Australian Government

Cotton Research and Development Corporation

Annual Report 2010–2011

"The quest for sustainable competitive advantage"

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Australian Government

Cotton Research and Development Corporation

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Annual Report

2010–2011

CRDC

Vision

A globally competitive and responsible cotton industry

Mission

The quest for sustainable competitive advantage

Purpose

Enhancing the performance of the Australian cotton industry and community through investing in research and development, and its application

Outcome

Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community

Who we are

One of 15 Rural R&D Corporations, CRDC is based in Narrabri, NSW – the heart of one of Australia's major cotton growing regions and home to the Australian Cotton Research Institute. The Corporation is a research and development partnership between the Australian cotton industry and the Australian Government.

What we do

CRDC invests in and manages a portfolio of research, development and extension projects that seek to enhance the environmental, social and economic values associated with cotton production systems and to increase benefit to cotton industry participants, regional communities and the Australian people.

CRDC funds and coordinates the development of technical and non-technical documents, guides and other information tools and coordinates workshops, seminars and field days for a range of purposes including research review and progression, information sharing and technology transfer to industry.

CRDC produces a range of publications about corporate activities and operations and disseminates research outcomes. It acts as a formal and informal information source for stakeholders and client groups (facilitated by its location in a major cotton growing centre), through general industry media activities and the Corporation's website, www.crdc.com.au.

CRDC researchers are actively involved in the dissemination of research results, working through a range of mechanisms, including the CRDC-supported Development and Delivery Team.

CRDC became the Managing Agent for the National Program of Sustainable Irrigation (NPSI) in 2009–10. As Managing Agent and a program partner, CRDC supports collaboration in research for improving the environmental and productive performance of irrigated agriculture and horticulture in Australia.

Key research partners

Cotton growers
Rural Research and Development Corporations
CSIRO
Universities
Cotton Australia
Cotton Catchment Communities CRC
Other Cooperative Research Centres
NSW Department of Primary Industries
Queensland Department of Employment, Economic Development and Innovation
Other State Government Departments
Crop Consultants Australia
Agribusinesses

Our people

Board of Directors

Mike Logan (Chair)
Leith Boully (Vice-Chair)
Bruce Finney (Executive Director)
Kerry Adby
Mary Corbett
Glenn Fresser
Juanita Hamparsum
Peter Hayes
Lisa Wilson

Staff

R&D investment team
Bruce Pyke
Dallas Gibb
Tracey Leven

Communication
Rohan Boehm

Business and finance team
Graeme Tolson
Elizabeth Eather
Dianne Purcell
Margaret Wheeler

CRDC Statement of Principles

CRDC Directors and staff members are required to:

- Commit to excellence and productivity
- Be accountable to stakeholders
- Act legally, ethically, professionally and responsibly in the performance of duties
- Strive to maximise return on investment of industry and public funds invested through our Corporation
- Strive to make a difference in improving the knowledge base for sustainable cotton production in Australia
- Value strategic, collaborative partnerships with research providers, other research and development bodies, industry organisations, stakeholders and clients, for mutual industry and public benefits; including cooperation with kindred organisations to address matters of national priority
- Value the contribution, knowledge and expertise of the people within our organisation and that of our contractual consultants, external program coordinators and research providers
- Promote active, honest and effective communication
- Commit to the future of rural and regional Australia
- Comply with and promote best practice in corporate governance
- Commit to meeting all statutory obligations and accountability requirements in a comprehensive and timely manner.

Contents

WANT AN OVERVIEW OF OUR OPERATIONS?

The Executive Summary will give you a good overview, with in-depth information available in the rest of the report if you would like more detail.

LETTER OF TRANSMITTAL

Australian Government
Cotton Research and Development Corporation

4 October 2011

Senator the Hon Joe Ludwig
Minister for Agriculture, Fisheries and Forestry
Parliament House
Canberra ACT 2600

Dear Minister

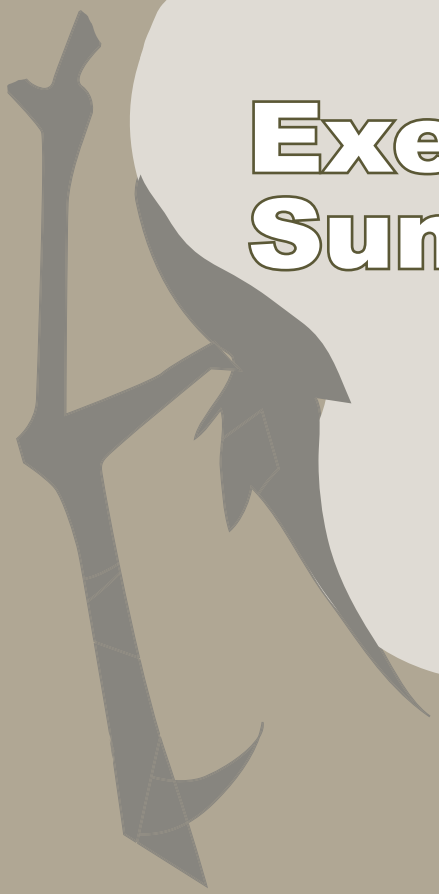
It is with great pleasure that I submit the Corporation's Annual Report for 2010–11, prepared in accordance with the provisions of section 28 of the *Primary Industries and Energy Research and Development Act 1989* and section 9 of the *Commonwealth Authorities and Companies Act 1997*.

Under section 9 of the Commonwealth Authorities and Companies Act 1997, CRDC Directors are responsible for the preparation and content of the Annual Report being made in accordance with the Finance Minister's orders. The report of operations has been prepared in accordance with a resolution of the Directors on 9 August 2011.

Yours sincerely

Mike Logan
Chair

Executive Summary



CHAIR AND EXECUTIVE DIRECTOR

"The quest for sustainable competitive advantage"

The good and the bad of an amazing season

The new century began a decade ago with what was then a record production of 3.6 million bales of cotton in the 2000–01 season. This was followed by a devastating decade-long drought but we in the business of R&D learned a lot in that decade. We learned how to make the most of the water that was available, using plant breeding and new, improved farming systems that maximised the crop's potential.

And then came the 2010–11 season. We saw an end to the long drought and the cotton harvest produced an all-time Australian record of just under four million bales, almost triple the previous season and expected to contribute around $2.4 billion in export earnings. At the same time, cotton prices rose, peaking at around $1,000 per bale, allowing growers to repair some of the financial damage of previous years. There is little doubt the R&D 'learnings' of the previous decade contributed to the excellent yields.

Unfortunately, the news was not good for all growers. Some in central Queensland and on the Darling Downs lost their entire crops – an estimated 10 per cent of total planted area – and suffered damage to their properties. Others in the northern regions suffered ongoing problems with waterlogged crops.

From an R&D perspective, these conditions 'reality tested' our new R&D Adoption Framework, which began delivering industry-wide extension in a more targeted and commercial-like manner in 2010. We are delighted to say the new cotton industry Development and Delivery team, and the scientists who worked with them, were well set up to provide timely post-flood advice to growers and consultants on how to manage flood-affected crops. Importantly, this included recovering seemingly lost yield potential through management strategies gained in years of research into growing cotton in tropical climates. To aid with such challenges in the future, CRDC is investing in a project in central Queensland to assess the response of flood-affected cotton crops to various management techniques.

The 2010–11 season also saw the launch of the new best management practices system, *my*BMP, which evolved the previous program into a responsive, interactive online portal designed to allow individual growers' to assess and manage risks. Following *my*BMP's launch in August 2010, the year's task has been to inform growers about the program and encourage them to participate. While the first growers have now been fully accredited under *my*BMP, the program's strength is that it allows growers to choose the level and type of involvement that suits their own circumstances.

None of this would be possible or as productive without the engagement of industry and our research partners. Cotton growers and ginners continue to provide valuable guidance through Cotton Australia on research priorities, critical review of project design and impact. Equally, these close linkages support strong levels of R&D adoption by industry and a responsive research community.

In February 2011, the Productivity Commission handed the Australian Government the final report of its inquiry into the return on its investments in the Rural R&D Corporations. The Minister for Agriculture, Fisheries and Forestry, Senator the Hon Joe Ludwig, subsequently announced that he would not be changing funding arrangements for RDCs, including CRDC, despite a recommendation contained in the report. CRDC is committed to working with both the Australian Government and cotton industry to ensure the continuing effectiveness and efficiency of our stakeholders' investment in rural R&D.

Looking to the future

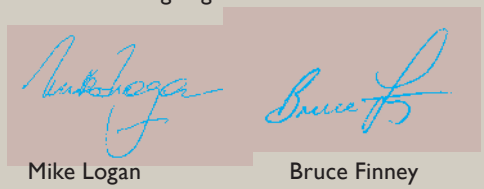
The enthusiasm generated by the promise of a good season was evident at the Australian

Cotton Conference, held on the Gold Coast in August 2010, with the theme *Fashioning the Future*. Almost 1000 delegates, including many growers, covered topics ranging from field to fabric – from global marketing issues right down to detailed research data on plant nutrition, water and soil health. The industry-developed and CRDC-coordinated Vision 2029 for the Australian cotton industry, detailed in last year's report, was launched to an enthusiastic reception at the conference. The Vision is playing an important role in guiding strategic planning by organisations within the industry, as well as a context for discussing industry progress.

At the time of writing, we are anticipating another good season in 2011–12, with ABARES forecasting a crop of more than five million bales. Given sufficient rain in the lead up to the season, we should see significant planting of dryland cotton and further expansion into areas as far south as Griffith in NSW.

Indications are that the industry will face a serious threat from pests and disease, particularly cotton bunchy top, which is spread by cotton aphid and causes severe damage to the plant. Work is underway to ensure farms practice appropriate hygiene – the most effective means of control. There will be a particular emphasis on assisting new growers with this and other challenges.

Finally, we will have a new Board of Directors in October 2011. Our thanks go to the current Board, who have guided the Corporation through difficult financial circumstances in the past three years at the same time as fostering an outward looking organisation.



Mike Logan
Chair

Bruce Finney
Executive Director

CRDC's Board of Directors for 2010–11: *(Back row)* Kerry Adby, Bruce Finney, Mary Corbett, Glenn Fresser, Lisa Wilson. *(Front row)* Leith Boully, Peter Hayes, Juanita Hamparsum, Mike Logan

THE YEAR'S HIGHLIGHTS

R&D highlights

2010–11 saw the first full year of operation of the new Development and Delivery (D&D) team, delivering extension in a more targeted, efficient, coordinated and transparent matter, integrated with the new online *my*BMP system.

The team devised the *Australian Cotton Production Manual 2011* and *Cotton Pest Management Guide 2011* and successfully addressed a range of important issues across the industry in 2010–11, such as the major disease threat cotton bunchy top, glyphosate & weed resistance workshops, self-sown (volunteer) cotton, energy use case studies, soil pit workshops and nitrogen use trials in back-to-back cotton and grower support for *my*BMP.

The post-flood effort by team members from the D&D team saw growers and consultants receive timely advice about how to manage flood-affected crops. CRDC-supported cotton researchers Paul Grundy (DEEDI) and Stephen Yeates (CSIRO) shared their knowledge about recovering seemingly lost yield potential through management strategies gained in their years of research into growing cotton in tropical climates in the Burdekin region of Queensland.

The second Sustaining Rural Communities conference, held in Narrabri in April 2011, brought together 270 delegates from broadacre agriculture, education, mining, local government and regional small business to work collaboratively to formulate ideas and concepts to secure the future of regional towns and communities.

The web-based, interactive *my*BMP program was launched at the Australian Cotton Conference in August 2010. Adoption rates across the industry are on target and the first growers – Katie and Johno Haire of Goondiwindi and Auscott Namoi – have been fully *my*BMP accredited.

The Chilean ash cloud and rain literally put a dampener on scheduled day of the 2011 Big Day Out – a large field day held each year on the farm of the previous year's recipient of Innovative Cotton Grower of the Year. In collaboration with the hosts, Rob and Susannah Tuck of Narromine, NSW, the day was quickly rescheduled and re-focused, leading to good attendance and an interesting and valuable debate on important farming systems issues.

An independent review of the business strategy for the Premium Cotton Initiative (PCI), which is devising a high value niche for Australian premium BMP cotton in the world marketplace, highlighted a number of opportunities not only for the PCI program but also for a broader industry program marketing Australian Cotton.

Australian Weaving Mills has developed a promotional program for their dri.glo line of towels, actively promoting the farmers who produce the premium cotton and the industry's BMP program that aids in guaranteeing its quality. For further information, see www.driglo.com.au/mod/farmers/guarantee#.

The project to achieve high standards in grower spray application saw a memorandum of understanding with ChemCert Australia for mentoring professional development of course deliverers through the ChemCert program, leading to a network of spray application workshop providers in NSW able to offer advanced level courses for spray applicators across the broadacre agricultural sector.

Corporate highlights

2010–11 was CRDC's second year as Managing Agent for the National Program for Sustainable Irrigation (NPSI). Qualdata Pty Ltd to conducted an external evaluation of NPSI operations in 2011 and found that '… informed persons rated the effectiveness of the NPSI program highly (7.2 on a scale of 1-10).' Positive comments were made by a number of respondents about the contribution NPSI had made in the development of an Australian irrigation RD&E program, its inclusion of industry groups and some of the outcomes of research.

CRDC facilitated the ongoing development and endorsement of the Cotton Sector RD&E Strategy during 2010-11. The Strategy was developed as part of the National Primary Industries Research Development & Extension (RD&E) Framework. Other parties to the strategy include the Cotton Catchment Communities CRC, Cotton Seed Distributors Ltd, CSIRO, NSW Department of Primary Industries, Queensland Department of Employment Economic Development and Innovation and Sydney University (on behalf of the Australian Council of Agricultural Deans).

The Cotton Sector RD&E Strategy sets out priorities for the sector's RD&E organisations and industry to cooperate on a national basis to address the strategic needs of the cotton industry by:

- Identifying key drivers for the cotton industry and associated RD&E;
- Defining a national set of priorities to guide RD&E investment;
- Analysing cotton RD&E capability against the priorities; and
- Considering and recommending options to improve cotton RD&E.

This strategy is a major efficiency and effectiveness tool for CRDC operations and further details can be found on page 19.

Aboriginal Employment Strategy (AES) trainee, Erika Anderson, continued her placement at CRDC, going from strength to strength during the year. Erika received the Giyannha Dirrabuu Murri Stage 6 Encouragement Award 2010, the Minister's Award for Excellence in Student Achievement by a Year 12 Student 2011, the Federation of P&Cs' Secondary Student Accomplishment Award 2011 and was a finalist in the VET in Schools Student of the Year 2011.

'Since I started my two-year School-based Traineeship with the Aboriginal Employment Strategy at CRDC, I have learnt and further developed my communication skills, phone etiquette, computer and database knowledge and my confidence has increased – all in a team office environment. As a part of my traineeship, I undertake a TAFE Business Certificate II Course.

I am able to apply the skills I have learnt through my traineeship and business course to my studies for class and assessments tasks at school, and have applied them to my home life as well.

Once I have completed my Higher School Certificate I plan to undertake a course at a university or college in the field of art and design. I feel that the skills and knowledge gained during my traineeship has set me up well for any vocational field I may choose.'

Erika Anderson

Erika Anderson with her CRDC mentor, Executive Assistant Dianne Purcell, at the 'VET in Schools' awards in Tamworth, NSW.

STRATEGIC PLAN 2008–2013
TRACKING CRDC'S POSITION

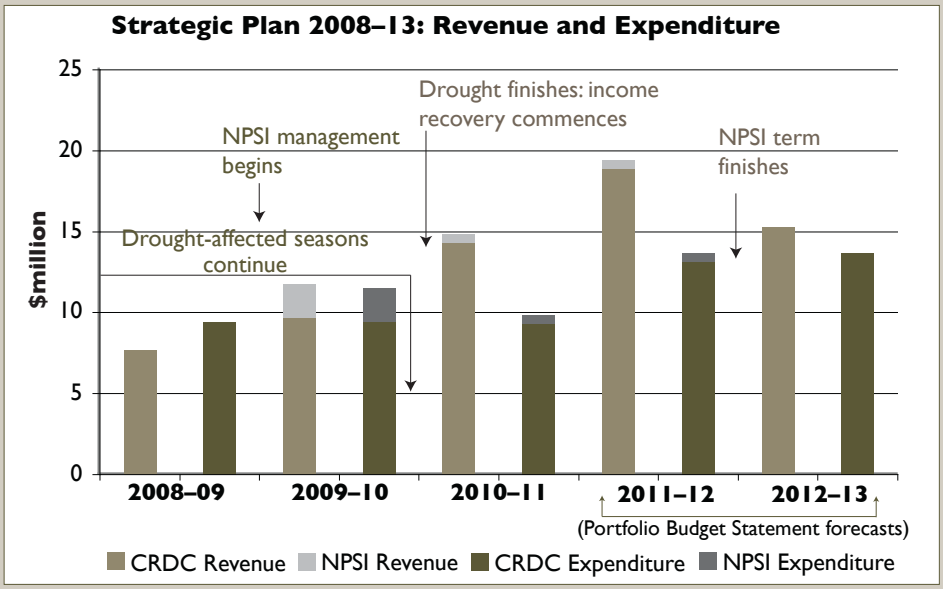
	2008–09	2009–10	2010–11
Cotton Crop Size (millions of bales)	1.45	1.71	3.99*
$million			
Total Revenue	7.681	11.736	14.824
Industry levies	2.374	3.433	4.576
Australian Government	2.436	2.997	5.677
Royalties	1.610	1.897	2.789
Interest	0.740	0.568	0.805
National Program for Sustainable Irrigation	n/a	1.985**	0.399**
Other	0.521	0.856	0.578
Expenditure total	9.408	11.501	9.812
Cotton RD&E activities	7.882	7.855	8.063
Total equity position	10.29	10.53	15.54

* Forecast ABARES September 2011 ** Included grant income and novation funding

CRDC staff	2008–09	2009–10	2010–11
Full-time employees	7	7	7
Number of part-time employees	1	1	1
Total CRDC staff	8	8	8

Operating Statistics***	2008–09	2009–10	2010–11
Number of new projects	44	57	66
Number of continuing projects	62	50	42
Projects finalised	61	58	45
Total number of R&D projects	106	107	108

*** Excludes National Program for Sustainable Irrigation (NPSI)



FINANCIAL SUMMARY

Revenue

Total revenue for 2010–11 was $14.824 million, comprising $14.316 million in cotton industry revenue and $0.508 million in NPSI revenue. Cotton industry revenue was $4.640 million (48 per cent) above budget of $9.676 million.

A record crop has boosted revenue from levies, Australian Government contributions and royalties. Normally, we receive 50 per cent of levies in the crop year but because of seasonal conditions, the 2010–11 harvest has been late and ginning is expected to continue until September. This means only 26.7 per cent of levies were received by 30 June. The record price of cotton has increased the Gross Value of Production to an estimated $2.59 billion.

The Australian Government contributions in recent years have been capped at 0.5 per cent of the three-year average gross value of production, as it was lower than the levies collected in the year. This year, with increased GVP, due to the later harvest, and therefore later levy collection, along with the record prices for cotton, the Australian Government contribution has been capped at the value of levy collections. Australian Commonwealth contributions include receipts for $1.1 million for a contingent Commonwealth liability for unmatched levies in prior years.

Revenue sources

CRDC's revenue is drawn from two main sources:

- Cotton farmers pay a levy of $2.25 for each 227-kilogram bale of cotton. Cotton levy revenue is collected at the point of ginning, that is, when cotton has been picked and delivered to cotton gins which then separate the cotton lint from the seed. This occurs from March to September of each calendar year, so cotton levy revenue in any financial year is drawn from two consecutive cotton crops.
- The Australian Government matches expenditure of levies on eligible R&D, capped at 0.5 per cent of the three-year average gross value of production or the cumulative levy receipts, whichever is the lesser. The setting and collection of the industry levy is enabled by the *Cotton Levy Act 1982* and the *Primary Industries Levied and Collections Act 1991*.

Royalties from the sale of domestic and international planting seed, interest on investments, external grant revenue and research project refunds make up the balance of Corporation income.

The ABARES, September quarter 2011 forecast lint production of 898,000 tonnes or marginally less than four million bales is 2.2 million bales higher than the CRDC 2010–11 budget, based on 1.7 million bales, which was established ahead of above average rainfall in summer cropping areas of Queensland and NSW and record cotton plantings. Flood damage in Queensland, which destroyed 40,000 hectares of crops, and outbreaks of pests and diseases in some regions impacted the final crop result.

Total revenue of $14.824 million for 2010–11 comprised:

- Industry levy revenue of $4.576 million, which includes $2.236 million (55.2 per cent) of the 2009–10 crop and $2.340 million (26.7 per cent) of the 2010–11 estimated crop.
- Australian Government contribution of $5.677 million. Australian Government matching of expenditure was capped at $4.575 million for levies collected during the year and $1.1 million for a contingent Commonwealth liability for unmatched levies in prior years.
- $2.789 million in royalties from the sale of CRDC-funded CSIRO seed varieties, which was 58 per cent above budget.

- Interest revenue of $0.805 million, which was 152 per cent above budget due to higher than expected interest rates on investments and additional funds under CRDC management for the NPSI program. Interest on NPSI investments was $0.078m.
- National Program for Sustainable Irrigation (NPSI) program grant income was $0.245 million and NPSI novation revenue utilised was $0.154 million.
- Other revenue of $0.578 million, which includes project refunds and external grant revenue.

Expenditure

Total expenditure for 2010–11 was $9.812 million, comprising $9.304 million in cotton industry expenditure and $0.508 million in NPSI expenditure. Cotton industry expenditure was $0.372 million (3.8 per cent) below budget of $9.676 million. Research expenditure in CRDC's three strategic research programs and research-related corporate activities (excluding NPSI expenditure) was $8.063 million, $0.094 million below budget. Other areas of expenditure for the Corporation included employees and operational expenditure.

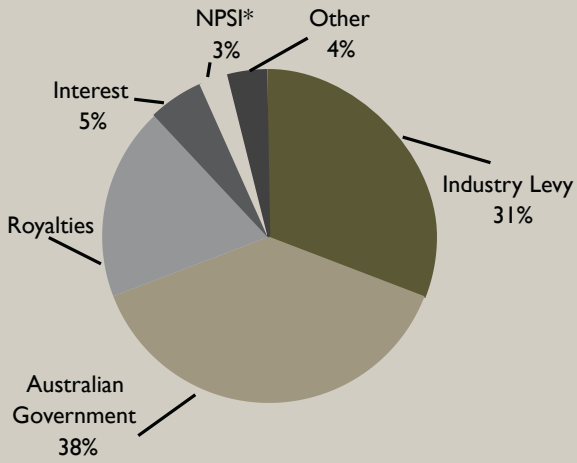
Financial position

CRDC reported a net surplus of $5.012 million for 2010–11 against a balanced budget, due to the record Australian cotton crop returning higher than budgeted levies, Australian Government matching contributions and increased royalties. In addition, expenditure did not exceed budget.

Cash reserves managed by CRDC have increased from $11.282 million at 30 June 2010 to $16.296 million at 30 June 2011. The NPSI novation net cash reserves decreased by $0.778 million as at 30 June 2011.

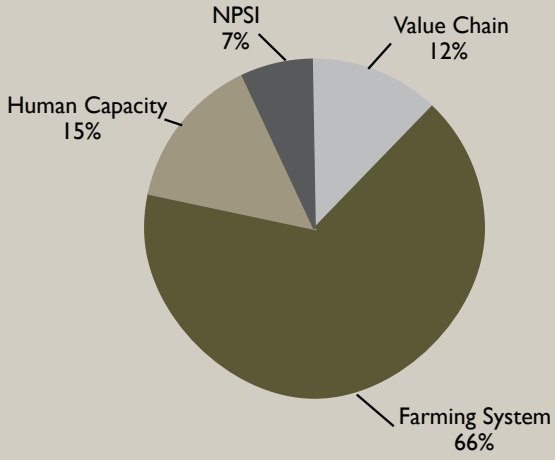
The Corporation's total equity position of $15.542 million at 30 June 2011 is an increase of $5.012 million from the previous year. The expenditure to equity ratio for 2010–11 was 63 per cent, which includes NPSI expenditure, while NPSI had no effect on equity. The cotton industry expenditure to equity ratio in 2010–11 was 60 per cent compared to 90 per cent in 2009–10, which is within the guidelines of the Corporation's policy to maintain reserves at a sustainable level.

CRDC revenue 2010–11



Note: Comprises grant income of $.0245 million and utilised novation revenue of $0.154 million

R&D-related expenditure by program



R&D Program Breakdown*

	Value Chain	Farming Systems	Human Capacity	Total
Number of projects	13	60	35	108
Program expenditure	$0.887m	$4.853m	$1.072m	$6.812m

*Excludes NPSI, Land & Water website grants, untied grants and corporate research activities supporting R&D planning and adoption.

Outcome 2010–11

'Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community'

Total Budgeted Revenue: $9,676,00

Total Actual Revenue: $14,824,165

Total Budgeted Cost of Outputs: $9,676,000

Total Actual Costs of Outputs*: $9,812,342

*Total cost is shown rather than total price because the Corporation is primarily funded through industry levies rather than on the basis of the price of its Outputs. Each research project and its funding contributes to the Outcome. Total research expenditure for the Outcome is calculated, with the remaining expenditure attributed to the Outcome on a pro rata basis.

The Coming Year

Revenue

Water availability continues to be a significant factor in cropping decisions. Most water storages in the cotton growing catchments are at pre-drought levels due to high rainfall during summer and plantings of cotton under irrigation are expected to increase in 2011–12. Low rainfall since the summer floods is expected to reduce dryland cotton plantings. World cotton prices have declined since the record levels of April 2011 but are still expected to be above average.

Based on these conditions, the Corporation has forecast a $5.557 million operating surplus for 2011–12. This reflects revenue of $19.438 million and expenditure of $13.881 million, including NPSI revenue and expenditure of $0.563 million. Revenue from industry levies and Commonwealth contributions will continue to be drawn from two crop seasons, 2010–11 and 2011–12.

The size of levy and Government contributions is heavily reliant upon crop production, which is budgeted to be 3.00 million bales for 2011–12. The recent estimates of 5.04 million bales for 2011–12 will increase industry levies and Commonwealth contributions. In 2010–11, the higher price for lint has lifted the *PIERD Act 0.5 per cent of Gross Value of Production* trigger above the value of industry levies collected in the financial year. The Corporation expects the Australian Government contribution to be limited to the value of industry levies received in 2011–12.

Expenditure

Budgeted expenditure for 2011–12 is $13.881 million: an increase of $4.069 million over 2010–11 actual expenditure. CRDC's capacity to invest in R&D in recent years had been reduced by the decline in revenues during the drought period and now faces the difficult and long-term task of rebuilding the cotton industry's research capacity. Therefore, the forecast expenditure for the coming year for research, development and extension expenditure (RD&E) is budgeted at $12.003 million: an increase of $3.890 million above 2010–11 actual RD&E expenditure.

NATIONAL PROGRAM FOR SUSTAINABLE IRRIGATION

NPSI STRATEGIC PLAN 2008–2011

Vision

Australian irrigation that is valued for its environmental, economic and social contribution

Mission

Investment in research, development and its adoption to improve the productivity and sustainability of irrigation in Australia.

Aims

- Provide national leadership for irrigation research and innovation
- Generate new knowledge and promote its adoption
- Contribute high quality science to the modernising of irrigation and its sustainability
- Contribute to the capacity of people to adapt, innovate and make better decisions
- Invest in the skills and knowledge of the irrigation community
- Enhance collaboration between industry and implementation with high quality science, and
- Enhance the global competitiveness and natural resource management of Australian irrigation.

These aims have been pursued through scientific innovation and excellence, compilation and extension of knowledge ready for adoption, collaboration across the irrigation industries, and a commitment to sustainable irrigation industries, communities and management of natural resources.

Partners

- Cotton Research and Development Corporation
- Goulburn-Murray Rural Water Corporation
- Gascoyne Water Cooperative and Gascoyne Water Asset Mutual Corporation
- Grains Research and Development Corporation
- Harvey Water
- Horticulture Australia Limited
- Lower Murray Water
- Ord Irrigation Cooperative and Ord Irrigation Asset Mutual Cooperative
- South Australian Research and Development Institute
- Sugar Research and Development Corporation
- SunWater
- Western Australia Department of Water
- Australian Government Department of Sustainability, Environment, Water, Population and Communities

Background

Following the closure of former Managing Agent, Land and Water Australia, in 2009, CRDC became Managing Agent for the National Program for Sustainable Irrigation (NPSI). For accounting purposes, CRDC has managed NPSI as Program Four.

Total planned expenditure 2008-2011 was $7.2 million in 32 collaborative projects around Australia. In addition, the program has supported 12 undergraduate student scholarships, four industry study award projects and other conferences and events.

NPSI income and expenditure 2010–11

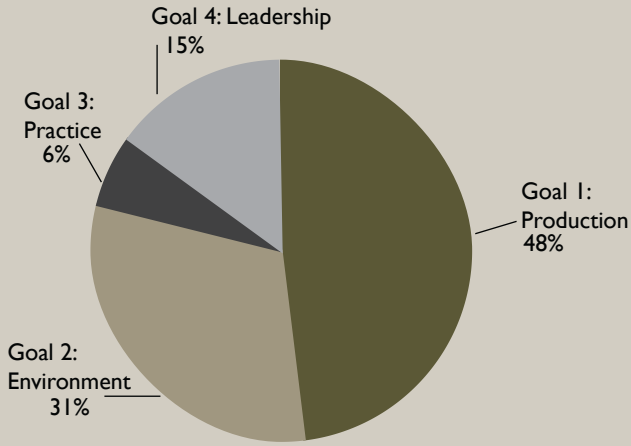
Income

NPSI grant income in 2010–11 was $0.245 million and novation revenue utilised was $0.154 million.

Expenditure

Total expenditure in 2010–11 was $0.508 million, which includes both R&D grant liabilities and administration costs.

R&D Grant Expenditure by Goal 2010–11



NPSI collaboration: at the Irrigation Australia Conference *(from left)* Peter Melville (Horticulture Australia Ltd/NPSI management committee), Peter Toome (Chair, Irrigation Australia), Bruce Pyke (CRDC) and Peter Egglestone (Goulburn Murray Water/NPSI management committee)

Highlights 2010–11

The program commissioned Qualdata Pty Ltd to conduct an external evaluation of its operations in 2011. This evaluation conducted interviews with end users and sourced data from project reports. It found that:

> … informed persons rated the effectiveness of the NPSI program highly (7.2 on a scale of 1-10). Positive comments were made by a number of respondents about the contribution NPSI had made in the development of an Australian irrigation RD&E program, its inclusion of industry groups and some of the outcomes of research. There were a number of comments about the broad focus and impact of the NPSI program having engaged many stakeholders, industry and research groups working together to address irrigation issues and R&D across the country. There was a view that there had been good industry buy in and the project had provided a crucial link between government and researchers.

NPSI has directly influenced a number of key industry and government areas that during the year:

- Taking a leadership role in collaboration with Irrigation Australia Limited to develop a *Future Vision and Options for Irrigation Research, Development and Extension Report*
- Leadership by co-chairing the Primary Industries Standing Committee Cross Sector Water Use In Agriculture Strategy, completed in June 2011
- Supporting the National Horticulture Water Initiative
- Communications with the Department of Agriculture Fisheries and Forestry Rural R&D Council, National Farmers Federation, National Irrigators Council, SEWPaC, NWC, MDBA and others
- Presenting cross sector interests to the national R&D reviews and to key partners and organisations, convening meetings of all the Rural Research and Development Corporations to improved understanding and direction of cross sector water R&D priorities,
- Initiatives to support increases in skilled human resources; and above all:
- Managing continued targeted R&D adoption to improve the productivity and sustainability of irrigation in Australia.

Addressing planned outcomes

Phase 2 NPSI outcome sought (KPI)	Some Achievements
Improved irrigation water use efficiency and enhanced ability to respond to changing levels of resource availability over time.	• Technology improvements and management options to maximise water-use efficiency at the farm and delivery system scale. Irrigators surveyed indicated 50-100% of their farmland had been impacted. • New evaporation calculator on web and field trials for polymers in three States • Improve benchmarking of water use by cotton and grain farmers. Evidence of 40% improvement in water use. 50 cotton and grain farms benchmarked • Changed thinking on drip irrigation lead to 50% yield improvement in various crops in Qld • Evaporation losses and mitigation evaluated in irrigation channels in Victoria

Phase 2 NPSI outcome sought (KPI)	Some Achievements
Improved irrigation water use efficiency ... *(continued)*	• Precision irrigation review completed • Increased soil testing, new soil management system in orchards evaluated • Decision support tools developed include; Prototype EC Sensor; Ready Reckoner Farm Dam Calculator; Irrigation Optimiser; Fertigation decision support tool; Water Storage management model; Economic model of open hydroponics compared to conventional fertigation; Prototype of oxygation system; Oxygation calculator; Prototype of a streambed temperature array; Tools for measuring and monitoring root zone drainage, salt and nutrients (e.g. SoluSAMPLER).
Reduced environmental impacts, more sustainable ecosystems and more prosperous communities.	• Biodiversity monitored in rice growing systems • Reduce salinity impacts in South Australia with new tools. • Reduce nutrient leaching with improved practices • New tool developed to understand surface and groundwater connectivity. • Improved soil structure using ryegrass in horticultural crops • Review completed on irrigation acidity and chloride • WA groundwater study used to inform allocations.
Improved skills, knowledge and decision making of end users which leads to practice change, and more efficient and sustainable use and management of water	• Improved current irrigation management practices and systems in cotton, grains, citrus, • 32 citrus growers trained in tools to reduce fertiliser costs • Improved accessibility of knowledge, tools and practices to end users with farm walks, workshops, training, • 60 farmer case studies published, 50 scientific papers, 210 industry conference papers, • 1500 visits per month to web site. • New irrigation essentials web search engine released • Provide training for irrigators in a range of industries.
A national approach to irrigation related R&D in Australia, which includes a strong focus on a skilled human resource base and enhanced R&D capacity and collaboration.	• A future national vision for national irrigation R&D investment plan launched in partnership with industry body. • Co-chaired with CSIRO, PISC National Water Use in Agriculture plan • Four Industry International travel fellowships funded • 12 undergraduate student research projects funded • Sponsorship Irrigation Australia Conferences and other conferences and workshops • Irrigation Essentials published with latest R&D knowledge for all industries.

COTTON AND CLIMATE CHANGE

Responding to the challenges of lower water availability and reliability while remaining profitable are the key drivers for change on Australian cotton farms. Successfully responding to these drivers will give cotton growers the best chance to adapt to climate change and reduce greenhouse gas emissions as a consequence. A SWOT (strengths/weaknesses/opportunities/threats) analysis in relation to climate change showed that the industry has a sound track record of addressing environmental impacts through the adoption of Best Management Practices, on-farm first and then through the rest of value chain, which should provide a head start for working to meet the Australian Government's goal to reduce national emissions.

In July 2009, a workshop co-convened by CRDC and the Climate Change Research Strategy for Primary Industries (CCRSPI) enabled the cotton industry to discuss the possible implications of climate change and identify research, development, extension and communication priorities. The following table lists the priorities that emerged from the 2009 workshop, along with current CRDC actions or investments that address each priority and future actions planned to address them.

Industry Priority	Actions/Activities Addressing Priority in 2010–11	Future or Planned Actions to Address Priority
Productivity related priorities		
Nitrogen Use Efficiency – seed Nitrogen testing	A Cotton Catchment Communities CRC project funded by CRDC has identified that: • on average, Australian cotton growers are oversupplying their crops with nitrogen (N) fertiliser • testing the N content in cottonseed can be used to estimate whether crop N use was undersupplied, oversupplied or optimal. Oversupply of N is associated with higher costs and nitrous oxide emissions (a potent greenhouse gas) and undersupply with lower yield. Development of a possible commercial service to test the N content of cottonseed at ginning time is under consideration through a Cotton CRC funded project	The success of existing Delivery and Development campaigns to encourage improved crop nutrition practices will be assessed in 2011–12 in order to ensure that future campaigns remain well focused.
De-nitrification inhibitors	No current research is taking place.	Research on de-nitrification inhibitors is being addressed in grain and livestock systems under the Nitrous Oxide Research Program. The outcomes are expected to inform the potential for using inhibitors in cotton systems.

Industry Priority	Actions/Activities Addressing Priority in 2010–11	Future or Planned Actions to Address Priority
Resource use efficiency (energy, water): relationship to carbon *(See above for Nitrogen Use Efficiency)*	Water Use Efficiency (WUE): A joint project with the Grains R&D Corporation (GRDC), funded through the National Program for Sustainable Irrigation (NPSI), has continued to benchmark water use on irrigated cotton and grain farms. For cotton, the project has confirmed a 40 per cent improvement in WUE over the last decade. Improved WUE reduces unnecessary water pumping and energy use.	Benchmarking WUE on irrigated cotton and grain farms is continuing.
	Energy Use Efficiency In 2007, CRDC funded the development of EnergyCalc, a tool to assist in monitoring and auditing on-farm energy use. Case studies on cotton farms associated with this study indicated that average greenhouse gas emissions from fuel and electricity use were 0.71 tonnes $CO_{2\text{-}e}$ per hectare. The average annual greenhouse gas emissions estimate from soils for cotton in the National Greenhouse Gas Inventory was 0.67 tonnes $CO_{2\text{-}e}$ per hectare. Consequently, CRDC has concluded that in order to reduce the industry's carbon footprint effectively, addressing energy use efficiency is of equal importance to nitrogen use efficiency.	A continuing National Centre for Engineering in Agriculture project conducted more detailed assessments of energy use on cotton farms will commence with the in 2010–11. The project is expected to develop the capacity to assess energy use on farms and integrate tools, information and services with the cotton industry's new *my*BMP system. In addition the project is expected to generate Australian data for practices that once relied on overseas data developed in different farming systems.
	Life Cycle Assessment (LCA) CRDC has agreed to contribute to a RIRDC initiative that will seek to develop a Life Cycle Inventory for Australian agricultural practices. This project will commence in 2011–12. An independent study commissioned by the UK Carbon Trust compared greenhouse emissions from five major cotton growing countries: China, US, Brazil, India and Australia and concluded that on-farm greenhouse emissions intensity was lowest in Australia cotton farming systems.	Existing cotton LCA work in Australia focussed on aspects such as greenhouse gas emissions, ozone layer depletion, mineral and fossil fuel resource depletion. Future work is likely to consider fine-tuning these initial assessments and also focussing on the water components of the cotton Life Cycle.
Comparisons of gross margins and future supply chain modelling	The completion of the first LCA for Australian cotton has introduced an understanding of the impacts of inputs, production practices and processing on greenhouse emissions. Further work is required to utilise this for benchmarking and modelling more widely by the industry.	This priority is being partially addressed in a continuing project established in 2010–11 which is developing a social, economic, environmental performance information and improving data gathering, access and reporting for the cotton industry.

Industry Priority	Actions/Activities Addressing Priority in 2010–11	Future or Planned Actions to Address Priority
Plant physiology under changed climate scenarios	A new post-graduate project was established in 2010–11 to address this information gap. It will measure the response of cotton to changes in temperature, moisture and vapour pressure deficit. The outputs will be use to improve the CSIRO's cotton model, OZCOT.	Outputs from this research could influence the selection of future traits in cotton cultivars.
Better Integrated Pest Management (IPM) of pests such as Silverleaf whitefly	Current research capacity has enabled the industry to respond to changing pest problems; however, pests that prefer hotter, drier conditions could further expand their territory under projected climate change scenarios. A new project established in 2010–11 has focused on IPM of key pests such as Silverleaf whitefly, which has expanded its impact from the northern to the central cotton growing regions in Australia in recent seasons.	Maintaining R&D capacity in IPM systems will continue to be important in helping the industry adapt and respond to climate driven changes in pest populations.
New diseases/ pests: new species and movement of existing pests	See the priority above for insect management. For diseases, CRDC continues to support projects in both NSW and Queensland, which conduct extensive surveys of commercial cotton crops in all districts to monitor the presence on existing diseases and to provide surveillance for potential new disease threats.	It is proposed to continue annual disease surveys in NSW and Queensland. Capacity to provide disease surveys in new areas (e.g. Burdekin and Ord River) will be addressed through the expertise established under these investments.
Market place: Australia v. global situation (for example, a scoping study of climate change policy in other cotton producing countries)	No study of this kind has been conducted; however, the development of collaborative assessments of Australian cotton with mills under the Premium Cotton Initiative (PCI) is starting to provide helpful insights into the policy and commercial drivers for these mills in addressing future climate change, water and energy consumption.	Ongoing work through the PCI is expected to lead to closer alignment of environmental credentials of Australian cotton with the needs of the mills seeking to meet consumer demand and expectation.
Social/Capacity and Communication related priorities		
Communication to public of results relating to greenhouse gas emissions	CRDC commissioned a cotton Life Cycle Assessment (LCA) in 2009, which considered global impacts including greenhouse gas emissions, ozone layer depletion, mineral and fossil fuel resource depletion. Results of the study were presented in the Summer 2009 edition of CRDC's *Spotlight* magazine. CRDC continues to publish a range of articles in *Spotlight* (which can be found– and subscribed to – at www.crdc.com.au), providing comprehensive information on different aspects of greenhouse gas emissions as they relate to the cotton industry.	The information provided in the LCA is being used to assist the industry to focus on key areas where cotton growers can achieve benefits from the Carbon Farming Initiative.

Industry Priority	Actions/Activities Addressing Priority in 2010–11	Future or Planned Actions to Address Priority
Government policy impacts on community	The Cotton CRC commissioned socio-economic case studies of eight communities in the Murray-Darling Basin. These were peer reviewed and released in July 2010. These case studies were of value to those communities, irrigation and other industries and policy makers in helping to understand the impact of policy responses to water resources and climate change.	CRDC continues to monitor the need for further socio-economic research in association with the Cotton Catchment Communities CRC and Cotton Australia.
Benefit of downscaling of climate models (to what level do we need to drill down?)	CRDC has not had the capacity to invest in the development of climatic models downscaled to provide better predictability of the impact of climate change scenarios at regional of local catchment scales. Instead, CRDC has concentrated on supporting research that will improve the responsiveness and accuracy of the cotton crop simulation model, OZCOT. If OZCOT is able to perform accurately under the current range of cotton production climatic conditions, it is reasoned that it can be used to forecast responses to future changes in climatic conditions.	CRDC will continue to monitor developments through the Bureau of Meteorology and potential for investment in the Managing Climate Variability Program managed by GRDC. A new post-graduate project established in 2010–11 is starting to measure the response of cotton to changes in temperature, moisture and vapour pressure deficit. The outputs will be use to improve the CSIRO's cotton model OZCOT.
Training on energy use efficiency	CRDC has previously contributed to projects that have led to training courses on water use efficiency. Courses on pump efficiency and the correct set up for overhead irrigation systems have been particularly popular amongst growers. Demand for these courses is expected to continue as the cost of energy increases. CRDC supported the development of the on-farm energy monitoring and assessment tool, EnergyCalc, as a first step in providing the foundation for training in energy use efficiency.	A project to further assess energy use on cotton farms is being led by the National Centre for Engineering in Agriculture. The project is expected to increase the capacity of growers and their advisors to assess energy use on farms and integrate tools, information and services with the cotton industry's new *my*BMP system. Development of training programs is a component of the latter stages of project.
A 'Carbon pack' linked to *my*BMP Highlight on-farm benefits of adapting to climate change – Win/win situation (NUE, energy savings) Benchmarking 'hot topics'	The incorporation of a new module on Energy and Input Efficiency in the revised BMP system, *my*BMP, has been done with an expectation that it will heighten the demand for information and training on energy use efficiency over time as more growers use the system in their business.	The new *my*BMP system became fully operational in 2010–11. *my*BMP will not only assist cotton growers to access relevant and up to date research information in accordance with their particular needs, but will also help the industry to identify demand for new information and training.

Industry Priority	Actions/Activities Addressing Priority in 2010–11	Future or Planned Actions to Address Priority
Collaboration across industries	CRDC has a representative on the Steering Committee of the Department of Agriculture, Fisheries and Forestry/GRDC Nitrous Oxide Research Program. CRDC and GRDC program managers meet six monthly to discuss opportunities for collaboration, particularly on cotton/grain farming systems issues. In terms of greenhouse gas emission research, cotton is included as a crop rotation in the irrigated farming systems research funded by GRDC at Kingsthorpe on the Darling Downs. Grain crops are included in the two long-term irrigated farming systems experimental sites at ACRI, Narrabri.	In June 2010, CRDC commissioned the construction of a new set of automatic greenhouse gas measuring chambers to be installed at ACRI. A new project was established in 2010–11 to use these chambers to measure greenhouse emissions in the ACRI long-term experiments. Even though this research is funded outside of the DAFF Nitrous Oxide Research Program, CRDC will ensure the data from these sites will be a contribution to the national program.
Adoption strategies – collaboration	CRDC has worked closely with the Cotton CRC and Cotton Australia in 2010–11 to restructure the extension team into a Development and Delivery team, with a clearer focus on implementation of R&D outputs and knowledge and integration with *my*BMP	The Cotton Development and Delivery team has developed its plans for 2010–11. Key priority areas include nitrogen and water use efficiency and Integrated Pest Management (IPM).
Biophysical related priorities		
Soil carbon-nitrogen interaction (with more locations, soil types over time) Soil carbon-water interaction (WUE: more location specific needs)	A CRDC funded research project which concluded in 2009–10 has identified farming systems practices which can build soil carbon levels and that, in some soils, carbon can increase more rapidly below the 30 centimetre depth than above it. See under "Resource use efficiency" for comments on WUE. CRDC invested in a new project in 2010–11 to more fully research the opportunities to increase soil carbon and how this interacts with nitrogen use and management.	CRDC will invest in a new project commencing in 2010–11 to more fully research the opportunities to increase soil carbon and how this interacts with nitrogen use and management. Opportunities to expand the number of sites and soil types covered by R&D in on carbon and nitrogen continue to be investigated.

EFFICIENCY AND EFFECTIVENESS OF OPERATIONS

1. THE COTTON RD&E STRATEGY

CRDC was part of the Strategy Working Group that developed the Cotton Sector RD&E Strategy, completed during the year after several years' work. The strategy is part of the National Primary Industries Research Development & Extension (RD&E) Framework (see www.daff.gov.au/agriculture-food/innovation/national-primary-industries). Other Working Group members represented the Cotton Catchment Communities CRC, Cotton Seed Distributors Ltd, CSIRO, NSW Department of Primary Industries, Queensland Department of Employment Economic Development and Innovation and Sydney University (on behalf of the Australian Council of Agricultural Deans).

The Cotton Sector RD&E Strategy will be a major efficiency tool for CRDC. It sets out priorities for the sector's RD&E organisations and industry to cooperate on a national basis to address the strategic needs of the cotton industry by identifying key drivers for the cotton industry and associated RD&E by:

- Defining a national set of priorities to guide RD&E investment, analysing cotton RD&E capability against the priorities; and
- Considering and recommending options to improve cotton RD&E.

A central component of the industry's success is a capable and effective network of RD&E organisations working with industry. The network faces challenges from a tight fiscal outlook and the need to maintain cotton specific capability, as well as drawing on a broad range of capabilities to deliver on an expanding suite of RD&E priorities.

RD&E Priorities

There are five distinct RD&E priorities for the cotton sector over the next 10 to 20 years, with the potential to individually and collectively improve the cotton sector while needing to be flexible to dynamically meet a range of social, climatic, market and regulatory conditions. There are challenges with maintaining a balanced portfolio of investment, focus (research versus development and extension) and capabilities across the priorities. The priorities are:

- **better cotton plant varieties,** which have significantly contributed to the sector's successes to date and is an area of considerable RD&E capability.
- **farming systems** to improve production sustainability and the quality of cotton produced.
- **i**nnovative, resilient and adaptive **people, businesses and communities** is crucial to the future success of the cotton sector. Building and sustaining the capacity of individuals and institutions, and working with them to adapt to change, will contribute to providing the future social fabric of the sector. This is an emerging RD&E priority with strong links to vocational training, regional development and structural adjustment.
- **product and market development**, which includes fibre processing, development of new high quality cotton products and markets, and providing quality assurance that integrates fibre quality and sustainability. This priority will become increasingly important to maintain market/resource access, improve industry reputation and differentiate Australian cotton.
- **RD&E development and delivery**, which explicitly recognises that considerable and sustained effort is required to ensure that research knowledge is developed to deliver a range of products and services to cotton farmers, communities, markets and government.

Capability Analysis

Investment in cotton RD&E averages $30 million per annum and employs more than 160 Full Time Equivalent (FTE) people, with a mixture of cotton-specific and broader expertise. While this represents a substantial investment and considerable capability, there are a number of challenges, including:

- the effective engagement of all stakeholders
- the difficulty in fully funding all cotton-specific and broader expertise to achieve the five priorities
- Cotton RD&E cannot fully fund all the cotton specific and broader expertise required to achieve the five RD&E priorities, particularly if total investment declines
- that the roles and capacity for the farming systems, people, business and communities, and development and delivery priorities aren't well defined and agreed upon.
- the need for coordinating frameworks for the farming systems, people, business and community priorities
- that while clustering human capacity and infrastructure can improve RD&E effectiveness (critical mass and linkages) and efficiency (less duplication, cost reduction and leverage), the benefit:cost of potential changes towards specialisation needs investigation and consideration.

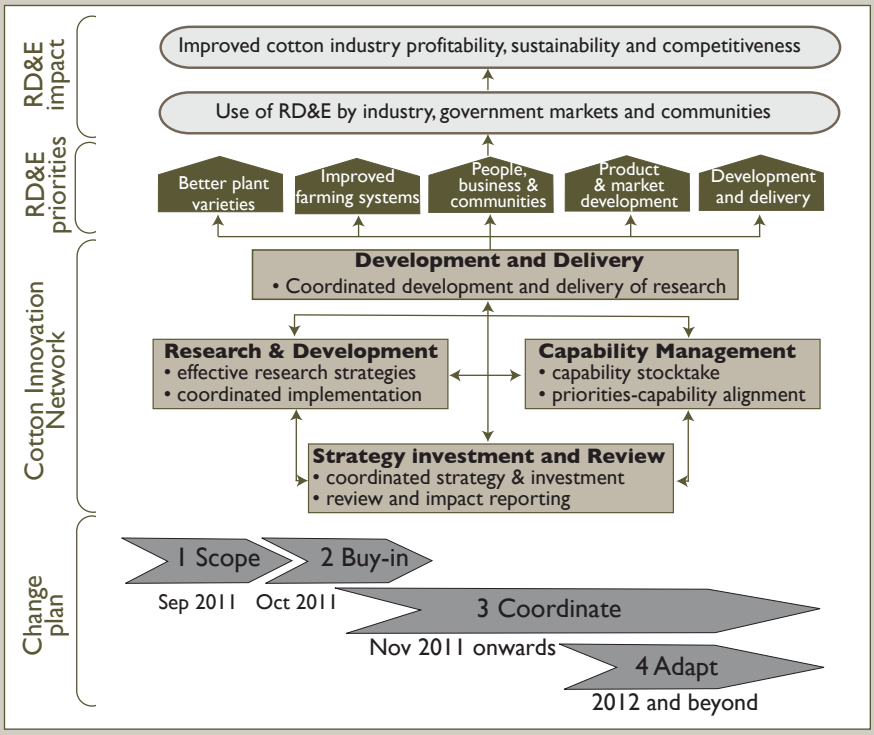
Improving Cotton RD&E

The Cotton Sector RD&E Strategy is seen as an opportunity to develop an overarching strategy, owned by all, to guide future RD&E. The specific benefits include establishing the strategic context and RD&E priorities to guide decision making and improve alignment, and effective partnerships to implement RD&E: to clarify roles, optimise resources, increase collaboration and enhance innovation.

Cotton Innovation Network

It is proposed to establish a Cotton Innovation Network to provide strategic oversight, coordination and communication for cotton RD&E in four interdependent focal elements: strategy and investment, research and development, development and delivery, and capability management.

Development of the strategy



The network will consist of senior representatives from the major cotton RD&E organisations, chaired by Cotton Australia. It is a logical evolution of current arrangements, introducing strategic oversight and coordination of RD&E at a sectoral level by a network of senior representatives. This approach recognises that cotton RD&E is a loose federation of organisations where improvements require consensus, negotiation and consideration of sectoral as well as individual needs and circumstances.

Implementation

The strategy will be implemented in four stages:

The **scoping stage** involves developing the Cotton Innovation Network's purpose, tasks, outcomes and governance to create an agreed terms of reference by September 2011.

The **buy-in stage** involves each of the Cotton Innovation Network member organisations agreeing to the terms of reference by October 2011.

The **coordination stage** focuses on establishing the network as a functioning entity and implementing immediate and practical coordination tasks identified for each element.

The **adaptation stage** involves on-going coordination across the four elements, revision of the RD&E Strategy, and adaptation of RD&E functions.

2. CORPORATE OPERATIONS

The Corporation is committed to continuous improvement in the efficiency of its expenditure, whilst maintaining or improving the effectiveness of its R&D investments. In doing so, CRDC takes a holistic business approach that recognises not only the costs but also the risks and returns in delivering outcomes from the 85 to 90 per cent of CRDC expenditure invested in R&D. Having skilled and experienced people who can scan, scope and manage portfolios of R&D investment proactively through to adoption for strategic outcomes is an important element of capacity, which supports the effectiveness of the rural R&D system as a whole.

In response to several years' reduction in revenue as a result of the drought, CRDC took a number of steps to improve the efficiency and effectiveness of its operations.

Management experience and capacity has been consolidated within a smaller team of personnel since 2007. The need for administrative assistance has been less, given downsizing of the business activity, better IT systems and personnel taking responsibility for their own clerical needs.

CRDC continued to work with the Council of Rural R&D Corporations' Chairs to investigate administrative efficiency gains within the rural R&D Corporations (RDCs) and the rural R&D system as a whole. This includes standardisation of agreements and intellectual property policy.

The results of an investigation in 2008–09 of collaboration options with the Grains R&D Corporation (GRDC) are being implemented through joint R&D management processes to deliver integration of investment in R&D and its adoption, targeting shared productivity, natural resource management and biosecurity outcomes. CRDC is collaborating with GRDC on best practices and innovation in IT, finance and administration.

Delivering return on investment

One of the Corporation's formal Principles of Operation is to strive to maximise return on industry and public funds invested through our Corporation.

With significant taxpayer dollars invested in industry R&D through the 15 RDCs, the Council of Rural Research and Development Corporations' Chairs developed a rigorous external process in 2006 to determine the value

of these R&D investments to the industries involved and to the Australian taxpayers.

Collaboration and Cooperation

CRDC sought to further extend collaborative links and partnerships in 2010–11, where these are likely to maximise investment outcomes or where there is a need to respond to a broader issue or challenge facing agriculture or the cropping sector.

Collaboration with other RDCs at both strategic and conceptual levels is an important means by which CRDC leverages higher returns from its investments. CRDC participated in activities that include joint national strategic R&D planning with the Primary Industries Standing Committee (PISC), particularly in relation to climate change and water, communication and impact evaluation. A great deal of collaboration and cooperation takes place through the Council of Rural Research and Development Corporations' Chairs: a forum for supporting the RDCs in collectively maximise their ongoing contribution to a sustainable and profitable Australian agricultural sector.

This collaboration extends well beyond co-investment: cooperation, coordination and communication are equally important to avoiding duplication in research and maximising the impact of research outcomes. The scale of this collaboration extends from large national research programs to small local projects and administration, to bring a national focus in dealing with climate change, soil health, irrigation, crop protection, farm safety and human capacity. In 2010–11, CRDC and GRDC continued to work closely in areas of common interest in program management and communication.

As in the previous year, CRDC's largest financial collaborative investment in collaboration in 2010–11 was through the Cotton Catchment Communities CRC. CRDC invested approximately $3.6 million dollars in the CRC, with all but $100,000 of that tied to specific projects which were required to directly address both CRDC's and the CRC's strategic objectives through this collaborative research framework. At the local level, community collaboration in 2010–11 included continuation of an Aboriginal school–based traineeship program, developed by CRDC with assistance from the Aboriginal Employment Strategy, and co-sponsorship and organisation of the secondSustaining Rural Communities Conference.

Below is a table summarising CRDC collaboration with other RDCs. Many of these initiatives are covered more fully in Report of Operations – Research and Development, beginning on page 29.

Collaboration with Rural R&D Corporations 2010–11

Theme, Program or Project	Nature of Collaboration
Council of Rural RDC Chairs	Collaboration with all RDCs in communication, coordination and collaboration between RDCs at the broadest level. Development of a common R&D Evaluation Framework.
Communications Managers	Using cross-RDCs communication opportunities to promote our rural industries and R&D achievements.
Business managers	Cooperation with all RDCs to improve administration, contracts, program management systems and IP management in alignment with the Council of RDCs harmonisation project. CRDC and GRDC continued to cooperate on best practices and innovation in IT, finance and administration. CRDC and RIRDC continue co-hosting arrangements for Clarity program managements systems.

Theme, Program or Project	Nature of Collaboration
Climate change	During 2010–11, CRDC worked collaboratively with other RDCs to establish a new agreement for the University of Melbourne to continue providing the administration of the National Climate Change Research Strategy for Primary Industries (CCRSPI). CRDC also continued to participate as a member of the steering committee for the Nitrous Oxide Research Program, which is convened by GRDC as the major industry co-investor with the Department of Agriculture, Fisheries and Forestry.
National Program for Sustainable Irrigation (NPSI)	During the year, CRDC successfully maintained the role as the managing agency for the NPSI program. NPSI involves GRDC, Horticulture Australia Ltd (HAL), the Sugar R&D Corporation (SRDC) and 12 other public and private sector partners and has allowed the establishment of cross-industry investment opportunities for irrigated agriculture. CRDC has benefited directly from investments in training and improved capacity to measure and manage water efficiently. The partnership has allowed targeted co-investment with GRDC in particular. During the year CRDC has sought provide support to the Program Management Committee in seeking approval of partners that NPSI be extended for a further 12 months to June 2012 without the need for additional investment. This is in part important to allow a number of projects to be completed as well as ensuring improved extension and communication of research results. NPSI has also worked collaboratively with Irrigation Australia Limited to develop a vision for future irrigation and water related R&D.
Collaborative Partnership for Farming and Fishing Health and Safety	CRDC continued this co-investment with the Rural Industries, Grains, Sugar and Fisheries RDCs and the Australian Government Department of Health and Ageing in this program which began in 2007–08.The Partnership invests in R&D to improve the physical and mental health of farming and fishing workers and their families and the safety of the environment and work practices in these industries.
Collaboration and R&D investment opportunities for cotton and grain	During the year CRDC and GRDC program management teams met once to discuss collaboration opportunities and initiate joint investments or identify new areas for improved joint communication and collaboration.
Spray drift minimisation	As the areas under conservation farming practices and GM herbicide-tolerant crop technology increase in cotton/grain regions, so too does the potential for spray drift damage to susceptible crops. During the year CRDC and GRDC continued to co-invest in a program to map the location of farms where cotton is grown and in delivering spray application management training workshops to growers and agronomic advisors. Spray drift damage to cotton crops in 2010–11 was low demonstrating that the excellent cooperation between the cotton and grains industries has started to achieve results even thought there was a significant increase in the area of cotton planted.

Theme, Program or Project	Nature of Collaboration
Crop nutrition	A collaborative project on phosphorus and potassium nutrition in cotton and grains in northern NSW and Queensland continued in 2010–11. CRDC investment is provided directly to GRDC as project manager to reduce administrative costs for the research provider.
Insecticide resistance monitoring and management	During the year CRDC and GRDC continued to co-invest in R&D to monitor resistance in *Helicoverpa armigera* and *Helicoverpa punctigera* to a range of pesticides commonly used on both crops.
Shared weed management issues	CRDC continued to collaborate with GRDC on a weed management research project in southern Queensland. In particular, close interaction continues within this project, and directly with GRDC, on the important issue of glyphosate resistance management and this led to the planning of a new joint development and delivery focused project to be initiated in 2011–12.
Education	CRDC is collaborating broadly with rural RDCs and universities through the national Primary Industry Centre for Science Education (PICSE). This program is building on a decade of success in attracting high school students into science education and, beyond that, to careers in science that support agriculture. Other rural RDCs co-investing in PICSE are GRDC, FRDC, Dairy Australia, RIRDC and HAL. The universities involved are the University of Tasmania, University of Western Australia, The University of New England, University of Southern Queensland, University of the Sunshine Coast and Flinders University. During the year CRDC continued a partnership with six other RDCs (RIRDC, Grains, HAL, Grape and Wine, APL, AECL) to invest an undergraduate scholarship program. The program is managed by RIRDC and has selected a second group of undergraduates and CRDC agreed to support a second student in 2011.

OPERATING CONTEXT

THE AUSTRALIAN COTTON INDUSTRY

Vision2029

Australian Cotton • Carefully Grown • Naturally World's Best

A vibrant industry

The Australian cotton industry is a regionally-based, market-focused industry, generating in excess of $1 billion of export revenue. Cotton is produced in regional NSW and Queensland by up to 1,000 growers, and employs up to 14,000 people depending on variable seasonal and market conditions. The productivity and sustainability of the cotton industry has improved significantly over the past 20 years through technology development and improved management practices.

The future of the industry is influenced by a number of critical uncertainties including climate variability, water availability, competitiveness with food, product differentiation, grower dedication and industry profitability. This means that while the cotton industry will continue, the size of the industry will vary year to year and growth is reliant on productivity gains, improved sustainability and market development.

The response to these challenges has been to develop a vision outlining the preferred future to which the industry can work collaboratively. *Vision 2029* is ***'Australia cotton, carefully grown, naturally world's best'***, with the attributes of differentiated, responsible, tough, successful, respected and capable.

Historically, 70 per cent of Australia's cotton has been grown in NSW, with the majority of the remainder grown in Queensland. Successful cotton trials are taking place in the Burdekin

Susan Maas, QDEEDI, is a Development and Delivery Team member leading successful campaigns in response to flooding in Queensland. This initiative allowed growers to recover yield from otherwise lost crops

under tropical conditions and in 2011–12, plantings are expected as far south as Griffith in NSW. The average Australian cotton farm is 4630 hectares in size, with 362 hectares planted to cotton and 2840 hectares used for dryland cropping or grazing. Cotton production is highly mechanised, capital intensive, technologically sophisticated and requires high levels of management expertise.

The decade-long drought had seen the number of cotton growers reduced to fewer than 900. However the excellent season and higher per-bale returns in 2010–11 saw the return of significant numbers of experienced cotton growers, as well as many growers new to the cotton industry.

The economic and environmental health of the cotton industry can largely be attributed to high quality collaborative research and development, much of it coordinated and funded by CRDC. A culture of innovation and continuous improvement with practical implementation and willingness by growers to adopt new ideas results in an industry that is very quick to pick up and act upon new research outcomes.

Despite its relatively small size, the Australian cotton industry makes an important contribution to the national economy, in terms of both exports and employment. On a global scale, Australia is not a large cotton producer, growing only around three per cent of the global crop. Nevertheless, because over 95 per cent of the national crop is exported, Australia is one of the major cotton exporting countries.

Because almost all the Australian cotton crop is exported, the industry operates in an environment of intense global competition and therefore must continually improve operational efficiency, environmental sustainability and quality of the product to remain competitive. An intensive R&D effort continues to develop and extend a high value market niche for Australian premium cotton.

The 2010–11 Harvest

The 2010–11 season was an Australian record cotton harvest of 3.993,947 million bales (ABARES Australian Commodity Report September 2011). This reflects above average rainfall in summer cropping areas of Queensland and New South Wales, with both states reporting record cotton plantings. ABARES estimates that flood damage in Queensland destroyed 40,000 hectares of crops, while the rainfall increased yields in some areas and reduced it in other areas, which had outbreaks of pests and diseases.

The coming season

World cotton prices reached historical highs in April 2011 and have declined since. However, world cotton prices are still expected to be above average in 2011–12 and grain prices have also increased. ABARES' September 2011 report has forecast an increase in area planted from 590,000 hectares in 2010–11 to 600,000 hectares in 2011–12 and lint production to increase from slightly under four million bales in 2010–11 to 5.04 million bales in 2011–12. This is a significant increase over the Corporation's earlier forecast of 3.0 million bales for 2011–12. Lack of rain since January's floods is likely to result in a higher proportion of the crop grown under irrigation, with a fall in dryland cotton plantings.

COTTON AUSTRALIA

Cotton Australia is CRDC's industry representative organisation under the *Primary Industries and Energy Research And Development Act 1989*. It was originally established in 1972 as the Australian Cotton Foundation. As the peak industry representative body, its membership comprises all Cotton Grower Associations, cotton processors and some service industry members. It is funded through a voluntary grower levy of $2.25 on each bale of cotton produced. Its head office is located in Sydney, with regional hubs in Narrabri, Brisbane and Toowoomba. The Board of Directors sets policy and strategic direction. It is chaired by Andrew Watson, a cotton grower from Boggabri in north west NSW, and consists of 10 elected directors who are growers and/or ginners.

The R&D role

Cotton Australia provides advice to CRDC on research funding submissions received by CRDC each year, after canvassing the views of its grower representative organisations on the relevance of the submissions to their needs.

Cotton Australia advisory panels reflect the R&D programs established under the CRDC Strategic Plan 2008–2013 – Value Chain, Farming Systems and Human Capacity – and address each of the CRDC Strategic Research Priorities under those programs.

Members' representatives are asked to nominate specific areas of research interest and are then allocated to the appropriate advisory panel. These panels consider relevant research applications in detail and report their views to the organisation as a whole at the annual research review meeting. These views are conveyed to CRDC staff, who also attend the annual meeting.

In addition to its role as CRDC's industry representative body, Cotton Australia is formally responsible for liaising on research issues generally for the cotton industry and advises the Cotton Catchment Communities CRC on its R&D program.

Other industry roles

Cotton Australia supports levy paying cotton growers in cotton production and marketing, represents and advances the interests of cotton growers and the Australian cotton industry and promotes the Australian cotton industry to the community. Directors and staff members are represented on a wide range of working groups, boards, committees, reference groups and Grower Associations, as well as the Australian Cotton Industry Council, the International Cotton Advisory Committee, the National Farmers' Federation and Queensland Farmers' Federation, and NSW and Queensland Irrigator Councils.

Further information can be found at www.cottonaustralia.com.au.

Cotton Australia Chair, Andrew Watson, was the cotton industry's Cotton Grower of the Year in 2008

INCORPORATING STAKEHOLDER R&D PRIORITIES

Objects of the PIERD Act 1989

a. Increase economic, environmental and social benefits
b. Achieve sustainable use and management of natural resources
c. Make more effective use of human resources and skills
d. Improve accountability for expenditure

National Research Priorities

Australian Government
December 2002

An Environmentally Sustainable Australia

Transforming the way we utilise our land, water, mineral and energy resources through a better understanding of human and environmental systems and the use of new technologies

Promoting and Maintaining Good Health

Promoting good health and well being for all Australians

Frontier Technologies for Building and Transforming Australian Industries

Stimulating the growth of world-class Australian industries using innovative technologies developed from cutting-edge research

Safeguarding Australia

Safeguarding Australia from terrorism, crime, invasive diseases and pests, strengthening our understanding of Australia's place in the region and the world, and securing our infrastructure, particularly with respect to our digital systems

Rural R&D Priorities

Australian Government
May 2007

Productivity and Adding Value

Improve the productivity and profitability of existing industries and support the development of viable new industries

Supply Chain and Markets

Better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers

Natural Resource Management

Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable

Climate Variability and Climate Change

Build resilience to climate variability and adapt to and mitigate the effects of climate change

Biosecurity

Protect Australia's community, primary industries and environment from biosecurity threats

Cotton Industry Priorities

Cotton Australia

Invest in the skills, knowledge and occupational health and safety of the human resources in the cotton industry and its communities

Improve the sustainability of the cotton industry and its catchments

Improve the profitability of the cotton industry

Create and support a strong, focused and committed research program

COTTON RESEARCH AND DEVELOPMENT CORPORATION

Strategic R&D Plan 2008–2013

Annual Operating Plan 2010–11

Annual Report 2010–11

Report of Operations

R&D

PROGRAM ONE
VALUE CHAIN

Goal

Add value to the Australian cotton industry with premium products in improved routes to market

Planned Outcome

High quality consumer-preferred Australian cotton products in the world marketplace

R&D activities 2010–11

Number of projects: 32

Expenditure: $0.887m

Performance against Annual Operating Plan (AOP)*

1. = 18 | 2. = 1 | 3. = 1 = **Achieving AOP**

1. KPIs achieved 2. Underway but not yet completed 3. Not achieved

* For detailed information, see *Measuring Performance*, beginning on page 121.

The value chain context

Australia will continue to face competition from key international markets. CRDC's investments in the value chain target production and processing management practices that optimise the value that can be obtained for Australian cotton.

Improving ginning practices to secure fibre quality has been a major area for CRDC investment. New technologies/practices across the gin stand, lint cleaner and moisture management have been assessed throughout 2010–11. Moving further down the value chain, CRDC investments include developing novel spinning software technology, assessing new spinning techniques and working with mill partners to develop premium fabrics for selected domestic and international markets.

CRDC continues to be a key driver of the Australian cotton industry's Premium Cotton Initiative (PCI), which involves partnerships across the cotton value chain to secure higher value markets for Australian premium cotton varieties and dominates this R&D program in its various aspects. The PCI brings together CSIRO-bred varieties, which have delivered a range of superior fibre quality attributes with new textile processing knowledge, Best Management Practices (BMPs) throughout the value chain and fibre measurement tools developed with CRDC investment.

Program One Investment Manager, Dallas Gibb

STRATEGIC OBJECTIVE 1

Develop contemporary knowledge and intelligence about products, markets and supply chains

Defining our major customers

Despite the Australian crop being relatively small in comparison to world production, Australian exports still make up over 10 per cent of the medium/high medium grade cotton volume in the export market. Nearly all of Australia's cotton lint is exported for high quality end use in mills in South East Asia. At 34 per cent, China continues to be the major destination of Australian cotton followed by Indonesia with 26 per cent, Thailand with 20 per cent, Korea with 8 per cent and Japan with 5 per cent.

Understanding how Australian cotton is used

Australian cotton is generally viewed worldwide as a quality fibre, It is purchased for a premium to produce high quality fine count yarns, normally combed ring spun, for use in the woven and knitted apparel sectors.
While Australian cotton may still enjoy premiums in the market, international competition will eventually place downward pressure on such premiums. A key focus of CRDC's post-farm gate investments is to identify opportunities to increase the market share and overall price for Australian cotton in the longer term.

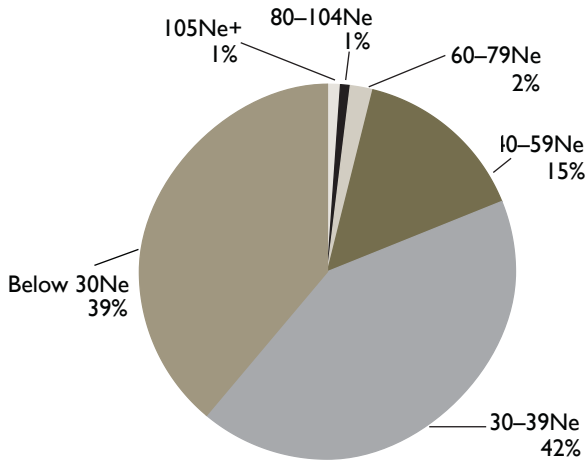
To understand where future premium market opportunities may exist, a major international survey of mills was conducted, with 35 companies in China, Japan, Korea, Thailand, Indonesia and Australia interviewed face to face about the quality of yarn they produce.

Yarn counts greater than 60Ne are of premium quality but comprise only 4 per cent of the total volume of yarn produced at these mills. Currently, Australian cotton is not used at this level. This clearly identifies a market opportunity for high quality fibres and CRDC aims to assess how Australian cotton can perform in these markets. A new premium Australian fibre category, Australian Long Staple (ALS), developed in collaboration with Australian Cotton Shippers Association, is being investigated. This new class of cotton aims to provide mills cotton of set specifications to enable production of higher quality yarns. Mill surveys of the potential use for ALS indicate that it can be used to produce 60Ne yarns consistently and, depending on mill set up, to 70Ne in a stand-alone lay-down.

Understanding how Australian cotton is valued

To understand where future premiums may be achieved, data was also obtained from mills of how Australian cotton compared with other competitive cotton types. Of particular interest was the comparison between Australian cotton and the USA cotton type SJV. Australian cotton

Breakdown of yarn counts
Overall data from mill surveys



has traditionally been ranked second after SJV, which continues to been seen as a superior fibre in such properties as staple strength, grade and micronaire.

In other key fibre properties of low levels of neps (small, tangled fibres), trash content and contamination, Australian cotton was seen as superior to SJV. Fibre contamination of foreign matter is a major concern for mills and has a direct impact of the quality of yarn produced and mill efficiency. The reputation of Australian cotton as having a low level of contamination is confirmed by International Textile Manufacturers Federation (ITMF) Contamination Surveys, with the latest survey (2009) rating Australian cotton in the five countries least affected by contamination.

STRATEGIC OBJECTIVE 2

Develop improvements in current products

Premium cotton: a new opportunity for Australia

CRDC has made significant contributions to the Premium Cotton Initiative (PCI), with the goal of understanding the market opportunities for new premium quality varieties. If a new premium class of cotton can be defined, it should be marketed not just as a commodity but as a separate premium line of cotton. Australian growers have the capacity to develop new market opportunities by developing stronger partnerships with mills and brand owners.

The PCI was established primarily in recognition of the shift in quality of Australian cotton. Fibre length has improved significantly over the last eight years and, together with anticipated improvements in fibre strength and fineness, real opportunities exist to secure new premium markets for Australian growers.

The industry's Best Management Practices (BMP) program also provides a range of tangible and intangible benefits for the promotion of Australian cotton, so it is important that BMP is an inherent component of any premium class of cotton. By combining fibre quality and BMP, the PCI program targets three core outcomes for the industry: strengthening the industry's reputation for quality, promoting industry values in production and providing value across all key aspects of the value chain.

A business strategy for PCI

Over the last four years the business strategy for activities under the PCI program have been focused at three levels The first and second focus on establishing collaborative product assessment and development programs with mills and fabric producers. The third is targeted at brand owners and the development of new markets for premium fabrics produced from BMP cotton.

CRDC invested in a number of activities in 2009–10 under the PCI, targeting assessment of Australian cotton by mills and promotion of BMP to brand owners. In 2010–11, specific shipments of BMP and Australian Long Staple (ALS) cotton have been delivered to mills in Hong Kong, China and India to allow production of products for selected brand owners interested in promoting the Australian cotton story and brands.

In 2010–11, CRDC initiated an independent review of the business strategy for the PCI. This has highlighted a number of opportunities not only for the PCI program but for a broader industry program marketing Australian cotton. A key recommendation from the review was that Industry should consider developing a clear cotton export market strategy that articulates opportunities and documents the supply and demand dynamics. Any such strategy might not be tied to specific PCI activities but rather focus on opportunities for whole of crop marketing. CRDC is working with Cotton Australian and ACSA to consider the review recommendations.

Linking BMP to the strategy

CRDC investments in BMP link to the PCI by developing management procedures and guidelines for growers, ginners and classers, as well as the transport, storage and shipping sectors, to ensure that fibre quality

is maintained right through the value chain. Investments in BMP guidelines for environmental management enable the industry to develop data on production performance and related natural resource management. Such information will provide key marketing material for brand owners.

Working collaboratively with Cotton Australia and the Australian Cotton Shippers Association (ACSA), CRDC has established links with a number of local brand owners to promote Australian cotton and BMP cotton to consumers. The iconic Australian brand owner, Fletcher Jones, and manufacturer, Australian Weaving Mills, have each launched a range of products in 2010 and 2011 under a new premium Australian cotton/BMP brand. The two companies expressed strong interest in promoting Australian cotton using the 'field to fabric' focus and the industry's BMP program. Labels developed by the industry will be the first major promotion of BMP to consumers in Australia. Building on the success of these partnerships, the industry will work with further brand owners in other non-competing market segments.

To customise the products developed by the brand owner, the opportunity exits to promote the farm source of the cotton and to use local material.

Australian Weaving Mills developed specific promotional program for their Dri.glo line of towels that is actively promoting the farmers who produce the premium cotton and the industry's BMP program that aids in guaranteeing its quality. For further information, see www.driglo.com.au/mod/farmers/guarantee#.

Hong Kong manufacturer, Central Textiles, is working with a Japanese brand owner, UNY, which operates about 1,500 various specialty stores within Japan. They market children's clothing (Teru Teru), women's apparel (Molie) and menswear (Rough Ox) and are interested in using the Australian cotton story and brands. The mill, Novetex, continues to promote Australian cotton and through their partners is developing ALS BMP cotton garments for the European market in 2011.

CRDC investments in post-farm gate BMP had focused on the ginning and classing sectors; this work was expanded in 2010 to include BMP for Warehousing and Dispatch. These new guidelines have been developed through collaboration with a range of private transport and warehouse companies, as well as with relevant state government transport agencies.

Preliminary Warehousing and Dispatch audits will be performed from late 2011 to ascertain the relevance and value of the draft BMP. It is anticipated that the new BMPs will lead to improvements in transport efficiencies.

BMPs required for new picking systems

The development by John Deere of new picking technologies that produce their own round modules (see the photograph below) has enabled growers to improve their overall harvest efficiency significantly. Adoption of the new machines has been rapid and it is anticipated that 75 per cent of the crop will be harvested with the new machines by 2013–14.

Compared to conventional modules, the new picking system results in cotton delivered to gins in smaller units that represent smaller areas of picked cotton. Throughout 2011–12, CRDC will investigate whether the small modules require changes to current BMP guidelines.

Optimising on-farm practices for fibre quality

A major collaborative project with the Cotton Catchment Communities CRC has investigated the key agronomic factors that affect fibre development and subsequent spinning efficiency. Work has continued on assessing the effect on fibre quality of crop conditions at the time of harvest. A key objective for the project is the development of crop management practices or tools that improve consistency in the production of quality fibre and also enable growers to estimate fibre quality outcomes.

Data developed over the last three years on the impact of the timing of picking and final crop quality has shown that accurate prediction of crop micronaire at harvest can be achieved by considering boll maturity at time of defoliation. While the technique involved assessing fibre quality of immature bolls before harvest, which may not be practical, a useful tool for predicting crop fibre quality may be developed using boll counts and boll maturity (seed coat colour).

STRATEGIC OBJECTIVE 3

Facilitate the development of novel products

Developing premium yarns

The development of premium cotton varieties may allow Australian cotton to compete within the high value yarn market but it is important to demonstrate that such yarns can be produced from the new cotton varieties.

CRDC, together with researchers are CSIRO Materials Science and Engineering (CMSE), has continued to investigate the performance of the new varieties in the production of premium yarns. Spinning trials conducted at CMSE showed that this Australian Long Staple (ALS) cotton can produce fine count combed ring-spun yarns in the range of Ne 60 to 70Ne. More critically, in blends with Extra Long Staple (ELS) cotton results, the trials found that a 70/30 blend of ELS/ALS did not result in a practical deterioration in yarn quality and processing efficiency. This is a key finding: ELS-type cotton can trade at prices 60 per cent to 80 per cent higher than traditional Australian cotton.

Throughout 2010, the CMSE small-scale trials were supported by commercial trials in India, China, Thailand and Vietnam. Current mill perceptions of potential ALS usage are broadly consistent with the controlled spinning trials at CMSE. As discussed above, there is general recognition that ALS fibre can be used to produce 60Ne yarns consistently and, depending on mill setup, to 70Ne in a stand-alone lay-down. Blending ALS with Pima enables the production of yarns up to 80 Ne yarns.

The new opportunity for marketing ALS cotton will be dependent on the price differential between ALS and ELS raw fibre. If the market can be developed, higher premiums may be secured for Australian growers that produce high quality cotton.

Developing new markets with novel spinning technology

The fabric industry continues to develop innovations in fabric treatments that improve function and durability. In 2010 a new project was initiated with CSIRO, Deakin University and Hong Kong Polytechnic University to assess use of Australian cotton in the production of low twist yarns, which without a reduction in yarn strength may not only reduce spinning costs but also produce a fabric of higher quality.

In another new collaborative project with an international mill, CSIRO and Deakin University will examine the development of new thermal fabrics designed for different markets sectors through the development of different thermal rating. Market research by project partners has indicated that there is growing demand for such new fabrics, particularly for casual business style clothing. This project involves designing new spinning and fibre blending techniques to develop fabrics with different thermal ratings.

STRATEGIC OBJECTIVE 4

Advance cotton product processing

Moisture management to maintain quality

Moisture management is a fundamental problem in the ginning process; as the cotton dries, it becomes more prone to damage. One key problem in maintaining moisture has been a lack of accurate measurement of moisture before and after ginning. CSIRO researchers have developed a new moisture sensor, in a joint investment with CRDC in a Cotton Catchment Communities CRC project. A provisional patent has been lodged for the technology and preliminary discussions have taken place with a potential commercial developer.

The new sensor was assessed throughout the 2011 ginning season in a commercial gin where moisture could be managed during the ginning process. The sensors were used to determine whether additional moisture should be added prior to lint cleaning.

While the technology aims to improve moisture management in ginning, additional benefits may include a reduction in total energy use in the gin. Real time moisture monitoring will enable more effective use of humidifiers and operations of the gin stand and lint cleaners, which are major energy users in the gin. Both fibre quality and total energy use in the gin were monitored throughout the trial. Trial outcomes will determine future commercial options for the technology.

Increasing Australia's low contamination advantage

The lack of contamination by foreign material in raw cotton is a key selling point for Australian cotton. The best opportunity to detect and remove contamination is in the ginning process. CRDC, with support from the Cotton Catchment Communities CRC, has continued the development of a new contamination sensor. In 2010–11, a prototype detector was assessed within a small scale ducting system to further optimise the lighting and colour image sensor technology.

Test results have proved successful in detecting a range of yellow and dark contaminates, which should prove of value in detecting the yellow and blue plastics that are used in the round bales that are being delivered to gins in increasing numbers. Such plastic material can pose a risk for fibre contamination.

The work has involved technical collaboration with the company Trützschler Gmbh, a producer of machines for spinning preparation and the non-wovens industry, headquartered in Germany. In terms of removing material once detected, Trützschler have commercial air nozzle ejection technology that may be adapted to use with the new sensors.

Cottonspec to improve mill efficiency

CRDC, together with the Cotton Catchment Communities CRC, has invested in the development of novel spinning software technology, Cottonspec. This is designed to improve mill efficiency by offering accurate prediction of final yarn quality traits such as strength and evenness, based on raw fibre inputs and spinning techniques.

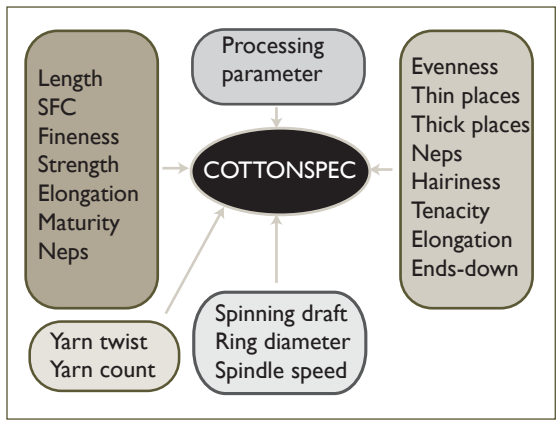
Cottonspec has been developed by CSIRO researchers through collaboration with a range of mills in China. Preliminary results have shown that used within a modern spinning mill Cottonspec can accurately predict key properties such as yarn tenacity and yarn evenness. The future of the technology will be assessed following review of a Cottonspec business plan currently under development.

STRATEGIC OBJECTIVE 5

Develop objective measurement of Australian cotton

Assessing Australian cotton fibre objectively

International mills that produce premium fabric pay particular attention to the quality of the cotton they purchase but in the past have lacked the means to measure the two key fibre quality attributes of maturity and fineness objectively. CRDC has invested more than one million dollars in the development of two technologies over the last six years. The first, SiroMat, which measures fibre maturity, began commercial development in 2009. The second, Cottonscan, assesses fibre fineness and was licensed for commercial development in early 2010.



Commercial partner, BSE Electronics, has combined the technologies into one machine and released its first prototype in mid-2010 as Cottonscope. By streamlining the two technologies and employing faster image processing and data analysis, BSE Electronics has reduced the test time for measuring fibre fineness and maturity to 25 seconds, making the technology very viable.

BSE Electronics has begun to promote Cottonscope to local and international classing houses and mills. To optimise the benefits for industry, the technologies may also be used to offer an additional objective measurement to mills and dyeing houses. To date, three instruments have been sold (two in the USA and one in Australia) and two other instruments are currently being used on approval before purchase (one in China and another in Australia).

Fibre strength a key property in yarn

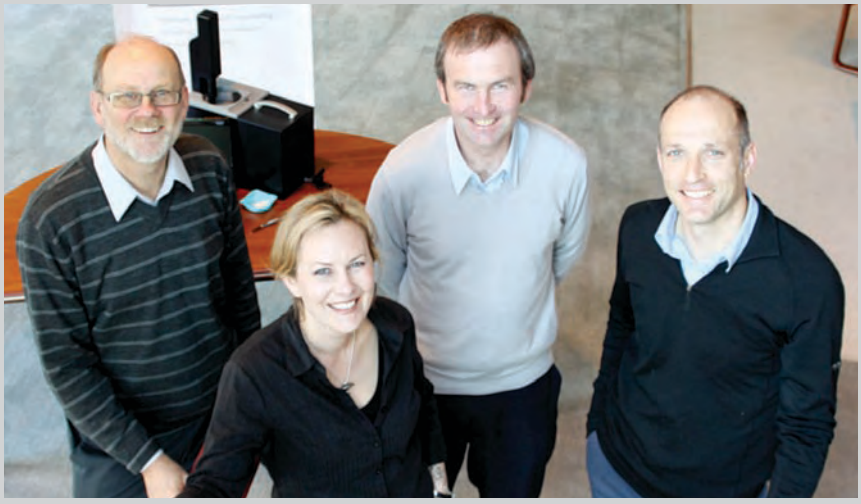
Fibre strength is a key fibre property affecting yarn strength. Currently, fibre strength is assessed indirectly by measuring cotton bundle strength with a High Volume Instrument (HVI).

New research has assessed individual fibre strength using a Textechno Favimat instrument located at the United States Department of Agriculture (USDA) Southern Regional Research Laboratory in New Orleans. The tests were undertaken across a number of different CSIRO-bred cotton genotypes. The data developed from the tests have been incorporated into yarn performance models, and show that yarn strength can be better predicted when single fibre tensile properties are substituted for HVI bundle tensile attributes. While single fibre assessments will never be used as a commercial marketing tool, the technique may prove using for the selection of new varieties in cotton breeding programs.

Cottonscope gaining local and worldwide recognition

Cottonscope is a finalist in the NSW Engineering Excellence Awards in two categories and the research team were finalists in the 2011 Australian Museum Eureka Award for Innovative Use of Technology.

Cottonscope will be exhibited at the Barcelona International Textile Manufacturers Association (ITMA) in September 2011 and at the China seminar in February 2012. Organisers have invited the researchers to present results from the new instrument at the Bremen International Cotton Conference, to be held in March 2012.



Cottonscope team members, *left to right,* Dr Geoff Naylor, Ms Nicole Phair-Sorensen, Dr Stuart Lucas and Dr Stuart Gordon

PROGRAM TWO
FARMING SYSTEMS

Goal

Cotton in a highly productive farming system with improved environmental performance

Outcome

A more resilient, profitable and competitive cotton farming system

R&D activities 2010–11

Number of projects: 60

Expenditure: $4.853m

Performance against Annual Operating Plan (AOP)*

1. KPIs achieved 2. Underway but not yet completed 3. Not achieved

* For detailed information, see *Measuring Performance*, beginning on page 121.

STRATEGIC OBJECTIVE 1

Build the industry's understanding of climate and natural resources challenges

Cotton in a changing climate

A range of activities addresses this important strategy. CRDC continues to support the Climate Change Research Strategy for Primary Industries (CCRSPI) as the main cross-sector communication vehicle for strategy and planning and has committed to continue this support up to December 2012.

CRDC supported two delegates to attend the inaugural CCRSPI Conference, held in Melbourne in March 2011. The Conference not only provided a showcase for researchers working on climate change and emission reduction, but also an ideal opportunity for some invited plenary talks to either set some future vision and challenges or describe the current state of our knowledge across particular topical areas. Conference presentations are available online at www.theccrspiconference.com.au.

A new project to investigate improving prediction of cotton growth and production in a changing climate is a good example of collaboration and effective use of limited resources. In early 2011, PhD student Katie Broughton enrolled at the University of Sydney with Dr Daniel Tann as her university supervisor. She will conduct her field and

Program Two Investment Manager, Tracey Leven

glasshouse research under the supervision of Project Leader, Dr Mike Bange (CSIRO), at the Australian Cotton Research Institute (ACRI). Katie will also work with Dr David Tissue at the University of Western Sydney, where she has already used the university's controlled environment facilities to conduct experiments on cotton response to water stress and elevated carbon dioxide levels and temperature.

Katie will be among 10 researchers sponsored by CRDC to attend World Cotton Research Conference 5 in Mumbai, India, in November 2011, where she will be able to present her initial results and discuss her R&D plans with international peers.

A new commissioned project to improve the capacity to assess greenhouse gas emissions from broadacre irrigated cropping systems has been established on one of the two long-term cotton farming systems experimental sites supported by CRDC at the ACRI. CRDC invested in a range of equipment to enable the project to proceed: a new set of automatic greenhouse gas measuring chambers manufactured by Queensland University of Technology, a trailer to house the electronics and gas controls and provision of power to the site.

CSIRO's Dr Jeff Baldock is the principal Researcher on the project, working with project researchers Dr Ben Macdonald, Dr Ian Rochester and highly experienced technical officer, Mr Tony Nadelko. Greenhouse gas measurements have commenced on the 2011 winter crop plantings in the trial site, including wheat, vetch and fababeans. CRDC participates

Dr Ian Rochester and Dr Ben Macdonald are working on a project to improve capacity to assess greenhouse gas emissions from broadacre cropping systems

on the steering committee on the Nitrous Oxide Research Program, which is jointly funded by the Australian Government Department of Agriculture, Fisheries and Forestry and the Grains R&D Corporation (GRDC). Although this project is not funded through that program, CRDC will ensure it provides data to enhance the national joint effort.

In 2007, CRDC invested in a National Centre for Engineering in Agriculture (NCEA) project which conducted preliminary energy audits on seven case study irrigated cotton farms. The results showed that energy cost on these farms could be significant and initial estimates suggest that greenhouse gas emissions associated with this energy use could be equivalent to the soil emissions of carbon dioxide and nitrous oxide associated with fertiliser use and tillage. This initial project also developed EnergyCalc, a prototype on-farm energy use calculator.

Now, a new project to develop a protocol for assessing on-farm energy use and associated greenhouse gas emissions has been established to reduce greenhouse emissions and save on costs. The task has begun to return to the seven original case study farms and begin the process of more detailed energy audits, aimed at improving the accuracy of measurement, creating data applicable to operations on local farms and identifying the key areas for improving energy use efficiency.

STRATEGIC OBJECTIVE 2

Enhance the capacity of the industry to adopt resilient and adaptive farming systems

Understanding the integrated nature of systems

CRDC had planned to further apply systems thinking to map key leverage points within farming systems for improvement by following up on a workshop held in 2008 to introduce the concept. However, the extraordinary conditions in the 2010–11 season made it impossible hold another workshop.

The original workshop highlighted the value in identifying systems and applying systems thinking techniques to them. The results are sometimes not what might be expected. In this instance over half of the potential 'intervention' points identified for improving Cotton Farming Systems were to do with human capacity rather than farming practices, as might have been expected initially, enabling CRDC management to apply this knowledge to enhance the Human Capacity Program.

Following consultation with the Cotton Catchment Communities CRC, the focus for this project in 2010–11 has been the 'Cotton Industry Water Story': the impact of the Cotton CRC's activities 2005 – 2012, which includes a significant number of investments by CRDC.

The Cotton Industry Water Story, which will be finalised in 2001–12, seeks to serve two closely aligned purposes. The first output will be a journal article summarising improvements in cotton farm water management. This will take some time, as it is to be peer reviewed. The second output will involve compiling a layperson's version of the peer-reviewed Cotton Industry Water Story. A draft paper has been prepared and work continues.

A summary water metrics is discussed under the following R&D investment, involving ongoing work to benchmark cotton and grains water use efficiencies. This project is also developing a detailed account of research investments and outcomes from soils R&D over the last five to six years.

Ongoing work to benchmark cotton and grains water use efficiencies has been an important investment for CRDC through the National Program for Sustainable Irrigation (NPSI) for two reasons. First, it continues the important and difficult task of benchmarking water use efficiency of cotton production, using data gathered on commercial cotton farming enterprises. Second, it is a project jointly funded with GRDC to develop similar water use efficiency benchmarks for key irrigated grain crops, many of which are grown on cotton farms.

Results from this project were reported at the 2010 Australian Cotton Conference and showed that the GPWUI (Gross Production Water Use Index), which accounts for rain, soil moisture and irrigation water and shows an improvement of over 40% –up from 0.79 bales of cotton produced per megalitre of water used to 1.14 bales – in the decade since similar benchmarking data was reported in the late 1990s. The 2010 range in the GPWUI data showed an improvement that ranged from 0.64 bales to 1.58 bales, which demonstrates that there is still room for improvement on many farms.

CRDC continues to invest in the Crop Consultants Association post-season survey series. Over fifty per cent of the cotton area is now covered by this survey, ensuring that it delivers reliable information to assist with future R&D planning. The 2009 survey report has been published and can be found at www.crdc.com.au. The 2010 survey is currently being analysed and the 2011 survey has been sent to consultants.

CRDC had intended to establish a new project to investigate applying plant-based measurement for irrigation in water-limited environments. Negotiations with US Cotton Inc and USDA are ongoing, as it is taking longer than expected to resolve issues around commercial in-kind support and intellectual property implications for further development of the measurement sensors if the research proves the concept. As a consequence, the project was not established during the reporting year; however, commencement is anticipated in 2011–12. The process serves as an important test case for the development of international collaborations, with their inherent difficulties.

A new commissioned project to investigate optimal irrigation of cotton via real-time adaptive control was established in 2010–11 as a post-doctoral fellowship for Alison McCarthy, to build upon the research previously undertaken by Alison and funded under a CRDC PhD scholarship. In this new project, however, the aim is to investigate opportunities for automation of furrow irrigation systems, in addition to the overhead irrigation systems studied previously. Alison was the recipient of the 2010 NPSI/Irrigation Australia Limited Travel Fellowship to the US.

Cotton in the Burdekin region: a whole new game

Additional resources have been committed to support completion of a Burdekin cotton feasibility case study. First time cotton growers, Layton and Sheree MacDonald, have commercially validated the best practice recommendations that are emerging from the Burdekin research effort. Their planting, fertiliser rates and application timings, irrigation and growth regulation decisions were all influenced by local research.

After surviving cyclones Anthony and Yasi seven and eight weeks after planting, their crop was then impacted by unseasonably cloudy conditions in late April and temperatures that were four degrees below average in May and two degrees below in June. Management decisions were adjusted in response to the declining yield potential to reduce financial risk. The end result was still positive. While the crop yielded only 6.9 bales per hectare it returned a gross margin of around $3000 per hectare, proving that there is robustness and flexibility in the management package.

The Burdekin research provided vital spin-off benefits in a strong La Niña-influenced season where cotton regions received between 1.5 and seven times average rainfall. Cotton grows quite differently in wet conditions and this research provided valuable information on how to manage crops under those circumstances. In addition, the flooding in Queensland cotton regions saw CRDC-supported Burdekin cotton researchers Paul Grundy (DEEDI) and Stephen Yeates (CSIRO) provide assistance redirecting management strategies after the flooding events. This aided many Emerald growers in recovering some lost yield potential.

Healthy soils for a healthy environment and crop.

2010–11 saw the finalisation of an investigation into the surface and groundwater implications of deep drainage under irrigated cotton. While Cotton Catchment Communities CRC work using the lysimeter at ACRI finished in 2010, CRDC and the Namoi Catchment Management Authority invested in 12 months of additional measurements using the lysimeter. The four years of research is being prepared as a consolidated report.

Continuing research into farming systems, aiming to maintain profitability and soil quality, has resulted in a comprehensive report containing over a decade of data. It addresses current community interest in soil carbon with data that can assist informed decision-making well beyond the cotton industry.

Analysis of 11 long-term data sets from cotton farms across NSW revealed an interesting finding: it is the soils that start from a low base of soil organic carbon (SOC) because of poor management practices that are able to show a net improvement in SOC levels when management practices are improved, whereas soils that have been well managed cannot display the same level of improvement. In addition, temperature has been found to be a stronger influence on SOC than management. Comparisons of SOC under the same cotton cropping system at several NSW locations showed that SOC storage increased on moving northwards from Hillston in southern NSW to Narrabri in northern NSW. The changes in SOC latitude were closely related to changes in average daily maximum temperature.

Ongoing research into the development of dynamic deficits is focusing on matching irrigation to plant requirements in a variable climate, involving further refinement of interaction between vapour pressure, plant

Burdekin researcher Stephen Yeates explains to cotton agronomists from flood-affected regions, Jamie Iker from Emerald and Belinda Chase from the Darling Downs, how nutrition influences the cotton plant response to wet summer conditions

stress and soil water relationship improving capacity to model cotton response to irrigation regimes. Principal Researcher Dr Rose Brodrick presented the findings on ABC radio and *Landline* in June 2011.

Ongoing research aims to define critical soil nutrient concentrations in soils used for irrigated cotton in northern NSW and Queensland. This is a co-investment with GRDC, who are managing the project.

Crop Consultants Australia (CCA) survey reports indicate that cotton growers are using a range of objective measurements such as soil and leaf testing to improve nitrogen use efficiency. The adoption of split application strategies for applying nitrogen is also indicating higher awareness of practices that minimise nitrogen losses. However, there is also evidence in surveys that more can be done to further optimise the use of nitrogen, phosphorus and potassium fertilisers in cotton systems. Through collaboration with the grains industry, there will be ongoing effort at both the research and development levels to drive further practice change.

Using pesticides appropriately

CRDC continues to provide support for the effort to build the capacity of the cotton and grains industry to improve pesticide application and drift management, and participated in the interim executive committee for the national working party on pesticide application. This involved all stakeholders engaged in supply and use of pesticides in cropping and aimed to address Council of Australian Governments (COAG) reforms on pesticide regulation and to develop a collective capacity for identifying gaps in current knowledge and develop proposals to address these.

The project to achieve high standards in grower spray application continued in 2010–11.

New cotton growers Layton and Sheree MacDonald are playing an important research support role in the Burdekin

Over past year Bill Gordon Consulting put in place a Memorandum of Understanding with ChemCert Australia for mentoring professional development of course deliverers through the ChemCert program. This means there is now a network of spray application workshop providers in NSW able to offer advanced level courses for spray applicators across the broadacre agricultural sector.

Achieving best management on-farm with *my*BMP

Following the launch of *my*BMP at the Australian Cotton Conference in August 2010, CRDC continues to provide support to link research, extension and BMP facilitation.

Agronomists working with agribusinesses such as Cotton Grower Services are being trained as accredited *my*BMP advisors to enable them to 'spread the word' to their industry clients. Each advisor is required to work with at least five farms per year and the service is free to growers. Katie and Johno Haire, who grow cotton near Goondiwindi, and the corporate farm, Auscott Namoi, near Narrabri, have now been fully *my*BMP-audited. For further information on *my*BMP, visit www.mybmp.com.au

*'I thought my*BMP *would be pretty time consuming but I was surprised at how flexible the program was, allowing me to do bits and pieces at a time and work at my own pace. I found the system to be extremely user friendly.'*

Katie Haire
'Undabri, Goondiwindi

Katie and Johno Haire receive their *my*BMP audit certification from *my*BMP Manager, Jim Wark

STRATEGIC OBJECTIVE 3

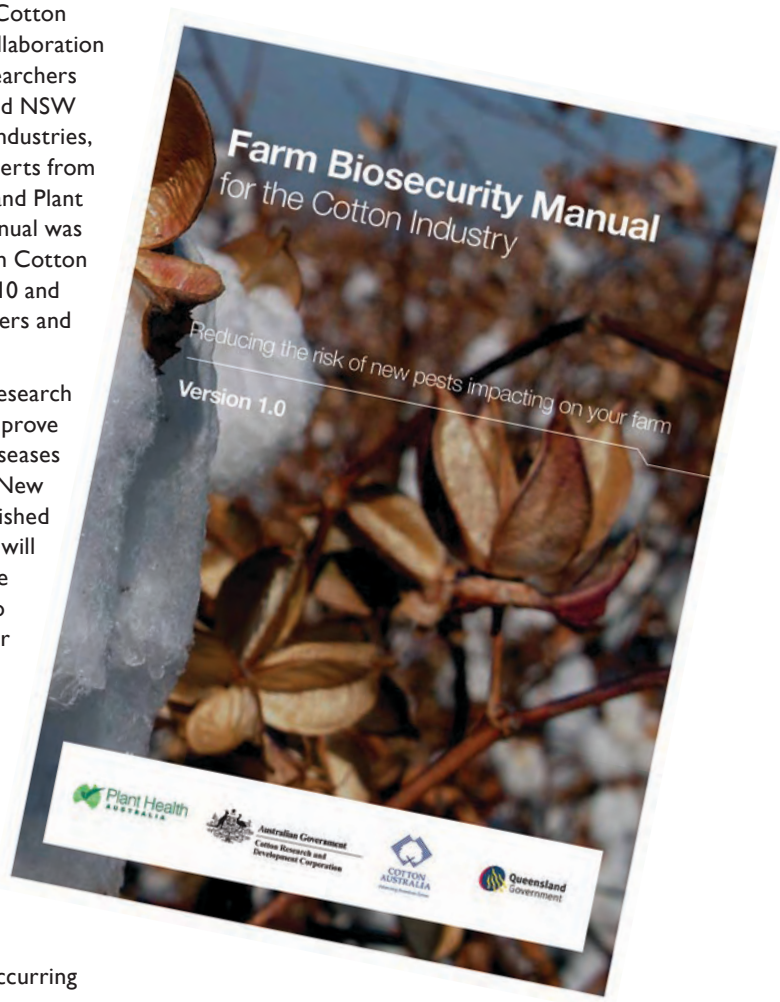
Protect industry from biosecurity threats

Protecting the industry – and the nation – from diseases

CRDC invested in development of the first Cotton Biosecurity Manual to raise grower awareness of the biosecurity threats faced by the industry and how on-farm management can reduce the risk of exotic pests or diseases. It includes information to help identify high priority pests and diseases and links with the Biosecurity Module of *my*BMP. The project was managed by Cotton Australia and involved collaboration with cotton industry researchers from CSIRO, QDEEDI and NSW Department of Primary Industries, as well as biosecurity experts from Queensland Biosecurity and Plant Health Australia. The Manual was launched at the Australian Cotton Conference in August 2010 and mailed to all cotton growers and consultants.

CRDC established new research projects in 2010–11 to improve management of cotton diseases and disease surveillance. New pathology projects established in NSW and Queensland will see long-term surveillance work continue. It will also look at whether particular management issues such as interactions between disease severity and crop nutrition, disease decline with crop rotation and the screening of novel seed treatments could be modified to lower the severity of diseases and/or lower the risk of the diseases occurring in the first place. The research teams will also increase their capacity to use new molecular techniques to track the genetic diversity of key diseases.

Surveillance in 2010–11 confirmed new cases of Fusarium wilt in the Hillston and Emerald areas, which had not seen the disease before. 2011–12 will see renewed emphasis on the farm hygiene program 'Come Clean, Go Clean' and selection of cotton varietals with high Fusarium resistance. The surveillance also identified significant increase in the distribution and severity of Cotton Bunchy Top, which is spread by cotton aphids and causes severe problems in



the plant such as stunting and reduced leaf and fruit size, leading to serious yield loss. Again, the control emphasis will be on over-winter farm hygiene practices.

Research continues to develop the capacity to manage cotton viral diseases. Australia's contingency plan for cotton leaf curl disease has been strengthened by new knowledge that several vegetable crops are also hosts, meaning the cotton industry can now collaborate with vegetable industries to achieve more effective surveillance. The protocol developed for surveillance of this disease in Australian cotton crops has been trialled in India, where the disease is present. Results suggest that the protocol is robust and gives the Australian cotton industry confidence.

R&D to stop insect pests in their tracks

A commissioned project established in 2010–11, which is investigating factors associated with the spread and incidence of Solenopsis Mealybug, was brought to a halt in the Burdekin because strong predation of the mealybugs by other insects prevented trial establishment and at Emerald because of flooding in December 2010. However, mealybug colonies have been established in glasshouses in Toowoomba to enable preliminary trials of insecticide efficacy. Communication to industry focused on promoting the value of beneficial insects which, ironically enough, was demonstrated by the project's problems in the Burdekin.

Silverleaf whitefly (SLW) is a major pest, which causes lint contamination through the excretion of honeydew. This contamination causes major price discounts and affects Australia's reputation for producing high quality cotton. Seasonal conditions meant that Silverleaf whitefly was not as significant a problem in 2010–11 as in recent seasons. Nevertheless, a new project to investigate Integrated Pest Management (IPM) for Silverleaf whitefly and emerging pests in central regions was established at ACRI and began investigation of rates of whitefly honeydew breakdown on cotton and consequences for cotton lint quality, as well as continuing with experiments to validate in southern cotton regions the threshold matrix and control recommendations that originated in Central Queensland. Significant expertise to assist the cotton industry with management of the viral disease, cotton bunchy top (discussed above) also resides in this research team.

CSIRO researchers at the Cotton Catchment Communities CRC have used knowledge gained in recent years from CRDC investments in whitefly control to develop a Threshold Matrix web tool to make whitefly management easier by entering regular sampling information and compare this with control thresholds, ensuring insecticide sprays are used only when necessary. The whitefly tool can be accessed through www.cottassist.crc.org.au.

Work continues within the new project on the ecology of green vegetable bugs, the damage potential and thresholds for cotton stainer bug and green jassids and management of mirids and stinkbugs. These pests create significant management problem in Bollgard II® cotton, especially as there are relatively few chemical controls that are IPM-compatible and few predator insects. The need to continue this research was underlines in 2010–11 by the withdrawal of endosulfan, which has been an effective insecticide for the management of these pests over many years within IPM programs.

CRDC had expected that the project partner in a project to support the commercialisation of, and develop new applications for, fungal insecticides against cotton pests would be in a position to submit a biological insecticide to the Australian Pesticides and Veterinary Medicines Authority for registration; however, the commercial partner received some negative test results involving rats, indicating that the organism would not be suitable for registration. Nevertheless, an earlier project had developed other potential bio-insecticides and this project continues to investigate and develop these promising organisms.

Researchers within ongoing research projects for managing weeds and herbicides in a genetically modified cotton farming system are undertaking a cost:benefit analysis of the use of proactive management to delay the development of herbicide resistance in weeds in GM cotton and broadacre grains systems. A presentation at the 2010 Australian Cotton Conference highlighted that the payback period for current resistance management tactics is fifteen to twenty years. This lengthy payback period would not encourage commercial adoption; hence, the research is now focusing on ways to reduce it to a point where growers would be likely to alter their current weed management practices.

Because the project aims to develop management tactics that are consistent across cotton and grains systems, in July 2010 CRDC and GRDC jointly held Glycom, a forum that unified research efforts from both industries to present common best practice recommendations to both industries and collectively identify research gaps.

PhD student, Jason Callander, continued his research into the flight characteristics of *Helicoverpa* spp. in relation to the efficacy of transgenic cotton refuges. This project is located in Brisbane and was seriously affected by flooding in January 2011. While laboratory-based milestones have progressed satisfactorily, glasshouse and field components of the study are now twelve months behind schedule, requiring an extension to the project.

The project benefited from a CRDC-supported scientific exchange in which Swiss Professor of Insect Behavioural Ecology, Sylvia Dorn, visited

At the Glycom forum: Rohan Rainbow, GRDC, Richard Daniel, CEO, Northern Grower Alliance; Frank Taylor, Nufarm; Michael Widderick, QDEEDI, Bill Gordon, Bill Gordon Consulting Pty Ltd; Tracey Leven, CRDC's Farming Systems Investment Manager

Australia during the cotton season to assist with the design of field experiments for the project and deliver a guest lecture at the ACRI on the capacity of insects to develop behavioural responses to changes in their environment.

Maintaining the efficacy of Bollgard II® cotton

Bollgard II technology has made an enormous contribution to the viability of the Australian cotton industry over the past decade. Due to a major resistance management effort since its introduction, the field efficacy of this biotechnology remains unaffected, with only very small upward changes in the frequency of resistance genes from the baselines established eight to nine seasons ago.

The use of refuge crops has been a significant part of resistance management. Research shows that at a landscape scale the performance of refuges is inherently variable; nevertheless, researchers remain confident that refuges are contributing to the very slow development of resistance to the *Bt* genes in both *Helicoverpa armigera* and *H. punctigera:* much slower than that experienced with conventional synthetic insecticides in previous decades.

Five years of research effort have not yet found alternative refuge crop options of comparable efficacy to current options, nor have researchers found success in applying different management regimes to cotton refuges to make cotton a more effective refuge option than when traditionally managed.

In other refuge-related research, PhD student, Dominic Cross began a new project to examine ways to improve management of cotton refuges within the BMP framework and experimentation has commenced.

A new project is revisiting the ecology of *H. punctigera* in relation to migration, overwintering and implications for *Bt* resistance. A PhD student, Kris Le Mottee, has now been granted Australian residency and the project, initially scheduled to start in 2010–11, will now commence in 2011–12.

Visiting scientist Professor Silvia Dorn *fourth from left)* with Tracey Leven (CRDC), Peter Gregg (UNE), Lewis Wilson (CSIRO), John Adomczyk, Robert Mensah (NSW DPI) and Sharon Downes (CSIRO)

PROGRAM THREE
HUMAN CAPACITY

Goal

A culture of innovation and learning

Planned Outcome

Innovative people in the cotton industry and community, creating a sustainable industry and viable regional communities

R&D activities 2010–11

Number of projects: 35

Expenditure: $1.072m

Performance against Annual Operating Plan (AOP)*

1. = 14 | 2. = 2 | 3. = 2 = **Achieving AOP**

1. KPIs achieved 2. Underway but not yet completed 3. Not achieved

* For detailed information, see *Measuring Performance*, beginning on page 121.

STRATEGIC OBJECTIVE 1

Identify, understand and plan for future industry capacity needs

Skills for the coming decades

Access to skilled labour in both agribusiness and farm enterprises remains a very challenging issue that is not simply about competing with other industries for scarce human resources. A series of focus group meetings with cotton producers and agribusinesses across Queensland and north west NSW cotton production regions asked the research question: 'what skills do people need in the next ten years to have viable businesses?'

This produced a valuable benchmarking of current thinking, attitudes, understanding and engagement with professional development activities and recognition by producers and agribusiness that learning is a lifelong issue that must occur in the workplace. The role of informal learning is just as critical, with a user-driven 'just in time' style of learning. It was felt more sectors of the industry need greater engagement with the community, and with schools at both secondary and vocational education level.

A commissioned project to develop approaches for human capacity assessment and benchmarking was established to test a potential new method to provide staff employed on cotton farms, or those seeking employment on cotton farms, to conduct an online assessment

General Manager R&D Investment and Investment Manager Program Three, Bruce Pyke

of their skills and competencies. The resulting assessments are able to be used in a range of ways by employers to ensure existing or new staff have the skills for certain tasks, to assess whether staff members needed additional training or to assess the skill levels of potential employees. They could also assist employees to identify areas in which skill development would benefit their employment prospects or enhance their current job role. The project experienced some difficulties with the Learner Management System to be used, but Tocal College has now established a system and the project is expected to generate pilot benchmarking results during the latter part of 2011.

Cotton and local communities: a symbiotic relationship

By using data gathered from 1996 to 2006 to identify trends, particularly those associated with climatic variation and technological change, a new commissioned project is studying the relationship between the cotton industry and cotton communities. It has built on research that described and quantified the relationship between cotton and other agricultural production and produced a range of socio-economic indicators of community wellbeing, sustainability and resilience.

Envisioning a sustainable future

The development of the industry Vision 2029 'Australian Cotton, Carefully Grown, Naturally World's Best' was completed in July and presented to the industry at the 2010 Australian Cotton Conference. The six key Vision 2029 headings that describe the industry and help gauge where it sat in 2010 and where it wants to be in 2029 are Differentiated, Responsible, Tough, Successful, Respected and Capable. For further information on Vision 2029, see www.crdc.com.au/emags/2010JuneSpotlight.

A new project conducted for CRDC by the Women's Industry Network – Cotton (Wincott) canvassed women from many sectors across the industry – including growers, agribusiness, marketing and agronomic, research – and from all cotton valleys, to gain insight into the perception, understanding and implementation of environmental resource management programs such as *my*BMP and determine future avenues and practices to encourage increased participation in the program. Wincott has subsequently run three focus groups in different regions to delve further into these issues and gain a richer understanding of rural women's opinions and what they actually do on their farms and in their businesses. These results will be disseminated to industry, with the suggestions and findings raised in this project aiding positive NRM action in the industry.

STRATEGIC OBJECTIVE 2

Improve human resource development and capacity

Lifelong learning accessible to all

Following a review by the industry advisory panel, a project for enhancement and development of e-Learning opportunities for BMP farm managers was replaced by work by the cotton industry's Professional Development Manager, in collaboration with Australian Agricultural College Corporation (AACC) and Tocal College, to develop a number of e-Learning tools for testing in the cotton industry This work was funded under the Australian Flexible Learning Framework (see www.flexiblelearning.net.au). In detail:

- AACC has finished the content development of its first e-Learning product: a 'manage staff' tool that will complement the HR module of *my*BMP. Following minor adjustments, it will be trialled in the industry.
- An AACC Centre Pivot Lateral Move tool that helps educated consultants and producers on how to perform a system evaluation of these machines is under final review and will be piloted as part of a blended learning (a combination of face to face and online teaching) initiative in 2011.
- Tocal College is developing a rapid skills online auditing system, which allows

producers to review how they might go in a Recognition of Prior Learning (RPL) assessment, either to encourage them to apply to do an assessment or start the collection of information that will help in an assessment. It will also highlight opportunities for further skills development opportunities.

- Tocal's second e-Learning product under development is a case study of how OH&S can be incorporated into an online system for two industries: the Australian saleyard industry and the cotton industry. This product will require feedback from experts in the industry and may be ready for testing in the 2012 cotton harvest.
- A new pilot project to better understand career pathways into the cotton industry was established in 2010–11 and a pilot program initiated with high schools in St George and Goondiwindi, where cotton is a significant industry and employer. The project is developing improved information and resources for teachers.

The industry's future was further secured when men and women from Victoria, NSW and Queensland, identified as future leaders and representing the production, agronomy, research, development, agribusiness and marketing sectors of the Australian cotton industry, graduated from the CRDC and Cotton Australia industry capacity building Future Leaders course in November 2010. Participants rated sessions on communication, personality types, leading change, leadership tools and engaging with industry as the most valuable aspects of the course. CRDC is supporting the third Australian Future Cotton Leaders program and an upcoming forum for all graduates of the program.

René van der Sluji (CSIRO Textile and Fibre Technology) conducts the Field to Fabric course each year. In 2010–11, René ran a one-day professional development event for teachers from Goondiwindi and St George schools as part of the CRDC gateway schools project with DEEDI and the Queensland Department of Education and Training

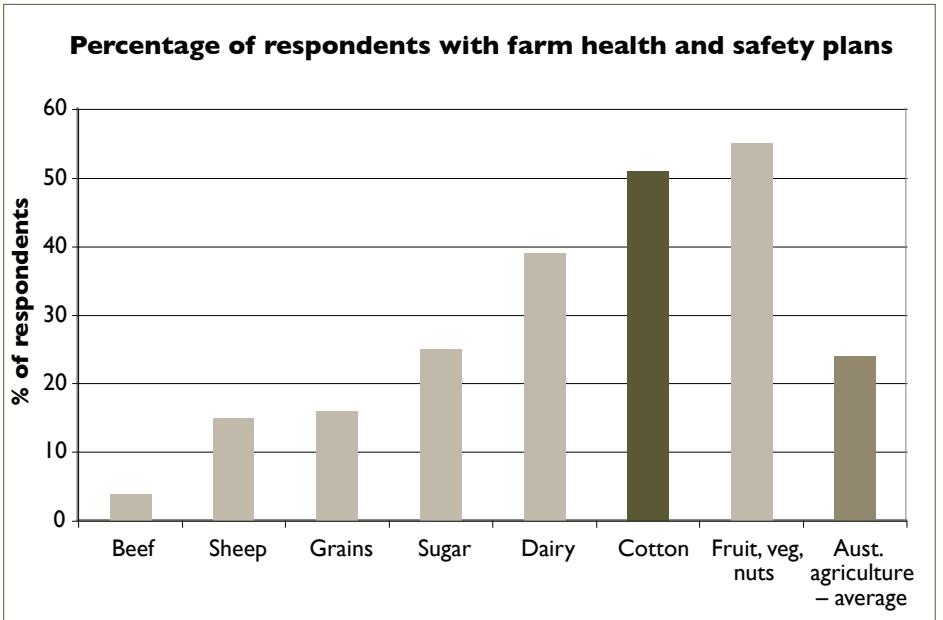
A new commissioned project piloting a Cotton Agribusiness Engagement Strategy by developing innovation through the corporate agribusiness sector did not proceed following review by the industry advisory panel. Instead, it was decided to concentrate on developing opportunities for the agribusinesses within the cotton industry to become more closely involved in the promotion and use of the industry's new *my*BMP system. For example, a 'Certified *my*BMP Advisor' program was introduced in 2011 to prepare agribusinesses to support growers access and start using the *my*BMP system. This is the start of what is hoped will be a long association between *my*BMP and agribusiness, to provide an important driver for many growers to become involved. A *my*BMP Awareness Program has included presentations to National Australia Bank, Westpac and AgriRisk.

A new project to share on-farm innovation to reduce the cost of cotton production in the Lower Namoi Valley was established and the local Cotton Growers Association planned the year's activities; however, the change in outlook and increased crop production in the 2010–11 season, particularly in the Namoi valley, coupled with local flooding in December, meant a number of the planned activities had to be postponed until the 2011–12 season. The project has been extended to allow these to take place.

Ensuring safe and healthy farms

CRDC provided ongoing support for the Cooperative Partnership for Farming and Fishing Occupational Health & Safety, managed by the Rural Industries R&D Corporation, with the 2010–11 effort concentrating on communications and extension of existing knowledge. The partnership defined this as a mixture of awareness-raising measures, including messages containing low-cost practices that improve safety, targeting of specific farming and fishing sectors with specific messages, and highlighting knowledge of risks and costs of farming and fishing health and safety. Above all is the challenge of developing new ways in which messages about health and safety can be best packaged and delivered.

As can be seen in the graph below, cotton enterprises surveyed are near the top in



Data source: March 2011 report *Health and Safety on Australian Farms* (www.rirdc.gov.au)

adopting farm health and safety plans, albeit with considerable room for improvement. Thus, support for the program will continue.

STRATEGIC OBJECTIVE 3

Enhance capacity to innovate

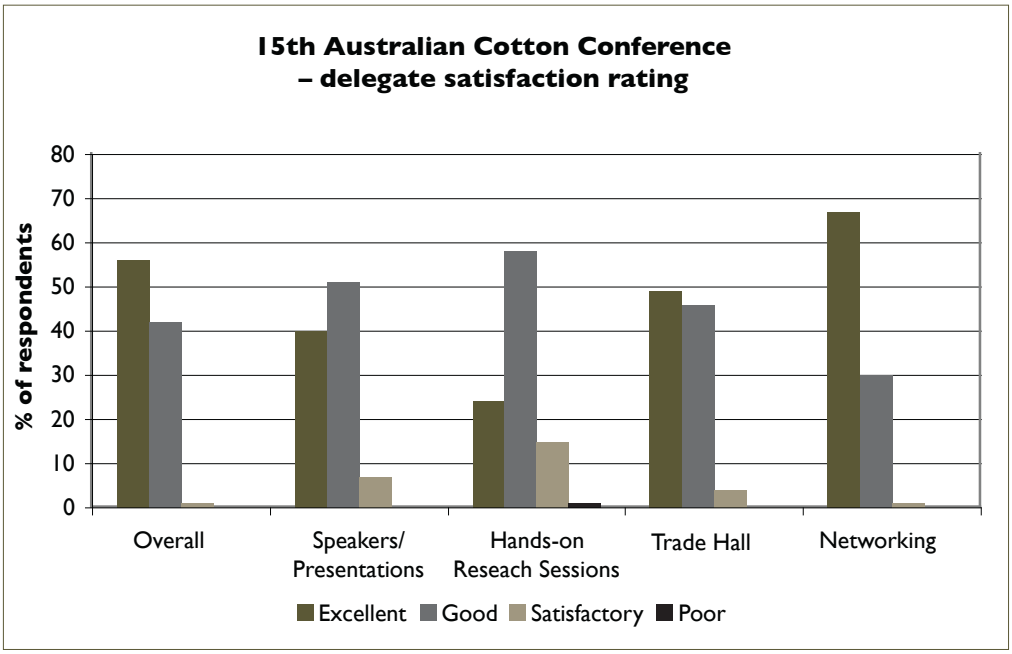
A shared R&D vision and commitment

CRDC was once again a major sponsor of the Australian Cotton Conference, with the 15th conference held on the Gold Coast in August 2010. Attendance returned to pre-drought levels of participation, with 997 delegates. This research-focused conference provides an opportunity for all sectors of the industry to come together to foster a culture for learning and innovation, provide an opportunity for connectivity and a vision for the long-term sustainability of our industry. For CRDC, it provides an excellent platform to disseminate and promote its R&D outcomes.

The 2010 conference canvassed issues such as the cotton industry's *Vision 2029*, water sharing, farming systems, energy resources, human capacity, improved productivity and sustainable production systems. Its field to fabric focus also covered post farm gate activities: specifically, understanding qualities of Australian cotton and opportunities to better evaluate markets for Australian-produced fibre.

The Big Day Out disseminating R&D

The 2011 Big Day Out was planned, as in past years, to take place on the farm of the previous year's recipient of Innovative Cotton Grower of the Year. It had been planned that the focus for this year's event would be around the innovative policies for managing staff that had won the award for Rob and Susannah Tuck of Narromine, NSW. In the event, the Chilean ash cloud and rain literally put a dampener on the day and a number of guest presenters were prevented from attending, so the event was postponed and rearranged to focus on farming systems. Although these changes affected the number of people attending from other districts, there was a good attendance by Macquarie valley growers, which contributed to an interesting and productive discussion around important farming



issues such as the management of soils in back-to-back (as opposed to rotational) systems, the impacts of different tillage system and efficiency at capturing rainfall.

Knowledge adoption: more, better, faster

The 2010–11 year saw the second year of operation of the demand-driven and commercial-like R&D Adoption Framework for the cotton industry, extending R&D knowledge to the industry through our Development and Delivery (D&D) team in a more targeted, efficient, coordinated and transparent matter. The D&D model gains strength from its integration with the new online *my*BMP system.

The new adoption framework partly replaces a regional extension model that had been in use industry wide for many years. Roles of regional extension were replaced by roles principally with a developmental focus relating to actual practices commonly in use throughout the industry. D&D roles are: Certified Best Practice within the *my*BMP framework; Weeds Management, Pest Management, Human Capacity, Farm Hygiene and Disease, Commercialisation, Catchment, Communities, Product-Post Farm Gate, Water Use Efficiency, Farm Systems and Energy, Soil and Plant Nutrition, and New Growers.

The D&D team is also responsible for producing industry resource guides and 2010–11 saw release of the *Australian Cotton Production Manual 2011* and *Cotton Pest Management Guide 2011*, with the *Pest and Beneficials in Australian Cotton Landscapes* due for release in August 2011, along with the industry-wide launch of the web-based *my*BMP system of best practice benchmarking that doubles as industry's newest information source.

The team addressed a range of important issues across the industry in 2010–11, such as the major disease threat cotton bunchy top, glyphosate and weed resistance workshops, self-sown (volunteer) cotton, energy use case studies, soil pit workshops and nitrogen use trials in back-to-back cotton and grower support for *my*BMP.

But without doubt, as shown in the accompanying story, the value-add by the D&D team was never better illustrated than by the role it played in mitigating the impact of floods and major rains in Queensland, bang in the middle of the 2010–11 cotton season.

Soil Health was an important topic explored at the 2011 Big Day Out

Fighting on after flood

D&D Team Specialist, Susan Maas (DEEDI), largely coordinated the post-flood effort, which saw growers and consultants looking for assistance in making decisions about how to manage flood-affected crops. As part of the effort, CRDC-supported cotton researchers Paul Grundy (DEEDI) and Stephen Yeates (CSIRO) shared their knowledge about recovering seemingly lost yield potential through management strategies gained in their years of research into growing cotton in tropical climates.

Discussions at three field walks not only assisted with decision making for the remainder of the season, according to Susan Maas, but also highlighted the opportunity for the industry to learn from the outcomes of this season and gain more information about the impact of various management practices (such as crop trimming) on crop growth following flooding and inundation. In fact, a CRDC investment sees central Queensland consultant Jamie Iker, in collaboration with Paul Grundy and Stephen Yeates, assessing the management practices that arose from the post-flood effort in order to set the industry up to deal with flood and inundation should it occur in future seasons.

For more information on the flood response and details of the new research, see *Spotlight* Winter 2011 at www.crdc.com.au.

Dr Paul Grundy used information gathered from research into growing cotton in wet climates to help growers affected by flooding in the Emerald district in Queensland

SOME OF OUR POSTGRADS

Olive Hood

University of Queensland PhD student Olive Hood is undertaking research focused on integrated Condamine catchment water governance during the development of Coal Seam Gas (CSG) and the reform of the Murray Darling Basin management. She recently travelled to the Austrian Alps to deliver a summary of this Cotton Catchment Communities Cooperative Research Centre and Cotton Research and Development Corporation funded research at the Water Governance Meeting the Global Challenge conference. The conference, which was hosted by the European Science Foundation and convened at the University of Innsbruck, Austria, brought together researchers from at least 20 different countries.

The Condamine river catchment, the focus of Olive's research, is located at the headwaters of the Murray Darling Basin, which contains wetlands and springs and overlays alluvial freshwater systems that interact with artesian groundwater systems. The Condamine catchment communities participate in a number of governance initiatives, including Murray Darling Basin activities, Great Artesian Basin activities, Natural Resource Management Activities, state water planning and administration activities, stream rehabilitation activities and water buy back activities for example. Olive's first question is how this governance is enacted across the totality of initiatives. that is, how does the range of initiatives perform and interact, and what do they produce together in terms of outcomes for the participants and the resources being contested?

Olive Hood

The Condamine river catchment water assets are also the subject of elevated deliberation due to the governance changes initiated through the *Water Act 2007*, Murray Darling Basin reform and the development of the coal seam gas industry. Both changes have implications for water governance in the catchment at present, across a number of areas, including surface, alluvial and groundwater management systems. Olive's second question, then, is how the set of governance initiatives relating to the Condamine River catchment interact and how to manage these proposed changes: that is, what is lost and gained for the participants and the resources being contested during this reorganisation.

Jason Callandar

It is vital for the ongoing effectiveness of transgenic crops that noctuid (night flying) pests not develop resistance to the *Bt* genes. The effectiveness of refuge crops has not been investigated in relation to flight of bollworm moths. Jason's PhD research focuses on the post-emergence flight of the bollworm moth in relation to the environmental factors that are known to influence moth flight. Of primary concern would be the host plant species used in refuges and the responses of moths to each of these host types as the plant pass through successive phenological stages. These plants present both egg depositing and adult feeding opportunities and the responses of moths to these options needs to be tested. Of related interest is the propensity of the moths to undertake flights that would take them out of the area of interest and the propensity of female moths to mate multiple times. Sperm

precedence would also need to be investigated to establish if sperm cells are used randomly relative to male parent when eggs are fertilised.

Jason began by establishing small cage trials in the 2010–11 season. Unfortunately, these trials were destroyed in the January floods before data could be obtained. For the 2011–12 season, Jason has constructed a flight mill system to investigate the influences of environmental factors on flight attributes of bollworm moths. In addition, large field cage trials will address when and where moths mate in relation to plants they developed on as larvae and the propensity of females to mate multiple times.

Katie Broughton

Katie Broughton is just beginning her PhD studies on the impacts of projected climatic changes – increasing carbon dioxide ($CO_{2)}$, rising temperatures and reduced water availability – on the physiology and production of cotton in Australia. Rising atmospheric CO_2 concentrations may have a positive effect on cotton, as increased CO_2 enhances photosynthesis and, consequently, growth of the plant: however, rising temperatures and reduced water availability negatively impact cotton growth and production. Katie's PhD will look at the responses of these interactive factors on cotton.

Katie's project involves collaborating with scientists from CSIRO, the University of Western Sydney and Sydney University. While she is in the early stages of her PhD, she has completed some experiments that have utilised the controlled environment facilities at the University of Western Sydney in Richmond. She is currently preparing for field-based experiments to be conducted at the Australian Cotton Research Institute, Narrabri. It is anticipated that a better understanding of the potential future environmental effects on Australian cotton production can be used to plan climate change adaptation strategies.

Alison Wilson

Alison's PhD topic is *Tradeoffs between environmental outcomes and agricultural productivity in the Lower Namoi.* She is developing an economic model that looks at which farm management strategies will be the most economically attractive for cotton growers in the Lower Namoi to adopt in response to climate variability.

She has undertaken grower interviews in the Lower Namoi, discussing management changes that growers had made or were considering. This field work is the basis of the economic model she is developing, and the time that those growers took to speak with her was invaluable in helping the model to be as strong a representation of their farming environment as possible.

The economic model that she develops will be included in an integrated model within the National Centre for Groundwater Research and Training, which will allow for tradeoffs between environmental outcomes and agricultural productivity to be examined.

Alison's PhD is supported by CRDC, the Cotton Catchment Communities CRC, the Centre for Environmental Economics and Policy at the University of Western Australia and the CSIRO.

Katie Broughton

In short: other learning initiatives

- CRDC supported five people to attend CSIRO's highly regarded, Field to Fabric Course in Geelong in 2010–11, which utilises outcomes from CRDC investments over a number of years.
- Researchers from CSIRO also conducted a Field to Fabric touring course for teachers and senior high school students across the Namoi valley in October 2010 to more actively involve students studying textile and design. This activity was part of the 'Promoting Science and Agriculture in Schools' project.
- Erika Anderson of Wee Waa continued her Aboriginal Employment Strategy Traineeship at CRDC, as part of her high school studies. For more details, see page 5.
- CRDC sponsored four girls from Calrossy school in Tamworth to attend the 15th Australian Cotton Conference in August 2010.
- Arthur Spellson undertook the second year of his CRDC sponsorship to the Australian Rural Leadership Program (ARLP). After completing the ARLP, previous scholarship recipient, Barb Grey, won the RIRDC-sponsored Queensland Rural Woman of the Year award and was runner-up in the national award. Barb is now on a number of boards and is Chair of Wincott.
- A successful educational tour of adaptability and innovation in other rural industries, supported by CRDC, Cotton Grower Services and Wincott, has seen participants, predominantly growers, share the insights they gained on common challenges and solutions more broadly within the cotton industry.

Sustaining rural communities

CRDC co-convened (with the Cotton Catchment Communities CRC) and financially supported the 2011 Sustaining Rural Communities Conference in Narrabri, with the theme 'Transforming Regional Australia'. The conference brought together 270 participants, with speakers and representatives from most rural industries throughout Australia. For further information, see Spotlight Winter 2011 at www.crdc.com.au.

CRDC is providing two undergraduate sponsorships through the Investing in Youth Undergraduate Studentship Program, managed by the Rural Industries R&D Corporation. Naomi Marks is in second year Bachelor of Agribusiness at the University of New England and Rebecca Dunsmuir is undertaking a Bachelor of Agricultural Science and Business at La Trobe University. They are with CRDC's Bruce Pyke.

Report of Operations

Corporate

CRDC's background

The Cotton Research and Development Corporation was established in 1990 under the *Primary Industries and Energy Research and Development (PIERD) Act 1989*. The Act provides the Corporation with a charter to invest in and manage a portfolio of research, development and extension projects and programs. The purpose of this Act is to secure economic, environmental and social benefits for the Australian cotton industry and the community and to achieve sustainable use and management of natural resources, while making more effective use of the resources and skills of the scientific and general communities. All of this is to be conducted in a framework of improved accountability for research and development spending in relation to the cotton industry.

CRDC is based in one of Australia's major cotton-growing areas, Narrabri, in north west NSW, centrally located within the Australian cotton industry with the benefits that brings in developing and maintaining important relationships with cotton growers, researchers, processors and members of regional cotton communities.

Arrangements with other companies

The Narrabri district is also home to a key industry research facility, the Australian Cotton Research Institute: a collaborative research site and headquarters of the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC), in which CRDC is a core participant. The activities of the Cotton CRC for 2010–11 are reported in that organisation's Annual Report, accessible on its website, www.cottoncrc.org.au, and its activities associated with CRDC are also contained in this publication in Report of Operation – Research and Development, starting on page 29.

Board of Directors

Composition

The Corporation's Board comprises the Chair (appointed by the Minister for Agriculture, Fisheries and Forestry), the Executive Director (selected by the Board) and seven non-executive Directors (reduced to six on 1 October 2011), nominated by an independent Selection Committee established by legislation. Appointment of non-executive Directors is subject to Ministerial approval and directors other than the Executive Director are appointed for three-year terms.

Appointments

The Minister appointed seven Directors for a three-year period commencing 1 October 2008; thus, the term of the current Directors finishes on 30 September 2011, shortly after the end of the reporting year.

Expertise

Directors are selected from across the cotton industry, as well as from business and research communities. Together they must, and do, bring expertise in cotton production, processing and marketing, conservation/management of natural resources, science and technology and technology transfer, environmental and ecological matters, economics, finance and business management, administration of research and development, sociology and public administration. The *Primary Industries and Energy Research and Development (PIERD) Amendment Act 2007* requires the CRDC Selection Committee to specify how its Board nominations will ensure that CRDC collectively possesses experience in board affairs, adding to the existing requirement for an appropriate balance of expertise.

Induction

Following appointment to the Board, each Director is provided with a Director's Manual, which provides them with an appropriate level of information about the Corporation, its history and operations, and the rights, responsibilities and obligations of Directors. Copies of the Board Charter, Strategic R&D Plan and relevant legislation are included in the package.

The induction process for Directors includes an initial visit to CRDC offices in Narrabri to meet with the Chair and staff for a comprehensive overview of corporate activities and practices and a tour of key industry research facilities.

Training

Where necessary and appropriate, the Corporation sources training for Directors, either individually or as a group. The Board generally establishes the need for such training. In 2010–11, no such training was undertaken.

Directors' responsibilities

The role and responsibilities of Directors are set out in the Board Charter (see below). Internal reviews of Board performance are conducted periodically. The Board also obtains an external review of its performance periodically. An internal Board review was held in January 2011 and reported to the February Board meeting. The Board performance was evaluated as of a high standard, meeting its charter. The review informed the Board work plan for the coming year.

Board functions

- Establishing strategic directions and targets
- Monitoring and evaluating the research and development needs of the industry and ensuring the Corporation's research program is effective in meeting those needs
- Approving policies, plans, performance information and budgets
- Monitoring policies, procedures and internal controls to manage business and financial risk
- Ensuring compliance with statutory and legal obligations and corporate governance standards.

Responsibility for the day-to-day management of the Corporation lies with the Executive Director and senior management team. Close links between the Board of Directors and management have assisted the development of a sense of mutual confidence, trust, teamwork and common purpose. Senior managers participate in Board meetings, with other staff invited to contribute wherever appropriate.

Directors may obtain independent legal and professional advice at CRDC's expense to enable them to discharge their duties effectively, subject to prior approval from the Chair and in consultation with the Board and Executive Director. This advice may relate to legislative and other obligations, technical research matters and general skill development to ensure there is a sufficient mix of financial, operational and compliance skills amongst Board members.

Governance

In accordance with Section 131 of the *PIERD Act 1989*, Directors are appointed based on their expertise and do not represent any particular organisation or interest group.

The Board follows section 54 of the *PIERD Act 1989* and section 21 of the *Commonwealth Authorities and Companies (CAC) Act 1997* regarding Directors' disclosures of interests. A Director who considers that he or she may have a direct or indirect pecuniary or non-pecuniary interest in a matter to be discussed by the Board must disclose the existence and nature of the interest before the discussion. Depending on the nature and significance of the interest, Directors may be required to absent themselves from the Board's deliberations. The Board has a standing notice of Director's interests, which is an agenda item at each Board meeting and is updated as necessary.

The Board is very aware of its responsibilities regarding conflict of interest and duty of care and has adopted a cautious approach. The Board Charter clearly outlines the roles and responsibilities of Directors in terms of potential conflicts of interest. This approach has been successful and no difficulties have been encountered.

Board Charter

A Board Charter and Statement of Principles assist Directors and staff in carrying out their duties by setting out their roles and responsibilities. The Statement of Principles can be found on page iii.

Board of Directors 2010–11

Chair

Mike Logan
(GAICD)

Mike Logan, was initially appointed Chair of CRDC on 13 August 2007, and reappointed for a further three-year term commencing 13 August 2010. He is Chair of the Remuneration Committee and a member of the Audit Committee.

Mr Logan is a cotton farmer from Narrabri, NSW, and brings a wealth of practical industry experience and a strong vision to the position. He has long been a strong advocate of best practice use of natural resources in the Australian cotton industry. His cotton farm was the first in the world to gain International Organisation for Standardisation (ISO) certification for compliance with world's best practice principles for environmental management.

Mr Logan also spent six years on the board of Land and Water Australia, where he played a leadership role in a number of key programs dealing with irrigation and climate variability. He was a Director of the Australian Rural Leadership Foundation, the CRC for Irrigation Futures and Cotton Australia (for four years).

Executive Director

Bruce Finney
BSc Ag (MAICD)

Bruce Finney joined the Board in August 2004 by virtue of his appointment as Executive Director of CRDC. He attends the Audit, Intellectual Property and Remuneration Committees as an observer.

Mr Finney has extensive experience in the agricultural sector. Prior to his appointment to CRDC he worked in corporate agriculture in various corporate, management and agronomy roles in Australia and in an advisory role in Argentina. He is a past chair of the Australian Cotton Growers Research Association, and a past director of the Cotton Catchment Communities CRC and Irrigation Association of Australia.

Mr Finney is a graduate of the Australian Rural Leadership Program and of the Company Directors Course of the Australian Institute of Company Directors.

Non-executive Directors at 30 June 2009

Kerry Adby
LLM (ANU), PED (IMD, University of Lausanne)
(FAICD)

Kerry Adby was appointed to the Board for a three-year term commencing 1 October 2008. She is a member of the Intellectual Property Committee.

Ms Adby is an investment banker and a solicitor, and Managing Director of Copernican Securities Pty Ltd. She also holds non-executive positions on various boards, such as the NSW WorkCover Insurance Investment Fund Board and the Australian infrastructure investment vehicles of the Canadian Pension Plan Investment Board. Ms Adby has extensive experience in government and the private sector and has worked in senior executive positions in Australia and Asia, including with AIDC Limited. She specialises in infrastructure finance and in the feasibility and funding of irrigation and water saving initiatives and has worked extensively as a consultant to the World Bank and Asian Development Bank.

Vice-Chair

Leith Boully
BRuSc, DipBusStud
(GAICD)

Leith Boully is a primary producer from Dirranbandi in Queensland and was appointed to the Board in October 2005. She is a member of the Remuneration Committee.

Ms Boully is an Adjunct Professor with the School of Integrative Systems at the University of Queensland. She is also Chair of Wide Bay Water Corporation, The Glennie School Council and Lower Balonne Water Resources Ministerial Advisory Council, and a Board member of Seqwater, Murrumbidgee Irrigation Ltd and Agrifood Skills Australia Ltd. She is a graduate of the Australian Rural Leadership Program.

Mary Corbett
BSc PhD (FAICD, AFAIM)

Mary Corbett was appointed to the Board for a three-year term commencing 1 October 2008. She is the Chair of the Intellectual Property Committee.

Dr Corbett is Managing Director of Australian Business Class, an organisation specialising in executive leadership development. She has a strong research background and over ten years experience in rural agriculture. She has an extensive background in the private and public sectors, with specific emphasis on capacity building and governance.

Dr Corbett is Deputy Chair of the Board of the Australian Agriculture College Corporation and of Southbank Institute of Technology. She was previously on the Board of the Sugar Research and Development Corporation.

Glenn Fleischfresser
(Fresser)
(MAICD)

Glenn Fresser was appointed to the CRDC Board in October 2005 and reappointed for a further three-year term commencing 1 October 2008. He has owned and operated a successful cotton and grain production business on the Darling Downs since 1981. He is a member of the Intellectual Property Committee.

Mr Fresser has extensive experience in the cotton industry. His farming approach is underpinned by a respect for the natural environment, and an interest in adopting new technology and farming systems approaches. Mr Fresser has a strong understanding of the needs and issues of farmers and a genuine interest in ensuring the cotton industry continues to be sustainable, profitable and progressive. Mr Fresser is past Chairman of the Australian Cotton Growers Research Association (ACGRA) and has held other industry positions including member of the Australian Cotton Conference Committee, Chairman of TIMS Committee and Cotton Biotechnology Review Panel. He is an Honorary Ambassador to the Queensland Minister for Primary Industries and Fisheries.

Juanita Hamparsum

B Bus, CA, (GAICD)

Juanita Hamparsum was appointed to the Board for a three-year term commencing 1 October 2008. She is Chair of the Audit Committee.

Ms Hamparsum is a chartered accountant. She is a Director of the Hamparsum Family Trust and Kalori Pty Ltd, where she is the corporate trustee, accountant and finance manager for the family farming agribusiness of irrigated and broad acre cropping of cotton, wheat, sunflowers, chickpeas and sorghum. She is also a board member of the Namoi Catchment Management Authority, a fellow of the Peter Cullen Trust and a member of the Watermark Coal Project Community Consultative Committee. Ms Hamparsum has previously worked with Goldman Sachs in London and Ernst and Young in Sydney. She is a graduate member of the Australian Institute of Company Directors.

Peter Hayes

BSc, Dip Ed, BAppSci, M S

Peter Hayes was appointed to the Board for a three-year term commencing 1 October 2008. He is a member of the Remuneration Committee.

Mr Hayes is a self-employed wine industry strategist and adviser. He worked as a national viticulturist, with roles in industry relations and grower relations management for Southcorp Wines/ Fosters Wine Estates.

Mr Hayes has extensive knowledge and experience in strategic planning and in the international commercial environment. He is a former Executive Director of the Grape and Wine Research and Development Corporation and is currently Vice President of the International Organisation of Vine and Wine.

Lisa Wilson

BAgSci (Hons) (FAICD)

Lisa Wilson was appointed to the CRDC Board in October 2005 and reappointed for a further three-year term commencing 1 October 2008. She is a member of the Audit Committee.

Ms Wilson is an agribusiness professional, senior executive and company director with more than 20 years experience in the agricultural sector. She was Chief Executive Officer of Australian Dairy Farmers Limited until April 2009 and previously acting Executive Director of the Australian Rural Leadership Foundation. She is Chair of the Albert Park Advisory Group for Parks Victoria and a Victorian Advisory Group Member of Landcare Australia Ltd. Her past non-executive directorships include Deputy Chair of the Australian Rural Leadership Foundation.

Board meetings

The Board held five meetings during 2010–11:

Board Meeting	Date	Location
2010/04	9 August 2010	Gold Coast, Qld (Cotton Conference)
2010/05	23-24 November 2010	Melbourne, Vic
2011/01	1-2 February 2011	Canberra, ACT
2011/02	21-22 March 2011	Narrabri, NSW
2011/03	2-3 June 2011	Emerald, Qld

Attendances at Board Meetings

Director	Board meeting				
	2010/04	2010/05	2011/01	2011/02	2011/03
Mike Logan *(Chair)*	Yes	Yes	Yes	Yes	Yes
Kerry Adby	Yes	Yes	Yes	Yes	Yes
Leith Boully	Yes	Yes	Yes	Yes	Yes
Mary Corbett	Yes	Yes	Yes	Yes	Yes
Bruce Finney	Yes	Yes	Yes	Yes	Yes
Glenn Fresser	Yes	Yes	Yes	Yes	Yes
Juanita Hamparsum	Yes	Yes	Yes	Yes	Yes
Peter Hayes	Yes	Yes	Yes	Yes	Yes
Lisa Wilson	Yes	Yes	Yes	Yes	Yes

Board Committees

The Board operated three committees in 2010–11: the Audit, Intellectual Property and Remuneration Committees. In addition to formal meetings, much of the work of the Committees is conducted via email and telephone. The Corporation finds this arrangement to be effective and productive.

Audit Committee

Established under section 89 of the *Primary Industries and Energy Research and Development Act 1989* and section 32 of the *Commonwealth Authorities and Companies Act 1997*, the Audit Committee's primary role is to ensure the Corporation's financial reporting is a true and fair reflection of its financial transactions. The Committee also provides a forum for communication between the Directors, the senior managers of the Corporation and the internal and external auditors of the Corporation. It carries responsibility for identifying areas of significant business risk and stipulating the means of managing any such risk.

Juanita Hamparsum continued as Chair of the committee in 2010–11, with Mike Logan and Lisa Wilson as the other members. The Executive Director, Bruce Finney, attended the meetings as an observer. The Audit Committee met five times during 2010–11.

Attendances at Audit Committee meetings

Member	Date of meeting				
	9 Aug 2010	20 Aug 2010	24 Nov 2010	17 Jan 2011	26 May 2011
Juanita Hamparsum *(Chair)*	Yes	Yes	Yes	Yes	Yes
Mike Logan	Yes	Yes	Yes	Yes	Yes
Lisa Wilson	Yes	Yes	Yes	Yes	Yes

Intellectual Property Committee

The role of the Intellectual Property Committee is to assist the Corporation's Board in fulfilling its responsibilities and to monitor the adequacy and effectiveness of the Corporation's policies and procedures relating to the management of intellectual property (IP). The Committee's specific responsibilities are to review the operation of CRDC's IP Policy and IP Operating Principles and to consider IP matters directed to it by the Board for consideration.

Mary Corbett was Chair of the Intellectual Property Committee in 2010–11. Kerry Adby and Glenn Fresser were the other members. Executive Director, Bruce Finney, attended as an observer. The committee met four times during 2010–11.

Attendances at Intellectual Property Committee meetings

Member	Date of meeting			
	8 Aug 2010	23 Nov 2010	24 Jan 2011	17 Mar 2011
Mary Corbett *(Chair)*	Yes	Yes	Yes	Yes
Kerry Adby	Yes	Yes	Yes	Yes
Glenn Fresser	Yes	Yes	Yes	Yes

Remuneration Committee

The Remuneration Committee advises the Board on the Executive Director's remuneration and senior staff remuneration adjustments. In 2010–11, the members were Mike Logan (Chair), Leith Boully and Peter Hayes. The Remuneration Committee met once during 2010–11.

Attendances at Remuneration Committee meeting

Member	Meeting 21 March 2011
Mike Logan *(Chair)*	Yes
Leith Boully	Yes
Peter Hayes	Yes

Indemnities

The Board has taken the necessary steps to ensure professional indemnity cover is in place for present and past Directors and officers of the Corporation. The Corporation's insurance cover is provided through Comcover; however, the insurance contract prohibits CRDC from disclosing the nature or limit of the liabilities covered or the amounts of premiums paid.

Selection Committee

The Minister notified the Corporation on 27 May 2011 that he had appointed Ms Christine Hawkins as the Presiding Member of the Cotton Research and Development Corporation Selection Committee. The term of appointment for the current non-executive Directors ends on 30 September. Ms Hawkins is conducting the process for the appointment of a new Board of Directors, whose appointments will commence on 1 October 2011, following the

Minister's approval of nominations. The Minister informed the Corporation that he has approved a new Board of six non-executive directors (a reduction of one, plus a chair and executive director and asked the selection committee to consider board diversity as part of their selection process. No Selection Committee activities occurred in 2010–11.

Legislation

The Cotton Research and Development Corporation began operations in 1990 under the *Primary Industries and Energy Research and Development (PIERD) Act 1989*, which sets out the following objectives:

a. Increasing the economic, environmental and social benefits to members of primary industries and the community in general by improving the production, processing, storage, transport and marketing of the products of primary industries
b. Achieving the sustainable use and management of natural resources
c. Making more effective use of the resources and skills of the community in general and the scientific community in particular
d. Improving accountability for expenditure on research and development activities in relation to primary industries.

The requirements of the PIERD Act are central to the Corporation's R&D planning. These requirements, as well as government and industry research priorities, form the Corporation's planning instruments and are addressed in the three R&D programs devised under the five-year Strategic Plan for 2008–2013.

The *Primary Industries and Energy Research and Development Amendment Act 2007* amended the PIERD Act in several respects intended to deliver an enhancement in the governance of Rural R&D Corporations.

The setting and collection of levies on the cotton industry is enabled by the *Cotton Levy Act 1982* and the *Primary Industries Levies and Collections Act 1991*. Accountability and reporting requirements are set out in the *Commonwealth Authorities and Companies (CAC) Act 1997*.

Legislative Functions

CRDC Function	Application
Investigating and evaluating the cotton industry's requirements for research and development, and the preparation, review and revision of an R&D plan on that basis	This is achieved by continuing interaction with CRDC's legislated industry body, Cotton Australia, as well as the industry peak body, the Australian Cotton Industry Council (ACIC). Cotton Australia undertakes a range of functions relating to CRDC, including an annual review to ensure the CRDC Strategic Plan remains current and relevant. The cotton industry and cotton researchers were closely involved in development of the CRDC Strategic Plan 2008–2013, which incorporated Government and industry R&D priorities, as well as advice from the Minister and the Department of Agriculture, Fisheries and Forestry.
Preparing an Annual Operating Plan for each financial year	An Annual Operating Plan is submitted to the Australian Government in April each year and implementation proceeds once Government approval is received.
Coordinating and funding R&D activities consistent with current planning documents	Research, development and extension projects are approved or commissioned in line with the Annual Operating Plan each year. The Annual Operating Plan is devised to address the objectives and strategies outlined in the current five-year Strategic R&D Plan.

CRDC Function	Application
Monitoring, evaluating and reporting to Parliament, the Minister for Agriculture, Fisheries and Forestry, and to industry on R&D activities coordinated or funded by the Corporation	The Corporation reports formally to the Australian Government through its Annual Report, which is usually tabled in Parliament in October; in addition, the Corporation informs the Minister for Agriculture, Fisheries and Forestry of any matters of interest or concern in the current operating environment. This occurs in written and, where possible, face-to-face communication. CRDC is also in communication with the Department of Agriculture, Fisheries and Forestry on a range of issues. Communication with the industry occurs continually on both a formal and informal basis, as outlined above. In order to ensure stringent evaluation of its R&D activities, CRDC is committed to the ongoing Council of Rural Research and Development Corporation's Impact Evaluation process.
Facilitating the dissemination, adoption and commercialisation of research and development results in relation to the cotton industry	Over the past decade, the Australian cotton industry has benefited from having an industry-wide extension network, the Cotton Catchment Communities CRC-coordinated Development and Delivery Team. In 2010–11 industry consolidation and investigation of new approaches for supporting R&D adoption by CRDC led actions to transition to a new demand driven and 'commercial-like' model. The new model recognises the importance of supporting adoption of R&D through multiple delivery pathways and will be underpinned by the redevelopment of the industry best management practice program, myBMP. CRDC staff members continued to play a pivotal role in facilitating fast and effective dissemination of CRDC-funded research outcomes. More broadly, CRDC hosts forums, participates in roadshows and the annual cotton trade show, produces publications, sponsors the biennial research-based Australian Cotton Conference and has a communication strategy to extend and enhance the adoption of R&D. CRDC also collaborates in the successful commercialisation of R&D where possible.

Legislative Powers

Under Section 12 of the PIERD Act, CRDC has the power to do all things necessary to carry out its functions, including but not restricted to:

- entering into agreements for the carrying out of R&D activities
- applying for patents, either solely or jointly
- charging for work done, services rendered, and goods and information supplied
- acquiring, holding and disposing of real or personal property
- anything incidental to any of its powers.

Responsible Minister

The Corporation is accountable to the Australian Parliament through the Minister for Agriculture, Fisheries and Forestry. The Hon Tony Burke MP was appointed Minister for Agriculture, Fisheries and Forestry on 3 December 2007. He continued in that role into the reporting year until 11 September 2010, at which time Senator the Hon. Joe Ludwig was appointed to the position.

The Minister's powers and responsibilities, as outlined under various sections of the PIERD Act, include:

- appointing the Corporation's Chair and Directors

- the option to terminate the appointment of the Chair or any Director under certain conditions
- approving the Corporation's Research and Development (Five Year) Plan and any variations
- approving the Corporation's Annual Operating Plans and any variations
- appointing a person as Presiding Member of the Corporation's Selection Committee, as well as other members of that Committee
- transferring to the Corporation any assets held by the Commonwealth that the Minister considers appropriate and which would assist the performance and function of the Corporation.

Ministerial Directions

As at 30 June 2011, CRDC is compliant with all legislative and policy requirements of the Australian Government that it has been able to ascertain.

Ongoing directions from previous years that are applicable to the Corporation are the Commonwealth Fraud Control Guidelines 2011 (see page 71), foreign exchange risk management, cost recovery policy, National Code of Practice for the Construction Industry (National Code) and the Australian Government Implementation Guidelines for the National Code of Practice for the Construction Industry (Implementation Guidelines), the Australian Government Property Ownership Policy 2005 and the Protective Security Manual 2005 as a general policy of government (see page 70). The Corporation was advised in June 2010 of a whole of government directive to transition to a new Protective Security Policy Framework.

CRDC complies with the Australian Government Bargaining Framework when exercising its power to engage employees in relation to sections 12, 87 and 119 of the PIERD Act. Arrangements are being finalised in line with the Framework to ensure fairness and flexibility, promote productivity and provide for collective agreement negotiated at the individual authority level.

On 29 April 2011, the Minister notified the Corporation that achieving diversity in Board appointments is to be a priority.

Research accountabilities

The Corporation is accountable to the Australian people through the Australian Government and to the cotton industry through its industry representative body, Cotton Australia.

The Corporation has been subject to the *Commonwealth Authorities and Companies (CAC) Act 1997* since August 1998. This Act provided enhanced levels of accountability, as well as a new planning and reporting framework. The Annual Operating Plan 2010–11 marked the third year of operation under the framework requirements of the Strategic Plan 2008–2013.

CRDC's stakeholders set broad objectives, which the Corporation addresses through its Strategic (Five Year) Plan and Annual Operating Plans. CRDC has used these objectives as a basis for the development of its planned outcomes and the identification of key outputs.

Intellectual property

A review of the Corporation's Intellectual Property (IP) policy and procedures was finalised in 2010. An audit of internal procedures is planned for 2011–12.

Risk management

The Corporation's risk management framework, new policies for Terms of Employment, Equal Employment Opportunity and Harassment, Appropriate Internet and Email Access, Government Protective Security, Delegations of Authority and Risk Register have been implemented.

The risk management process also involves consulting widely and participating in appropriate industry, Rural Research and Development Corporations and Government forums to keep fully informed about the environment in which the Corporation operates. Situations involving even minor business risk are fully discussed at a Board level, with policy

developed through consensus. Management and staff have responsibility for implementing policy as directed by the Board.

The Protective Security Manual 2005 (PSM) has applied to CRDC as a general policy of the Government since 1 March 2007. In accordance with subsections 28(2) and 28(3) of the *CAC Act*, the Corporation has continued to ensure that Protective Security Policy was carried out and is now transitioning to the Australian Government Protective Security Policy Framework as directed.

The Board holds a focused and facilitated strategic review session in conjunction with Board meetings, focusing on a specific issue or area of research. Depending on the topic, a variety of speakers and industry participants may also be invited to attend, to enable broad discussion and to expose risks and opportunities for the Corporation and the industry. The Corporation adopted risk management as a standing item at staff meetings, including discussing and defining fraud.

Risk Management reviews

Directors and management conducted, commissioned or enacted the following reviews during 2010–11:

Corporate reviews	
Review	Process and/or Outcome
Risk management framework and risk register	The audit committee and Board reviewed and updated the risk management framework and risk register. CRDC also participated in Comcover's Risk Management and Benchmarking Survey 2011.
Fraud control and risk management audit	Nexia Court & Co. conducted an external audit in May 2011. The audit was conducted in accordance with Australian Auditing Standards for the assistance of Directors in evaluating the compliance of CRDC with internal controls.
R&D strategic reviews	
Review	Process and/or Outcome
Review of the Marketing Strategy for Australian Premium Cotton	Review was commissioned in May/June 2011 and expected to report to CRDC and Cotton Australia in August.
Review of Ginning R&D	The board approved commissioned funding to conduct a review of ginning in 2010–11.
Mid-term review of CRDC's 2008-13 Strategic Plan	A review of progress against CRDC's strategic plan and gap analysis was conducted in February in Canberra with industry and government representatives.
Productivity Commission Review of RDCs	CRDC contributed a written response to the PC review and attended initial and follow up interviews with the commission.
Reviewing the Cotton Water Story	CRDC collaborated with the Cotton CRC and Cotton Australia to plan a review of water-related research, development and extension, to be held in August 2011.

Industry Stakeholder Reporting

CRDC's reporting processes include the presentation of a formal report to its industry stakeholder. This presentation includes an opportunity for questioning and debating Board decisions. The Corporation's industry stakeholder is Cotton Australia. Further information on the relationship between the Corporation and Cotton Australia can be found on page 27.

Corporate Planning

In accordance with the *Primary Industries and Energy Research and Development (PIERD) Act 1989* and the *Commonwealth Authorities and Companies (CAC) Act 1997*, the Corporation prepares a Strategic (Five Year) Plan as well as an Annual Operating Plan for each financial year.

The Corporation submitted its Annual Operating Plan 2010–11 to the then Minister for Agriculture, Fisheries and Forestry, the Hon. Tony Burke MP, on 23 April 2010 and received written advice of approval dated 24 May 2010. The Annual Operating Plan for 2011–12 was submitted to his successor as Minister for Agriculture, Fisheries and Forestry, the Hon. Joe Ludwig MP, on 23 April 2011 and received written advice of approval dated 7 June 2011.

The Corporation submitted its Annual Report 2009–10 to the Minister on 11 October 2010 and received acknowledgement from him on 25 October 2010. The report was tabled in the House of Representatives on 24 November 2010.

Fraud Control

The Corporation fosters an environment that minimises the likelihood and impact of fraud. Active fraud control is a major responsibility of all staff and clear standards and procedures have been established. All personnel engaged in the prevention, detection and investigation of fraud receive appropriate fraud control training, consistent with the Australian Government's Fraud Control Guidelines.

The Audit Committee endorses, monitors and reviews the plan, which is read in conjunction with the Risk Management Plan and the Board Charter for Directors and Statement of Principles for staff.

The Corporation's Audit Committee, Executive Director and General Manager Business and Finance (the nominated fraud control officer) carry out the functions of a fraud investigation unit collectively, as described in the Commonwealth Fraud Investigation Model. The support of the Australian Federal Police would be sought if the Corporation felt there was a prima facie case of fraud and further investigation was required. No such action was necessary in 2010–11.

Service Charter

The Corporation does not provide services direct to the public and does not have a service charter; however, it has a Board Charter and a Statement of Principles. The latter can be found at the front of this publication and embodies the set of values underlying our decisions, actions and relationships.

Our People

Employment

Staff members are employed under Section 87 of the *PIERD Act 1989*, which provides that the terms and conditions of employment are to be determined by the Corporation. Including the Executive Director, there were seven full-time employees and one part-time casual employee as at 30 June 2010.

CRDC complies with the Australian Government Bargaining Framework when exercising its power to engage employees in relation to sections 12, 87 and 119 of the PIERD Act.

Staff Changes during 2010–11

Program Coordinator Helen Dugdale resigned on 31 December 2010 after some 14 years of service to the Corporation, both as a contractor and then an employee.

Staff training and development

In 2010–11, the Corporation spent $17,083.73 on training and $80.00 on recruitment (the latter paid in the 2010–11 year but relating to 2009–10). Areas of direct training activities were Central Budget Management System training, fire safety training, national work health & safety workshop, national archive workshop, Australian Institute of Company Directors' (for a manager), CPA workshop, Communications workshops, website development training and publishing software training.

Throughout the year, Corporation Directors and staff participate in a wide range of Corporation-related activities involving external bodies relating to the operations of the Corporation, providing valuable experience, as well as skills and knowledge upgrades for the personnel involved.

Equal Employment Opportunity

CRDC is committed to a merit-based, non-discriminatory recruitment and promotion policy and staff members are chosen strictly according to their qualifications for the job.

Scientists undertaking CRDC-funded research are of diverse backgrounds and cultures.

CRDC's Equal Opportunity and Harassment Policy defines prohibited discrimination and harassment and sets out a complaints procedure to be followed if there is a breach of this policy, including details of what action can be taken once the complaint has been made. The policy applies to all employees, whether full-time, part-time, casual or temporary, to directors and to contractors and customers (clients).

Contractors and Consultants

The Corporation employs consultants and contractors on a needs basis and after background checks to ensure proposed appointees have the necessary skills and experience. During the reporting year the Corporation spent $476,756.99, exclusive of GST, to remunerate consultants and contractors. Privacy and confidentiality arrangements mean that Corporation policy is not to disclose amounts paid to individual consultants. A list of contractors and consultants with remuneration of $10,000 or more, inclusive of GST, can be found in the table on the adjacent page.

Organisational structure at 30 June 2011

CRDC Board of Directors **Chair** Mike Logan		
Executive Director Bruce Finney		
R&D Investment Team	Communication	Business and Finance Team
General Manager R&D Investment *Bruce Pyke** Research Program Investment Managers Program 1 *Dallas Gibb*** Program 2 *Tracey Leven** Program 3 *Bruce Pyke**	Communication Manager *Rohan Boehm**	General Manager Business and Finance *Graeme Tolson** Trainee Accountant *Elizabeth Eather** Executive Assistant *Dianne Purcell** Project Administration Officer *Margaret Wheeler**

* Employee ** External (contractor)

Contractor	Service provided 2010–11
Apical International	Strategic advice
Banki Haddock Fiora Lawyers	Legal advice
BDA Group	Program evaluation
B McGahan Consultancy Services	Strategic advice
CA (Pacific) Pty Ltd	IT support
Emergent Futures Pty Ltd	Strategic advice
Melanie Jenson	Publication content
Neil Deacon Art Director	Creative advice
Nexia Court & Co	Accounting services
TechMAC Pty Limited	Program management
Weemalah Writeability	Publication writing, editing and design

Commonwealth Disability Strategy

Corporation working conditions and procedures for employees and stakeholders are compliant with the Commonwealth Disability Strategy insofar as the small size of the Corporation and physical nature of the CRDC building allows. CRDC has ensured that any person with a disability could be properly accommodated and carry out all functions, as either a staff member or a visitor. Should a future staff member need more specialised disability assistance, CRDC will assess and meet these needs to the extent that it is possible.

CRDC's Equal Opportunity and Harassment Policy defines prohibited discrimination and harassment and sets out a complaints procedure. Further details can be found above under Equal Employment Opportunity on page 72.

Significant Events

The Corporation had no significant events in 2010–11, as defined in section 15 of the *Commonwealth Authorities and Companies (CAC) Act 1997*.

Significant Changes in the State of Affairs

CRDC had one significant change in its state of affairs in 2009–10, as defined in section 16 of the *CAC Act 1997*. In response to a letter from the Minister for Agriculture, Fisheries and Forestry on 25 February 2011, CRDC Chair, Mr Mike Logan, notified the Minister of the impact of floods on the cotton industry and the activities of the Corporation, and the steps taken to mitigate that impact.

Judicial decisions and reviews by outside bodies

In 2010–11, CRDC had no judicial decisions or reviews by outside bodies within the meaning of Division two of Part two of the *PIERD Act 1989*.

Occupational Health and Safety

CRDC has a strong culture of achieving best practice and continuous improvement in Occupational Health and Safety (OH&S), as required by the *Occupational Health and Safety Act 1991*. This is achieved by providing the necessary resources (both human and financial) to ensure that OH&S functions effectively.

In accordance with s.74 (1) (e) of the Act, CRDC details accidents and dangerous occurrences reported each year.

The Corporation sets annual objectives for improvements under its Health and Safety Management Arrangements. In view of its OH&S record, CRDC remains vigilant in maintaining its safety performance by conducting both internal and external audits and reviews of policies and procedures.

Notifiable incidents	2006–07	2007–08	2008–09	2009–10	2010–11
Deaths	0	0	0	0	0
Serious personal injuries (a)	0	0	0	0	1
Prescribed incapacities of 30 days or more	0	0	0	0	0
Dangerous occurrences (b)	0	0	0	0	0
Total	0	0	0	0	1

(a) Serious personal injury means that a person needs emergency treatment by a doctor; treatment in a hospital as a casualty, with or without being admitted to the hospital; or admission to hospital.

(b) Dangerous occurrences are 'near misses' that could have, but did not, result in death, serious personal injury or incapacity.

CRDC Occupational Health and Safety 2010–11: a summary

Legislative reporting requirements under s.74 of the Occupational Health and Safety Act 1991	Action undertaken 2010–11
Health and safety management arrangements	Regular OH&S committee meetings. OH&S is a standing item at general staff meetings.
Initiatives during the year	An external audit of OH&S highlighted the Corporation's sound practices and systems already in place and recommended areas for improvement in information recording. These recommendations were implemented. Safety issues formally discussed, workplace inspections held (including vehicles) and staff consulted in resolving safety issues and physical conditions of the workplace. Flu vaccination program for all staff. General OH&S inductions provided for new staff, directors and contractors.
Statistics of any accident or dangerous occurrence as defined by s.68 of the OH&S Act	An employee sustained a redback spider bite, which was a notifiable incident managed in accordance with the Act.
Details of any investigations conducted during the year, including details of all notices given to the employee under s.29, 46 or 47 of the OH&S Act	CRDC conducted no investigations and no notices were given to an employee.

Freedom of Information

General enquiries regarding access to documents or other matters relating to Freedom of Information should be made in the first instance to the General Manager Business and Finance. The Corporation did not receive any requests under the *Freedom of Information Act 1982* in 2010–11.

Funding information on individual projects funded by the Corporation is available on request, unless that information has been classified as commercial-in-confidence. Information about CRDC projects is also available through the Australian Agricultural and Natural Resources Online (AANRO) Database, which can be accessed online and through most Australian research and public libraries.

Categories of documents held

Category	Nature	Access
Administration	Files	D
Annual Operational Plans	Files, Publications	C
Annual Reports	Files, Publications	C
Applications, Guidelines and Contracts	Files, Publications	D, C
Assets Register	Files	D
Financial Management	Files	D
Five Year Plans	Files, Publications	C
Project Lists	Files, Publications	D, C
Research Reports	Files, Publications	D, C
Workshop Reports	Files, Publications	D, C

C: Documents customarily made available

D: Documents not customarily made available for reasons of privacy or commercial-in confidence

Payments to advertising agencies

The Corporation did not engage the services of any advertising agency, market research organisation, polling organisation, direct mail organisation or media advertising organisation during the reporting year.

Payment to representative bodies

The Corporation's industry representative body in 2010–11 was Cotton Australia. The role of industry representative body involves several specific activities:

- Participation in development of the five year Strategic Plan. This ensures CRDC's strategic planning continues to address evolving industry R&D needs
- A meeting to receive and discuss the CRDC annual report for the preceding year. This enables the industry representative body to ensure CRDC's activities for that year have met its strategic objectives (listed on page 27 in this report) and to question senior staff on any matters of interest or concern
- Participation in CRDC and Cotton Catchment Communities CRC Farming Systems forums.

While CRDC does not pay a fee for service to the industry representative body for these activities, it contributes to the expenses they incur in carrying them out, as authorised by s.15 of the PIERD Act, which relates to consultation with the industry stakeholder.

In 2010–11, CRDC contributed a total of $98,316 to Cotton Australia for the following activities:

- Review of CRDC research 2010–11 research applications and reports
- Support for the CottonMap program
- Support for the Cotton Farm Biosecurity manual
- Support for the 15th Australian Cotton Conference
- Support for Kondinin Conference

Financial Statements

INDEPENDENT AUDITOR'S REPORT

To the Minister for Agriculture, Fisheries and Forestry

I have audited the accompanying financial statements of the Cotton Research and Development Corporation for the year ended 30 June 2011, which comprise: a Statement by the Directors, Executive Director and Chief Finance Officer; the Statement of Comprehensive Income; Balance Sheet; Statement of Changes in Equity; Cash Flow Statement; Schedule of Commitments; Schedule of Contingencies; Schedule of Asset Additions; and Notes comprising a Summary of Significant Accounting Policies and other explanatory information.

Directors' Responsibility for the Financial Statements

The directors of the Cotton Research and Development Corporation are responsible for the preparation of the financial statements that give a true and fair view in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, including the Australian Accounting Standards, and for such internal control as the directors determine is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Corporation's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Corporation's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial statements.

GPO Box 707 CANBERRA ACT 2601
19 National Circuit BARTON ACT 2600
Phone (02) 6203 7300 Fax (02) 6203 7777

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Opinion

In my opinion, the financial statements of the Cotton Research and Development Corporation:

(a) have been prepared in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, including the Australian Accounting Standards; and

(b) give a true and fair view of the matters required by the Finance Minister's Orders including the Cotton Research and Development Corporation's financial position as at 30 June 2011 and of its financial performance and cash flows for the year then ended.

Australian National Audit Office

S. Buchanan

Serena Buchanan
Audit Principal

Delegate of the Auditor-General

Canberra
16 September 2011

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Statement by the Directors, Executive Director and Chief Finance Officer

In our opinion, the attached financial statements for the year ended 30 June 2011 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, as amended.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Cotton Research and Development Corporation will be able to pay its debts as and when they become due and payable.

This statement is made in accordance with a resolution of the directors.

Signed	Signed	Signed	Signed
			
Mike Logan	**Juanita Hamparsum**	**Bruce Finney**	**Graeme Tolson**
Chairperson	Director	Executive Director	Chief Finance Officer
16th September 2011	16th September 2011	16th September 2011	16th September 2011

STATEMENT OF COMPREHENSIVE INCOME

for the period ended 30 June 2011

	Notes	2011 $	2010 $
EXPENSES			
Employee benefits	3A	**1,260,230**	1,163,108
Supplier	3B	**379,967**	474,246
Grants	3C	**8,112,576**	9,810,662
Depreciation and amortisation	3D	**51,431**	53,338
Losses from asset sales	3E	**8,138**	–
Total expenses		**9,812,342**	11,501,354
LESS:			
OWN-SOURCE INCOME			
Own-source revenue			
Levies and penalties	4A	**4,575,879**	3,433,626
Interest	4B	**804,851**	567,559
Rental income	4C	**15,000**	15,000
Royalties	4D	**2,789,277**	1,896,750
Other	4E	**962,054**	2,826,716
Total own-source revenue		**9,147,061**	8,739,651
Net cost of (contribution by) services		**665,281**	2,761,703
Revenue from Government	4F	**5,677,104**	2,996,541
Surplus (deficit) attributable to the Australian Government		**5,011,823**	234,838
Total comprehensive income (loss) attributable to the Australian Government		**5,011,823**	234,838

The above statement should be read in conjunction with the accompanying notes.

BALANCE SHEET

as at 30 June 2011

	Notes	2011 $	2010 $
ASSETS			
Financial assets			
Cash and cash equivalents	5A	**16,296,478**	11,282,420
Trade and other receivables	5B	**1,884,714**	3,384,817
Total financial assets		**18,181,192**	14,667,237
Non-financial assets			
Land and buildings	6A,C	**531,000**	540,500
Property, plant and equipment	6B,C	**68,059**	59,869
Intangibles	6D,E	**12,386**	31,997
Other	6F	**7,695**	7,485
Total non-financial assets		**619,140**	639,851
Total assets		**18,800,332**	15,307,088
LIABILITIES			
Payables			
Suppliers	7A	**54,786**	73,452
Grants	7B	**1,900,362**	3,260,945
Other	7C	**51,867**	49,502
Total payables		**2,007,015**	3,383,899
Provisions			
Employee provisions	8A	**217,747**	205,422
Other	8B	**1,033,901**	1,187,921
Total provisions		**1,251,648**	1,393,343
Total liabilities		**3,258,663**	4,777,242
Net assets		**15,541,669**	10,529,846
EQUITY			
Reserves		**206,699**	206,699
Retained surplus		**15,334,970**	10,323,147
Total equity		**15,541,669**	10,529,846

The above statement should be read in conjunction with the accompanying notes.

STATEMENT OF CHANGES IN EQUITY

for the period ended 30 June 2011

	Retained earnings		Asset revaluation reserve		Total equity	
	2011	2010	**2011**	2010	**2011**	2010
	$	$	**$**	$	**$**	$
Opening balance						
Balance carried forward from previous period	**10,323,147**	10,088,309	**206,699**	206,699	**10,529,846**	10,295,008
Adjustment for errors	**–**	–	**–**	–	**–**	–
Adjustment for changes in accounting policies	**–**	–	**–**	–	**–**	–
Adjusted opening balance	**10,323,147**	10,088,309	**206,699**	206,699	**10,529,846**	10,295,008
Comprehensive income						
Other comprehensive income						
Surplus (deficit) for the period	**5,011,823**	234,838			**5,011,823**	234,838
Total comprehensive income	**5,011,823**	234,838	**–**	–	**5,011,823**	234,838
Transfers between equity components	**–**	–	**–**	–	**–**	–
Closing balance as at 30 June	**15,334,970**	10,323,147	**206,699**	206,699	**15,541,669**	10,529,846

The above statement should be read in conjunction with the accompanying notes.

CASH FLOW STATEMENT

for the period ended 30 June 2011

	Notes	2011 $	2010 $
OPERATING ACTIVITIES			
Cash received			
Industry levies and penalties		**4,531,539**	3,113,854
Commonwealth contributions		**5,448,799**	3,475,473
Royalties		**4,796,622**	1,702,528
Grants		**27,000**	–
NPSI novation receipts		**270,022**	3,449,120
Interest		**716,489**	439,807
NPSI interest		**87,269**	59,306
Net GST received		**536,619**	389,185
Other		**647,216**	529,646
Total cash received		**17,061,575**	13,158,919
Cash used			
Employees		**1,247,570**	1,171,032
Grants		**8,689,722**	8,764,172
Suppliers		**278,823**	269,931
NPSI novation grants paid		**1,690,824**	975,619
NPSI novation suppliers paid		**101,930**	72,130
Total cash used		**12,008,869**	11,252,884
Net cash from (used by) operating activities	9	**5,052,706**	1,906,035
INVESTING ACTIVITIES			
Cash received			
Proceeds from sales of property, plant and equipment		**2,273**	–
Total cash received		**2,273**	–
Cash used			
Purchase of property, plant and equipment		**40,921**	–
Total cash used		**40,921**	–
Net cash from (used by) investing activities		**(38,648)**	–
Net increase (decrease) in cash held		**5,014,058**	1,906,035
Cash and cash equivalents at the beginning of the reporting period		**11,282,420**	9,376,385
Cash and cash equivalents at the end of the reporting period	5A	**16,296,478**	11,282,420

The above statement should be read in conjunction with the accompanying notes.

SCHEDULE OF COMMITMENTS

as at 30 June 2011

	2011	2010
BY TYPE	**$**	$
Commitments receivable		
Sublease rental income	**–**	8,250
Net GST recoverable on commitments[1]	**813,358**	848,723
Total commitments receivable	**813,358**	856,973
Commitments payable		
Other commitments		
Operating leases[2]	**60,676**	109,218
Research grant commitments[3]	**8,886,263**	9,234,984
Total other commitments	**8,946,939**	9,344,202
Net commitments payable by type	**8,133,581**	8,487,229
BY MATURITY		
Commitments receivable		
Operating lease income		
One year or less	**–**	8,250
Total operating lease income	**–**	8,250
Other commitments receivable		
One year or less	**535,312**	444,826
From one to five years	**278,046**	403,897
Total other commitments receivable	**813,358**	848,723
Commitments payable		
Operating lease commitments		
One year or less	**48,541**	48,541
From one to five years	**12,135**	60,677
Total operating lease commitments	**60,676**	109,218
Other Commitments		
One year or less	**5,839,888**	4,852,792
From one to five years	**3,046,375**	4,382,192
Total other commitments	**8,886,263**	9,234,984
Net commitments by maturity	**8,133,581**	8,487,229

Note 1: Commitments are GST inclusive where relevant.

Note 2: Operating leases are effectively non-cancellable and comprise of agreements for the provision of motor vehicles for the Corporation.

Note 3: Research grant commitments are amounts payable under grant agreements in respect of which the recipient is yet to perform the services required or meet eligibility conditions.
This schedule should be read in conjunction with the accompanying notes.

SCHEDULE OF CONTINGENCIES

as at 30 June 2011

The Corporation had no contingent assets and liabilities in the current or prior period.

The above schedule should be read in conjunction with the accompanying notes.

SCHEDULE OF ASSET ADDITIONS

for the period ended 30 June 2011

The following non-financial non-current assets were added in 2010–11:

	Office equipment $	Intangibles $	Total $
Additions funded in the current year			
By purchase – Government funding	**37,636**	**3,285**	**40,921**
Total funded additions funded in the current year	**37,636**	**3,285**	**40,921**

This schedule should be read in conjunction with the accompanying notes.

Note 1: Summary of Significant Accounting Policies

1.1 Objective of Cotton Research and Development Corporation

Cotton Research and Development Corporation is an Australian Government controlled entity. The objective of the Corporation is to bring industry and researchers together to establish research and development strategic directions and to fund projects that provide the cotton industry with the innovation and productivity tools to compete in global markets.

The Corporation is structured to meet one outcome:

"Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community."

The continued existence of the Corporation in its present form and with its present programs is dependent on Government policy and on continuing funding by Parliament for the Corporation's administration and programs.

1.2 Basis of Preparation of the Financial Statements

The financial statements are general purpose financial statements and are required by clause 1(b) of Schedule 1 to the *Commonwealth Authorities and Companies Act 1997*.

The financial statements have been prepared in accordance with:

a) Finance Minister's Orders (FMOs) for reporting periods ending on or after 1 July 2010; and

b) Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest dollar unless otherwise specified.

Unless an alternative treatment is specifically required by an accounting standard or the FMOs, assets and liabilities are recognised in the balance sheet when and only when it is probable that future economic benefits will flow to the Corporation or a future sacrifice of economic benefits will be required and the amounts of the assets or liabilities can be reliably measured. However, assets and liabilities arising under Agreements Equally Proportionately Unperformed are not recognised unless required by an accounting standard. Liabilities and assets that are unrecognised are reported in the schedule of commitments or the schedule of contingencies.

Unless alternative treatment is specifically required by an accounting standard, income and expenses are recognised in the Statement of Comprehensive Income when, and only when, the flow, consumption or loss of economic benefits has occurred and can be reliably measured.

1.3 Significant Accounting Judgements and Estimates

In the process of applying the accounting policies listed in this note, the Corporation has made the following judgements that have the most significant impact on the amounts recorded in the financial statement:

- The fair value of land and buildings has been taken to be the market value of similar properties as determined by an independent valuer.

- Leave provisions also involve actuarial assumptions based on the likely tenure of existing staff, patterns of leave claims and payouts, future salary movements and future discount rates.

No accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

1.4 New Australian Accounting Standards

Adoption of New Australian Accounting Standard Requirements

No accounting standard has been adopted earlier than the application date as stated in the standard.

No new standards, amendments to standards or interpretations applicable to the current reporting period had a material financial impact, and are not expected to have a future financial impact on the entity.

Future Australian Accounting Standard Requirements

Of the new standards, amendments to standards or interpretations that have been issued by the Australian Accounting Standards Board that are applicable to future reporting periods, none will have a material impact on the Corporation.

1.5 Revenue

Revenue from the sale of goods is recognised when:

a) the risks and rewards of ownership have been transferred to the buyer;
b) the Corporation retains no managerial involvement or effective control over the goods;
c) the revenue and transaction costs incurred can be reliably measured; and
d) it is probable that the economic benefits associated with the transaction will flow to the Corporation.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

a) the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
b) the probable economic benefits associated with the transaction will flow to the entity.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance account. Collectability of debts is reviewed at end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

Interest revenue is recognised using the effective interest method as set out in AASB 139 *Financial Instruments: Recognition and Measurement.*

Resources Received Free of Charge

Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense. Resources received free of charge are recorded as either revenue or gains depending on their nature.

Revenue from Government

Funding received or receivable from agencies (appropriated to DAFF as a CAC Act body payment item for payment to this Corporation) is recognised as Revenue from Government unless they are in the nature of an equity injection or a loan.

Parental Leave Payments Scheme

Amounts received under the Parental Leave Payments Scheme by the Corporation not yet paid to employees were presented as gross cash and a liability (payable). The total amount received under this scheme is disclosed as a footnote to the Note 4F: Revenue from Government.

1.6 Royalties

Revenue from royalties are recognised on an accruals basis in accordance with the substance of the relevant agreements. CRDC's major agreement in plant breeding royalties with CSIRO ceases at 30th June 2017.

Royalties from Australian cottonseed include "End-Point-Royalties" based on bales of cotton ginned. The proportion of End-Point-Royalty crop ginned at 30th June cannot be measured with sufficient reliability, accordingly the End-Point-Royalties revenue recognised is based on the cash received.

1.7 Gains

Resources Received Free of Charge

Resources received free of charge are recognised as gains when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Resources received free of charge are recorded as either revenue or gains depending on their nature.

Contributions of assets at no cost of acquisition or for nominal consideration are recognised as gains at their fair value when the asset qualifies for recognition, unless received from another Government agency or authority as a consequence of a restructuring of administrative arrangements (Refer to Note 1.8).

Sale of Assets

Gains from disposal of assets are recognised when control of the asset has passed to the buyer.

1.8 Transactions with the Government as Owner

Equity Injections

Amounts that are designated as equity injections for a year are recognised directly in contributed equity in that year.

Restructuring of Administrative Arrangements

Net assets received from or relinquished to another Government agency or authority under a restructuring of administrative arrangements are adjusted at their book value directly against contributed equity.

Other Distributions to Owners

The FMOs require that distributions to owners be debited to contributed equity unless it is in the nature of a dividend.

1.9 Employee Benefits

Liabilities for 'short-term employee benefits' (as defined in AASB 119 *Employee Benefits*) and termination benefits due within twelve months of the end of reporting period are measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

Other long-term employee benefits are measured at the present value of the estimated future cash outflows to be made in respect of services provided by employees up to the reporting date.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Corporation is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including the Corporation's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the Dept of Finance and Deregulation standard parameters for the Long Service Leave Shorthand Method as at 30 June 2011. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and Redundancy

Provision is made for separation and redundancy benefit payments. The Corporation recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Superannuation

Staff of the Corporation are members of Public Superannuation Funds, Self Managed Superannuation Funds, the Public Sector Superannuation Scheme (PSS) or the PSS accumulation plan (PSSap).

The PSS is a defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported by the Department of Finance and Deregulation as an administered item.

The Corporation makes employer contributions to the employees' superannuation scheme at rates determined by an actuary, or by statute, sufficient to meet the current cost to the Government. The Corporation accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final fortnight of the year.

1.10 Leases

A distinction is made between finance leases and operating leases. Finance leases effectively transfer from the lessor to the lessee substantially all the risks and rewards incidental to ownership of leased

assets. An operating lease is a lease that is not a finance lease. In operating leases, the lessor effectively retains substantially all such risks and benefits.

Where an asset is acquired by means of a finance lease, the asset is capitalised at either the fair value of the lease property or, if lower, the present value of minimum lease payments at the inception of the contract and a liability is recognised at the same time and for the same amount.

The discount rate used is the interest rate implicit in the lease. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets.

1.11 Borrowing Costs

No borrowing costs were incurred by the Corporation during the year.

1.12 Cash

Cash and cash equivalents includes cash on hand and demand deposits in bank accounts with an original maturity of 12 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value. Cash is recognised at its nominal amount.

1.13 Financial Assets

The Corporation classifies its financial assets in the following categories:

a) financial assets at fair value through profit or loss;
b) held-to-maturity investments;
c) available-for-sale financial assets; and
d) loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

Effective Interest Method

The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset, or, where appropriate, a shorter period.

Income is recognised on an effective interest rate basis except for financial assets that are recognised at fair value through profit or loss.

Financial Assets at Fair Value Through Profit or Loss

Financial assets are classified as financial assets at fair value through profit or loss where the financial assets:

a) have been acquired principally for the purpose of selling in the near future;
b) are derivatives that are not designated and effective as a hedging instrument; or
c) are a part of an identified portfolio of financial instruments that the Corporation manages together and has a recent actual pattern of short-term profit-taking.

Assets in this category are classified as current assets.

Financial assets at fair value through profit or loss are stated at fair value, with any resultant gain or loss recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest earned on the financial asset.

The Corporation has no derivative financial assets in both the current and prior year.

Available-for-Sale Financial Assets

Available-for-sale financial assets are non-derivatives that are either designated in this category or not classified in any of the other categories.

Available-for-sale financial assets are recorded at fair value. Gains and losses arising from changes in fair value are recognised directly in reserves (equity) with the exception of impairment losses. Interest is calculated using the effective interest method and foreign exchange gains and losses on monetary assets are recognised directly in profit or loss. Where the asset is disposed of or is determined to be impaired, part (or all) of the cumulative gain or loss previously recognised in the reserve is included in profit and loss for the period. The Corporation has no available-for-sale assets.

Where a reliable fair value cannot be established for unlisted investments in equity instruments, these instruments are valued at cost. The Corporation has no such instruments.

Held-to-Maturity Investments

Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the Corporation has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are recorded at amortised cost using the effective interest method less impairment, with revenue recognised on an effective yield basis.

Loans and Receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost using the effective interest method less impairment. Interest is recognised by applying the effective interest rate.

Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period.

Financial assets held at amortised cost – if there is objective evidence that an impairment loss has been incurred for loans and receivables or held to maturity investments held at amortised cost, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the Statement of Comprehensive Income.

Available for sale financial assets – if there is objective evidence that an impairment loss on an available-for-sale financial asset has been incurred, the amount of the difference between its cost, less principal repayments and amortisation, and its current fair value, less any impairment loss previously recognised in expenses, is transferred from equity to the Statement of Comprehensive Income.

Financial assets held at cost – If there is objective evidence that an impairment loss has been incurred, the amount of the impairment loss is the difference between the carrying amount of the asset and the present value of the estimated future cash flows discounted at the current market rate for similar assets.

1.14 Financial Liabilities

Financial liabilities are classified as either financial liabilities 'at fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

Financial Liabilities at Fair Value Through Profit or Loss

Financial liabilities at fair value through profit or loss are initially measured at fair value. Subsequent fair value adjustments are recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest paid on the financial liability.

Other Financial Liabilities

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective yield basis.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period.

Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

Grants

Grant liabilities are recognised to the extent that:

- the services required to be performed by the grantee have been performed, or
- the grant eligibility criteria have been satisfied, but payments due have not been made.

A commitment is recorded when the Corporation enters into an agreement to make these grants but services have not been performed or criteria satisfied.

1.15 Contingent Liabilities and Contingent Assets

Contingent liabilities and contingent assets are not recognised in the balance sheet but are reported in the relevant schedules and notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

1.16 Financial Guarantee Contracts

Financial guarantee contracts are accounted for in accordance with AASB 139 *Financial Instruments: Recognition and Measurement.* They are not treated as a contingent liability, as they are regarded as financial instruments outside the scope of AASB 137 *Provisions, Contingent Liabilities and Contingent Assets*. The Corporation does not have any financial guarantee contracts.

1.17 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

1.18 Property, Plant and Equipment

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the balance sheet, except for purchases costing less than $1,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

The initial cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located.

Revaluations

Fair values for each class of asset are determined as shown below:

Asset Class	***Fair value measured at***
Land	Market selling price
Buildings	Market selling price
Office equipment	Depreciated replacement cost
Computer equipment	Depreciated replacement cost
Fixtures and fittings	Depreciated replacement cost

Following initial recognition at cost, property, plant and equipment were carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations were conducted with sufficient frequency to ensure that the carrying amounts of assets did not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depended upon the volatility of movements in market values for the relevant assets.

Fair value is measured at market selling price where the market value can be determined in an "Active Market" in accordance with AASB 116 Property, Plant and Equipment, and AASB 136 Impairment. Where an active market is not available then "Depreciated Replacement Cost" has been used.

Revaluation adjustments were made on a class basis. Any revaluation increment was credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets were recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

Depreciation

Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Corporation using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	2011	2010
Buildings on freehold land	**40 years**	40 years
Plant and Equipment	**3 to 10 years**	3 to 10 years

Impairment

All assets were assessed for impairment at 30 June 2011. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if the Corporation were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

No indicators of impairment were found for assets at fair value.

Derecognition

An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

1.19 Intangibles

The Corporation's intangibles comprise internally developed software for internal use. These assets are carried at cost less accumulated amortisation and accumulated impairment losses.

Software is amortised on a straight-line basis over its anticipated useful life. The useful lives of the Corporation's software are 5 years (2009–10: 5 years).

All software assets were assessed for indications of impairment as at 30 June 2011.

1.20 Taxation / Competitive Neutrality

The Corporation is exempt from all forms of taxation except Fringe Benefits Tax (FBT), NSW payroll tax and the Goods and Services Tax (GST).

Revenues, expenses and assets are recognised net of GST except:

a) where the amount of GST incurred is not recoverable from the Australian Taxation Office; and

b) for receivables and payables.

Note 2: Events After the Reporting Period

No matters or circumstances have arisen since the end of the financial year which significantly affected or may affect the operations of the Corporation, the results of these operations or state of affairs of the Corporation in subsequent years.

Note 3: Expenses

	2011 **$**	2010 $
Note 3A: Employee Benefits		
Wages and salaries	**1,063,602**	973,454
Superannuation:		
Defined contribution plans	**85,745**	75,461
Defined benefit plans	**44,232**	48,411
Leave and other entitlements	**66,651**	65,782
Total employee benefits	**1,260,230**	1,163,108

	2011 $	2010 $
Note 3B: Suppliers		
Goods and services		
External Parties	**334,406**	424,972
Total goods and services	**334,406**	424,972
Goods and services are made up of:		
Provision of goods – external parties	**43,568**	62,412
Rendering of services – external parties	**290,838**	362,560
Total goods and services	**334,406**	424,972
Other supplier expenses		
Operating lease rentals – external parties:		
Minimum lease payments	**44,128**	48,237
Workers compensation expenses	**1,433**	1,037
Total other supplier expenses	**45,561**	49,274
Total supplier expenses	**379,967**	474,246
Note 3C: Grants		
Public sector:		
Australian Government entities (related entities)	**708,364**	2,529,109
State and Territory Governments	**1,170,860**	1,359,437
Universities & Colleges	**626,441**	594,370
Other Research Institutions	**4,074,266**	3,777,822
Corporate activities	**947,665**	932,838
Private sector:		
Commercial entities	**584,980**	617,086
Total grants	**8,112,576**	9,810,662
Note 3D: Depreciation and Amortisation		
Depreciation:		
Buildings	**9,500**	9,500
Office equipment	**6,402**	4,097
Computer equipment	**8,214**	11,814
Fixtures & Fittings	**4,419**	4,418
Total depreciation	**28,535**	29,829
Amortisation:		
Intangibles		
Computer Software	**22,896**	23,509
Total amortisation	**22,896**	23,509
Total depreciation and amortisation	**51,431**	53,338

	2011 $	2010 $
Note 3E: Losses from Asset Sales		
Other Property, plant and equipment:		
Proceeds from sale	**(2,273)**	–
Carrying value of assets sold	**10,411**	–
Total losses from asset sales	**8,138**	**–**

Note 4: Income

OWN-SOURCE REVENUE

Note 4A: Levies and Penalties		
Industry Levies	**4,574,863**	3,433,414
Penalties	**1,016**	212
Total fees and fines	**4,575,879**	3,433,626
Note 4B: Interest		
Deposits	**726,481**	499,354
Deposits held for NPSI	**78,370**	68,205
Total interest	**804,851**	567,559
Note 4C: Rental Income		
Operating lease:		
Other	**15,000**	15,000
Total rental income	**15,000**	15,000
Note 4D: Royalties		
Royalties	**2,789,277**	1,896,750
Total royalties	**2,789,277**	1,896,750
Note 4E: Other Revenue		
Project refunds	**445,610**	476,652
Industry grants	**350,000**	–
Land & Water Communications grant	**–**	280,000
NPSI novation revenue utilised	**154,020**	1,947,643
Other revenue	**12,424**	122,421
Total other revenue	**962,054**	2,826,716

REVENUE FROM GOVERNMENT

Note 4F: Revenue from Government		
Department of Agriculture, Fisheries and Forestry:		
PIERD Act 1989 Contribution	**5,677,104**	2,996,541
Total revenue from Government	**5,677,104**	2,996,541

The entity received $0.00 (2010: $0.00) under the Paid Parental Leave Scheme.

	2011 $	2010 $
Note 5: Financial Assets		
Note 5A: Cash and Cash Equivalents		
Cash on hand or on deposit	**2,496,478**	4,782,420
Other	**13,800,000**	6,500,000
Total cash and cash equivalents	**16,296,478**	11,282,420
Note 5B: Trade and Other Receivables		
Other receivables:		
GST receivable from the Australian Taxation Office	**152,288**	121,552
Interest	**120,990**	119,897
Industry levies receivable	**789,051**	744,711
Commonwealth contributions receivable	**789,051**	560,746
Royalties receivable	**–**	1,757,080
Other receivables	**33,334**	80,831
Total trade and other receivables	**1,884,714**	3,384,817
Receivables are expected to be recovered in:		
No more than 12 months	**1,884,714**	3,384,817
Total trade and other receivables	**1,884,714**	3,384,817
Receivables are aged as follows:		
Not overdue	**1,851,380**	3,371,858
Overdue by:		
0 to 30 days	**–**	–
31 to 60 days	**33,334**	–
61 to 90 days	**–**	–
More than 90 days	**–**	12,959
Total receivables (gross)	**1,884,714**	3,384,817
Note 6: Non-Financial Assets		
Note 6A: Land and Buildings		
Land:		
Land at fair value	**170,000**	170,000
Buildings on freehold land:		
Work in progress	**–**	–
Fair value	**380,000**	380,000
Accumulated depreciation	**(19,000)**	(9,500)
Accumulated impairment losses	**–**	–
Total buildings on freehold land	**361,000**	370,500
Total land and buildings	**531,000**	**540,500**

No indicators of impairment were found for land and buildings.

No land or buildings were expected to be sold or disposed of within the next 12 months.

	2011 $	2010 $
Note 6B: Other Property, Plant and Equipment		
Office equipment:		
Fair value	**59,606**	40,970
Accumulated depreciation	**(14,172)**	(16,359)
Total office equipment	**45,434**	24,611
Computer equipment:		
Fair value	**49,692**	49,692
Accumulated depreciation	**(49,692)**	(41,478)
Total computer equipment	**–**	8,214
Fixtures and fittings:		
Fair value	**44,188**	44,188
Accumulated depreciation	**(21,563)**	(17,144)
Total fixtures and fittings	**22,625**	27,044
Total other property, plant and equipment	**68,059**	59,869

No indicators of impairment were found for property, plant and equipment.

No property, plant or equipment is expected to be sold or disposed of within the next 12 months.

Revaluations of non-financial assets

All revaluations were conducted in accordance with the revaluation policy stated at Note 1. On 30th June 2009, an independent valuer conducted the last revaluation.

Note 6C: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment (2010–11)

	Land	Buildings	Total land and buildings	Office equipment	Computer equipment	Fixtures & fittings	Total other property, plant & equipment	Total
	$	$	$	$	$	$	$	$
As at 1 July 2010								
Gross book value	**170,000**	**380,000**	**550,000**	**40,970**	**49,692**	**44,188**	**134,850**	**684,850**
Accumulated depreciation and impairment	**–**	**(9,500)**	**(9,500)**	**(16,359)**	**(41,478)**	**(17,144)**	**(74,981)**	**(84,481)**
Net book value 1 July 2010	**170,000**	**370,500**	**540,500**	**24,611**	**8,214**	**27,044**	**59,869**	**600,369**
Additions*	**–**	**–**	**–**	**37,636**	**–**	**–**	**37,636**	**37,636**
Depreciation expense		**(9,500)**	**(9,500)**	**(6,402)**	**(8,214)**	**(4,419)**	**(19,035)**	**(28,535)**
Disposals:								
Gross book value	**–**	**–**	**–**	**(19,000)**	**–**	**–**	**(19,000)**	**(19,000)**
Accumulated depreciation and impairment	**–**	**–**	**–**	**8,589**	**–**	**–**	**8,589**	**8,589**
Net book value 30 June 2011	**170,000**	**361,000**	**531,000**	**45,434**	**–**	**22,625**	**68,059**	**599,059**
Net book value as of 30 June 2011 represented by:								
Gross book value	**170,000**	**380,000**	**550,000**	**59,606**	**49,692**	**44,188**	**153,486**	**703,486**
Accumulated depreciation and impairment		**(19,000)**	**(19,000)**	**(14,172)**	**(49,692)**	**(21,563)**	**(85,427)**	**(104,427)**
	170,000	**361,000**	**531,000**	**45,434**	**–**	**22,625**	**68,059**	**599,059**

* Disaggregated additions information are disclosed in the Schedule of Asset Additions.

Note 6C (Cont'd): Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment (2009–10)

	Land	Buildings	Total land and buildings	Office equipment	Computer equipment	Fixtures & fittings	Total other property, plant & equipment	Total
	$	$	$	$	$	$	$	$
As at 1 July 2009								
Gross book value	170,000	380,000	550,000	40,970	51,942	44,188	137,100	687,100
Accumulated depreciation and impairment	–	–	–	(12,262)	(31,915)	(12,725)	(56,902)	(56,902)
Net book value 1 July 2009	170,000	380,000	550,000	28,708	20,027	31,463	80,198	630,198
Additions*	–	–	–	–	–	–	–	–
Depreciation expense		(9,500)	(9,500)	(4,097)	(11,813)	(4,419)	(20,329)	(29,829)
Disposals:								
Gross book value	–	–	–	–	(2,250)	–	(2,250)	(2,250)
Accumulated depreciation and impairment	–	–	–	–	2,250	–	2,250	2,250
Net book value 30 June 2010	170,000	370,500	540,500	24,611	8,214	27,044	59,869	600,369
Net book value as of 30 June 2010 represented by:								
Gross book value	170,000	380,000	550,000	40,970	49,692	44,188	134,850	684,850
Accumulated depreciation and impairment	–	(9,500)	(9,500)	(16,359)	(41,478)	(17,144)	(74,981)	(84,481)
	170,000	370,500	540,500	24,611	8,214	27,044	59,869	600,369

* Disaggregated additions information are disclosed in the Schedule of Asset Additions.

	2011 $	2010 $
Note 6D: Intangibles		
Computer software:		
Purchased	**120,830**	117,545
Accumulated amortisation	**(108,444)**	(85,548)
Total intangibles	**12,386**	31,997

No indicators of impairment were found for intangible assets.

No intangibles are expected to be sold or disposed of within the next 12 months.

Note 6E: Reconciliation of the Opening and Closing Balances of Intangibles

	Computer software purchased 2011 $	Computer software purchased 2010 $
As at 1 July		
Gross book value	**117,545**	117,545
Accumulated amortisation and impairment	**(85,548)**	(62,039)
Net book value 1 July	**31,997**	55,506
Additions*	**3,285**	–
Amortisation	**(22,896)**	(23,509)
Net book value 30 June	**12,386**	31,997
Net book value as of 30 June represented by:		
Gross book value	**120,830**	117,545
Accumulated amortisation and impairment	**(108,444)**	(85,548)
	12,386	31,997

* Disaggregated additions information are disclosed in the Schedule of Asset Additions.

Note 6F: Other Non-Financial Assets		
Prepayments	**7,695**	7,485
Total other non-financial assets	**7,695**	7,485
Total other non-financial assets - are expected to be recovered in:		
No more than 12 months	**7,695**	7,485
More than 12 months	**–**	–
Total other non-financial assets	**7,695**	7,485

Non-financial assets are expected to be recovered in no more than 12 months.

No indicators of impairment were found for other non-financial assets.

	2011 $	2010 $
Note 7: Payables		
Note 7A: Suppliers		
Trade creditors and accruals	**54,786**	73,452
Total supplier payables	**54,786**	73,452
Supplier payables expected to be settled within 12 months:		
Related entities	**668**	–
External parties	**54,118**	73,452
Total	**54,786**	73,452

Settlement was usually made within 30 days.

Note 7B: Grants, Subsidies and Personal Benefits		
Grants:		
Public sector:		
Australian Government entities (related entities)	**329,718**	1,086,877
State and Territory Governments	**569,869**	699,252
Universities and colleges	**113,146**	492,556
Other research organisations	**800,517**	807,297
Private sector:		
Other	**87,112**	174,963
Total grants	**1,900,362**	3,260,945
Total grants, subsidies and personal benefits are expected to be settled in:		
No more than 12 months	**1,900,362**	3,260,945
More than 12 months	**–**	–
Total grants, subsidies and personal benefits	**1,900,362**	3,260,945

Settlement was usually made according to the terms and conditions of each grant. This was usually within 30 days of performance or eligibility.

Note 7C: Other Payables		
Salaries and wages	**17,301**	16,528
Superannuation	**2,108**	413
PAYG & FBT	**28,627**	28,490
State payroll tax	**3,656**	4,071
Other	**175**	–
Total other payables	**51,867**	49,502
Total other payables are expected to be settled in:		
No more than 12 months	**51,867**	49,502
More than 12 months	**–**	–
Total other payables	**51,867**	49,502

	2011 $	2010 $
Note 8: Provisions		
Note 8A: Employee Provisions		
Leave	**217,747**	205,422
Total employee provisions	**217,747**	205,422
Employee provisions are expected to be settled in:		
No more than 12 months	**139,647**	146,191
More than 12 months	**78,100**	59,231
Total employee provisions	**217,747**	205,422
Note 8B: Other Provisions		
Novation of National Program for Sustainable Irrigation		
Revenue received in advance refundable on termination of management agreement	**1,033,901**	1,187,921
Total other provisions	**1,033,901**	1,187,921
Other provisions are expected to be settled in:		
No more than 12 months	**1,033,901**	855,069
More than 12 months	**–**	332,852
Total other provisions	**1,033,901**	1,187,921

The Novated Program Management Agreement for the National Program for Sustainable Irrigation states in clause 14.5 Repayment of Contributions: The Manager must, on termination of this agreement, repay any unexpended or uncommitted monies to the Parties in accordance with their respective Interests.

The Program Management Agreement also states that any Party to the agreement can terminate the agreement with 60 days notice. Therefore, partner contributions received and held by Cotton Research and Development Corporation are a current liability held in trust until paid to Project Researchers in accordance with the research agreements.

	2011 $	2010 $
Note 9: Cash Flow Reconciliation		
Reconciliation of cash and cash equivalents as per Balance Sheet to Cash Flow Statement		
Cash and cash equivalents as per:		
Cash flow statement	**16,296,478**	11,282,420
Balance sheet	**16,296,478**	11,282,420
Difference	**–**	–

(Note 9 cont'd)

	2011 **$**	2010 $
Reconciliation of net cost of services to net cash from operating activities:		
Net cost of services	**(665,281)**	(2,761,703)
Add revenue from Government	**5,677,104**	2,996,541
Adjustments for non-cash items		
Depreciation / amortisation	**51,431**	53,338
Net write down of non-financial assets	**8,138**	–
Changes in assets / liabilities		
(Increase) / decrease in net receivables	**1,500,103**	(307,087)
(Increase) / decrease in prepayments	**(210)**	480
Increase / (decrease) in employee provisions	**12,325**	10,951
Increase / (decrease) in employee withholdings	**(530)**	(20,702)
Increase / (decrease) in supplier payables	**(18,664)**	43,036
Increase / (decrease) in other payable	**2,894**	3,772
Increase / (decrease) in grants payable	**(1,360,584)**	699,488
Increase / (decrease) in NPSI novation payable	**(154,020)**	1,187,921
Net cash from (used by) operating activities	**5,052,706**	1,906,035

Note 10: Contingent Liabilities and Assets

Significant Remote Contingencies

The Cotton Research and Development Corporation was established under the *Primary Industries and Energy Research and Development Act, 1989*. This Act states the Commonwealth government will make payments to the Corporation equal to one half of the Corporation's annual expenditure. However, government matching payments must not exceed industry levy receipts nor exceed 0.5% of the amount that the Minister determines to be the gross value of production (GVP) for that financial year. In 2010–11 Commonwealth contributions were capped to levies, leaving a remote contingent receivable of $10.600m. The probability of receiving this receivable is remote whilst cotton production and prices continue to remain low.

	2011 **No.**	2010 No.
Note 11: Directors Remuneration		
The number of non-executive directors of the entity included in these figures are shown below in the relevant remuneration bands:		
$15,000 to $29,999	**7**	7
$30,000 to $49,999	**1**	1
Total	**8**	8
Total remuneration received or due and receivable by directors of the entity	**190,080**	181,845

Remuneration of executive directors is included in Note 17: Senior Executive Remuneration.

Note 12: Related Party Disclosures

Grants were made to a number of research institutions which are director related entities. They were approved under the normal terms and conditions of the Corporation. Following full disclosure of their relevant interests, the relevant Directors may or may not take part in discussion and abstain from decisions of the Board.

	2011 $	2010 $
Grants to Director-Related Entities		
CRC Irrigation	**–**	78,215
Queensland Dept. Of Primary Industries & Fisheries	**604,646**	681,133
University of Queensland	**41,000**	5,000
Grants to director-related entities	**645,646**	764,348

Note 13: Senior Executive Remuneration

Note 13A: Senior Executive Remuneration Expense for the Reporting Period

Short-term employee benefits:		
Salary	**467,236**	332,054
Annual leave accrued	**6,359**	(8,000)
Other[1]	**29,637**	25,148
Total short-term employee benefits	**503,232**	349,202
Post-employment benefits:		
Superannuation	**50,459**	37,960
Total post-employment benefits	**50,459**	37,960
Other long-term benefits:		
Long-service leave	**15,924**	20,854
Total other long-term benefits	**15,924**	20,854
Total	**569,615**	408,016

Notes:

1. Other includes motor vehicle allowances, other allowances and fringe benefit tax on allowances.

2. Note 13A excludes acting arrangements and part-year service where remuneration expensed for a senior executive was less than $150,000.

Note 13B: Average Annual Remuneration Packages for Substantive Senior Executives as at the end of the Reporting Period

		as at 30 June 2011		
		Fixed elements		
Fixed Elements and Bonus Paid[1]	Senior Executives No.	Salary $	Allowances $	Total $
Total remuneration (including part-time arrangements):				
less than $150,000	2	131,789	–	131,789
$150,000 to $179,999	–	–	–	–
$180,000 to $209,999	1	205,394	–	205,394
Total	**3**			

		as at 30 June 2010		
		Fixed elements		
Fixed Elements and Bonus Paid[1]	Senior Executives No.	Salary $	Allowances $	Total $
Total remuneration (including part-time arrangements):				
less than $150,000	2	130,195	–	130,195
$150,000 to $179,999	–	–	–	–
$180,000 to $209,999	1	196,330	–	196,330
Total	3			

Notes:

1. This table reports substantive senior executives who were employed by the entity at the end of the reporting period. Fixed elements were based on the employment agreement of each individual. Each row represents an average annualised figure (based on headcount) for the individuals in that remuneration package band (i.e. the 'Total' column).

2. The Corporation does not operate a bonus pay system for senior executives.

Variable Elements:

Variable elements were not included in the 'Fixed Elements' table above. The following variable elements were available as part of senior executives' remuneration package:

(a) On average senior executives were entitled to the following leave entitlements:

- Annual Leave (AL): entitled to 22 days (2010: 22 days) each full year worked (pro-rata for part-time SES);
- Personal Leave (PL): entitled to 10 days (2010: 10 days) or part-time equivalent; and
- Long Service Leave (LSL): in accordance with Long Service Leave (Commonwealth Employees) Act 1976.

(b) Senior executives were members of one of the following superannuation funds:

- Public Sector Superannuation Scheme (PSS): this scheme is closed to new members, with current employer contributions were set at 15.4 per cent (2010: 15.4 per cent) (including productivity component). More information on PSS can be found at http://www.pss.gov.au;

- Other: there were some senior executives who had their own superannuation arrangements (e.g. approved public superannuation funds and self-managed superannuation funds). Their employer contributions were set at 9 per cent (2010: 9 per cent).

(c) Various salary sacrifice arrangements were available to senior executives including superannuation and motor vehicle.

- Salary sacrifice superannuation was available to senior executives during the year, however, was not used; and
- Salary sacrifice motor vehicle fringe benefit was available to senior executives during the year. Total benefit provided was $29,637 (2010: $25,148);

Note 14: Average Staffing Levels

	2011	2010
The average staffing levels for the Corporation during the year were:	**8.2**	7.2

Note 15: Remuneration of Auditors

	2011 $	2010 $
Financial statement audit services were provided to the corporation by the Auditor General.		
Fair value of the services provided:	**12,750**	12,250
Total	**12,750**	12,250

No other services were provided by the auditors of the financial statements.

Note 16: Financial Instruments

	2011 $	2010 $
Note 16A: Categories of Financial Instruments		
Financial Assets		
Loans and receivables:		
Cash and cash equivalents	**16,296,478**	11,282,420
Trade and other receivables	**154,324**	1,957,808
Carrying amount of financial assets	**16,450,802**	13,240,228
Financial Liabilities		
At amortised cost:		
Grants payable	**1,900,362**	3,260,945
Other payables	**54,786**	73,452
Carrying amount of financial liabilities	**1,955,148**	3,334,397

	2011 $	2010 $
Note 16B: Net Income and Expense from Financial Assets		
Loans and receivables		
Interest revenue	**804,851**	567,559
Net gain/(loss) from financial assets	**804,851**	567,559

Note 16C: Fair Value of Financial Instruments

	Carrying amount 2011 $	Fair value 2011 $	Carrying amount 2010 $	Fair value 2010 $
Financial Assets				
Cash and cash equivalents	**16,296,478**	**16,296,478**	11,282,420	11,282,420
Trade and other receivables	**154,324**	**154,324**	1,957,808	1,957,808
Total	**16,450,802**	**16,450,802**	13,240,228	13,240,228
Financial Liabilities				
Grants payable	**1,900,362**	**1,900,362**	3,260,945	3,260,945
Other payables	**54,786**	**54,786**	73,452	73,452
Total	**1,955,148**	**1,955,148**	3,334,397	3,334,397

The Corporations financial assets and financial liabilities comprise cash and deposits held at banks, current receivables and current liabilities. It is held that their carrying amount and fair value are the same.

Note 16D: Credit Risk

The Corporation's maximum exposure to credit risk is the risk that arises from the potential default of a debtor. This amount is equal to the total amount of trade receivables (2011: $1,884,714 and 2010: $3,384,817). The Corporation has assessed that there is no risk of default and has not recognised an impairment allowance account.

The Corporation manages its credit risk through monthly reviews by management of the Corporation's investments and the use of policies and procedures that guide employees in managing debtors.

The Corporation holds no collateral to mitigate against credit risk.

(Note 16D Cont'd)

Credit quality of financial instruments not past due or individually determined as impaired

	Not past due nor impaired	Not past due nor impaired	**Past due or impaired**	Past due or impaired
	2011	2010	**2011**	2010
	$	**$**	$	$
Cash and cash equivalents	**16,296,478**	11,282,420	**–**	–
Trade and other receivables	**120,990**	1,944,849	**33,334**	12,959
Total	**16,417,468**	13,227,269	**33,334**	12,959

Ageing of financial assets that were past due but not impaired for 2011

	0 to 30 days	**31 to 60 days**	**61 to 90 days**	**90+ days**	**Total**
	$	**$**	**$**	**$**	**$**
Trade and other receivables	**–**	**33,334**	**–**	**–**	**33,334**
Total	**–**	**33,334**	**–**	**–**	**33,334**

Ageing of financial assets that were past due but not impaired for 2010

	0 to 30 days	31 to 60 days	61 to 90 days	90+ days	Total
	$	$	$	$	$
Trade and other receivables	–	–	–	12,959	12,959
Total	–	–	–	12,959	12,959

The following list of assets have been individually assessed as impaired

The Corporation's receivables overdue are not impaired as they relate to grant refunds due from government entities and the grants have not been finalised.

Note 16E: Liquidity Risk

The Corporation's financial liabilities are payables. The exposure to liquidity risk is based on the notion that the Corporation will encounter difficulty in meeting its obligations associated with financial liabilities. This is highly unlikely due to the internal policies and procedures put in place to ensure there are appropriate resources to meet its financial obligations.

Maturities for non-derivative financial liabilities 2011

	On demand $	within 1 year $	1 to 5 years $	> 5 years $	Total $
Grants payable	–	**1,900,362**	–	–	**1,900,362**
Other payables	–	**54,786**	–	–	**54,786**
Total	–	**1,955,148**	–	–	**1,955,148**

Maturities for non-derivative financial liabilities 2010

	On demand $	within 1 year $	1 to 5 years $	> 5 years $	Total $
Grants payable	–	3,260,945	–	–	3,260,945
Other payables	–	73,452	–	–	73,452
Total	–	3,334,397	–	–	3,334,397

The Corporation manages its finances to ensure it has adequate funds to meet payments as they fall due. In addition, the Corporation has policies in place to ensure timely payments are made when due and has no past experience of default.

The Corporation has no derivative financial liabilities in both the current and prior year.

Note 16F: Market Risk

The Corporation holds basic financial instruments that do not expose it to certain market risks. The Corporation is not exposed to 'currency risk' or 'other price risk'.

Interest Rate Risk

The only interest-bearing items on the balance sheet are the "Cash and cash equivalents'. Cash at bank has variable interest rates and term deposits have fixed interest. Interest will fluctuate due to changes in the market interest rate. The interest rate risk does not have any impact on the fair value of the Cash and cash equivalents.

Interest rates for cash held at banks in operating accounts and at call accounts ranged from 0% to 5.1% as at 30th June 2011. Term deposit fixed interest rates during the year remained steady and have been fluctuating around 6.0% to 6.5% at the end of the year. It is expected that interest rates will remain steady with some volatilty as the world economy continues to affect the Australian economic recovery. The sensitivity analysis has used 175 basis points as a reasonable representation of the continued volatility in the economy.

(Note 16F Cont'd)

Sensitivity analysis of the risk that the entity is exposed to for 2011

	Risk variable	**Change in risk variable %**	**Effect on Profit and loss $**	**Equity $**
Interest rate risk	**Interest**	**+1.75%**	**241,315**	**241,315**
Interest rate risk	**Interest**	**-1.75%**	**(241,315)**	**(241,315)**

Sensitivity analysis of the risk that the entity is exposed to for 2010

	Risk variable	Change in risk variable %	Effect on Profit and loss $	Equity $
Interest rate risk	Interest	+1.5%	154,941	154,941
Interest rate risk	Interest	-1.5%	(154,941)	(154,941)

Note 17: Reporting of Outcomes

The Corporation is structured to meet one outcome:

"Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community."

Note 17A: Net Cost of Outcome Delivery

	Outcome 1	
	2011 $	2010 $
Expenses	**9,812,342**	11,501,354
Income from non-government sector		
Industry Contributions	**4,575,879**	3,433,626
Royalties	**2,789,277**	1,896,750
Interest	**804,851**	567,559
Other	**977,054**	2,841,716
Total	**9,147,061**	8,739,651
Other own-source income	**–**	–
Net cost/(contribution) of outcome delivery	**665,281**	2,761,703

Note 17B: Major Classes of Expenses, Income, Assets and Liabilities by Outcomes

	Outcome 1	
	2011 $	2010 $
Expenses:		
Grants	**8,112,576**	9,810,662
Employees	**1,260,230**	1,163,108
Suppliers	**379,967**	474,246
Depreciation and writedowns	**59,569**	53,338
Total	**9,812,342**	11,501,354
Income:		
Income from government	**5,677,104**	2,996,541
Industry contributions	**4,575,879**	3,433,626
Royalties	**2,789,277**	1,896,750
Interest	**804,851**	567,559
Other	**977,054**	2,841,716
Total	**14,824,165**	11,736,192
Assets		
Cash and cash equivalents	**16,296,478**	11,282,420
Trade and other receivables	**1,884,714**	3,384,817
Land and buildings	**531,000**	540,500
Infrastructure, plant and equipment	**68,059**	59,869
Intangibles	**12,386**	31,997
Other non-financial assets	**7,695**	7,485
Total	**18,800,332**	15,307,088
Liabilities		
Grants payable	**1,900,362**	3,260,945
Suppliers payable	**54,786**	73,452
Other payables	**51,867**	49,502
Employee provisions	**217,747**	205,422
Other provisions	**1,033,901**	1,187,921
Total	**3,258,663**	4,777,242

Appendices

APPENDIX ONE
ADDRESSING AUSTRALIAN GOVERNMENT RESEARCH PRIORITIES

National Research Priorities

Four National Research Priorities (NRPs) were issued by the Australian Government in 2002, and enhanced and refined in 2003. Not all the Australian Government National Research Priorities' associated goals are applicable to the work of the Corporation. The following are the associated goals that are relevant to our 2010–11 R&D program:

A An environmentally sustainable Australia

- A1 Water – a critical resource
- A2 Transforming existing industries
- A3 Overcoming soil loss, salinity and acidity
- A5 Sustainable use of Australia's biodiversity
- A7 Responding to climate change and variability

B Promoting and maintaining good health

- B4 Strengthening Australia's social and economic fabric

C Frontier technologies for building and transforming Australian industries

- C2 Frontier technologies
- C3 Advanced materials
- C4 Smart information use
- C5 Promoting an innovation culture and economy

D Safeguarding Australia

- D3 Protecting Australia from invasive diseases and pests

Rural Research and Development Priorities

The Australian Government issued five revised rural research and development priorities in May 2007 and all are addressed below.

Minister's Priorities

The previous Minister for Agriculture, Fisheries and Forestry, The Hon Tony Burke MP, notified the Corporation of a range of priorities that he wished emphasised in 2010–11. These were incorporated into the Annual Operating Plan for 2010–11 and are reported below.

Australian Government Priorities			CRDC R&D outputs 2010–2011
Applicable NRP Goals *(see above)*	Rural R&D Priorities	Minister's Priorities for 2010–11	
C5	**Productivity and Adding Value** Improve the productivity and profitability of existing industries and support the development of viable new industries	**Productivity improvement** Generate new knowledge, which will lead to improved technology that will be adopted by producers to increase productivity	Ongoing R&D cross-sectors partnerships addressed climate change, irrigation, farm health & safety and encouraging the development of future scientists. Consolidated new collaborations with Grains RDC addressing productivity and climate change preparedness in cotton and grains farming systems. Extended case studies to farmers demonstrating the impact of farming systems innovation on improved production efficiencies and resource management (soils, water, fertiliser, energy) and environmental performance. Further tested and commercialised novel biopesticides for key cotton and grain pests. Enhanced the best management practices system to integrate planning, risk management and benchmarking with development of skills, knowledge and adoption of research outputs throughout the value chain and launched web-based, interactive myBMP.

Australian Government Priorities			CRDC R&D outputs 2010–2011
Applicable NRP Goals *(see above)*	Rural R&D Priorities	Minister's Priorities for 2010–11	
C2; C3	**Supply Chain and Markets** Better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers.	**Maintaining and improving international market access opportunities** Work to combat pests and diseases that can potentially be obstructive to trade and to guide production decisions in accordance with the requirements of consumers Value chain effectiveness and efficiency Investment in research and development must extend beyond the farm gate to ensure the whole value chain is able to operate at optimum levels	Increased international market access opportunities Improved industry awareness and preparedness for major biosecurity threats, particularly silver leaf whitefly, Solenopsis mealybug, *Helicoverpa* spp. and viruses. Continued to improve market intelligence and customer feedback on Australian cotton's competitive advantage. Increased value chain effectiveness and efficiency Facilitated post-farm gate best practices for classing, ginning, transport and storage and handling. Enhanced the best management practices system to integrate planning, risk management and benchmarking with development of skills, knowledge and adoption of research outputs throughout the value chain and launched web-based, interactive 'field to fabric' myBMP. Continued to improve market intelligence and customer feedback on Australian cotton's competitive advantage. Continued the development of collaborative R&D partnerships with Australian cotton shippers and overseas cotton spinning mills to investigate opportunities for using newly developed Australian premium-quality cotton varieties, innovations in objective fibre measurement and textile processing knowledge. Built new collaborations with Australian Wool Industries (AWI), spinners and domestic brand owners.
A1; A2; A3; A5; C1	**Natural Resource Management** Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable	**Sustainable environmental resource management** Build and share our knowledge to ensure our soils, water and vegetation are managed properly and invasive pests are controlled	Supported ongoing R&D cross-sectors partnerships addressing climate change, irrigation, farm health & safety and encouraging the development of future scientists. Enhancement of the best management practices system (as above)

Australian Government Priorities			CRDC R&D outputs 2010–2011
Applicable NRP Goals *(see above)*	Rural R&D Priorities	Minister's Priorities for 2010–11	
A4; A7	**Climate Variability and Climate Change** Build resilience to climate variability and adapt to and mitigate the effects of climate change	Reduce greenhouse gas emissions and improve soil management, and assist producers to adapt and change farming practices whilst boosting productivity	R&D investments in biosecurity as well as cropping systems for improved nitrogen, energy and water use efficiency that will increase farm businesses' climate change preparedness and reduce greenhouse gas emissions. Extended case studies to farmers demonstrating the impact of farming systems innovation on improved production efficiencies and resource management (soils, water, fertiliser, energy) and environmental performance. Supported ongoing R&D cross-sectors partnerships addressing climate change, irrigation, farm health & safety and encouraging the development of future scientists. Consolidated new collaborations with Grains RDC addressing productivity and climate change preparedness in cotton and grains farming systems. Scope the potential impacts of climate change on textile production and markets.
D3	**Biosecurity** Protect Australia's community, primary industries and environment from biosecurity threats	Maintain our research capability to prevent and deal with disease outbreaks, particularly as such biosecurity threats are expected to become more prevalent with climate change	Improved industry awareness and preparedness for major biosecurity threats, particularly silver leaf whitefly, Solenopsis mealybug, Helicoverpa and viruses. Further tested and commercialised novel biopesticides for key cotton and grain pests. Continued surveying for the incidence of endemic diseases and pests and surveillance for the presence of exotic diseases and pests in all cotton growing districts. R&D investments and activities that underpinned the stewardship of biotechnologies and chemicals.
B3; B4; C4	**Supporting the Rural R&D Priorities 1:** Improve the skills to undertake research and apply its findings	**Workforce, skills, education** Take a strong role in educating future scientists, improving the knowledge and skills of producers and encouraging people to work in the sector	**Workforce, skills, education** Supported ongoing R&D cross-sectors partnerships addressing climate change, irrigation, farm health & safety and encouraging the development of future scientists. Continued support for: Schools level programs (Primary Industries Centre for Science Education – PICSE) Undergraduate level programs (Cotton Production Course sponsorship; Undergraduate Studentship Program scholarships) Post-graduate scholarships (PhD and Masters degrees) Leadership programs (Australian Rural Leadership Program (ARLP) scholarship support; and; Future Cotton Leaders; and PhD scholarships for new scientists. Built on the 'Sustaining Rural Communities Initiative' with a conference in 2011. Continued establishing networks and collaborations with education providers to develop e-Learning and enhance Recognition of Prior Learning opportunities. Enhancement of the best management practices system (as above). Gained improved understanding of future industry human capacity and R&D capability needs.

Australian Government Priorities			CRDC R&D outputs 2010–2011
Applicable NRP Goals *(see above)*	Rural R&D Priorities	Minister's Priorities for 2010–11	
B3; B4; C4 *(continued)*	**Supporting the Rural R&D Priorities 1** *(continued)*	**Diversity** ***T***ake on a greater role in building strong leadership capacity in the sector and encourage a diversity of people in primary industries, including a greater role for Indigenous Australians, women and young people	**Diversity** Gained improved understanding of future industry human capacity and R&D capability needs. Invested in projects and partnerships with Wincott (Women in Cotton), the Aboriginal Employment Strategy and Future Cotton Leaders program.
	Supporting the Rural R&D Priorities 2: Promote the development of new and existing technologies	**Collaboration** Finalise the National Primary Industries Research, Development and Extension Framework sector plans, develop the cross-sectoral plans and work through implementation	**Collaboration** Completed the Cotton Sector Plan and coordinated RDCs input for the Water Use in Agriculture Cross-Sectoral plan under the PISC National R, D & E Framework. Continued management and stewardship of the National Program for Sustainable Irrigation (NPSI) Maintained the former LWA website to ensure the knowledge assets remain accessible. Built new collaborations with AWI, spinners and domestic brand owners. Invested collaboratively in human capacity development for workforce, industry leadership, research and innovation skill outcomes. Supported ongoing R&D cross-sectors partnerships addressing climate change, irrigation, farm health & safety and encouraging the development of future scientists Consolidated new collaboration with GRDC addressing productivity and climate change preparedness in cotton and grains farming systems.
		Evaluation Support the current joint RDC evaluation process, to demonstrate returns on investment and guide future investment decisions	**Evaluation** Continued to support the evaluation framework developed by the Council of Rural RDC Chairs. Invested in industry surveys and continued to develop an information repository to improve triple bottom line performance reporting capacity, particularly environmental and social performance. Mapped CRDC's investments and achievements against previous and current strategic plans.

Composition of National Research Priorities attributed to each CRDC R&D Program 2010–11 ($'000)

National Research Priorities (NRP)	An Environmentally Sustainable Australia							Promoting and Maintaining Good Health				Frontier Technologies for Building and Transforming Australian Industries					Safeguarding Australia					Total
Expenditure																						
	A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**	**D3**	**D4**	**D5**	
Program 1: Value Chain							39				572		172	46	58							887
Program 2: Farming Systems	281	165	161		190		754				931		430			115			1826			4853
Program 3: Human Capacity	39	10	20		19		108				247		10		46	529			44			1072
Total	**320**	**175**	**181**	**–**	**209**	**–**	**901**	**–**	**–**	**–**	**1,750**	**–**	**612**	**46**	**104**	**644**	**–**	**–**	**1870**	**–**	**–**	**6812**

Composition of Rural Research and Development Priorities attributed to each CRDC R&D Program 2010–11 ($'000)

Rural Research & Development Priorities (RRDP)	Productivity and Adding Value	Supply Chain and Markets	Natural Resource Management	Climate Change and Climate Variability	Biosecurity	Supporting the Priorities		Total
						Innovation Skills	Technology	
Expenditure								
Program 1: Value Chain	309	263		39			276	887
Program 2: Farming Systems	931		797	754	1826	64	481	4853
Program 3: Human Capacity	236	12	78	117	44	529	56	1073
Total	1,476	275	875	910	1870	593	813	6812

Note

These tables exclude $227,947 of NPSI R&D 2010–11 grant payments. NPSI became Program Four under a novation agreement when CRDC assumed the role of Managing Agent in 2009–10. It also excludes untied grants and corporate research activities supporting R&D planning and adoption.

APPENDIX TWO
MEASURING PERFORMANCE

1. Operation Sunlight Key Performance Indicators 2010–11

Operation Sunlight is the Government's reform agenda to improve the openness and transparency of public sector budgetary and financial management and to promote good governance practices. In accordance with Australian Government requirements, these Key Performance Indicators (KPIs) were submitted in CRDC's Portfolio Budget Statement 2010–11.

Key Performance Information

KPIs Strategic Plan 2008–2013		KPIs 2010–11	Comment
Goal One: Add value to the Australian cotton industry with premium products in improved routes to market (Program One: Value Chain)			
Collaboration with mills to define properties of Australian Premium Class cotton (PCI)	Mill surveys	2	***Achieved.***
	Result communication forums	1	***Achieved.***
	Feasibility study interim report	1	***Partially achieved.*** A review of the PCI commissioned in June 2011 to report in August 2011
New spinning and classing technologies	Interim reports	1	***Achieved.***
	Final Report	1	***Achieved.***
Market potential for modified cottonseed and cottonseed oils	Human product analysis	1	***Not achieved.*** CSIRO has been unsuccessful in finding a commercial partner for this technology to date. As a result, the proposed additional work has been put on hold.
Warehousing BMPs	Trialing	1	***Achieved***.
Goal Two: Cotton in a highly productive farming system with improved environmental performance (Program Two: Farming Systems)			
Greenhouse gas measurement	Interim reports	2	***Achieved.***
Measuring N use efficiency protocol	Testing (no. of regions)	2	***Achieved.***
Farming systems research program in coastal North Queensland	Interim report	2	***Achieved.***
New methods for measuring refuge crops	Interim reports	2	***Achieved.***
Changes in resistance to insecticides and transgenic *(Bt)* cotton	Surveys	1	***Achieved.***
	Result communication forums	1	***Achieved.***
Collaborative farming systems research	Collaborative model established	1	***Achieved.***
	Events held to promote innovative practice	1	***Achieved.***
	Increased adoption of *my*BMP system	3 per cent	***Partially achieved.*** *my*BMP system launched at the 2010 cotton conference. As of June 2011 2 cotton enterprises had been audited against this new system and over 150 growers were registered on the new system.

KPIs Strategic Plan 2008–2013		KPIs 2010–11	Comment
Goal Three: Development of a culture of innovation and learning (Program 3: Human Capacity)			
Online aggregation of knowledge services and systems	Feasibility and business case	1	***Partially achieved.*** Initial discussions held with Cotton Australia and the Cotton CRC regarding the proposed 'Cotton Campus' concept and revision of the CRDC website planned.
R&D adoption services and surveys	Interim reports	1	***Achieved.***
	Final reports	3	***Achieved.***

2. Towards the Strategic Plan outcome: Annual Operating Plan 2010–11 KPIs

Program One: Value Chain

R&D Investments	KPIs	Measure of Success
Strategic Objective 1 Develop contemporary knowledge and intelligence about products, markets and supply		
A pilot study to develop and monitor raw cotton, yarn and textile indices relevant to Australian cotton	Textile indices pilot study established and results evaluated by industry	***Achieved.*** International surveys of mills and brand owners has collected preliminary data on growth markets in the apparel sector. Specific fabric markets have been estimated from data collected on yarn production. Targeted fabric market assessment yet to be completed.
Completion of surveys with key international mills on the use of Australian cotton	Reports on mills surveys completed and results discussed with industry	***Achieved.*** Interim report reviewed and summary findings presented to key industry groups and industry conference.
A continuation of the Premium Cotton Initiative (PCI) including spinning trials	PCI project established and results prepared for extension to international spinners of Australian cotton	***Achieved.*** International mills trials have continued to evaluate the performance of premium Australian cotton. Results have been presented to Australian merchants for promotion to mill customers.
Further trial market developments with mills and brand owners to evaluate the competitive advantages of Australian cotton	Trial cotton and cotton/wool blend products tested in Australian and International markets	***Successfully underway but not yet completed.*** Project yet to be finalised.
Strategic Objective 2 Develop improvements in current products		
A new project to investigate development of low twist fine count yarns and fabrics from Australian long staple upland cotton	Low twist, fine count project established	***Achieved.*** Project established with CSIRO, Deakin University and Hong Kong Polytechnic University.

R&D Investments	KPIs	Measure of Success
A new project to validate Cottonspec; a program for predicting yarn fibre quality	Project commissioned to evaluate Cottonspec in one or more international mills	***Achieved.*** Cottonspec has been assessed across several international mills to demonstrate how best to use Australian cotton in the production of quality yarns.
Continued study of agronomic management to optimise textile performance	Extension of results to industry demonstrating best practice in agronomic management to maintain high quality	***Achieved.*** Research finding from three-year study on key agronomic factors affecting fibre quality have been published and presented to industry.
A continuation of the Premium Cotton Initiative including spinning trials	PCI project established and results prepared for extension to international spinners of Australian cotton	***Achieved.*** International spinning trials continued with selected mills. Programs developed with selected brand owners to promote Premium Australian Cotton.
Further trial market developments with mills and brand owners to evaluate the competitive advantages of Australian cotton	Trial cotton and cotton/wool blend products tested in Australian and International markets	***Achieved.*** Programs developed with selected brand owners to promote Premium Australian Cotton. Collaborative arrangements established for developing future projects with mills in assessing cotton/wool blends.
A pilot study to develop and monitor of raw cotton, yarn and textile indices relevant to Australian cotton	Textile indices pilot study established and results evaluated by industry	***Achieved.*** International surveys of mills and brand owners has collected preliminary data on growth markets in the apparel sector. Specific fabric markets have been estimated from data collected on yarn production. Targeted fabric market assessment yet to be completed.
Strategic Objective 3 Facilitate the development of novel products		
Completion of surveys with key international mills on the use of Australian cotton	Final reports on mills surveys completed and results discussed with industry	***Achieved:*** Surveys completed and presentation to industry made.
A commissioned collaborative project to investigate cotton and cotton blend fabrics with directional water transfer and/or other novel new properties	New collaborative project to develop cotton fabrics with novel properties established.	***Not proceeding*:** Discussions with commercial partners indicated limited commercial interest in water transfer technology as this time.
The above commissioned project will create new partnerships	New partnerships established in development or assessment of nanotechnology	**Achieved:** Although no project established, a number of new partnership have been developed for further assessment of related nanotechnologies.
Strategic Objective 4 *Advance cotton product processing*		
At least one forum with industry stakeholders and researchers to review R&D results and identify new opportunities for Australian cotton	At least one forum held, new opportunities identified	***Achieved.*** Value Chain forum in August 2010 covered all aspects of production and processing.

R&D Investments	KPIs	Measure of Success
A continuation of industrial testing and commercial development of moisture and contamination sensors	Reports demonstrating commercial potential for improved moisture and contamination sensors.	***Achieved.*** Novel moisture sensor technology has been developed and commercial scale assessment completed. Prototype contamination sensor has been developed and shown to detect foreign material in raw cotton.
Completion of Ginning BMP development and implementation	Report demonstrating increased adoption of ginning BMPs in Australian cotton gins	***Achieved.*** Independent ginning Audits have been complete across all gins in 2010. BMP practices have been adopted across the majority of gins. Audits to continue in 2011.
Ongoing support to ensure high standards for the classification of cotton are maintained	Evidence that the standards of Australian classing facilities are maintained at the highest level	***Achieved.*** Classing BMPs have been completed and independent audits conducted. Classing houses take part in ITMF testing program for assessment of testing standards.
Further development and initial implementation of warehousing and despatch Best Management Practice	Project to complete development of warehousing BMPs established.	***Achieved.*** Draft BMPs have been developed for cotton transport and warehousing. Initial testing of BMPs will be completed in 2011.
Strategic Objective 5 Develop objective measurement of Australian cotton fibre		
Several investments contribute: Premium Cotton Initiative; validation of Cottonspec; and commercialisation of Cottonscan and SiroMat	An improved capacity to integrate several tools and methods to better demonstrate the textile qualities and values of Australian cotton fibre	***Achieved.*** Commercialisation of Cottonscan completed. Cottonspec tested in Chinese mills and business plan under development.
Support for the commercialisation of Cottonscan and SiroMat instruments	Commercialisation pathway for both instruments is finalised.	***Achieved.*** Siromat and Cottonscan technologies combined into Cottonscope. Commercial partner has developed and promoted Cottonscan in Australian classing houses and international mills.

Program Two: Farming Systems

R&D Investments	KPIs	Measure of success
Strategic Objective 1 Build the industry's understanding of climate and natural resources challenges		
Participation in ongoing work under the Climate Change Research Strategy for Primary Industries (CCRSI)	CCRSPI continues to provide strategic direction and coordination	***Achieved.***
A new project to investigate improving prediction of cotton growth and production in a changing climate	PhD student identified, project established	***Achieved.*** PhD student Katie Broughton has commenced this project.

R&D Investments	KPIs	Measure of success
A new commissioned project to improve capacity to assess greenhouse gas emissions from broadacre irrigated cropping systems	Post-doc identified, project established	***Achieved.*** CSIRO post-doc Ben Macdonald appointed and project established
A new project to develop a protocol for assessing on-farm energy use and associated greenhouse gas emissions	Project established and case study sites identified	***Achieved.***
Strategic Objective 2 Enhance the capacity of the industry to adopt resilient and adaptive farming systems		
Further application of systems thinking to map key leverage points for improving farming systems knowledge	Key leverage points assessed	***Not achieved*** due to season's extraordinary conditions.
A new project to establish a social, economic, environmental performance information repository and a reporting framework for the cotton industry	Project established and key Triple Bottom Line performance data identified and collected	***Achieved.*** Data forming basis for both peer reviewed and 'layperson' journal articles.
Ongoing work to benchmark cotton and grains water use efficiencies	Reports showing cotton and grains water benchmark data	***Achieved.*** Data reported at 15th Australian Cotton Conference.
A continuation of the Crop Consultants Association post season survey series	Survey results analysed and reported to industry and more widely	***Underway.*** 2009 survey analysed and disseminated, 2010 survey undergoing analysis.
Additional resources to support completion of the Burdekin cotton feasibility study	Annual reviews to report progress	***Achieved***. Additional resources enabled more comprehensive monitoring of nitrogen movement in soil and water during the wet season. Research progress reported at the annual NORCOM review.
A new project to investigate applying plant-based measurements for irrigation in water limited environments	Project established with co-investment from Cotton Inc., post-doc identified, project established	***Underway.*** Negotiations with international partners took longer than expected – project will commence in 2011–12.
A new commissioned project to investigate optimal irrigation of cotton via real-time adaptive control	Project established	***Achieved.***
Finalisation of an investigation on Deep Drainage Under Irrigated Cotton - Surface & Groundwater Implications	A report to industry detailing the implications of deep drainage on surface and groundwater	***Underway.*** Project completed – four years' research being compiled into single report.
Continuing research into farming systems aiming to maintain profitability and soil quality	A report demonstrating key farming systems management options to maintain profitability and reduce environmental impact	***Achieved.*** Comprehensive report contains over a decade of data.

R&D Investments	KPIs	Measure of success
Ongoing research into the development of dynamic deficits-matching irrigation to plant requirements in a variable climate	Reports showing the potential for dynamic deficits to improve water use efficiencies	***Achieved.*** Improved capacity to model cotton response to irrigation regimes.
A new project to develop a protocol for assessing on-farm energy use and associated greenhouse gas emissions	Project established and case study sites identified	***Achieved.***
Ongoing research to define critical soil nutrient concentrations in soils supporting irrigated cotton in Northern NSW & Queensland	Reports identifying the range of critical soil nutrient concentrations in cotton growing soils	***Achieved.*** Project managed by GRDC.
A new commissioned project to encourage cotton systems that are nutrient-efficient and promote healthy soil	Evidence that the knowledge to improve nitrogen use efficiency is being adopted by the industry	***Achieved.*** Survey results show that growers are using practices that lower the risks of nitrogen losses from the cotton system, however results also indicate additional opportunities for further improvement in nitrogen use efficiency.
Ongoing support to building cotton and grain industry capacity to improve pesticide application and drift management	Evidence that drift damage incidents are declining	***Achieved.*** During the season there were no herbicide damage reports logged with Cotton Australia, the first time in five seasons that this has been the case.
Ongoing support for the *my*BMP system to enable linking of research, extension and BMP-Facilitation	Release of the new myBMP systems with improved access for R&D knowledge and resources	**Achieved.** *my*BMP launched, adoption on target, two farms audited.
Strategic Objective 3 Protect industry from biosecurity threats		
Completion of the first Cotton Biosecurity Manual	Biosecurity Manual successfully launched to the industry	***Achieved.*** Available at www.cottassist.crc.org.au.
New research projects for improving management of cotton diseases and disease surveillance	Projects established and disease survey results communicated to industry annually	***Achieved.***
Continuing research to develop capacity to manage cotton viral diseases	Report recommending areas for where improvements to the industry's viral disease preparedness can be made	***Achieved.*** Points to new collaborative research. Protocol trial proved robustness.
A commissioned project to investigate factors associated with the spread and incidence of Solenopsis Mealy Bug	Project established	***Achieved.*** Project delayed by extraordinary seasonal conditions but now back on track.
A new project to investigate IPM for Silverleaf whitefly and emerging pests in central regions	Project established, evidence that silverleaf whitefly management is improving in central cotton regions	***Achieved,*** but low SLW rates during season did not allow for meaningful longitudinal data on improved management.

R&D Investments	KPIs	Measure of success
Continuing research to improve the management of mirids & stinkbugs in Bollgard II	Report with recommendations for improved management of mirids and stinkbugs	***Underway.*** Industry recommended thresholds for mirids have been revised in light of research findings, work continues on important stinkbug species.
A new project to provide Whitefly resistance monitoring 2010-2013	Project established and resistance results reported to industry at least annually	***Achieved.***
A continuing project to provide *Helicoverpa* spp. insecticide resistance: monitoring, management & esterase gene research	Resistance results reported at least annually	***Achieved.***
Continuing research to provide sustainable chemical control of mirids, aphids and two-spotted mites in cotton	Resistance results reported at least annually and implications for maintaining ongoing control analysed	***Achieved.***
A new project to support the commercialisation and develop new applications for fungal insecticides against cotton pests	Registration package submitted by commercial partner, research on new applications for biofungicide commenced	***Not achieved.*** Organism proved not suitable for registration but work continues on other promising organisms.
A new project to provide resistance monitoring of *Helicoverpa* spp. to *Bt* cotton	Resistance results reported regularly and implications discussed with industry	***Achieved.***
Ongoing research projects for managing weeds and herbicides in a genetically modified cotton farming system	Reports demonstrating improved management opportunities for weeds in GM systems	***Not achieved.*** Cost:benefit analysis proved unacceptably long pay-back time – work continues to shorten this.
A new project to revisit ecology of *Helicoverpa punctigera* in relation to migration, overwintering and implications for Bt resistance	PhD student identified, project established	***Achieved*** but initial trials destroyed by floods – re-established for new season.
A new project to examine ways to improve management of cotton refuges within the BMP framework	PhD student identified, project established	***Underway.*** PhD student, Kris Le Mottee appointed, project to commence 2011–12
Ongoing research to enhance the efficiency of Bt refuge crops within a changing cotton environment	Reports showing options for improving refuge efficiency	***Ongoing.*** Significant research efforts to date have not identified any management or alternative crop options that consistently improve refuge efficiency but effort continues.
Ongoing research into the flight characteristics of *Helicoverpa* spp in relation to the efficacy of transgenic cotton refuges	Interim reports	***Underway.*** PhD is underway, but significantly impacted by the Brisbane floods, with a year's preparation for experiments lost at UQ. Delays in completion of the study are expected.

Program Three: Human Capacity

Key R&D investments	KPIs	Outcome
Strategic Objective 1 Identify, understand and plan for future industry capacity needs		
Ongoing initiatives and needs analysis by the Professional Development Officer (Cotton)	Project established and key changes in the market for skills identified.	***Achieved.***
A commissioned project to develop approaches for human capacity assessment and benchmarking	Project established and interim benchmarking results reported.	***Achieved.***
A new commissioned project to study the relationship between the cotton industry and cotton communities 1996–2006	Reports identifying implications for demographic information to be used to benefit planning for future HR needs.	***Achieved.***
Completion of a vision for the Australian cotton industry	Vision finalised and supported by all key cotton industry organisations.	*Achieved***.**
A new project to develop to develop an on-farm environmental resources survey	Survey established and initial results reported.	***Achieved.***
Strategic Objective 2 Improve human resource development and capacity		
A new project to enable an educational tour of adaptability and innovation in other rural industries	Tour undertaken, results shared with cotton industry stakeholders.	Achieved.
A new pilot project to better understand career pathways into the cotton industry	Pilot project established, results evaluated and reported.	Achieved.
Cotton Australia Future Leaders Course 2009–10 finalisation and an evaluation of the impact of the course	Individual reports from participants provided, demonstrating the influence the course has had on their roles in the industry.	***Underway.*** Participants from courses 1 and 2 will report on outcomes at a general 'debrief' session in 2011.
Enhancement and development of e-Learning opportunities for BMP farm managers	Project established and e-Learning opportunities tested and evaluated.	***Not achieved – alternative strategy pursued.*** Project not established following industry panel review. Instead, several e-Learning tools were developed for testing in the cotton industry under Australian Flexible Learning Framework
A new commissioned project piloting a Cotton Agribusiness Engagement Strategy	Pilot project established and new pathways for engagement of agribusiness identified and tested.	***Not achieved.*** Following industry panel review, alternative strategy of agribusiness engagement in myBMP pursued successfully.

Key R&D investments	KPIs	Outcome
Ongoing support for the Cooperative Partnership for Farming and Fishing Occupational Health & Safety	Progress against the partnership strategic plan reported.	***Achieved.*** Year's objectives achieved by partnership.
A new project to share on-farm innovation to reduce the cost of cotton production in the Lower Namoi Valley	Grower group established, activities documented and results evaluated and reported	***Partially achieved.*** Increased crop production and local flooding has delayed planned activities to 2011–12 and project has been extended.
Strategic Objective 3 Enhance capacity to innovate		
A new project to establish a repository of social, economic and environmental performance information for the cotton industry	A new project to establish a repository of social and economic, environmental performance information for the cotton industry	***Achieved.*** In 2010–11, project focused on the 'Cotton Industry Water Story' and the impact of Cotton CRC activities.
Ongoing support for the Cotton Extension Officers in St George/Dirranbandi,	Multiple extension activities in the region in 2010–11	***Achieved.***
Ongoing support to deliver regional extension in Central Queensland farming systems and Darling Downs farming systems	Multiple extension activities in these regions in 2010–11	***Achieved.***
A new commissioned project to provide resources for the adoption of the *my*BMP program	Key adoption framework targets being met.	Achieved.
Support and planning for the third annual Big Day Out field day to highlight achievements of the 2010 Cotton Innovator of the Year	Big Day Out field day held; highlights documented for *Spotlight* and *The Australian Cottongrower*. High grower participation and positive feedback received.	***Achieved***, although weather conditions meant last minute change of date and focus (restricting attendance) and of focus.
A commissioned project to promote R&D results and outcomes at the 15th Australian Cotton Conference 2010	Evaluation of conference showing a high level of satisfaction from growers.	***Achieved.*** 98 per cent of delegates surveyed rated the conference as excellent or good.

APPENDIX THREE
ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PERFORMANCE

CRDC has integrated the principles of ecologically sustainable development under s.516A of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* into its planning framework and developed contributions to Strategic Plan Measures of Success within each program for the broader triple bottom line outputs contained in the CRDC Strategic R&D Plan 2008–2013. In line with this, the Annual Operating Plan 2009–10 was designed to ensure strategic research initiatives that provide measurable environmental, economic and social benefits to the cotton industry and the wider community.

The principles contained in the EPBC Act include:

- integrating long-term and short-term economic, environmental, social and equitable considerations into decision making processes;
- not using lack of full scientific certainty as a reason to postpone measures to prevent environmental degradation if there is the threat of serious or irreversible environmental damage; maintaining or enhancing the health, diversity and productivity of the environment for future generations;
- ensuring the conservation of biological diversity and ecological integrity is a fundamental consideration in decision-making; and,
- promoting valuation, pricing and incentive mechanisms.

Each of the three programs contains research investments that support these principles. Program One extends environmental sustainability and best practice beyond the farm gate into the areas of classing, ginning, and storage and handling.

Program Two contributes research that enhances on-farm sustainability and catchment health, and addresses the adaptation to, and mitigation of, climate change.

Program Three addresses the skills and education, health and wellbeing and economic sustainability of industry participants and cotton communities. Within this program, CRDC also addresses the development of the capacity of women, through support of Wincott (Women's Industry Network – Cotton) in particular, and indigenous participants (through investment in a school-based traineeship program, developed by CRDC with the help of the Aboriginal Employment Strategy and the Cotton Catchment Communities CRC), and farming families. The development of leadership skills for the industry and wider agricultural communities is a priority, with a high take up of these opportunities by women a notable feature in recent years.

To ensure sustainably produced cotton, CRDC developed, and continues to broaden and update, the cotton industry's environmental management system, Best Management Practices (BMP) which is now available as an interactive online program, *my*BMP. BMP facilitates continuous improvement in farm and environmental risk management throughout the value chain – 'from field to fabric'.

These environmental and social objectives also underpin the economic viability of the industry. Improvements in the efficient use of resources (water, nutritional supplements and chemicals), crop yields per hectare, and efficient farming methods aid the economic performance of cotton growers. A three-year contract with Crop Consultants Australia gathers on-farm information across the industry, which CRDC then analyses and which provides valuable guidance to future R&D directions.

APPENDIX FOUR
R&D PORTFOLIO

Contracted R&D organisations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ARLP	Australian Rural Leadership Foundation
BG	Bill Gordon Pty Ltd
CA	Cotton Australia
CCA	Crop Consultants Australia
CH	Collin Higgins Consultancy
CIF	CRC for Irrigation Futures
CRC	Cotton Catchment Communities CRC
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DU	Deakin University
DW	DW Consulting Services
GHD	GHD Pty Ltd
GMW	Goulburn-Murray Water
GRDC	Grains Research and Development Corporation
GS	Graham Spackman & Associates
IAL	Irrigation Australia Ltd
JCU	James Cook University
JS	Judith Stubbs & Associates
LNCGA	Lower Namoi Cotton Growers Association
NCEA	National Centre for Engineering in Agriculture
NSW DPI	NSW Department of Primary Industries
POLCRC	CRC for Polymers
QDEEDI	Queensland Department of Employment, Economic Development and Innovation
QUT	Queensland University of Technology
RIRDC	Rural Industries Research and Development Corporation
Roth R&R	Roth Regional & Rural
SARDI	South Australian Research and Development Institute
SRP	Soils Research Pty Ltd
TAC	Tocal Agricultural Centre
UA	University of Adelaide
UM	University of Melbourne
UNE	University of New England
UNSW	University of New South Wales
USQ	University of Southern Queensland
Wincott	Women in Cotton Network
WR	Western Rivers
WVG	West Australian Vegetable Growers Association

R&D investments 2010–11

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
Program One: VALUE CHAIN					
CMSE1101	Cotton scan commercialisation	CSIRO	Geoffrey Naylor	1/07/10	30/06/11
CMSE1102	Premium Cotton Initiative spinning trials	CSIRO	Rene Van der Sluijs	1/07/10	30/06/12
CMSE1103	Warehousing and Despatch Best Management Practice	CSIRO	Rene Van der Sluijs	1/07/10	30/06/12
CRC1004	Agronomic Management to Optimise Textile Performance	CRC	Mike Bange	1/07/09	30/06/12
CRC1008	Technical Support of SiroMat in the Australian Market	CSIRO	Stuart Gordon	1/07/09	30/06/11
CRC1009	Industrial testing and commercial development of moisture and contamination sensors	CSIRO	Stuart Gordon	1/07/09	30/06/12
CRC1114	Validation of Cottonspec: a program for predicting yarn fibre quality	CSIRO	Shouren Yang	1/07/10	30/06/12
CRDC1103	ACIC 69th Plenary meeting Lubbock	CA	Gregory Parle	1/07/10	30/06/11
DU1102	Development of low twist fine count yarns and fabrics from Australian long staple upland cotton	DU	Xungai Wang	1/07/10	30/06/13
RIRDC1101	Sustainable Food and Fibre Program Foundation Project	RIRDC		1/07/10	1/08/11
TFT0002	Commercialisation of Cotton Scan	CSIRO	Geoffrey Naylor	1/07/08	30/06/11
TFT0003	Classification of Cotton	CSIRO	Rene Van der Sluijs	1/07/08	30/06/11
TFT0903	Mills Survey	CSIRO	Rene Van der Sluijs	1/07/08	30/06/11
R&D Investment Program One					**$887,096**
Program Two: FARMING SYSTEMS					
02CRC011	Postgrad: Catchment scale risk assessment for agrochemicals	CRC	Mitchell Burns	1/01/08	30/06/11
03CRC003	Postgrad: Genetic Factors involved in pathogenicity of *Thielaviopsis basicola* towards cotton	CRC	Ali Getachew	7/01/07	1/07/11
03UA002	Significance, mechanism and new management strategies of inducible tolerance	UA	Otto Schmidt	11/01/07	31/12/10
BGC1001	Building industry capacity for continual improvement of application and drift management	BG	Bill Gordon	1/07/09	30/06/12
CCA1101	*Helicoverpa* egg collecting in cotton regions to support Bt and insecticide resistance monitoring	CCA	Fiona Anderson	1/07/10	30/06/13
CCA1102	Cotton bunchy top survey	CCA		23/05/11	30/09/11

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
CLW1101	Validate and extend the IrriGATEWAY irrigation management tools into the cotton industry	CSIRO	John Hornbuckle	1/07/10	30/06/11
CLW1102	Measuring and monitoring water quality and quantity under long term cotton/ wheat trials	CSIRO	Tony Nadelko	1/07/10	30/06/11
CRC1001	The Development of Sustainable Cotton Farming Systems for Coastal North Qld	CRC	Stephen Yeates	1/07/09	30/06/12
CRC1002	The Ecology and Sustainable Management of Soil Borne Fungal Diseases	CRC	Alison Seyb	1/07/09	30/06/12
CRC1002A	Diseases of Cotton 10	NSW DPI	Chris Anderson	1/07/10	30/06/13
CRC1003	Managing Weeds and Herbicides in a Genetically Modified Cotton Farming System	CRC	Graham Charles	1/07/09	30/06/12
CRC1005	Enhancing the efficiency of Bt refuge crops within a changing cotton environment,	CRC	Geoff Baker	1/07/09	30/06/12
CRC1006	Dynamic Deficits - matching Irrigation to Plant Requirements in a Variable Climate	CRC	Rose Brodrick	1/07/09	30/06/12
CRC1010	CCA Consultants Post Season and Grower Context Surveys (2008/09, 2009/10, 2010/11 seasons)	CRC	Amber Dimond	1/07/09	30/06/12
CRC1012	Collective NRM and socio economic scenarios in cotton communities	CRC	Olive Hood	15/08/09	14/08/12
CRC1015	PhD: Economic-environmental water trade-offs in the Namoi under climate change and variability	CRC	Alison Wilson	1/04/10	31/03/13
CRC1101	Improving prediction of cotton growth and production in a changing climate	CSIRO	Michael Bange	1/07/10	30/06/13
CRC1102	IPM for Silverleaf whitefly and emerging pests in central regions	CSIRO	Lewis Wilson	1/07/10	30/06/13
CRC1103	Improving ways to manage cotton refuges within the BMP framework	CSIRO	Mary Whitehouse	1/07/10	30/06/13
CRC1106	Completion of Burdekin Cotton Feasibility Study	QDEEDI	Paul Grundy	1/07/10	30/06/12
CRC1109	Ecology of *Helicoverpa punctigera* revisited: migration, overwintering and implications for Bt resistance	UNE	Peter Gregg	1/07/10	30/06/13
CRC1109A	PhD - Ecology of *Helicoverpa punctigera* revisited: migration, overwintering and implications for Bt resistance	UNE	Student TBA	1/07/10	30/06/13
CRC1115	Developing cotton systems that are nutrient-efficient and promote healthy soil	CSIRO	Ian Rochester	1/07/10	30/06/13

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
CRC1116	Molecular ecology of microbial functions involved in plant nutrition and greenhouse gas emissions in cotton farming systems	CRC	Gupta Vadakattu	1/07/10	30/06/13
CRC1117	Assessing greenhouse gas emissions from broadacre irrigated cropping systems	CRC	Jeff Baldock	1/07/10	30/06/13
CRC1119	Scientific Exchange: Professor Silvia Dorn	NSW DPI	Silvia Dorn	1/07/10	30/06/11
CRC1120	Correlating refuge attractiveness with productivity (Mary Whitehouse)	CSIRO	Mary Whitehouse	1/12/10	28/02/11
CRC139	Postgrad: Nutrient redistribution within cotton plants	CRC	Meredith Errington	1/10/07	30/06/11
CRC140	Postgrad: Getting the best out of gypsum and lime to combat sodicity in the Macquarie and Lachlan valleys	CRC	John Bennett	5/03/07	30/09/10
CRC146	Weed Management Strategies for Farming Systems with Herbicide Tolerant Cotton	CRC	Jeff Werth and David Thornby	7/01/08	30/6/11
CRC149	Deep Drainage Under Irrigated Cotton - Surface and Groundwater Implications	CRC	Thusitha Gunawardeena	7/01/08	30/06/11
CRC150	Maintaining Profitability and Soil Quality in Cotton Farming Systems III	CRC	Nilantha Hullugalle	1/07/08	30/06/11
CRC151	Development of A Quantitative Set of Enviro-Economic Sustainability Indicators	CRC	Angus Crossan	7/01/08	31/07/11
CRC155	Management of Mirids and Stinkbugs in Bollgard II	CRC	Moazzem Khan	7/01/08	30/06/11
CRC156	Linking Research, Extension and BMP-Facilitation	CRC	Sandra Deutscher	1/07/08	30/06/11
CRDC1006	The Strategic Decision of *my*BMP	CH	Stuart Higgins	1/07/09	31/08/10
CSE0801	Genomics of Helicoverpa armigera insecticide resistance (PhD)	CSE	Claire Farnsworth	1/03/09	28/02/12
CSE1103	Bt Resistance Monitoring	CSIRO	Sharon Downes	1/07/10	30/06/11
CSP1003	USDA Trip for BGII and pest management, Lewis Wilson	CSIRO	Lewis Wilson	1/05/10	31/10/10
CSP1105	Greenhouse Gas Field Measurement Equipment - trailer	QUT	Tony Nadelko	1/09/10	31/10/10
DAN1101	New Tools for IPM 1: Development of Fungal insecticides against cotton pests	NSW DPI	Robert Mensah	1/07/10	30/06/13
DAN1103	Capital Item: Transformer and electricity outlets Field 6 ACRI	NSW DPI	Ken Nobilo	1/10/10	30/06/11
DAN196	*Helicoverpa* spp. Insecticide Resistance: Monitoring, Management and Esterase gene research	NSW DPI	Louise Rossiter	1/07/08	30/06/11

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
DAN197	Sustainable Chemical Control of Mirids, Aphids and TSM in cotton	NSW DPI	Grant Herron	1/07/08	30/06/11
DAQ0001	Developing the Capacity to Manage Cotton Viral Diseases	QDEEDI	Cherie Gambley	1/07/08	30/06/11
DAQ0002	Tobacco streak virus in cotton-scoping study	QDEEDI	Murray Sharman	1/07/08	30/06/11
DAQ1001	Defining critical soil nutrient concentrations in soils supporting irrigated cotton in Northern NSW and Queensland	GRDC	Mike Bell	1/07/09	30/06/12
DAQ1103	Fusarium wilt management	QDEEDI	Linda Smith	1/07/10	30/06/13
DAQ1104	Whitefly resistance monitoring 2010-2013	QDEEDI	Zara Ludgate	1/07/10	30/06/13
MON1101	Analysis of pesticide resistance study (co-investment with Monsanto)	UM/ Monsanto	Ian Gordon	1/07/10	30/06/11
NEC1101	A Protocol for Assessing On Farm Energy Use and Associated Greenhouse Gas Emissions	NCEA	Craig Baillie	1/07/10	30/06/13
QUT3	Greenhouse Gas Field Measurement Equipment	QUT	Peter Grace	25/06/10	30/09/10
RIRDC1102	Developing a National life cycle inventory database for Australian agriculture	RIRDC		30/06/11	30/06/13
SPA1101	Recovery of flooded cotton crops in CQ-Case studies	GS	Jamie Iker	16/02/11	31/08/11
SPA1101T	Travel: Recovery of flooded cotton crops in CQ-Case studies	QDEEDI	Paul Grundy and Steve Yeates	16/02/11	31/08/11
UA1101	Postgrad: The use of biological control agents in resistance management of Helicoverpa	UA	Otto Schmidt	1/07/10	30/06/11
UNSW1101	Travel: SAGEEP Conference, South Carolina, USA	UNSW	John Triantafilis	9/04/11	31/05/11
UQ1001	Flight characteristics of *Helicoverpa* spp. in relation to the efficacy of transgenic cotton refuges	UQ	Jason Callander	15/09/09	15/09/12
USQ1101	Optimal irrigation of cotton via real-time adaptive control	NCEA	Alison McCarthy	1/07/10	30/06/13
Total investment Program Two					**$4,852,947**
Program Three: HUMAN CAPACITY					
ABA1101	Sponsorship 2011 Science and Innovation Awards	ABARES	Award Recipient	1/07/10	30/06/11
CA1002	CottonMap	CA		1/07/10	30/06/11
CA1101	15th Australian Cotton Conference 2010	CA	Cleave Rogan	1/07/10	30/06/11

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
CRC1007	Cotton Field to Fabric Training Course,	CSIRO	Rene van der Sluijs	1/07/09	30/06/12
CRC1011	Delivering Regional Extension in Qld Farming Systems- Darling Downs	CRC	Duncan Weir	1/07/09	30/06/12
CRC1016	Primary Industry Centre for Scientific Education	CRC	David Russell	1/07/09	30/06/12
CRC1018	Adoption of my BMP - General Manager: Best Practice and research implementation	CRC	Ken Flower	1/07/10	31/06/12
CRC1104	Studying the Relationship Between the Cotton Industry and Cotton Communities 1996-2006	JS	Judith Stubbs	1/07/10	30/06/11
CRC1105	Sharing on-farm innovation to reduce the cost of cotton prod in the Lower Namoi	LNCGA	Philip Firth	1/07/10	30/06/11
CRC1107	Career pathways into the cotton industry	QDEEDI	John Martin	1/07/10	30/06/11
CRC1108	Social, economic, environmental performance information repository and reporting for the cotton industry	Roth R&R	Guy Roth	1/07/10	30/06/13
CRC1110	St. George / Dirranbandi Cotton Extension Officer	WR	Dallas King	1/07/10	30/06/13
CRC1111	Target Lead Pest Management and Macquarie local delivery	CRC	Sally Seeney	1/07/10	31/6/12
CRC1112	Target Lead Weed Management, New Growers and Southern local delivery	CRC	James Hill	1/07/10	31/6/12
CRC1118	Schools Cotton Course	CRC		1/10/10	31/10/10
CRC1121	Sponsorship 2011 Sustaining Rural Communities Conference	CRC		1/07/10	30/06/11
CRC147	National Cotton Training Coordinator	CRC	Mark Hickman	7/01/08	30/06/11
CRC148	Delivering Regional Extension in Qld Farming Systems - Central Queensland	CRC	Susan Maas	7/01/08	30/06/11
CRDC1101	Cotton Sector RD&E Plan	GHD	Jan Paul Van Moort	1/07/10	30/09/10
CRDC1102	Scholarship to UNE Cotton Production Course	Lightfoot, Jayne	Jayne Lightfoot	1/07/10	30/06/12
CRDC1104	Attend Kondinin Group's farming ahead conference Sydney	CA	Lyndon Mulligan	1/09/10	3/09/10
CRDC1105	Scholarship to UNE Cotton Production Course	Gray, Trevor	Trevor Gray	1/01/11	31/12/13
CRDC1106	Scholarship to UNE Cotton Production Course	Sandow, Thomas	Thomas Sandow	1/01/11	31/12/13
CRDC1107	Scholarship to UNE Cotton Production Course	O'Keeffe, Kieran	Kieran O'Keeffe	1/01/11	31/12/13
CRDC1108	Scholarship to UNE Cotton Production Course	Goodhew, Nicholas	Nicholas Goodhew	1/01/11	31/12/13

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
CRDC1109	Big Day Out - Warren (June 2011)	CRDC	Tracey Leven	1/06/11	30/06/11
CRDC1110	Scholarship to UNE Cotton Production Course	Byrne, Rebecca	Rebecca Byrne	1/01/11	31/12/13
DAN1102	Human Capacity Assessment and Benchmarking	TAC	Charlie Bell	1/07/10	30/06/13
DWC1101	The role of agribusiness in communities of practice and cotton adoption strategy	DW	David Wigginton	1/07/10	30/06/11
RIR1101	ARLP Course 17	ARLP		1/07/10	30/06/12
RIRDC002	Farm Health and Safety New Joint Venture	RIRDC	Helen Moffet	1/07/08	30/06/12
RIRDC1001	Investing in Youth Undergraduate Studentship Program	RIRDC		1/01/10	31/12/14
RIRDC1103	Investing in Youth Undergraduate Studentship Program	RIRDC		1/01/11	31/12/15
WIN1101	On-farm environmental resources survey	Wincott	Barbara Grey	1/07/10	30/06/13
WIN1102	Educational tour of Rural Industries	Wincott	Coote Grey	1/07/10	30/06/13
Total Investment Program Three			**$1,071,620**		
Program Four: NATIONAL PROGRAM for SUSTAINABLE IRRIGATION					
USQ5024	Review of precision irrigation technologies and their applications	USQ	Rod Smith	1/07/08	28/02/11
SRD9	Impact of hydroponics irrigation in the citrus industry	SARDI	Jim Cox	1/05/07	1/04/10
GMW5034	Channel evaporation mitigation	GMW	Michelle Winter	1/07/08	31/03/11
UCQ5070	Optimising delivery & benefits of aerated irrigation water	UCQ	David Midmore	1/07/08	1/05/12
QPI5161	Increasing the resilience of Eastern Australian irrigation farm businesses	DAQ	Daniel Rodriguez	1/11/08	30/11/11
POL5067	New technologies to reduce evaporation from large water storages	POLCRC	David Solomon	1/01/10	30/11/11
SRP5026	Soil management for irrigated agriculture	SRP	Bruce Cockroft	1/07/08	1/05/11
CSE5029	Effect of changing irrigation strategies on biodiversity	CSE	Sue McIntyre	1/09/08	31/08/11
CIF5121	Managing soil salinity for wine quality	CIF	Robert Stevens	1/06/08	15/05/12
GHD5207	WA ground & surface water	GHD	Fionnuala Hannon	1/02/09	31/08/10
UNS5127	Quantifying surface/ground water exchange	UNSW	Ian Acworth	1/07/08	31/12/11
IAL1102	Irrigation Australia Ltd Conference sponsorship	IAL	Trevor Le Breton	1/07/10	30/06/11
WVG1001	Upskilling water managers	WVG	John Shannon	1/10/09	1/06/11
IAL4779	NPSI/IAL travel fellowship	IAL	Trevor Le Breton	1/07/08	1/12/10
IAL1001	NPSI/IAL travel fellowship	IAL	Trevor Le Breton	1/07/10	30/11/11

Project ID	Project	Organisation	Principal Researcher	Start Date	End Date
JCU1101	Scholarship	JCU	Jacl Kiki	29/11/10	21/01/11
USQ1101N	Scholarship	USQ	Samuel Ponce	1/12/10	28/02/11
UM1101	Scholarship	UM	Xiaobo Liu	30/11/10	1/03/11
UM1102	Scholarship	UM	Kevin Anthony	25/11/10	25/02/11
QLD4711	NPSI Impact survey	Qualdata	Gordon Stone	1/08/08	1/09/10
QLD1101	NPSI Impact survey	Qualdata	Jeff Coutts	25/11/10	31/05/11
UCW5208	Preparing irrigated agriculture for statutory and climate change	UCW	Mark Gibberd	15/01/09	31/03/11
GGA1101	Irrigation R&D future options	GGA	Garry Goucher	1/01/11	30/06/11
DAN5027	Tools to manage fertigation technologies in citrus orchards	NSW DPI	Michael Treeby	1/05/08	1/04/11
UAD25	Long term sustainability of precision irrigation	UA	Rob Murray	1/01/06	30/06/11
DAN5162	Water Smart in cotton & grains NSW	NSW DPI	Janelle Montgomery	31/10/08	1/11/11
R&D Investment Program Four					**$227,947**

Total R&D Investment Portfolio 2010–11	$7,039,610

APPENDIX FIVE
ACRONYMS AND TERMINOLOGY

AACC	Australian Agricultural Colleges Corporation
AANRO	Australian Agricultural and Natural Resources Online Database
ABARE	Australian Bureau of Agricultural and Resource Economics (*now ABARES – see below)*
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACEC	Australian Cotton Exhibition Centre
ACGRA	Australian Cotton Growers' Research Association (now merged with Cotton Australia)
ACIC	Australian Cotton Industry Council
ACIPA	Australian Centre for Intellectual Property in Agriculture
ACGRA	Australian Cotton Growers Research Association
ACRI	Australian Cotton Research Institute
ACSA	Australian Cotton Shippers Association
AES	Aboriginal Employment Strategy
ai/ha	Active ingredient per hectare
ANAO	Australian National Audit Office
ANCID	Australian National Committee on Irrigation and Drainage
APVMA	Australian Pesticides and Veterinary Medicines Authority
ARLP	Australian Rural Leadership Program
AWAF	Department of Agriculture and Food, Western Australia
AWM	Area Wide Management
Bollgard II®	Cotton varieties contain two genes resistant to *Helicoverpa* spp.
BMP	Best Management Practices program
BRS	Bureau of Rural Sciences
Bt	Bacillus thuringiensis (crystal protein gene expressed in INGARD® and Bollgard II® cotton varieties
CA	Cotton Australia
CAC Act	Commonwealth Authorities and Companies Act 1997
CCA	Crop Consultants Australia Inc. (formerly Cotton Consultants Australia Inc.)
CCRSPI	National Climate Change Research Strategy for Primary Industries
Cotton CRC	Cotton Catchment Communities Cooperative Research Centre
CMA	Catchment Management Authority
CMSE	CSIRO Materials Science and Engineering
CPRS	Carbon Pollution Reduction Scheme
CRC	Cooperative Research Centre
Corporation, the	Cotton Research and Development Corporation
CRDC	Cotton Research and Development Corporation
CRRDCC	Council of Rural Research & Development Corporations' Chairs
CSD	Cotton Seed Distributors Ltd (a grower-owned cooperative)

CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVCB	Cooperative Venture for Capacity Building
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DECCW	NSW Department of Environment, Climate Change and Water
DEEDI	Queensland Department of Employment, Economic Development and Innovation
DERM	Queensland Department of Environment and Resource Management
DOFD	Australian Government Department of Finance and Deregulation
EIQ	Environmental Impact Quotient
e-Learning	On-line learning, training and education
EM	Electromagnetic conductivity
EPOI	Environmental Performance Indicator
ESD	Ecologically Sustainable Development
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
FH&SJV	Farm Health & Safety Joint Venture
F Rank	Measure of Fusarium wilt resistance
FRDC	Fisheries Research and Development Corporation
GM	Genetically modified
GMAC	Genetic Manipulation Advisory Committee
GOA	Groundrig Operators Association
GRDC	Grains Research and Development Corporation
HAL	Horticulture Australia Ltd
ha.	Hectare
Helicoverpa spp.	Cotton's major insect pests (*H. armigera* and *H. punctigera*)
Heliothis	Insect pest, more properly known as *Helicoverpa* spp. (see above)
I&I NSW	Industry & Investment NSW
IBP	Industry Biosecurity Plan
ICAC	International Cotton Advisory Committee
IP	Intellectual Property
IDM	Integrated Disease Management
Irrigation deficit	Millimetres of plant-available soil water removed at the time of irrigation
INGARD®	Cotton varieties containing one gene of resistance to *Helicoverpa* spp. *(ceased use in 2004)*
IPM	Integrated Pest Management
IRMS	Insecticide Resistance Management Strategy
ISO	International Organisation for Standardisation
IWM	Integrated Weed Management
IWUI	Irrigation Water Use Index

KPI	Key Performance Indicator (measure of success)
LCA	Life Cycle Assessment
LWA	Land and Water Australia *(ceased operations in 2009)*
MLA	Meat and Livestock Australia
MP	Member of Parliament
NCEA	National Centre for Engineering in Agriculture, University of Southern Queensland
NFF	National Farmers' Federation
NHT	Natural Heritage Trust (Australian Government)
NIPI	National Insect Pest Initiative
NPSI	National Program for Sustainable Irrigation
NRM	Natural Resource Management
NSW DPI	NSW Department of Primary Industries *(formerly part of Industry & Investment NSW)*
NUEI	Nitrogen Use Efficiency Index
OGTR	Office of the Gene Technology Regulator
OHS	Occupational health and safety
PICSE	National Primary Industry Centre for Science Education
PISC	Primary Industries Standing Committee
PIERD Act	Primary Industries and Energy Research and Development Act 1989
Pima cotton	*Gossypium barbardense*. Related to Egyptian cotton, having extra long and fine staples. Limited Australian production.
QDEEDI	Queensland *Department of Employment, Economic Development and Innovation)*
QFF	Queensland Farmers ' Federation
QUT	Queensland University of Technology
RDC	Rural Research and Development Corporation
RIRDC	Rural Industries Research and Development Corporation
RMP	Resistance Management Plan
RRDCC	Rural Research and Development Chairs' Committee
SFF	Sustainable Farm Families
SJV	San Joaquin Valley (California): the industry benchmark in the international marketplace
SLW	Silverleaf whitefly
spp.	species
SRDC	Sugar Research and Development Corporation
TIMS Committee	Transgenic and Insect Management Strategy Committee
'Upland' cotton	*Gossypium hirsutum*. Comprises the vast majority of the Australian cotton crop, with Pima cotton *(see above)* comprising the remainder
Wincott	Women's Industry Network – Cotton
WUE	Water use efficiency

APPENDIX SIX
LEGISLATIVE COMPLIANCE INDEX

Commonwealth Authorities and Companies Act 1997, section 9

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Preliminary	
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Primary Industries and Energy Research and Development Act, Section 28

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