



SCIENTIFIC EXCHANGE

Final Report

(Due within 30 days of travel)

Part 1 - Summary Details

Cotton Catchment Communities CRC Project Number:

Project Title: **The International Plant Nutrition Colloquium, Sacramento, USA as a part of the PhD project "Nutrient Redistribution in High Yielding Cotton" (Meredith Errington).**

Project Commencement Date: 25th August 2009

Project Completion Date: 2nd September 2009

Research Program:

Part 2 – Contact Details

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1. What were the:

a) Major findings, outcomes and highlights.

The International Plant Nutrition Colloquium is the major international plant nutrition conference, held every four years. This year the 16th IPNC, entitled “*Healthy Plants, Healthy Planet*” was held in Sacramento, California. Topics presented included issues to do with plant homeostasis, nutrient requisition, source-sink dynamics, maximising productivity and efficiency of agricultural nutrient systems, plant nutrition and human health, the impacts of environmental stresses on plant nutrition and the diagnosis of plant nutrient status. Scientists, students, extension officers and representatives of commercial fertiliser companies from 45 nations attended the conference - representing a broad spectrum of researchers and end users of plant nutrition research and widening the scope of the conference and discussions of many issues.

Keynotes speakers at each session were at the forefront of new research issues and methods, and included many highly influential and respected scientists, such as Dr Emanuel Epstein, Dr Arnold Bloom, Dr Patrick Brown, Dr Leon Kochian, Dr Michael Grusak, Dr Ismail Cakmak, Dr Ross Welch and Dr Bert Janssen (amongst others). The opportunity to hear these people speak, and to meet them personally and gain advice and feedback from them was invaluable to a young scientist like myself.

As a part of the session “Nutrient acquisition, homeostasis and source-sink relations” the paper *Nitrogen allocation in high yielding Bollgard II® cotton* was presented as a poster (the paper is attached as an appendix to this report). The chance to discuss this work and these results was valuable and lead to interesting comparisons with other nitrogen redistribution work occurring all over the world, particularly that at the Institute of Plant Nutrition, Hannover, Germany, and at the CNRS-INRA, Versailles, France. A particular highlight was meeting several of these scientists, whose work I had been reading and reviewing as a part of my literature review and in preparation for my experiments.

These networks and the ideas gained from fruitful discussions could lead in future to collaboration with scientists from other institutions, particularly from Adelaide, the USDA and the Plant Nutrition Institute, Hannover, who offered practical help, advice on experimental design and methodologies and advice on the access to materials and equipment which we do not have access to at ACRI or at Sydney University. The advice on the use of stable Isotope

tracing within plants, the sampling of the phloem sap using the aphid stylet technique and the analysis of phloem samples for amino acids and other nitrogenous compounds was particularly helpful, and will add greatly to the depth of the research and the presentation of the results. Already as an outcome of this, some of the samples which were taken in the 2008-09 cotton season will be re-analysed for different compounds, which hopefully will lead to stronger conclusions being able to be made about the influence of nitrogen stress and water stress on the different forms of N used as a transport compound within the plants.

Overall the opportunity to attend this conference has led to an enormous boost in my knowledge and in the sharing of information with other, more experienced scientists in this area. I learnt a tremendous amount about techniques and approaches to the investigation of nutrient redistribution and developed several new ideas about the future direction of my experiments and research. It was particularly valuable to learn what is happening around the world at the centres of plant nutrition research and have a feel for the directions in which current research is heading. This information has helped to clarify and identify questions about the data I am collecting and give me an idea of ways I can analyse, further investigate and supplement the information I have, and will collect this coming cotton season.

2. Detail the persons and institutions visited, giving full title, position details, location, duration of visit and purpose of visit to these people/places.

The 16th International Plant Nutrition Colloquium was held from the 25th – 30th August, at the Sacramento Convention Centre. The conference was hosted by the University of California, Davis. No other institutions, places or people were visited during the trip.

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

There is some potential for collaboration with scientists from other institutions in setting up and running future experiments. These would add to the scope of future experiments in terms of the access to equipment and analytical instruments, particularly for the sampling of phloem and analysis of the collected sap.

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

This trip will add greatly to the experiments run and the knowledge gained from the completed PhD thesis “Nutrient redistribution in high yielding cotton”.

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

The knowledge gained from this trip will be used to enhance my PhD project experiments, analysis of results and give more depth to the interpretation of the results obtained.

5. Executive summary. Provide a one paragraph summary of the scientific exchange, suitable for posting on the Cotton CRC web site.

The International Plant Nutrition Colloquium is the major international plant nutrition conference, held every four years. This year the 16th IPNC, entitled “*Healthy Plants, Healthy Planet*” was held in Sacramento, California and was attended by people from 45 different countries. As a part of the session “Nutrient acquisition, homeostasis and source-sink relations” the paper *Nitrogen allocation in high yielding Bollgard II ® cotton* was presented as a poster, with the corresponding paper published in the conference proceedings. The information presented at the conference and also gained through informal discussions with other conference participants will greatly enhance the experimental techniques, methodologies used and analysis of the results in my PhD. The exposure to a wider international research community and the chance to meet and talk with these scientists was something which could only have been possible in the context of a major international conference like this one, and was a great opportunity for a young PhD student!