bollworm and *H. armigera* in India.

We interacted with colleagues from Cotton Incorporated and in concert with staff from CRDC discussed the potential for future collaborations.

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.)

As part of the meeting we visited an EMBRAPA (Brazilian agricultural research organisation) field station and observe the excellent facilities and ongoing plant breeding research on going at EMBRAPA. This has prompted contacts between CSIRO and EMBRAPA in order to further research the potential for the development of Bt resistance in Brazil and the risks of its spread to Australia.

Outside of the conference we went to the University of Goias and met with Dr. Cecelia Czepak, a cotton researcher working on lepidopteran pests including *H. armigera*, whitefly and cotton boll weevil. Dr Czepak hosted a lunch for us with half a dozen of her graduate students who then showed us their laboratories and took us on a tour of the University facilities. This included considerable discussion about methods for rearing insects, and overviews of the main pest management projects undertaken by the group. We visited the University field site and viewed several research trials on cotton and other crops.

Three students from Dr Greg Sword's lab from Texas A&M were present and discussions with one of them, Ashley Tessnow about visiting CSIRO and repeating work done in the USA on *H. zea* with *H. armigera* was planned. Ashley is presently in Canberra at CSIRO working with Dr Walsh.

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

We have agreed to collaborate with the University of Goias and two students from Dr Czepak's lab will be visiting CSIRO in July and August for six months to work with Dr Tek Tay and Dr Tom Walsh on lepidopteran pests of cotton.

During the lunch hosted by Dr Czepak we met a colleague Dr Marcos Gomes da Cunha who expressed interest in collaborating with Drs Walsh and Tay on molecular aspects of plant pathology.

Dr Keshev Kranthi has expressed an interest in a joint application for an Australia-India strategic research project looking at the mechanisms of Bt resistance in pink bollworm which are apparently resistant to both Cry1Ac and Cry2Ab.

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

The situation in Brazil with multiple crops with a variety of Bt toxins being used is the ideal situation for the development of Bt resistance and there is a risk that resistant individuals could find their way to Australia. Furthermore, potentially dual resistant pink bollworm represent a threat to the cotton industry in northern Australia. By strengthening collaborations with Brazil we will not only be in a position to better understand the evolution of resistance per se in insect pests but also be on the forefoot should any incursions to Australia be realised.

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

Dr Sharon Downes and Dr Walsh will hold discussions with other researchers about the situation in Brazil. Other possibilities include articles in Spotlight or the Cotton Grower magazine as a mechanism for passing on our findings.

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

Date	Description	Amount excl GST	GST	Total
	airfare	2,561.40	284.60	2,846.00
	Subsistence (A\$166 per night for 7 nights)	1,154.00	0.00	1,154.00
			TOTAL	4,000.00

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