Australian Government
Cotton Research and Development Corporation

Annual, Progress and Final Reports

# REPORTS

## *Part 1 - Summary Details*

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

**CRDC Project Number:** **UNE38**

**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 to 12th Australian Cotton Conference Gold Coast

**Project Commencement Date:** 10/8/04 **Project Completion Date:** 12/8/04

**Research Program:** 1 People and Knowledge

## *Part 2 – Contact Details*


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**Signature of Research Provider Representative:** _____

## *TRAVEL REPORTS*

**1. A brief description of the purpose of the travel**.
Travel to attend the 12th Cotton Conference, Gold Coast, August 2004. Abstract presented as a poster is attached at the end of this document.

**2. What were the:**
   **a) major findings and outcomes**
   **b) other highlights**

Our new project on studying Thielaviopsis basicola-cotton interactions was presented in this conference series for the first time. I was invited by the conference organisers to present this topic in a poster and to include a summary in the conference proceedings. This hopefully enhanced the recognition of the project by other cotton researchers and industry and possibly enhanced collaborations with other researchers working on cotton disease.
In addition, I enhanced my knowledge on the current status of cotton in Australia, the needs of the industry and what other researchers are working on.

**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.)**

N/A

**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?**

During the conference I was introduced by the CRDC team to several researchers working on soil biology projects. As soil microbiology is my main area of research, I was happy of the opportunity to join a team of researchers involved in this research area and hope for future discussions on the use of this field by the cotton industry.

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

Attending the above conference was part of fulfilling this aim.

Abstract presented as a poster

### *Thielaviopsis basicola* Cotton-Interactions leading to Black Root Rot: A molecular Approach

Lily Pereg-Gerk[1], Margaret Katz[1], David Backhouse[2], Samiya Al-Jaaidi[1] Geraldine Mijajlovic[1]

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Black root rot presents a substantial threat to cotton. The disease is caused by the soilborne fungal pathogen *Thielaviopsis basicola*, which produces thick walled spores that can survive in the soil for years. While management strategies based on cultural practices can reduce the severity of the disease, there is considerable scope for new disease control methods based on an improved knowledge of the biology of the pathogen and its interactions with cotton.

Two strategies are in use to study the infection process: (1) generate mutants which are altered in the ability to complete one or more of the six steps in establishing infection, and (2) study *T. basicola* isolates obtained from the field, which vary in their host range.

We develop methods for random mutagenesis (integrative transformation) of *T. basicola*, including PEG-mediated transformation using fungal protoplasts and *Agrobacterium tumefaciens*-mediated transformation. We have managed to transform *T. basicola* with pGpdGFP using PEG-mediated transformation, and following optimisation of the method will use random mutants to investigate genes involved in strain-host associations. Our objective is to explain why some fungal-root interactions are compatible, leading to disease, and others are incompatible, leading to the phenomenon of resistance.

We have established and optimised growth systems for the pathogenicity tests, including: Gnotobiotic chambers, where 10 seeds are germinated and inoculated simultaneously, and growth tubes for individual seedlings. Preliminary pathogenicity tests indicated several degrees of strain-host specificity, where e.g. spores of strains isolated from cotton are highly pathogenic to cotton, germinate in the presence of wheat and slowly germinate in the presence of cucumber seedlings. We will present our strategy and Results in a poster during the 12$^{th}$ cotton conference, Gold coast.