Cotton Research & Development

Annual, Progress and Final Reports

Part 1 - Summary Details REPORTS

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

CRDC Project Number: **DAQ89C**

Annual Report: ☐ Due 30-Sep-03

Progress Report: ☐ Due 29-Jan-03

Final Report: ☒ Due 30-Sep-03
(or within 3 months of completion of project)

Project Title: Cotton Strain and Cultivar Testing in Queensland

Project Commencement Date: 01/07/1998 **Project Completion Date:** 30/06/2003

Research Program: Plant Breeding and Biotechnology

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Part 3.3 – Final Reports

1. **Australia produces millions of bales of cotton per annum valued at many millions of dollars. A breeding program is normally expected to increase the yield/quality of new cultivars by approximately 1 – 2 percent per annum which is worth extra millions of dollars per annum to the industry.**

   Australia exports about 90% of its cotton crop and the market now demands good fibre quality. The Australian Cotton Growers require cultivars with high yield and good fibre quality.

   Cotton breeding programs are conducted at Narrabri in NSW by CSIRO.

   This project evaluated both preliminary and advanced breeding selections from these breeding programs in several locations in Queensland under both irrigated and dryland conditions. The inclusion of Queensland environments together with the NSW sites will improve the efficiency of the selection process in targeting the major cotton producing areas of Australia.

2. **The objective of the project is to evaluate breeding selections and cultivars of cotton at up to 7 locations in Queensland. All preliminary and advanced breeding selections originate from the CSIRO cotton breeding programs at Narrabri.**

   The commercial release of many new improved varieties by Cotton Seed Distributors over the past five years shows that these objectives have been achieved.

3. **The following annual trial program provided the milestones for this project:**

   - **Australian Cotton Cultivar Trials (3 irrigated sites – Brookstead on the Darling Downs and Moura and Emerald in central Queensland).**
   - **"Short Season" Trials on the Darling Downs (1 site – Brookstead)**
   - **"Full Season" Trials in central Queensland (2 sites – Moura and Emerald)**
   - **"Hot Area – Material" Trials in central Queensland (1 site – Emerald)**
   - **"Ingard" Variety Trials (Emerald in central Queensland and Brookstead on the Darling Downs)**
   - **Dryland Cotton Cultivar Trial at Dalby on the Darling Downs.**

Release of cultivars to industry on the basis of these evaluations was determined by CSIRO breeders.

4. **Queensland trials in the 2002/2003 Australian Cotton Cultivar Trial series produced few promising lines. At Brookstead on the Darling Downs, none of the new lines outyielded the highest yielding commercial variety. In central Queensland, 2 lines were better yielding at Emerald than the highest yielding commercial variety by up to 3 percent; none of the new lines were better yielding at Moura than the highest yielding commercial variety.**

   The Dryland Cotton Variety Trial at Dalby on the Darling Downs showed that good results can be achieved in good seasons. The Dryland Cotton Variety Trial in central Queensland was not planted due to drought conditions.

   Strain trials to evaluate advanced breeding lines were grown at Brookstead ("Short Season") and at Moura and Emerald ("Full Season). One new "Short Season" line showing promise, outyielded the highest yielding commercial variety by up to 2 percent. In the "Full Season" trials, 18 lines outyielded the best commercial variety at Moura by up to 20 percent and 2 lines outyielded the highest yielding commercial variety at Emerald by up to 5 percent.

   A strain trial to evaluate breeding lines suitable for the "hot Area" was grown at Emerald. Nine of these lines outyielded the best performing commercial variety by up to 3 percent.

   At Emerald, 1 "INGARD" line outyielded the best yielding commercial 'INGARD' variety by up to 1 percent.

   Of the 3000 plus lines tested in the 'Fusarium Screening" Trials at Pampas on the Darling Downs, a few hundred promising lines, as good as or significantly better than the best current commercial varieties, will be retested this season together with another 3000 new lines generated by CSIRO.

5. **These evaluations have met the aims of this project. The results from these trials indicate that genetic improvement in yield and quality is still being achieved in new cultivars.**

6. **The testing of vast numbers of cotton breeding lines, from the CSIRO program, throughout the cotton growing regions of Queensland, has resulted in the eventual release of new/improved commercial cotton varieties. These (especially INGARD varieties) require less chemical spraying during the growing season (sustainability of natural resources – Environmental) and at end of season produce higher yields (profitability for grower – Economic) and better quality cotton (competitive markets and higher prices - Economic). This then has a flow-on effect on people and communities whether they are in the cotton industry directly or indirectly (Social).**

7. **Technical advances achieved in the last 5 years from this project were the release of many new commercial varieties by Cotton Seed Distributors. Cotton variety testing trials throughout Queensland by Queensland Department of Primary Industries has contributed to these new releases.**

8. **No future Research Plan is envisaged by the Queensland Department of Primary Industries for the Cotton Strain and Cultivar Testing Project in Queensland.**

9. **Results of the trials over the last five years have been published in the Australian Cotton Conference papers (2000, 2002) and the central Queensland Trial Results Booklet (1999-2002).**

10. **The impact of the results and conclusions from the Cotton Strain and Cultivar Testing Project in Queensland is the commercial release of new varieties and the cost benefits that go with the uptake of these better performing varieties.**

    These new varieties are often condition and/or region specific, with increased yields, better fibre qualities, herbicide resistance, disease resistance, etc.

Part 4 – Final Report Executive Summary

A series of trials for evaluating new cotton strains and cultivars in Queensland was conducted in collaboration with the CSIRO cotton breeding programs based at Narrabri.

Queensland trials in the Australian Cotton Cultivar Trial series were grown at Brookstead on the Darling Downs and at Moura and Emerald in central Queensland.

Strain Trials to evaluate preliminary and advanced breeding lines were grown at Brookstead (Short Season lines) and Moura and Emerald (Full Season lines).

"Hot area – material" was tested in trials at Emerald while "Ingard" lines were tested in trials at Emerald and Brookstead.

Once again Dryland cotton variety trials were attempted on the Darling Downs (Dalby) with the hope that the current drought conditions did not prevail.

The outcome of these trials was the commercial release of new cotton varieties that have higher yields and improved fibre qualities, especially fibre strength.

The inclusion of Queensland sites for early generation testing improves the efficiency of the selection process and assists the CSIRO breeders identify high yielding cultivars with high fibre quality and other desirable attributes suited to "local conditions"

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