Final Reports

Part 1 - Summary Details

CRDC Project Number: **CSP175C**

Project Title: **Field Experiments at ACRI**

Project Commencement Date: 1/7/05 **Project Completion Date:** 30/6/06

Research Program: On farm

Part 2 – Contact Details

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Signature of Research Provider Representative: _____

Part 3– Final Reports

Background

Costs associated with growing cotton on ACRI are part of an agreement between NSW DPI and CSIRO. This project funded a small part of the net costs as charged by NSW DPI. The following table lists CSIRO Plant Industry, Land and Water and Entomology CRDC and CRC field research projects at ACRI in 2005/06. CSIRO's Leitch lease is a separate operation to ACRI and those costs were not included in the project.

This report is for a one year project funded for 2005/06.

The CSIRO Cotton Research Unit is a mission-directed strategic research team driven by impact. We address major national challenges for a future, valuable and sustainable industry. We are world leaders in cotton science and are a multi-division team, not a collection of projects.

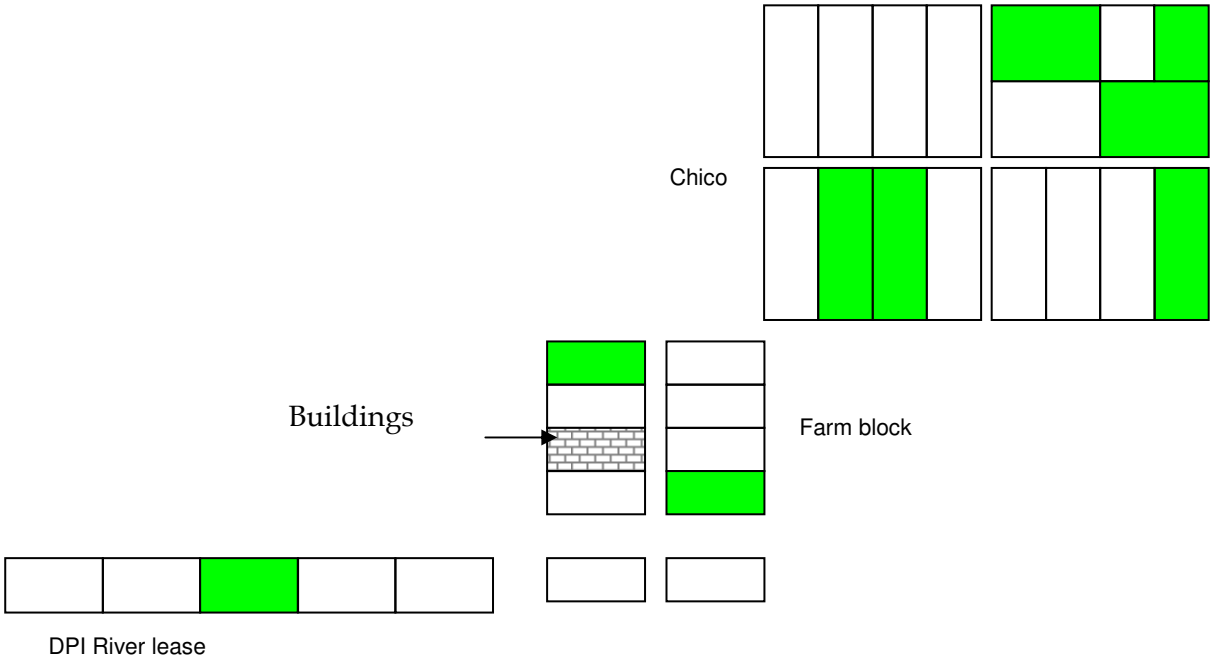
Ref	Short Name	Project Leader
1.1.01	Mirid Predation	Whitehouse
1.1.02	Rhizoshpere Biological Functions	Knox
1.1.03	Mortality of Helicoverpa in Bollgard II	Downes
1.1.05	Ecology of Helicoverpa	Tann
1.1.07	Supporting IPM for Future Cotton Systems	Wilson
1.1.46	Weed resistance modelling	Wilson
1.2.02	Water relations of the cotton plant	Wilson
1.3.01	Cotton Crop Mgnt for Improved Fibre Qual	Bange
1.3.02	Nutritional Constraints to Cotton Production	Rochester
1.3.03	Physiological Basis for Cotton Yields	Bange
1.4.01	New Generation Scouting Tools	Bange
5.10.06.01	Evaluation of Cotton Cropping Systems	Rochester
5.2.02	DSA - Cotton Mgnt Support Systems	Bange
5.2.03	DSA - Cotton Irrigation Mgnt	Richards
CRC 47C	Quantifying Deep Drainage	Nadelko
CSE 112C	Monitoring Resistance to Transgenic Cotton	Downes
CSP 159	Breeding improved cotton varieties	Constable
CSP 161	Physiology of High Retention Cotton Crops	Yeates
CSP 162	Effects and Mgnt of Green Mirids in Cotton	Duggan
CSP 165	Aphids - Control, ecology, BT resistance	Wilson
CSP 170	New Uster HVI	Constable
CSP 173	ACRI Computing Support	Bange
CSP172	Field experiments at ACRI	Constable
CSP176	Plant Breeding Fibre Quality Lab	Constable
	Linking Farming Systems to Fibre Qual & Textile Perf.	Gordon

Detailed aspects of each specific project will be reported in their annual and final reports.

Objectives

The aim was to conduct the routine management operations required on experiments done by CSIRO in CRDC and CRC funded projects at the Australian Cotton Research Institute in the disciplines of Plant Breeding, Entomology and Agronomy. The funds were paid direct to NSW DPI to part fund field operation costs.

The following simplified map of ACRI shows the fields occupied by CSIRO field cotton research in 2005/06. Rotation with wheat means there is less than 50% occupancy by cotton in any one season and that CSIRO occupies about 50% of the cropped area each season.



Conclusions

Our longer term analysis of factors contributing to yield improvement in the Australian cotton industry have shown breeding new varieties is responsible for 45% of the improvement, with soil and water management and insect management responsible for about another 25% each. CSIRO's field research portfolio covers these factors in great detail with environmental sustainability as an important criterion for all research and management recommendations.

Thus CSIRO field research projects which have been partly supported by this CRDC funding have addressed important issues of relevance to future viable and sustainable cropping systems (see list in section 1).

Results

Economic benefit to growers and industry is through increased yield and fibre properties – a CIE report in 2002 calculated that CSIRO's cotton breeding program and decision support projects have added $5.2b in net present value to Australia's cotton industry. That equates to about $260,000 pa for each cotton grower.

Benefits to the environment from research are a 70% reduction in pesticide use (from the combination of IPM and BT transgenic varieties). In addition, the cotton industry now achieves twice the yield for the same irrigation water as was the case 20 years ago.

Industry investment in research would appear to be providing substantial rewards and supporting overall field costs at ACRI are an important component of that funding.

Part 4 – Final Report Executive Summary

This project has part funded field operation costs charged by DPI to CSIRO for experiments on ACRI at Narrabri in 2005/06. More than 20 projects have been supported over the three years and all field operations have been done well through collaboration within CSIRO and between CSIRO and NSW DPI.

CSIRO field research has addressed all important areas for yield and sustainability: breeding, disease resistance, soil and water management and insect management. Results of that research have substantially improved industry performance and value. Cotton breeding and decision support systems have been estimated to have added $5.2 to regional economies in the past 20 years. IPM research (by all research organisations) has been successful in substantially reducing the volume of insecticide used on cotton.