

COTTON RESEARCH AND DEVELOPMENT CORPORATION

To promote agronomic and management practices, including the Cotton BMP program, which preserve and protect optimal fibre quality characteristics

Background

The Cotton Research and Development Corporation (CRDC) commissioned BDA Group in July 2009 to undertake a benefit cost analysis of three randomly selected sub-programs across their 2003/04 to 2007/08 research and development portfolio. These analyses form part of a wider assessment of the return from rural research that is being conducted by the Council of Rural Research and Development Corporation Chairs.

Over the period 2003/04 to 2007/08 one of CRDC's main investment programs was "Value Chain". The objective of this program was to produce high quality consumer preferred cotton and develop new international and domestic market opportunities for Australian cotton. Fibre quality can be affected by management practices across the entire cotton supply chain - from growing through to spinning. Consequently, there is potential for value to be added across the supply chain from practice change, with flow on benefits back to Australian cotton growers. Within the program CRDC invested in five sub-programs with sub-program 2 aimed at improving agronomic and management practices along the cotton supply chain that will improve fibre quality. This sub-program, 6.2, is the focus of this evaluation.

The Projects

There were 19 projects funded in sub-program 6.2 between July 2003 and June 2008. The main research partners included the Australian Cotton Cooperative Research Centre and CSIRO. Considerable support was also provided by the commonwealth Department of Agriculture, Fisheries and Forestry (DAFF) through their "Pathway to Industry Environmental Management Systems Programme"¹.

Between 2003/04 and 2007/98 CRDC and partners invested nearly \$2m in total, as reported in Table 1. Across the 19 projects CRDC has contributed 40% of funds in nominal terms. Most investment projects were funded on a short term basis (less than 1 year) except for the

¹ This programme was funded under the Natural Heritage Trust.

Environmental Management Systems (EMS) Pathways project which ran over three years and the Field to Fabric course that ran over most years, with the CRDC sponsoring several participants.

Table 1: CRDC and Partner Investment (nominal \$)

Year	CRDC Investment	Partner Investment	Total
2004	\$6,034	\$0	\$6,034
2005	\$305,095	\$171,468	\$476,563
2006	\$66,000	\$190,000	\$256,000
2007	\$121,740	\$277,780	\$399,520
2008	\$278,184	\$504,500	\$782,684
Total	\$777,053	\$1,143,748	\$1,920,801

Note: Year refers to year ending June.

Outputs and Outcomes

Outputs from sub-program 6.2 have been described as either technology based (product, process or information on a specific aspect of cotton production or processing that has resulted in a beneficial impact across the industry), training (outputs designed to convey information to the cotton industry on fibre quality) and knowledge (projects designed to increase scientific understanding which underpins future technology development). A breakdown of investment across these groups is provided in Figure 1.

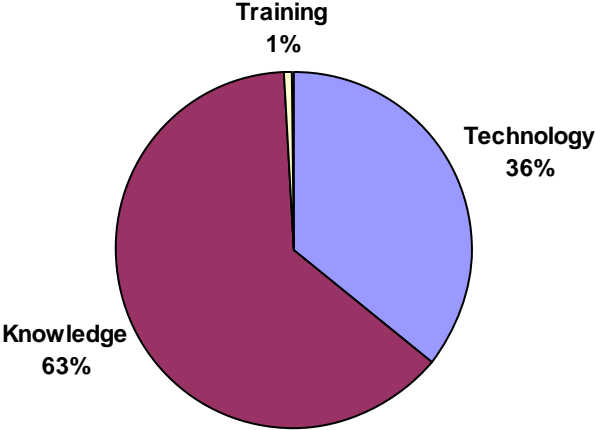
The two main outputs from the sub-program include the generation of knowledge to better understand the impact of post farm activities on fibre quality and how different farming practices can impact on processed fibre quality. The main technology output from the sub-program was the enhancement of Best Management Practices (BMP) in cotton classing and ginning and support for the development of new branded cotton products as result of the EMS pathways investment.

An example of a major knowledge project supported under sub-program 6.2 was the work of Dr Bange from CSIRO. The project aimed to fill the gap in knowledge that existed between on-farm management practices (such as variety, nutrition, irrigation, disease, insect and weed management) and their impact on fibre quality (micronaire, short fibre and neps)². Research

² CRC 80 Final report

outputs have been used to help improve the predictive capability of the OZCOT cotton simulation model used by CSIRO Plant Industry and helped support field work undertaken under other CRDC and partner projects linking farming systems to textile performance.

Figure 1: Breakdown of Outputs from Sub-Program 6.2



Technology outputs from sub-program 6.2 are largely based around the EMS Pathways investment. The program was initiated by DAFF who sought to increase the adoption of profitable and sustainable farming practices across a wide range of agricultural industries. If successful this would lead to improved natural resource management with associated environmental benefits and an ability to demonstrate stewardship to markets and the wider community³. Underpinning the program was recognition that industry developed and implemented EMS systems would likely be more successful than DAFF and other government agencies seeking to develop such programs in isolation.

In response to DAFF’s programme the CRDC was successful in its submission for funding support to develop and implement an EMS pathways program for the Australian cotton industry. Prior to the EMS pathways project the Australian cotton industry had developed BMPs for cotton growing which already focussed on enhancing environmental outcomes in conjunction with increased farm productivity. As such, the EMS Pathways project sought to

³ Hassall & Associates 2007, Pathways to Industry Environmental Management Systems Programme, Final Report to DAFF, October.

extend the BMP both in scope (to include fibre quality) and in extent (beyond the farm sector). Specific outputs included⁴:

- Fibre quality management BMP's were integrated into Fibrepak⁵. In collaboration with Cotton Classers Association of Australia three previously developed programs were consolidated into one program that provided a single method for reporting bale grades. BMPs were also developed for the ginning sector and were piloted in 27 out of 40 gins operating in Australia at that time.
- Information on current industry practices along the supply chain that impact on fibre quality.
- Development, or re-establishment, of linkages between a number of industry sectors where fibre quality issues could be discussed.
- Development and implementation of a process to identify and brand Australian cotton grown and processed as certified EMS right through to the retail sector.

The four main outcomes associated with investment outputs have been an increase in industry knowledge and hence capacity to implement BMP, the trialing of BMP for the ginning sector, classing facilities audited against developed cotton classing BMPs, and BMP certified cotton sold in a Japanese department store³.

Benefits

- **Economic**

Economic benefits would be generated if increased adoption of BMPs for fibre quality resulted in lower production costs and / or increased returns that were greater than the cost of implementing BMP.

⇒ On-farm – Much of the linkages regarding downstream fibre quality and farm productions systems have been developed under other CRDC investment sub-programs (such as the work carried out on fibre maturity, length and fineness).

⁴ A & A Willimas 2007, Enhancing the Cotton Industry's BMP Program to Improve Adoption, Final Project report to DAFF, June.

⁵ Part of a suite of manuals for cotton production and processing which is actively extended to industry.

However, the EMS pathways project has resulted in an increased awareness of BMPs and between 2002 and 2007 BMP certified growers increased from 20% to 37%.

While it may be expected that the EMS pathways project has made some contribution to this increase there is little evidence to suggest that grower returns have increased.

- ⇒ Classing – The Cotton Classers Association has *expressed the desire to maintain the BMP program and to have on-going industry development in future refinements*⁴. By streamlining BMPs in the classing sector cost savings would be achieved. These cost savings are likely to be modest and have not been quantified in this evaluation.
- ⇒ Ginning – Cotton ginning was identified as the main sector that did not have a BMP that satisfactorily linked in with both downstream and upstream sectors. This was seen as a limitation in developing an industry wide EMS. Although there is little information available on how the piloted BMP program has been adopted since the end of the trial it is unlikely that any direct economic benefits have been generated in this sector. There was already some Quality Assurance systems in place and the main outcome has been the capacity of the ginning sector to demonstrate their part in an accepted industry wide EMS certification process.
- ⇒ Retail – More than 330,000 garments that were certified as 100% Australian BMP cotton were sold through the Japanese Department store Izumiya⁶. While successful in achieving sales there was no evidence that consumers would be willing to pay a premium for BMP certified cotton products and hence no flow back benefit to Australia cotton producers in the form of higher prices for raw cotton. It was recognised however, that in the future there may be the development of market premiums for cotton that is grown and processed in an environmentally sustainable way. This premium might arise if consumers are willing to pay more or if garments made from BMP certified Australian cotton is preferred by consumers to cotton from other countries⁷. This shift in interest to quality has probably been one of the main impacts of the EMS pathways project that would help the Australian industry to pursue higher value markets⁸.

⁶ This work was also supported by Austrade and the Australian Cotton Shippers Association.

⁷ Cotton from different countries is often blended during processing making it difficult to identify a garments country of origin.

⁸ Focus on Quality – Bruce Pyke CRDC reported in CRDC Spotlight on Cotton R&D, Spring edition 2007

If any economic benefits have been generated to date they are likely to be modest at best. Longer term benefits may result as consumers become more willing to pay a premium for BMP certified cotton garments. The sub-program has clearly increased the industry's capacity to understand its markets and this will place the industry in a solid position to develop future initiatives to create quality based premiums.

- **Environmental**

No or limited environmental benefits could be attributed to the sub-program as there has been modest on-farm changes and downstream impacts have been based around contamination levels.

- **Social**

The sub-program has continued to increase the scientific understanding of fibre quality issues and production processes along the cotton supply chain. This increased technical capacity will provide the platform for the development and future adoption of technologies that will improve fibre quality and the profitability of cotton production and processing.

The sub-program, through the EMS pathways project has also increased linkages within industry, between industry sectors and with external stakeholders. This will deliver a greater capacity for EMS to be developed and delivered within agricultural industries and increase industry ownership of EMS. Through enhanced working relationships with industry and governments it is likely that the development of future natural resource management policies will be more effective and reduce cost burdens on both the cotton industry and government. To capture these possible benefits further investment will be required.

Results and Conclusion

Derivation of benefit cost analysis criteria was not undertaken as the benefits from the project were largely defined in terms of capacity building for the cotton industry. Sub-program outcomes will better place the Australian cotton industry to increase their resource security and maintain market access in face of growing consumer awareness of the need for environmental sustainability in agricultural production and processing. This was found to be consistent with impacts achieved on other DAFF funded EMS projects.