Cotton
RESEARCH & DEVELOPMENT

A SPOTLIGHT Special

Cotton Research & Development Corporation

"TRIPLE BOTTOM LINE" HIGHLIGHTS

August 2003

Strategic Plan 1998—2003

ENVIRONMENTAL ECONOMIC SOCIAL ENVIRONMENTAL ECONOMIC SOCIAL ENVIRONMENTAL

Background

Introducing " Triple Bottom Line" reporting

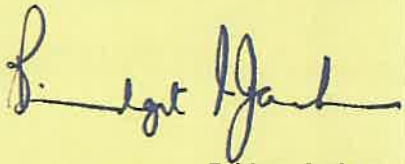
Seeking to report rigorously on the outcomes of its recently completed five-year research and development strategic plan, the Cotton Research and Development Corporation asked the basic question: "What is the meaning of sustainability?"

The Corporation believes it means more than environmental performance and more than economic performance. Instead, it is an amalgam of economic, environmental and social achievement that measures the true sustainability of an agricultural industry.

As a result, CRDC is moving to a system of Triple Bottom Line reporting – looking at what its research program has brought to the cotton industry economically and environmentally, but also socially. What has it delivered that enhances regional communities and, indeed, the broader Australian community? How has it improved the knowledge and career prospects of those within the industry?

These pages show highlights from the Corporation's full report on the three bottom line outcomes during the period of its Strategic Plan 1998 – 2003 that demonstrate the ways in which the cotton industry is increasing its economic, environmental and social performance.

And above all, they show the important contribution that a coordinated and carefully targeted program of research and development is making to the Triple Bottom Line sustainability of the Australian cotton industry.



Bridget Jackson
Chair
Cotton Research & Development Corporation

If you are interested in Triple Bottom Line reporting, CRDC has further information, and the full Strategic Plan 1998-2003 Triple Bottom Line Report will be available in late 2003.

The Australian cotton industry

Everyone, every day wears cotton clothing. Cotton is the most widely produced natural fibre in the world and represents about 46 per cent of the world textile market.

Australians are the highest consumers of cotton products in the world. The fact that cotton breathes makes it the natural choice in the hot and often humid Australian climate.

There are about 1200 cotton farmers in Australia. Seventy per cent of Australia's cotton is grown in NSW with the remainder grown in Queensland. Cotton growing is also being trialled in northern Australia.

Today's cotton farms are typically 500 to 2000 hectares, highly mechanised, capital intensive, technologically sophisticated and require high levels of management expertise. About 80 per cent of farms are irrigated, with about 400,000 hectares of irrigated cotton grown in Australia, depending on water availability. Yields for Australian irrigated cotton are 1600 kilograms per hectare – the highest in the world.

The area of rain grown or dryland cotton changes considerably from year to year, depending on rain and prices. The area ranges from 5000 to120,000 hectares, produced by up to 450 growers, with yields ranging from 200–1600 kilograms per hectare.

On a global scale Australia is a relatively small producer of cotton, growing about 3 per cent of the world's cotton, although we are the third largest exporter of cotton in the world.

Major buyers of Australian cotton are Indonesia, Japan, China, Thailand and South Korea. Australia has a reputation for producing high quality cotton. There is no government intervention in the growing or marketing of the crop. Since 1980, the value of Australian cotton produced annually has increased dramatically to about $1.4–1.6 billion per annum.

Our operating environment 1998–2003

Implementation of the 1998-2003 strategic plan has seen significant changes within the cotton industry, with the introduction of new technologies (particularly genetically-modified cotton varieties), the introduction of new ways to manage production in an environmentally-aware fashion (Best Management Practices) and expansion of the industry in traditional and new production areas.

The 2002–03 harvest was dramatically affected by the drought that hit so much of Australian agricultural production, with the cotton crop falling from some 3.1 million bales in the previous harvest to 1.5 million bales.

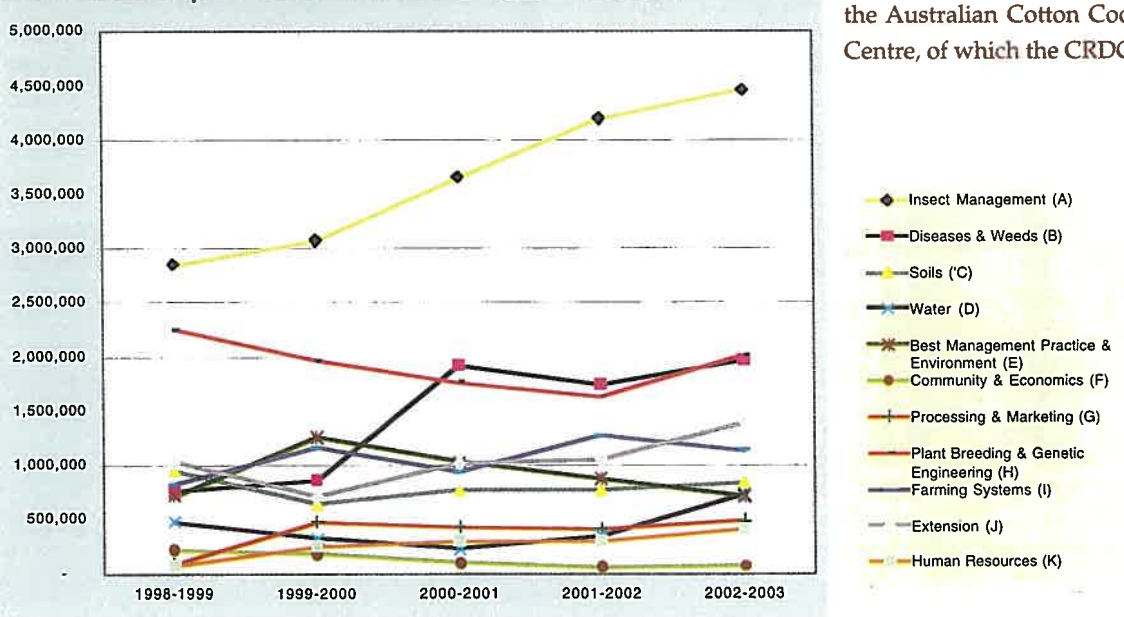
With severe restrictions on water availability facing the industry in the coming (2003–04) season, the predicted crop is even lower than the season just completed – with expectations of less than one million bales, unless there is a dramatic change in water availability.

Restricted water availability is emerging as probably the most significant challenge facing the cotton industry – and CRDC's research and development program – along with the rapidly spreading disease, Fusarium wilt.

An ever-increasing proportion of CRDC's research and development budget has been dedicated to issues aimed at tackling current or potential environmental issues such as chemical use, water use efficiency, farming systems and salinity.

A dramatic reduction in community complaints to the New South Wales Environmental Protection Agency – with a total of ten complaints in the last growing season, down from a high of 130 complaints in 1998–1999 – gives a good indication of the determination of cotton farmers, researchers, consultants and other industry personnel to improve the industry's environmental performance.

How CRDC spent research funds 1998 – 2003



About CRDC

The Cotton Research and Development Corporation (CRDC) was established in 1990 under Federal legislation.

Cotton growers support the corporation through a levy of $2.25 per bale (227 kilograms ex-gin) of cotton, with a matching contribution from the Commonwealth Government up to a maximum of 0.5 per cent of the gross value of production, or up to 50 per cent of expenditure, or not exceeding those from industry. Royalties from the sale of domestic and international planting seed and interest on investments make up the balance of the Corporation's income.

Based in Narrabri, NSW, the heart of one of Australia's major cotton-growing areas, CRDC is unique among the rural Research and Development Corporations in being based in a rural cotton production area, rather than a capital city.

The Narrabri district is also the home of a key industry research facility, the Australian Cotton Research Institute. The Institute is a collaborative research site and headquarters of the Australian Cotton Cooperative Research Centre, of which the CRDC is a core partner.

The Economic Bottom Line

An Economic overview

The gap between income and expenses is continually narrowing for Australian cotton growers who face ever-increasing costs in many areas of production, such as machinery (imported, and thus sensitive to the value of the Australian dollar) and water and freight costs. This makes the efficiency contributions from CRDC's research and development program vitally importance for the continued economic sustainability of the industry – efficiencies such as increased water use efficiency, lower chemical use and higher yield from improved varieties.

The 2001–02 season saw the Australian cotton industry achieve what is believed to be a world record for the highest average yield for a major cotton producing nation, while growers continued to focus on implementing environmentally sustainable management practices. More than 95 per cent of that crop was exported, adding some $1.3 billion to the Australian economy.

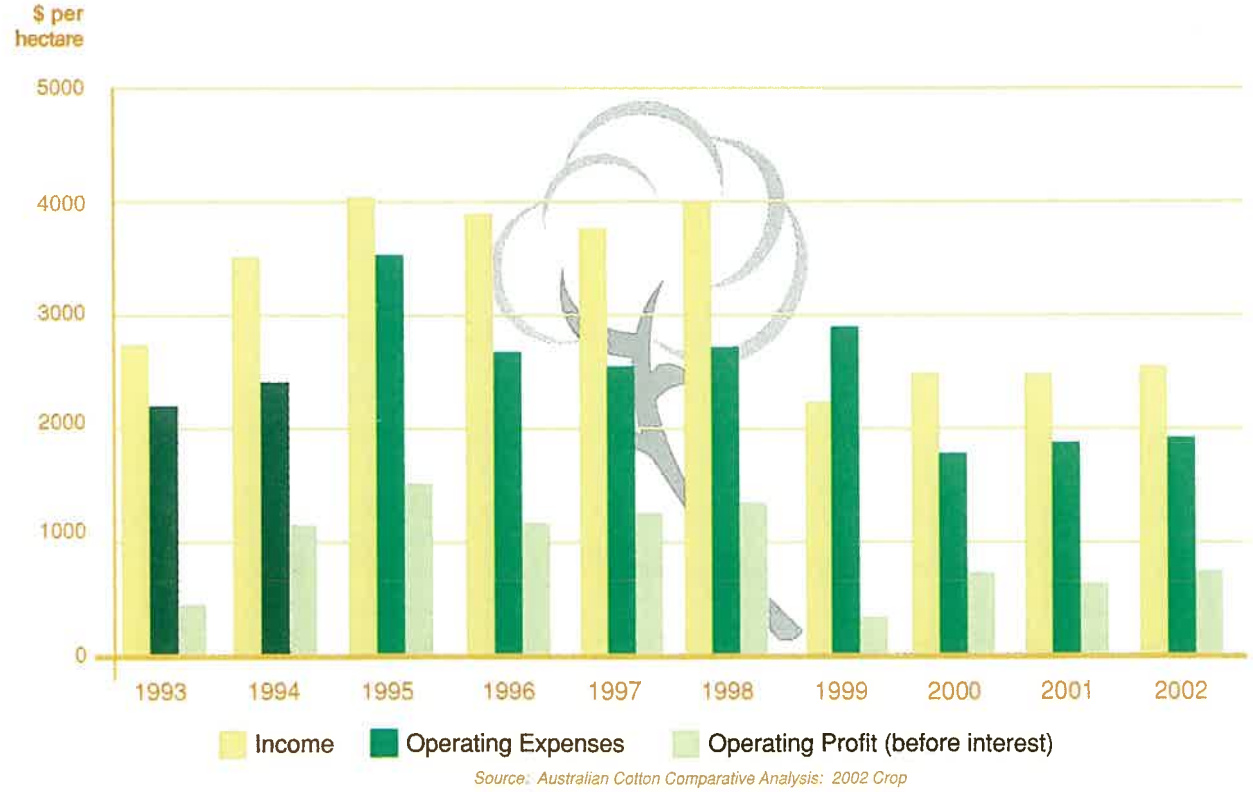
Since1960, cotton lint yields have steadily increased at about 30 kilograms of lint per hectare per year. Australian average yields are now the highest of any major cotton producing country in the world and yields have continued to edge upwards from1200 kg/ha in the 1970s, through 1400 kg/ha in the 1980s to 1600 kilograms per hectare in the 1990s. This level of efficiency helps Australian cotton farmers maintain profitability in the face of growing production costs.

Research and development, combined with its practical implementation by Australian cotton growers– who are very quick to pick up research and development outcomes – has under pinned these significant increases in production.

A surge of world overproduction pushed world cotton prices much lower in 2001and 2002; however, Australian cotton is strongly sought after and was able to command a sizeable premium. This is largely because Australian researchers have bred high fibre quality cotton varieties that satisfy market needs.

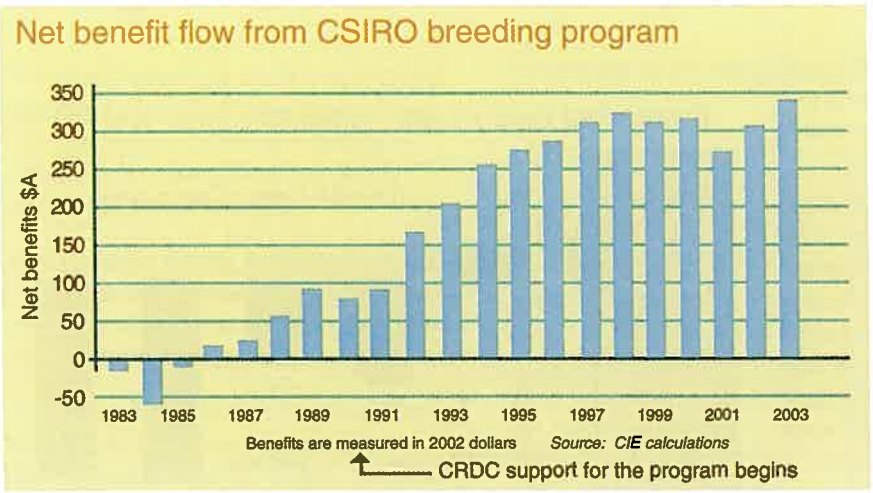
Other factors working in Australia's favour are that cotton farmers and ginners deliver a consistently high quality product and our exporters have earned a reputation as reliable and ethical shippers.

Australian Cotton Growers:
Comparison of Average Income and Expense items



Source: Australian Cotton Comparative Analysis: 2002 Crop

CSIRO cotton programs bring economic success



Economic analysis shows CSIRO'S cotton research has provided significant economic benefits to the Australian community, as well as to cotton farmers, returning a net benefit of over $5 billion since 1973, with a benefit:cost ratio of 51 and internal rate of return of 31 per cent.

Most of the benefit has come from the cotton breeding programs – a major focus of CRDC's research and development funding – which have returned net benefits of $4.9 billion, with a benefit:cost ratio of 86 and internal rate of return of 34. The present value of net benefits from CSIRO's award-winning decision support software, entomoLOGIC and CottonLOGIC, was estimated at just over $200 million, with a benefit:cost ratio of 18.5.

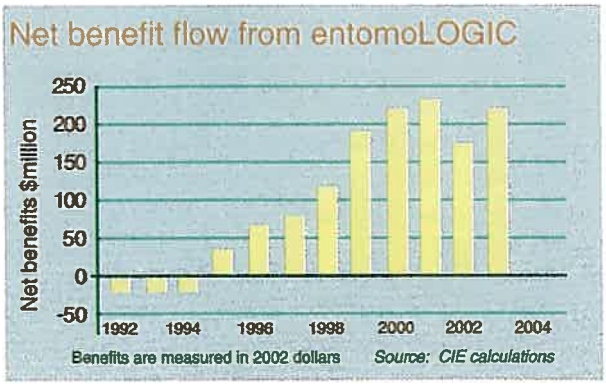
Much of the CSIRO cotton breeding research focused on producing high yielding, high quality and better adapted varieties, with increased resistance to pests and disease, with the development of management tools for growers also having this aspect as a strong focus. It is beyond doubt that the breeding program has played a significant role in reducing the number of insecticide sprays and use of chemicals on cotton crops, providing a significant economic benefit. In comparison to the varieties grown a decade ago, the new varieties are also at least 11 per cent more water-use efficient.

Want to know more? *The full CIE report is available from CRDC*

BACKGROUND

The Cotton breeding program, financially supported by CRDC, is undertaken by the CSIRO Cotton Research Unit, which was established in 1972.

In 2002, CSIRO and CRDC commissioned the Centre for International Economics to undertake a benefit cost analysis of the breeding program, as well as the development of several decision support management tools for cotton farmers and their advisers. These tools include SIRATAC, used from 1984 to 1989, entomoLOGIC, released in 1994 and more recently, CottonLOGIC.



R&D delivers financial "best practice" tool to growers

For the past two years, CRDC and BOYCE Chartered Accountants of Moree, NSW, have collaborated on producing an industry benchmark for the economics of cotton growing in Australia.

The "Australian Cotton Comparative Analysis*: 2002 crop*" can be downloaded from the CRDC website and used by cotton growers, consultant agronomists and cotton Industry Development Officers. It provides a valuable benchmarking tool against which growers can measure their own cotton farming operation's performance, identify strengths and weaknesses and improve their management in areas identified as needing improvement.

Just as many farmers have now implemented Best Management Practices in growing their cotton, this report is a management tool to allow them to develop "best practice" in financial management. It is then up to individual growers to use this knowledge to develop and implement specific action plans to reach new goals.

Transgenic cotton — an Australian biotechnology success story

ties with the trade name INGARD®, have been grown commercially in Australia for seven consecutive seasons.

In commercial use INGARD has reduced pesticide needs for Heliothis caterpillars by an average of 56 per cent, compared to conventional cotton. This has delivered an economic and environmental dividend by reducing the use of chemicals on the crop. Spraying for Heliothis on INGARD was reduced by 82 per cent last season. Yield potential and fibre quality have been maintained, with significant yield increases in some cases .

Although variability in performance has been a challenge to cotton farmers, there is evidence from the 2000–01 and 2001–02 seasons that it is declining. This suggests that both performance and management of INGARD is improving, as a result of farmers' growing experience and use of the results of CRDC investment in research.

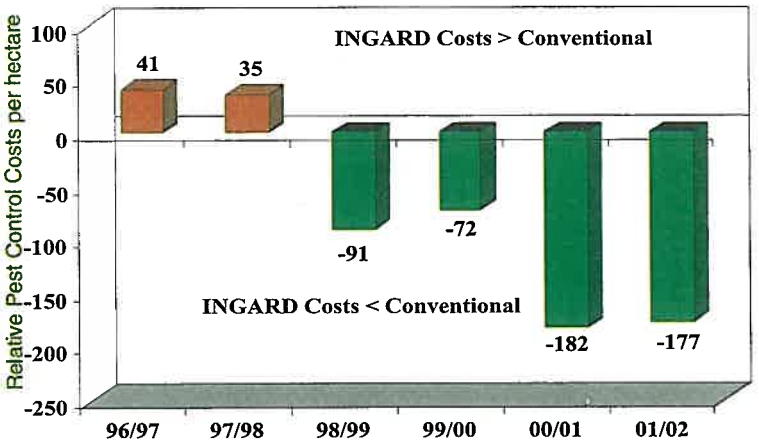
INGARD cotton was the first transgenic crop approved for commercial release in Australia. It has been introduced gradually in staged releases, starting at 10 per cent of total planted area in 1996–1997 and reaching 30 per cent in 2000–2001, which remains the cap.

The establishment of a cap is a result of a restriction recommended and supported by the industry, aimed at preventing the development of resistance. The industry takes a very responsible attitude to the prevention of resistance and this is backed by a major CRDC-funded research program to monitor for any early signs of resistance to the use of INGARD in the field. Integrated pest management techniques such as pest 'refuges', crop residue destruction and designated planting windows are all mandatory components of that strategy.

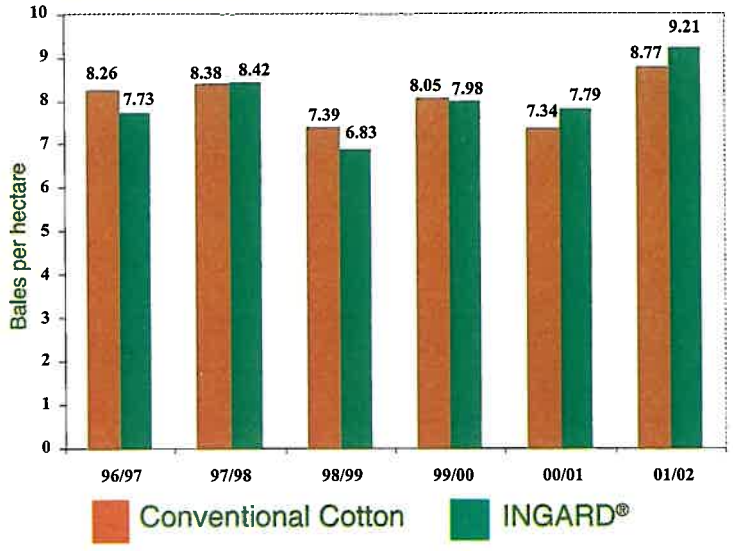
CRDC commissioned Cotton Consultants Australia to survey its members to measure the performance of INGARD cotton at each harvest, using a range of indicators.

Despite the benefits conferred on the cotton industry and local environments by INGARD, the industry is now able to move on to newer and even better technology with BOLLGARD II™ varieties – containing two pest resistance genes – now approved for commercial use. The two gene varieties will provide further improvements to efficacy, meaning the industry can expect even greater reduction in pesticide requirement. However, their main purpose is to provide much greater resilience against the risk of resistance. A rapid transition to BOLLGARD II™ is planned, with INGARD varieties likely to be withdrawn after the 2003/04 season.

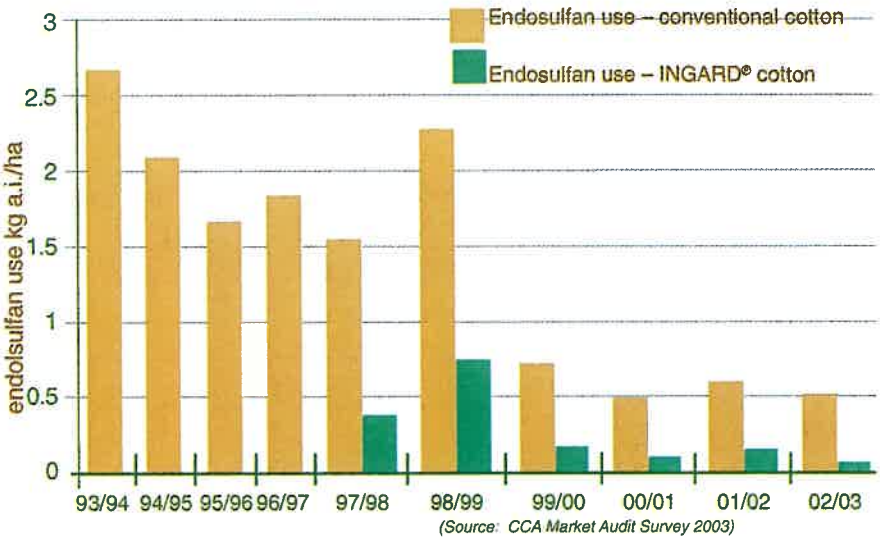
Relative Pest Control Costs: conventional cotton and INGARD®



Relative Yields: Conventional Cotton and INGARD®



Relative Endosulfan Use: conventional cotton and INGARD®



(Source: CCA Market Audit Survey 2003)

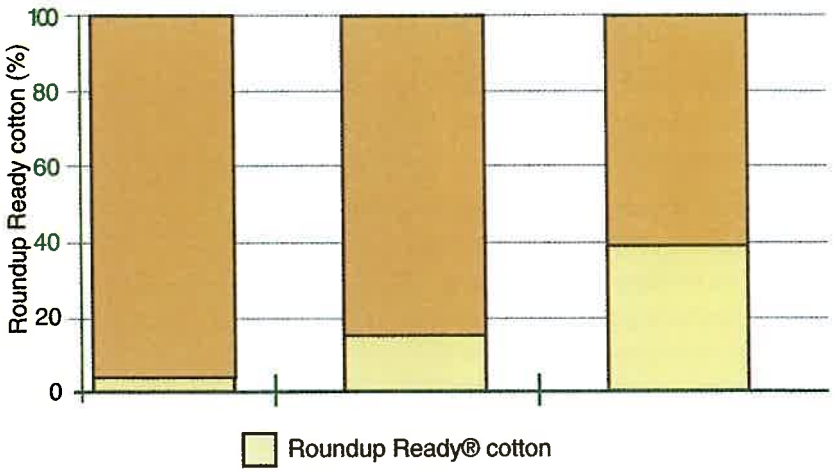
Roundup Ready® Cotton — decreasing herbicide use; increasing returns

The cotton industry is the first agricultural industry in Australia to have been able to plant transgenic, glyphosate herbicide-tolerant cotton using Roundup Ready technology from Monsanto.

With Roundup Ready, cotton farmers have a new tool to help manage weeds more efficiently, at less cost and with the use of less residual herbicide.

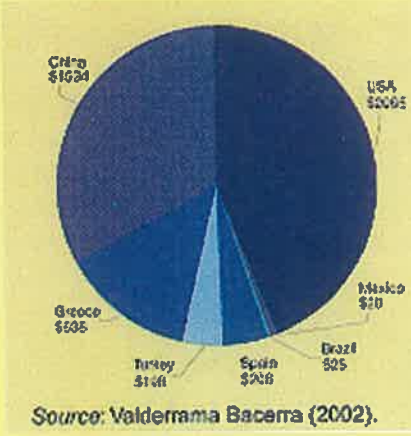
Its effectiveness can best be measured by how rapidly it has been adopted in the three seasons since its release, comprising an estimated 40 per cent of the crop planted in the 2002–2003 season.

Percentage of Roundup Ready® Cotton Planted in Australia



Cotton price distortions: building a case for reform

Direct assistance to cotton production 1999-2000 ($US)



There is no intervention by the Australian Government in the growing or marketing of the cotton crop in Australia. Instead, individual growers must become marketing experts, using the full range of market risk management tools such as forward selling, the use of New York Futures, commodity and currency hedging and participating in collective pools. This means that although they are subject to the vagaries of the international market, they can protect themselves to some degree by the use of these techniques.

But in some major producing countries, up to half of the returns to cotton farmers come from government subsidies, discouraging growers in those countries from having to race the realities and disciplines of the world cotton market. These countries also maintain substantial barriers to imports of yarns, textiles and clothing.

The consequences for non-subsidising countries are disastrous. When international prices start to fall, there is no supply response in countries, such as the United States, which heavily subsidise their producers. The subsequent oversupply greatly exacerbates the downturn in world prices so that all the adjustment is forced onto non-subsidising countries. This, in turn, causes significant disruptions in developing countries.

The International Cotton Advisory Committee (ICAC) has an ambitious agenda aimed at reforming this situation and has established a Working Group on Government Measures "to identify effective strategies to reduce and eventually eliminate the negative effects on trade caused by direct government assistance to cotton production and trade."

CRDC is an active member of the Australian Cotton Industry Council's trade committee and Raw Cotton Marketing Advisory Committee (for which the Corporation provides the secretariat). The work of these committees means the industry and government can pursue common objectives in removing distortions in free trade.

In the meantime, Australian research and development is working to keep Australian cotton growers profitable despite the international price distortions they face.

The Environmental Bottom Line

Cotton's Best Management Practices program delivers environmental benefits

The Australian cotton industry's Best Management Practices (BMP) program is acknowledged as a leader within the Australian agricultural sector.

BMP had its origins in a joint research program funded by CRDC, Land and Water Australia (then the Land and Water Resources Research and Development Corporation) and the Murray-Darling Basin Commission, which sought to minimise the impacts of pesticides on riverine and aquatic ecosystems in cotton-producing areas.

The BMP program, together with a cotton farmer-focused implementation strategy and associated voluntary audit, has led to an improvement in the way that cotton farmers manage pesticides. This in turn has led to reduced detections of pesticides – particularly endosulfan – in the rivers in cotton growing areas of New South Wales and Queensland. The Department of Land and Water Conservation in New South Wales found that concentrations of endosulfan detected in the lower Namoi valley have dropped significantly since monitoring commenced in 1991 and noted that this indicates a real decrease in detected environmental endosulfan levels; a trend which was observed across all 5 study basins.

Cotton farmers have reported a number of benefits, including improved communications –both internally with staff, and externally with contractors such as spray applicators – and improved handling and management of pesticides.

Development of the BMP Manual began in 1997. It allows cotton farmers assess their operations against industry recommended practices, and then develop action plans to address issues identified during the self-assessment process. It provides farmers with a set of environmental management guidelines, together with a framework to document and plan the environmental management of their farming operations.

Areas covered by the BMP Manual to date are:

- Application of pesticides
- Storage and handling of pesticides
- Integrated pest management
- Farm design and management, including storm-water management
- Farm hygiene
- Petrochemical storage and handling

A land and water management module for the BMP Manual is currently in draft form. The land and water draft will be trialled for its practicality on a range of cotton farms in a range of catchments over the next 3 years as part of the ongoing development of the BMP Program.

BMP is supported by detailed technical publications dealing with the various aspects of cotton growing. For land and water management existing information includes SOILpak (soil management) and NUTRIpak and NutriLogic (nutrition management). An integrated irrigation scheduling decision support system is currently under development to complement the existing soil water monitoring undertaken by cotton growers.

Implementation of the BMP Manual is the responsibility of Cotton Australia, the peak organisation representing cotton farmers. Cotton Australia estimates that more than 82 per cent of cotton farmers in Australia are actively involved in the BMP program.

Cotton Australia's team of eight Grower Services Managers, located throughout cotton growing regions, facilitates cotton farmer involvement in the BMP program and the adoption of the practices contained in the BMP Manual. Regular face-to-face contact between Cotton Australia's team and cotton farmers ensures that the growers fully understand the issues involved, how the manual works, and allows them to voice concerns or questions.

BMP COTTON
BEST MANAGEMENT PRACTICES

Auditing BMP

The Audit component of the BMP program was developed out of the need to objectively verify the on-farm implementation of best management practices.

Farm audits verify the compliance of the farm's operations with the BMP Manual, providing an objective assessment for the cotton farmer, as well as advice on areas where improvements can be made. A dedicated audit office provides the interface between cotton farmers and auditors.

Auditors for the BMP program are drawn from people who have practical experience in cotton growing, and who are then trained as environmental auditors. Their practical background has been especially well received by cotton farmers.

At June 2003, 280 cotton farms had been audited against the BMP Manual: approximately 45 per cent of the cotton area in Australia in the 2001–2002 season.

One of Australia's largest cotton operations receives Best Management Practices certification

Looking to the future with BMP

In a jointly funded project between the Cotton Research & Development Corporation and the Murray-Darling Basin Commission, the BMP Manual will be expanded to form the basis of a broader environmental program addressing the full range of natural resource management issues relevant to cotton production. This pilot project has a number of aims, including:

- Equipping cotton farmers with the skills to ensure the continual improvement and sustainability of their management practices
- Development of natural resource management guidance materials
- Determining the linkage between the natural resource management guidance materials and catchment plans, objectives and targets
- Determining the appropriate balance between formal 'management system' approaches and practical information
- Determining the appropriate pace for introduction of new modules for any broader environmental management program
- Mapping the future of the cotton industry's BMP program.

As part of its evolution into a comprehensive Environmental Management System, the BMP program's new land and water management module will address issues such as salinity, biodiversity, native vegetation, water quality and water use efficiency.

The development of this module is an excellent example of research and development collaboration between government and industry, involving:

- the Cotton Research and Development Corporation
- the cotton industry's peak organisation, Cotton Australia
- the Australian Cotton CRC, which provides technical support
- the Environmental Management System National Pilot Program: an initiative of Senator the Hon. Judith Troeth, Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry and funded by the Federal Government through the Department of Agriculture, Fisheries and Forestry
- and the Murray Darling Basin Commission, which has been collaboratively involved with CRDC since the inception of the BMP program

Further water use efficiency improvements called for

While water use efficiency in the Australian cotton industry compares well with overseas cotton industries, there is a wide variation in performance between properties. Achieving further efficiency gains remains a major challenge for the cotton industry and its research and development program.

The economic benefit of irrigation water in the cotton industry is $500 to $800 per megalitre, which compares well with other major irrigated crops.

Recent research by CSIRO Plant Industry, funded by CRDC, surveyed the water use efficiency of 25 farms over a number of seasons, involving almost 300 cotton crops.

This study found that, on average, the whole-farm water application efficiency was 57 per cent. However, there was a wide range of results, with some properties showing very good performance. The most frequent score was between 60 and 70 per cent, which matches the standards for similar systems set by the Food and Agriculture Organisation of the United Nations.

Whole farm water use efficiency is determined by soil type, farm design, water storage management and water distribution infrastructure.

Measuring actual water use across a property is important, allowing the farmer to assess what areas of their system and aspects of their management present most scope for improvements in water use efficiency.

Furrow irrigation is the most common water application method for growing irrigated cotton, but there is increasing interest in alternative application systems such as sub-surface drip irrigation and low pressure overhead systems, such as a Lateral Move machine which waters by sprinklers, rather than by flooding the crop as is more common. As well as improving water use efficiency, this technique causes less waterlogging. It also has the potential to deliver nutrients to the crop with the water.

Sound water management is fundamental to the health of our environment, our rural communities and agricultural industries. It is basic to the current success of the cotton industry as one of Australia's top rural export earners. To improve natural resource management, significant effort is being made to ensure that the cotton industry uses water efficiently.

Thanks to the Australian Cotton Cooperative Research Centre – an important research partner in achieving water use efficiency through research and extension – for much of this summary.

The pictures tell a story

Some cotton farmers are setting a great example in undertaking restoration of riverine environments on their farms. These photographs taken at a farm near Boggabri, New South Wales, show before and after views of the secton of the Namoi River passing through the farm that was remediated, as well as an enthusiastic group of tree planters establishing a biodiversity research trial.

Independent Environmental Audit finds significant improvements

This article is from the Executive Summary of the Second Australian Cotton Industry Environmental Audit, conducted in 2003 by GHD Pty Ltd: an independent firm of consulting environmental scientists, planners, engineers and project managers.

An independent environmental audit of the Australian cotton industry was first conducted in 1991. The aims of the inaugural audit were to assess the environmental impacts of the cotton industry, determine how such impacts could be reduced and how environmental performance could be improved.

The Cotton Research and Development Corporation commissioned this second environmental audit of the Australian cotton industry to assess the industry's response to the previous audit recommendations identify the environmental issues currently facing the industry, and to recommend strategies and priorities to further improve the cotton industry's environmental management practices.

> "... the most significant and far-reaching environmental improvements have been implemented over the last five years"

The Australian cotton industry has been subject to intensive environmental scrutiny, which, in part, was triggered by events such as fish kills from pesticides and, about five years ago, pesticide residues found in beef exports. There are ongoing concerns with the intensive use of pesticides and perceived high water use. As a result of these incidents and concerns, the cotton industry has developed and implemented a wide range of improvements in its operations and environmental management practices.

These improvements have been implemented over the last twelve years, since the inaugural environmental audit in 1991; however, the most significant and far-reaching environmental improvements have been implemented over the last five years.

Although the cotton industry has vastly improved since the 1991 audit was conducted, there are still areas where significant environmental improvements could be achieved.

The main environmental issues facing the cotton industry and opportunities for improved performance are in:

- Water management;
- Pest management and pesticide use; and
- Waste management.

Whilst there have been improvements in land and vegetation management and Occupational Health & Safety, there are still improvements that may be achieved in these areas.

There has been considerable investment by the industry into research and implementation to achieve long-term environmental outcomes. Some of the key areas of improvement have been:

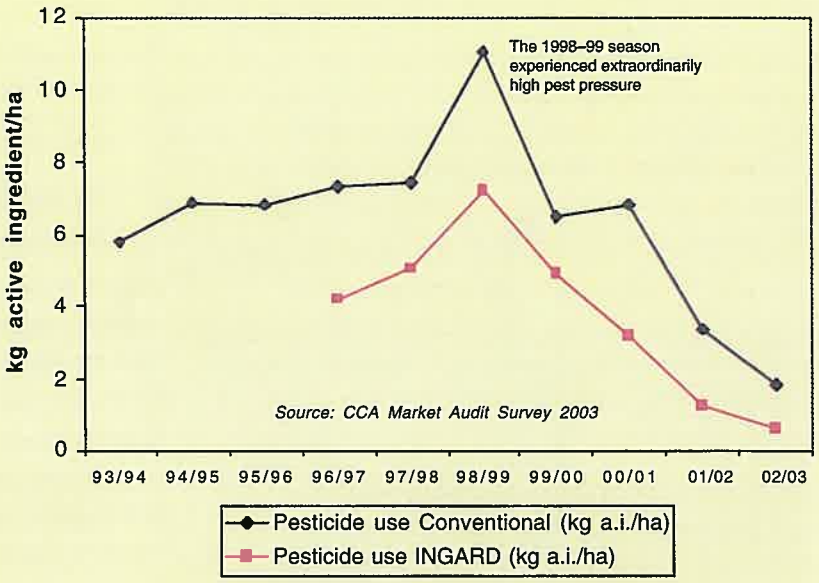
- Formulating and implementing a Best Management Practices (BMP) approach to cotton farming and environmental management. The BMP program has been a driving factor for the improved environmental management observed on cotton farms;
- Ongoing increases in water use efficiency, which have resulted in lower quantities of water applied per unit of production;
- Improved pest management, including less reliance on pesticides, through the adoption and implementation of Integrated Pest Management strategies of which the use of genetically modified cotton crops is a key component;
- Improved spray application to more effectively target spray placement and minimise off-target drift;
- Introduction of increased chemical container recycling to reduce disposal in landfills;
- Improved land management through minimising erosion, identifying and managing salinity and reduced soil compaction;
- Development and adoption of farm management tools, directed to achieve environmentally positive outcomes (such as improved soil structure and health by implementing SOILpak); and
- Conducting a strong research, extension and development program. This has resulted in identification of environmental issues and introduction of improved management practices in pesticide use, pest management, water use, vegetation and land management, waste recycling and disposal, wildlife management and biodiversity.

Insecticide use on the decline

Reliance on chemicals to manage insect and mite pests is a world wide problem for the cotton industry. In Australia, the expansion of cotton production during the 1980s and 1990s has brought the industry's use of insecticides under scrutiny from local communities and other agricultural industries in cotton growing regions as well as from regulators in state and federal governments.

For many years, farmers and researchers within the Australian cotton industry have been concerned that over-reliance on chemicals was neither environmentally or economically sustainable and have sought to develop and use alternatives to chemicals wherever possible.

In this environment, insect management became a high research and development priority. This problem received more of CRDC's research funds than any other from 1998 to 2003, with excellent results. Since 1998/99, pesticide use per hectare has been declining rapidly in both conventional and INGARD cotton.



Cotton-related complaints to the NSW Environmental Protection Agency 1998–2003

Integrated Pest Management

Since 1998, a number of research and development-driven factors have converged to enable a more rapid adoption of Integrated Pest Management (IPM) practices, which has led to a significant reduction in pesticide use. Implementation of this research has been led by the Australian Cotton CRC.

- The introduction of a comprehensive set of IPM guidelines for cotton and the inclusion of IPM as a module in the cotton industry Best Management Practice Manual
- Improved management and performance of Ingard® cotton
- The introduction of several new narrow –spectrum insecticides that are highly compatible with IPM and present low risk to animals
- The increased availability and use of biological insecticides
- The establishment of grower driven Area Wide Management groups, which allow cotton growers to coordinate pest management on a regional basis, share information and benchmark practices about managing pests
- The development and introduction of an IPM short course for cotton growers

A Cotton Benchmark Survey undertaken in 2000 identified a range of factors leading to a more environmentally friendly approach by many growers to managing pests – factors such as:

- An increased awareness, use and management of beneficial insects (such as the Spotted Ladybird, the Big eye bug, Assassin bug and Orange Caterpillar parasite)
- Managing chemicals through delayed spraying, choosing softer chemicals and using less chemicals
- An increased awareness and use of the IPM guidelines introduced in 1999, with a 93 per cent awareness of the Guidelines. 65 percent of respondents always used the guidelines, and a further 28 percent mostly used them.
- 75 percent of growers had changed their approach to management of insects and mites in the 5 years prior to 2000.
- Increasingly tolerating early season damage, tipping out and thrips, rather than spraying
- The planting of INGARD® Cotton in order to reduce the number of insecticide applications

The Social Bottom Line

Wincott Inc—Supporting women in the Australian cotton industry

Women are involved in many sectors of the cotton industry and are often active within family farming enterprises. With other agricultural industries, such as dairying, having established groups to provide support and opportunities for women, a group of women in cotton met in 1998 to discuss the formation of a network for women in the cotton industry.

The result was the formation of Wincott – the Womens Industry Network Cotton.

Wincott is going from strength to strength, providing women in the cotton industry with information and resources that encourage and empower them to attain skills and confidence and have an informed voice in the agricultural sector.

CRDC is providing seed funding for Wincott currently, but the organisation aims to become self funding by the end of the 2003–2004 financial year.

More and more women are becoming involved in Wincott information days, general interest field days and opportunities for skill building within the industry. Feedback is enthusiastic, reflecting how much women feel they gain from Wincott membership.

Recent months have seen events such as an insect control field day at Boggabri and a briefing on cotton classing and important associated issues, such as why cotton receives premiums and discounts in the market.

Six workshops on subjects as diverse as legislation updates, personal development and financial planning were held at the Annual General Meeting in March this year.

Regular newsletters update members on issues affecting thecotton industry, Wincott activities and other activities and opportunities in the wider industry.

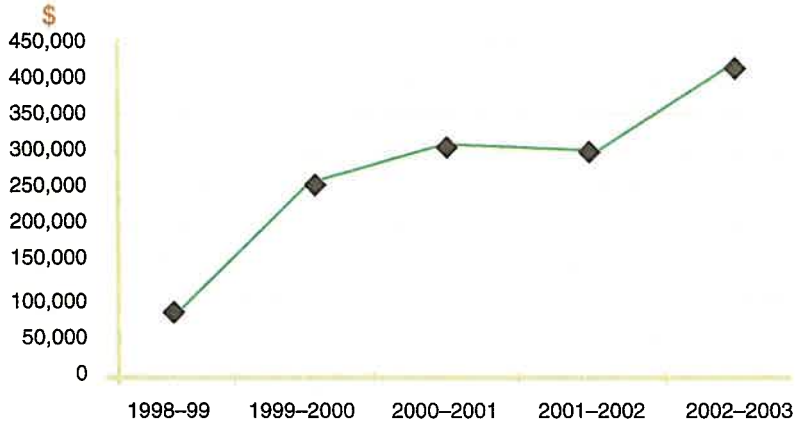
A major challenge for Wincott is the sheer distances separating some cotton valleys, making it difficult for the women to get together. An ever-increasing number of events will be held in different cotton districts to help overcome the problem.

A Wincott field day on insect control and bug checking was held this year near Boggabri in north west New South Wales

Wincott members from the Emerald district in Queensland arrive in Narrabri for the Wincott General Meeting in March 2003

Fostering knowledge and careers in the cotton industry pays dividends

CRDC funding for human resource development 1998 to 2003



A continually improving culture of innovation and increased skill level in scientists, advisers and growers is providing significant benefits to the cotton industry – and to regional communities. This makes the support and development of the men and women who conduct research and transfer the knowledge gained from that research a high and continuing priority for CRDC.

Research Reviews

CRDC periodically conducts research reviews of programs by independent international research scientists, to ensure opportunities are not overlooked. Examples are 2002 reviews of Whitefly research by Dr Peter Ellsworth of the University of Arizona and of Australian Fusarium wilt research by Dr Pat Collyer, Chair of the USA Cotton Disease Council, as well as reviews of spray application research and extension by British research scientist, Dr Steve Parkin, in 1999 and 2002.

Study Tours

CRDC provides support for researchers and extension personnel to travel overseas to gain a better insight into particular issues facing the Australian cotton industry, such as disease and pest management. The Corporation sponsored five researchers to join a study tour to gain further knowledge of Silverleaf Whitefly, in response to a major outbreak in some areas of Central Queensland in 2001–02. The group was able to consult with producers, researchers, extension staff, cotton consultants and aerial operators in regions of the USA that had experienced similar problems.

World Cotton Research Conference

This conference, held four-yearly, provides a forum where those involved in all facets of cotton production can learn from each other. The conference was held in Athens in 1998 and in Capetown in 2003. Joint funding by CRDC and the Cotton CRC made it possible for a group of 23 cotton researchers to participate at Capetown, with a similar number attending the Athens conference. Apart from the benefits of information transfer, participation in the World Conference showcases Australian science on the world stage and benefits developing nations who do not have the same research capacities.

Other Conferences

CRDC has sponsored 32 researchers to attend other international conferences and present papers, and sponsors attendance at relevant Australian conferences.

The Australian Cotton Conference

CRDC was one of the founding sponsors of the biennial Australian Cotton Conference, which is run by the Australian Cotton Growers Research Association and attended by some 1300 growers, researchers and industry personnel. It is a mark of the importance cotton growers place on the role of research and development in their industry to have a research-based conference as the most important industry gathering.

Mixing together freely in sessions and seminary growers and researchers are able to exchange views and information and ensure that research remains relevant to the needs of the industry. For organisations such as CRDC and the Australian Cotton Cooperative Research Centre, it is an unparalleled opportunity to promote the very latest in research to the end users.

Study Exchanges

CRDC provides opportunities for Australian researchers to spend time overseas on study exchanges.

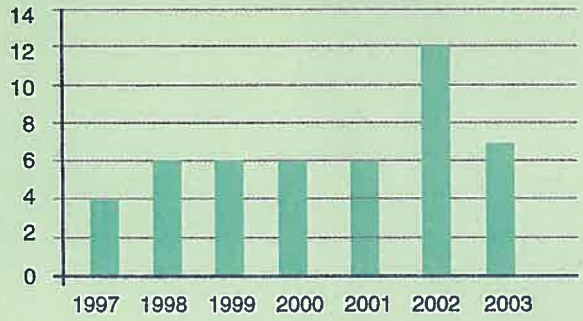
Supporting Postgraduate Students

CRDC believes it is very important to encourage bright postgraduate students to undertake research that benefits the cotton industry. The Corporation supported 37 PhD. students between 1998 and 2003. During this period, the Australian Cotton Cooperative Research Centre funded an additional 19 PhD. students, bringing the total to 56.

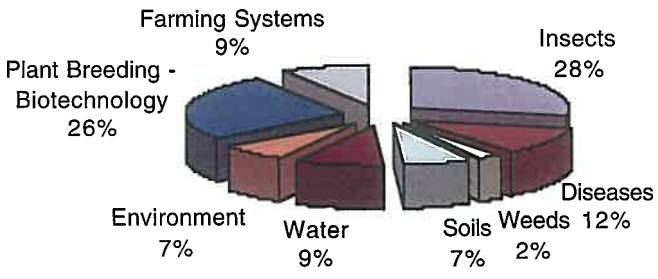
Dr John Triantafilis undertook doctoral and post-doctoral research, funded by CRDC, into understanding the salinity threat in the irrigated cotton growing areas of northern NSW. He has moved on to research salinity in a wider context, benefiting Australian agriculture and the wider community. John is pictured at the Australian Cotton Research Institute near Narrabri, NSW, with his salinity mapping machine.

CRDC postgraduate awards 1998 to 2003

(the length of each award was approximately 3.5 years)



Disciplines of CRDC-supported postgraduate students 1998–2003



Australian Cotton Centre assists regional economy

The Australian Cotton Centre (ACC), located at Narrabri, NSW, and officially opened by the Deputy Prime Minister, the Hon. John Anderson MP, in July 2002, conveys key industry messages through interactive, informative and engaging exhibits developed and constructed by the National Science and Technology Centre, Questacon.

ACC has served as a valuable information and educational resource centre for the national cotton industry while simultaneously encouraging regional economic development and job creation. The Cotton Centre is playing a key role in the development of tourism in the Narrabri district, encouraging tourists to stay longer and spend money in the local community.

Funding from CRDC was used for two of the Centre's exhibits: the Wheel of Life and Better Breeding exhibits. The Wheel of Life exhibit allows visitors to investigate the Heliothis (*Helicoverpa* spp.) life cycle and corresponding farm management practices. The Better Breeding exhibit means visitors can undertake a virtual experiment in crossing cotton plant varieties to produce a high yielding plant with high tolerance to insect attack. The information provided in these hands-on exhibits brings home in an entertaining and interactive way the message that research has played a significant role since the commencement of the industry in the 1960s – and it manages this while avoiding technical jargon and utilising novel delivery mechanisms.

An educational pack for students identifies includes worksheets specifically developed to link the information found within the exhibits to the educational curriculum.

The Federal Government priorities include "the need to promote and develop competitive, profitable and sustainable Australian agriculture, food, fisheries and forest industries which promote economic development and job creation, particularly in rural and regional Australia". Support for the Australian Cotton Centre is one way in which the Corporation addresses this priority.

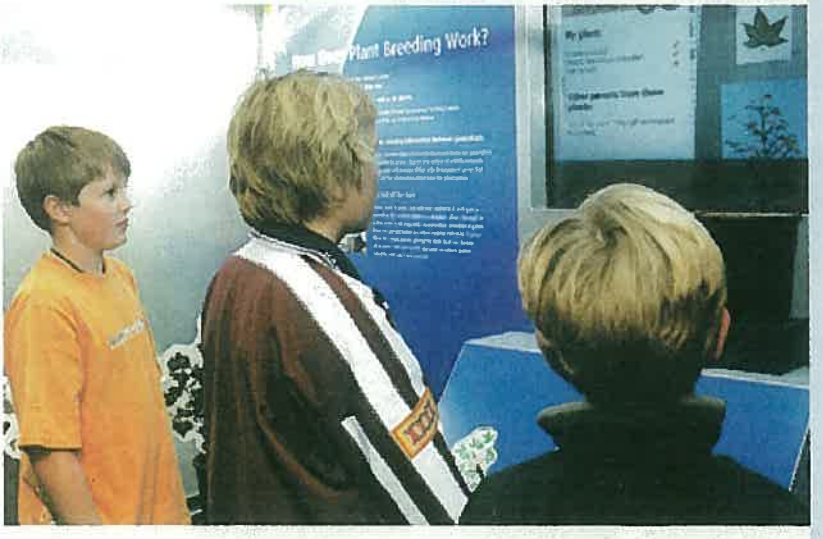
"The Australian cotton industry is committed to developing and improving its competitiveness, profitability and sustainability that ultimately leads to economic development and job creation in rural and regional Australia."

This message has been conveyed to almost 8,000 visitors at the Australian Cotton Centre in the past year.

Left: ACC staff Carol Russell and Paula Baillie

***Below, left:** Children enjoy the ACC's interactive displays*

Photograph courtesy of *The Narrabri Courier*



ISSN: 1448 – 4838

Enquiries regarding SPOTLIGHT should be addressed to:

The Communications Manager
CRDC
PO Box 282
NARRABRI 2390

Telephone (02) 6792 4088
Fax (02) 6792 4400
Email crdc@crdc.com.au