

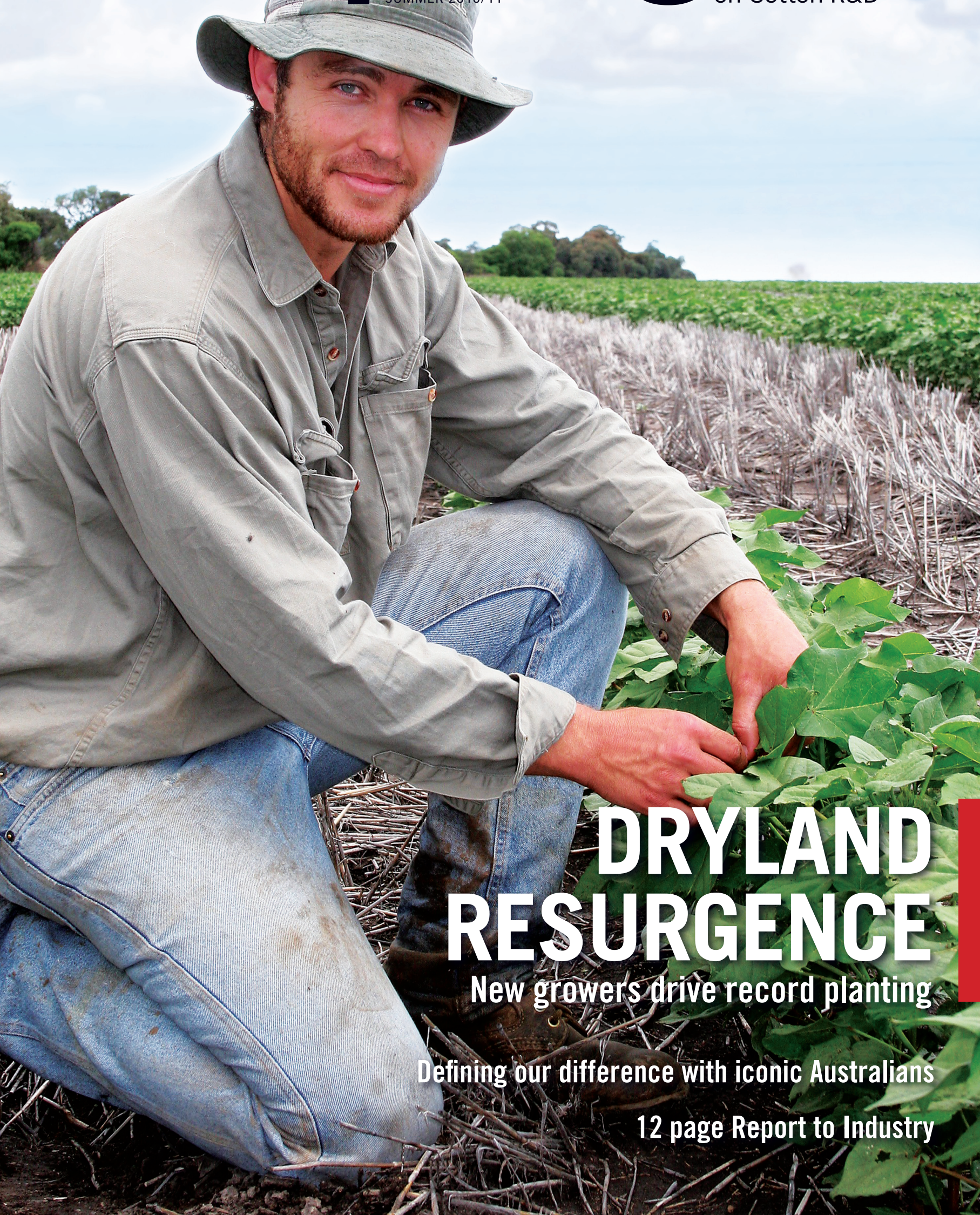
COTTON RESEARCH & DEVELOPMENT CORPORATION



# Spotlight

SUMMER 2010/11

on Cotton R&D



## DRYLAND RESURGENCE

New growers drive record planting

Defining our difference with iconic Australians

12 page Report to Industry

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**COVER IMAGE: Oscar Pearse will grow cotton for the first time this year, one of many new growers who have contributed to a record planting.**

PHOTO MELANIE JENSON.



p.12 Volunteers are a major cause for concern in the war on pests

## IN THE SPOTLIGHT



As this edition of *Spotlight* goes to print, the Australian cotton industry enjoys a rare high point of high prices coupled with high rainfall and high dam levels. This has led to a greatly enlarged

planted area, a fact which brings many new challenges. Severely damaged winter crops will certainly impact strongly on all producers and many new cotton crops seem likely to go the same way so here's hoping the high tides abate soon.

In this edition we outline how CRDC and its partners are working to gain new markets for new premium varieties of cotton and cotton grown under Best Management Practices.

One particular investment partnership is the Premium Cotton Initiative, which in a bold move has aimed to provide 100 percent premium Australian cotton to Australian companies for use in their products – a move not seen since the industry began. Added to this has been the quest to capitalise on our Best Management Practice and use this as a marketing tool. It is through these companies we are seeking to define or differentiate our cotton in a market dominated by imported fibre and off-shore manufacture.

Australians supporting Australians may have seemed a 'pie in the sky' idea, but it has become a reality through the 100 percent Australian cotton shirts being sold through Fletcher Jones, the company that is the namesake of its founder.

Next year two more iconic Australian brands - Dri-Glo and Koala Blue will begin marketing 100 percent Premium Australian

**“Australians supporting Australians may have seemed a 'pie in the sky' idea, but it has become a reality...”**

and BMP homewear to Australians.

The cotton industry should be extremely proud of the efforts of all those who have worked to see this to fruition in such a short time and we share these stories with you here.

It has also been extremely pleasing to see the number of growers entering the industry for the first time this season and we welcome them wholeheartedly and offer our support and guidance. While cotton planting may have been outrightly 'opportunistic' for many this year due to price and good season, it is these new growers who will help maintain the strength, diversity and vibrancy of the industry going forward.

We have provided information in this edition for these new and returning growers we hope will help make their cotton growing experience an easier and more profitable one.

While the wonderful rain brings blessings it also brings its own unique sets of challenges which the industry information and support services are willing to support as much as they can. Pests, low temperatures and less sunlight hours can adversely affect crops, but these issues can be overcome. Experts in their respective fields have joined forces to provide some advice to deal with these challenges. Please feel free to contact the people mentioned in the articles in *Spotlight* when you need additional advice or support.

CRDC's Annual Report has recently been approved by the Minister for Agriculture Senator Joe Ludwig. As in previous years, we have provided in *Spotlight* the Annual Report to Industry – which is a condensed version of the 175-page Annual Report. It is full of useful information for the industry, and we hope you enjoy the read and catching up on what CRDC investment is bringing to the industry, which is enjoying one of the best starts to a season on record. CRDC Annual Reports are available to download or read directly from the CRDC website [www.crdc.com.au](http://www.crdc.com.au)



**Australian Government**  
**Cotton Research and Development Corporation**

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**Our mission:** Invest and provide leadership in research, innovation, knowledge creation and transfer.

**Our 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.

**Corporate background:** CRDC was established in 1990 under the Primary Industries and Energy Research and Development Act 1989 (PIERD Act.) which outlines its accountability to the Australian Government and to the cotton industry through the Cotton Australia. CRDC is responsible to the Australian Government through the Minister for Agriculture, Fisheries and Forestry, Joe Ludwig. CRDC is committed to fulfil its legislated charter to: Invest in and manage an extensive portfolio of research, development and extension projects to enhance the ecological, social and economic values associated with cotton production systems and to benefit cotton industry participants, regional communities and the Australian community.

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### STOP PRESS...STOP PRESS...STOP PRESS...STOP PRESS...

Applications for CRDC scholarships to The University of New England Cotton Production Course close January 29 2011. Cotton growers, consultants, trainees, agronomists, cotton processors, researchers and existing students can apply for the scholarship. Study can be undertaken at home over a one to two year period, dependent on personal or time commitments, with each module requiring a short residential school of three to four days. For more information contact Bruce Pyke, CRDC, 02 6792 4088.



# ICONIC BRANDS WARM TO AN AUSSIE-GROWN STORY

THE 'AUSTRALIAN MADE' STORY IS MOVING UP A NEW LEVEL BY ADDING THE 'AUSTRALIAN-GROWN' TAG AS WELL.

**A**ustralian Weaving Mills' Dri-Glo towel range is one of Australia's leading iconic home-wear brands. Having been made in Australia since the 1930, AWM is adding another chapter to its 'Australian story' through involvement with the Australian cotton industry.

It seems fitting that the only company to manufacture towels in Australia is rediscovering the magic of local manufacture and the great story of Australian cotton production.

Through the Premium Cotton Initiative (PCI), a project supported by CRDC, Cotton Australia, Australian Cotton Shippers Association (ACSA), CSIRO and Cotton Seed Distributors, AWM has already produced the first batch of 100 percent Australian Premium Cotton towels – made from the premium variety Sicala 350B and grown using best management practices at St George, Queensland.

Retailing will commence in 2011 after the towels were on display for the first time at the Australian Cotton Conference in August. The range has been pitched to retailers and the response was 'fantastic' according to AWM Marketing Manager Bronwyn Morgan. She says the company hopes to bring its 'Australian Made' story up to a new level, by adding the 'Australian-grown' tag as well.

Bronwyn applauded the Premium Cotton Initiative and the industry as a whole for seeing this initiative to fruition.

"We are the last Australian manufacturer of towels, so the Australian-grown concept goes hand in hand with this," she said.

"In terms of marketing, it is a massive task to educate consumers, however the PCI gave us a walk up start, as Australian cotton is already a



**"Being able to honestly feature Glenn Rogan in our campaign consolidates the 'grass roots' angle of the products and is a real story to tell that we feel Australians can relate to."**

well-known commodity.

"We could introduce Australian cotton into our products without having to do the consumer education."

The concept of an all-Australian cotton product is not new to AWM.

"Years ago we looked at a collaboration with the cotton industry using Australian cotton, but the signals we were getting was that there was too much fragmentation.

"However through the PCI, we could see that collaboratively the industry wanted to make changes regarding branding, marketing and supply and this gave us confidence to go ahead this time.

"Even though there are different cotton industry bodies involved they work well together – with a 'can do' attitude."

Traceability is also a concept

becoming more important to consumers in today's marketplace and Bronwyn's own market research shows this.

"Consumers want to trust a product and if you can show your product has real honesty - like the iconic Dri-Glo brand does - we're not about to go putting something into our product our consumers can't trust," she explains.

"Being able to honestly feature Glenn Rogan in our campaign consolidates the 'grass roots' angle of the products and is a real story to tell that we feel Australians can relate to.

"They will know what this product 'honestly' is - that is where this traceability we now have is important."

This traceability and honesty will also be translated to the range of 100 percent Australian BMP cotton Koala Blue bed linen range, also manufactured by AWM, which will go on sale in March next year.

This has also come about due to the PCI initiative.

Koala Blue is the brainchild of pop superstar Olivia Newton-John and Pat Farrar, and has an ethical, healthy brand positioning.

"Olivia and Pat will only endorse products that are boldly Australian and environmentally sustainable, hence the use of BMP Australian cotton in these products," Bronwyn said.

"We also hope to have Olivia encourage other farmers to also get on board with BMP, to promote the benefits to environment and sustainable farming."

With things moving rapidly ahead on the manufacturing side, the industry must now focus on providing enough Premium and BMP cotton to meet AWM's demand.

"The enthusiasm and commitment already shown by the cotton industry needs to continue to give this initiative the longevity it really needs," Bronwyn says.

"We have invested heavily in this initiative and now what we need is to have surety of supply.

"At the moment we are relying on cotton grown this season for next year's product launches."

PCI Chair Pete Johnson said he was currently working to identify growers with Sicala-340BRF to meet the demand created through the initiative.

"As Sicala 340BRF is most likely to meet the specifications required for the new Australian Long Staple (ALS) standards, I encourage growers with any planted to let me know," he said.

"Individual ACSA members have already entered contracts for supply



**Bronwyn caught up with Glenn Rogan at the cotton conference, illustrating that the cotton production chain has become very well linked, a key aim of the PCI and the CRDC Value Chain Program. "This was a first not just for me, but also for Glenn, as I asked him had he ever seen a product made from his cotton and he said no, so this was certainly a new experience for us. Together we have linked the supply chain so well that I (manufacturer) could be there standing next to the grower," Bronwyn muses.**

of more than 1000 bales of ALS/BMP (Premium) cotton for shipment in 2011.

"We are also encouraging brand-owners and spinning mills to enter forward supply arrangements to meet their commercial requirements in order to avoid disappointment in a tight global supply situation - despite the fact we have a much larger Australian crop."

Looking even further ahead, Bronwyn Morgan says a spinning mill in Australia would be 'ideal' to complete the 100 percent Australian story, and also because cotton spun overseas adds complexity to the supply chain for AWM.

"It would be fantastic to one day to

have a spinning mill here," Bronwyn said.

"It would also mean the supply chain was completely linked in Australia and we would be faster to market allowing us to manufacture closer to consumer demand."

The Dri-Glo towels will be available in September 2011 with planned distribution of Myer, David Jones, Spotlight, Harris Scarf, Pillow Talk, specialty stores and on-line. The Koala Blue range will be available in stores from March. 

*For more information on the PCI and how to be involved, contact CRDC or Pete Johnson 0409 893 139, mailto: [petejohnson@leftfieldsolutions.com.au](mailto:petejohnson@leftfieldsolutions.com.au)*



# PREMIUM COTTON EXCITES LOCAL AND INTERNATIONAL CUSTOMERS

THE PREMIUM COTTON INITIATIVE HAS LED TO A REALISATION OF MARKET OPPORTUNITIES FOR NEW PREMIUM QUALITY COTTON VARIETIES AND BMP COTTON, WITH THREE ICONIC AUSTRALIAN BRANDS ALREADY ON BOARD.

The Premium Cotton Initiative (PCI) began in 2008 as a project under the CRDC Value Chain Investment Program, and is supported by Cotton Australia and Australian Cotton Shippers Association. The initiative has a strong collaborative network in the industry that includes CSIRO textile technologists and plant breeders, Cotton Seed Distributors as suppliers of the premium variety seeds. Many growers are involved through trials of the premium varieties Sicala 340BRF and its predecessor Sicala 350B.

Dallas Gibb manages the CRDC Value Chain investment portfolio, and with former ACSA Chair Pete Johnson, now PCI chair, much has been achieved in a short time to secure these markets for Australia's Premium and BMP-certified cotton fibre.

Much of the task centred around ascertaining the true capabilities of premium Australian fibre. This has required close involvement along the value-chain with growers through to spinners, mills, manufacturers and retailers.

"The catalyst for the Initiative was the introduction of Sicala 350B and the need to prepare markets for an increased adoption of successive higher yielding premium quality varieties such as Sicala 340BRF," Pete Johnson says.

"The PCI's aim was that if a new premium class of cotton could be defined, it should be marketed not just as a commodity but as a separate premium line of cotton.

"This product 'differentiation' has been an involved process, first to explore and 'define' why our product is 'better' and most importantly, how to convey this to the consumer."

Mill trials and customer surveys have identified a minimum specification of 1-1/4" staple and 32GPT strength to produce premium yarns. This cotton is now readily produced from a number of seed varieties – particularly CSD's Sicala 340BRF.

The PCI has been working with a

number of commercial partners to define this product as Australian Long Staple (ALS) cotton, and the Australian Cotton Shippers Association has actively been promoting the traits and performance data to a wide audience of spinning mill customers.

Dallas Gibb said in defining a new premium class of cotton, it was recognised that the industry's BMP program also provided a range of tangible and intangible benefits for the promotion of Australian cotton, so it is important for BMP to be an inherent component of any Premium class of cotton.

"The PCI has achieved its major aims, having established links with a number of local brand owners to promote Australian cotton and BMP cotton to consumers. The Australian brand owner, Fletcher Jones, and manufacturer, Australian Weaving Mills, have launched products in 2010 under a new premium 100 percent Australian cotton/BMP brand," Dallas said.

Labels developed by the industry were the first major promotion of the new premium cotton together with BMP to consumers in Australia.

They include the slogans "Who grows cotton that's as gentle on your skin as it is on the environment?" and "Premium Australian Cotton - Cotton without Compromise".

Internationally the PCI program has been promoted to a range of mills, with links to a number of brandowners who work across the European, Asian and US markets. Dallas says international promotion is critical to create future demand for Premium (ALS and BMP) Australian cotton and purely BMP cotton.

Initial promotional efforts included activities with mills in China and India.

"In some cases this included working with staff from Australian Wool Innovation based out of Hong Kong," Dallas said.



"This promotion has led to initial orders for ALS and BMP cotton.

"Feedback from mill partners has demonstrated that some international brandowners see value in promotion of Australian cotton and its production systems based on BMP.

"The Australian story provides a new message for use by brandowners that the industry needs to capitalise on.

"Working with mills to give us the capacity to promote the message to brandowners is critical."

On the domestic front, building on the success of the partnerships with AWM and Fletcher Jones, the industry will work with further brand owners in other non-competing market segments. The PCI team are currently putting together a 'portfolio' of fabric / garment samples to assist with further promotions.

Pete Johnson is also working with ACSA members to identify growers with Sicala-340BRF, to meet current and future demands.

"As demand begins to grow, it will be critical to ensure continuity of supply of both Australian Long Staple and BMP cotton," Pete said.

"The challenge for the PCI is to develop sufficient demand to generate a viable market for what should be a premium fibre, while still ensuring there is more than adequate supply to satisfy customers."

Contact Pete Johnson, 0409 893 139 to advise if you have 340BRF in the ground.

Dallas Gibb says that international promotion is critical to create future demand for premium (Australian Long Staple) /BMP Australian cotton.



## Premium Australian Cotton Brand

Australia Long Staple cotton grown under Best Management Practice cotton farms (ie - ALS plus myBMP)

## Australian Cotton Brand

Australian cotton grown on Best Management Practice farms (ie myBMP)

# AN AUSTRALIAN STORY

FLETCHER JONES WAS A PIONEERING AUSTRALIAN, A ONE-MAN OUTFIT WHO BUILT A BUSINESS BASED ON THE PRINCIPLES OF QUALITY, WORKMANSHIP AND SERVICE.

Today, the company he founded is renewing its ties with rural Australia through the cotton industry and the production of shirts manufactured and branded as 100 percent Australian BMP cotton.

Through the Premium Cotton Initiative (PCI) the industry closely supports the Fletcher Jones company in its vision that “The quality of our garments reflects not just the quality of raw materials, but the qualities of the people who create them”.

Fletcher Jones’ range of long-sleeved shirts were produced using high quality 60Ne yarn spun from the 2009 crop of Australian Long Staple (ALS) Sicala 350B, grown in initial trials for the PCI by Glenn Rogan. The cotton was then spun by the Chinese company Esquel, who have also taken a close look at the Australian cotton industry with representatives visiting gins and farms earlier this year with members of the PCI. (See *Spotlight* Autumn 2010 <http://www.crdc.com.au/index.cfm?pageID=172>)

The shirts went into Fletcher Jones’ stores this year, and the response from customers has been one of amazement according to Fletcher Jones’ Menswear Designer, Arthur Thomasse. Quality and the traceability of the raw material that goes into them are the factors that have appealed to customers, he said.

“Feedback from store managers is that people notice the point of sale posters and swing tags, they stop to look at and feel the shirt,” he said.

“They are impressed with the quality by look and feel – but when they hear about the technology that has gone into creating this sustainable, high quality product they are amazed - and to be able to find out where in Australia the cotton for that shirt came from - it’s something we thought we would never be able to do.”



The impressive display in Fletcher Jones’ Melbourne store

**The quality of our garments reflects not just the quality of raw materials, but the qualities of the people who create them – it is the premium Australian cotton, together with the Australian BMP cotton production story that truly defines quality for brand owners and their consumers.**

This traceability aspect of the PCI helps give the product integrity and ‘honesty’ and the consumer peace of mind.

“People’s reaction was positive in that they can be assured they were paying for product that was the ‘real thing,’” Arthur said.

“This is a huge step forward for FJ and Australian cotton.

“Even though our production went offshore we want to support the Australian cotton industry because they are the best at what they do.

“This initiative allows Fletcher Jones to define our Australian-ness, our commitment to quality and sustainability - it reinforces our image.”

As it is with Australian Weaving Mills (AWM) and their iconic Dri-Glo brand, Fletcher Jones also has loyal customers to this Australian heritage brand – so to maintain their reputations for quality, superior quality raw materials must be sourced.

“We want to make sure it is all about the fibre,” Arthur said.

“We think it is time to attract a new customer while looking after our existing loyal customers.

“Fletcher Jones aims to give value back to the customer by providing superior quality at the same price as regular garments.”

Through closer collaboration between the cotton industry, retail and irrigation industry, Arthur feels the cotton industry could make its story more widely heard.

“I think to let people know about the research and development that has been undertaken to make gains in efficiency and sustainability, would be a great thing for the industry and as us as retailers, it would help customers be more reassured, which is of benefit to us all,” he said.

For more information contact:  
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<mailto:dallas@techmac.com.au>  
Australian Cotton Shippers Association  
[www.austcottonshippers.com.au](http://www.austcottonshippers.com.au)



# DRYLAND APPEAL DRIVES HIGH PREMIUM PLANTING

**THIS PLANTING SEASON THE DEMAND FOR VARIETIES WITH INHERENT PREMIUM FIBRE QUALITY ATTRIBUTES HAS BEEN STRONG, ACCORDING TO CSD'S GENERAL MANAGER STEVE AINSWORTH.**

CSD estimates that around 10,000 ha of the premium quality varieties has been planted this season by growers, with Sicala 340BRF being the major variety in this class in addition to a small area of ELS (Extra Long Staple) cotton in two Pima varieties.

"These new varieties complement our mainstream varieties such as Sicot 71BRF and Sicot 74BRF both of which have excellent fibre quality packages," Steve said.

"The level of interest in Sicala 340BRF is a very strong result for a new variety in its first year of release.

"This variety has been sought out because of its exceptional fibre quality

and its good fit into dryland cotton production whilst providing growers an upside potential to attract a premium return from the bales produced.

"The combination of good fibre quality and the incorporation of the Bollgard II and Roundup Ready Flex technology has been important contributing factors to the increased interest in dryland cotton.

"These two factors are helping to reduce production risks and fibre quality discounts."

In CSD's replicated variety trials last season Sicala 340BRF proved its adaptability in both irrigated and dryland cotton trials and importantly maintained its quality characteristics with exceptional fibre length and impressive fibre fineness and fibre maturity assessments.

Sicala 340BRF has helped to close the yield gap which existed in comparison with Sicala 350B.

"In CSD trials we have seen up to a 10 percent increase in comparative yield with Sicala 350B which is encouraging progress and we have assessed a very significant



ABOVE:  
Mark Cotter has planted Sicala 340BRF into dryland country this year near Biniguy, Northern NSW

LEFT:  
Steve Ainsworth

improvement in tolerance to fusarium wilt," Steve says.

"Sicala 340BRF's commercial debut has seen good demand from irrigated growers but the variety is really carving out a niche in the expanding dryland and limited water production environments.

"It is pleasing for CSD and CSIRO to be able to deliver such high quality varieties to Australian cotton growers and we look forward to seeing the value generated from such premium quality varieties being shared with growers to help grow this market segment for the long run."

# QUALITY ASSURANCE HAS GROWERS' ATTENTION

NOT ONLY HAS B&W AGRONOMIST CHRIS MAUNDER ADVISED SOME OF HIS CLIENTS TO GROW DRYLAND SICALA 340BRF, HE HAS PLANTED SOME HIMSELF AT "STRATHBOGIE", JUST SOUTH OF MOREE.



Chris says the popularity of the variety has been driven by a number of factors, but largely the availability of a higher fibre quality variety.

"The number one stumbling block for dryland growers in the past has been the risks associated with quality downgrades, but the advent of premium variety 340BRF and its precursor Sicala 350B has allayed many of those fears and is encouraging more farmers to plant.

"The choice to grow 340BRF in dryland isn't necessarily in an effort to attract premiums, it is more of a surety of quality issue, especially if it turns into a less than ideal season weather wise."

Traditionally always grown in the wide double skip configuration, Chris said new licensing arrangements introduced by Monsanto for an end-point royalty scheme has seen growers move to single skip (or two in – one out) as there is no cost advantage to growing these wide configurations now with the EPRS.

"Coupled with the superior fibre properties and improved yield of Sicala

340BRF, narrower configurations can be used without the risk of quality discounts," Chris said.

Mark and Millie Cotter, "Bonnie View" Biniguy are just one example. The Cotters have grown dryland cotton intermittently in the past, but are traditionally broadacre grain growers.

However after a three-year break, this year they have decided to grow 500 hectares of 340BRF in the single skip configuration after hearing about the positive results from CSD trials last year and because "there is more yield potential without the quality downgrades," Mark said.

The Cotters have also planted another 500 ha of cotton, made up of a smaller area of 340BRF planted in double skip configuration, which went in straight behind the headers who have recently finished the grain harvest at "Bonnie View".

The balance has been planted to 71BRF also in double skip configuration and a small area of Siokra 24BRF to "test its longer growing season traits for suitability in our farming system".

## PLEASE INTRODUCE YOURSELF...

If you are a new grower, or have a neighbour, associate or client who is new to cotton growing, CRDC encourages you to alert them to services available by registering with CRDC.

It is important for new and returning growers to have access to the latest information from research and development. There are several ways growers can register to make sure they are on mailing lists for publications such as Spotlight and are alerted to coming events. Go to the CRDC or Cotton CRC website to register, this information will be used strictly to add your name to the CRDC mailing list and so we can call you to make sure you are aware of how to access industry tools, knowledge and publications. (This information will not be made available for any commercial purposes).

In addition, registration with the Cotton Australia database gives access to a wide range of services from the industry's peak body.

<http://www.crdc.com.au>  
<http://www.cottoncrc.org.au>  
<http://www.cottonaustralia.org.au>





# THE FACE OF A NEW INDUSTRY

COTTON PLANTING SEED SALES AND INDUSTRY FEEDBACK POINTS TO ONE OF THE BIGGEST COTTON CROPS EVER PLANTED IN AUSTRALIA. BOTH NEW AND DRYLAND GROWERS ARE LEADING THE RESURGENCE.

**G**ood soil moisture profiles, an encouraging seasonal outlook, strong cotton prices and improvement to variety and technology options are reported as the key factors underpinning the industry's surge to dryland (rain-fed) cotton in 2010-11.

"We expected the dryland cotton area to be much greater than 100,000 hectares, which it is with around 250,000 - exceeding the largest dryland planting ever of 130,000 hectares," said Steve Ainsworth, Cotton Seed Distributors' General Manager.

In the Gwydir Valley yield potential for dryland cotton crops remains positive with good soil moisture profiles, crops planted in the ideal window and above average rainfall forecast for the production period according to B&W Rural Agronomist, Chris Maunder.

"The price is good and it looks good compared with other summer crop options," he said.

"Another reason for the increase in growers planting dryland cotton is that the technology available now, in particular Bollgard II and Roundup Ready Flex, makes it easier to grow than ever. Most of the dryland area will be Bollgard II with the mandatory 10 percent refuge."

Dryland cotton is only grown opportunistically in Central

Queensland due to the risk of inadequate moisture. DEEDI Extension Officer Susan Maas who is based in Emerald says this year's wet winter in the area has allowed a number of dryland growers to plant cotton for the first time in many years.

Even though advancements in the Australian cotton industry have made the crop less challenging to grow, growers need to keep abreast with latest technology and best management practices.

## Knowledge and skill become keys to success

Knowledge and skill building is ongoing for all growers, especially new growers. Cotton Industry Development and Delivery New Grower Specialist James Hill, says growers needing assistance can access an extensive range of services and resources through the cotton industry (see box next page).

One newcomer to the cotton industry is Oscar Pearse who began leasing country near Moree recently.

"We planted cotton for the first time because it makes a good rotation with our winter crops of chickpeas and wheat," Oscar said.

"Wheat was grown back to back previously in the paddock so there are



no disease worries. The other reason is that prices are good and there are good contracts being offered now.

"Bollgard II availability and the fantastic End Point Royalty (EPR) system offered by Monsanto also helped with the decision to grow cotton."

Oscar speaks enthusiastically about growing dryland cotton.

"We have three neighbours who have been growing dryland cotton successfully for a while so that made us confident. With the wet season it was easy to get the crop planted in the ideal window but then we had two cold shock days so I have been checking the establishment rates regularly," he said.

Accessing technical support for Oscar has been relatively easy. Apart from his agronomist Chris Maunder, he talks to more experienced neighbours, listens to a weekly podcast and says "I get a lot of information off the web, I have downloaded a lot of the technical publications which I skim through then ask my agronomist questions".

Oscar Pearse has joined the fold of cotton growers this year, helping to push the industry toward a record planting

This season the Australian cotton crop is on target for a record harvest, with Cotton Australia indicating more than four million bales will be grown this year, with more than 655,000 hectares planted. The largest crop previous to this was 561,000 hectares in 1988-89.

Upward of 238,000 hectares was planted in Queensland, and 260,000 in NSW. While the vast majority of this crop will be irrigated, 40 percent is dryland with an estimated 260,000 hectares, larger than last season's total planting of 211,000. The highest percentage of dryland cotton grown was in 2000-01 with 31 percent.

It is estimated this season's total crop has the ability to generate around \$2.2 billion in export income for the Australian economy.

# PRODUCTION MANUAL IN HIGH DEMAND

There has been a such a high demand for the new *Australian Cotton Production Manual* since its launch in August, the hard copy version has literally 'walked off the shelves', with growers now being redirected to the web-based version on the CRDC website.

It is not just experienced growers wanting to access the latest information which has driven this demand, but also the high number of new growers entering the industry according to James Hill, New Grower Specialist with the Cotton Industry Development and Delivery Team.

James said feedback suggested growers see it as a valuable source of information as it provides basic explanations about current cotton production practices and references as to where growers can go to seek further information.

Picked up by growers at this year's Cotton Conference and available from the internet on the Cotton Catchment Communities and CRDC websites (below), the manual is a key reference document.

New grower Justin Walsh, Coleambally, remarked that at planting time he found practical information such as seed and fertiliser placement very useful.

"I can use it as a how-to manual which I can refer to when information is required," Justin said.

Coleambally District Agronomist Kieran O'Keefe says the influx of new growers had meant the manual was in short supply, describing it as a 'one-stop shop' for first time growers.

"It is a great lead-in for new growers," Kieran said

"The main issue has been that there is not

enough to meet demand of potential growers who are looking at how the crop goes this season," he said.

Fortunately for those who have missed out on securing a hard copy, the manual is available in electronic form as a complete viewable manual or in downloadable form and an updated manual will be printed before next season.

Cotton CRC Technology Resource Centre Coordinator Dave Larsen said the publication has been popular on the web, with hundreds of viewings the document.

He said this demand was really positive and augured well for plans to print an updated version next year.

The manual was produced by the cotton industry Development and Delivery Team of specialists, headed by Ken Flower.

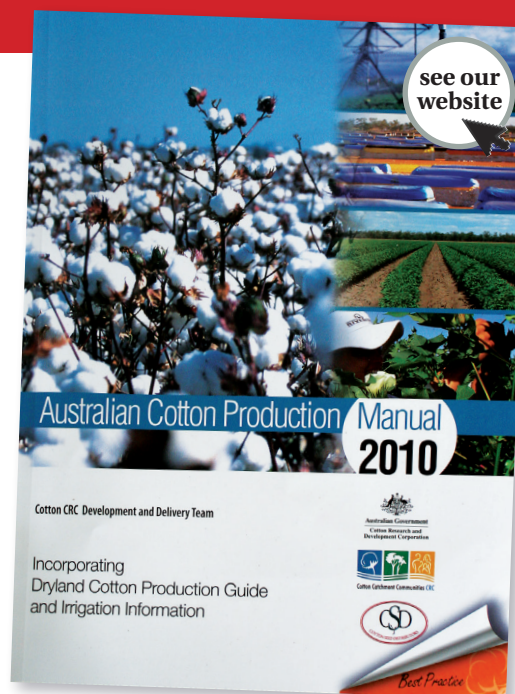
"It's very pleasing to see the manual so well received by industry, evident through its popularity," Ken said.

"It is a credit to the Development and Delivery Team, CRDC's Helen Dugdale and our industry partners that growers and consultants are finding this publication to be such a useful tool.

"We look forward to hearing feedback so we can make improvements and additions in preparation for next year's printing and encourage users to contact us with feedback."

[http://www.cottoncrc.org.au/content/Industry/Publications/Australian\\_Cotton\\_Production\\_Manual.aspx](http://www.cottoncrc.org.au/content/Industry/Publications/Australian_Cotton_Production_Manual.aspx)

[http://www.crdc.com.au/emags/Production\\_Manual2010](http://www.crdc.com.au/emags/Production_Manual2010)



## INDUSTRY'S KNOWLEDGE STORE

James Hill invites new growers to build their knowledge quickly about production and services by contacting any of the industry's D&D Team Specialists ([http://www.cottoncrc.org.au/content/Industry/About\\_Us/People/Extension.aspx](http://www.cottoncrc.org.au/content/Industry/About_Us/People/Extension.aspx)) and:

- Attend grower meetings, forums promoted through *Cotton Tales*
- Check CRC web calendar for events, courses and workshops
- Support local Cotton Grower Associations by attending meetings and being involved (<http://www.cottonaustralia.com.au/contacts/index.aspx?category=1>)
- Attend and support short courses offered through Cotton CRC, I&NSW, DEEDI etc
- Contact a Cotton Australia representative
- Growers can access a wealth of information and tools on the internet with these key websites.

<http://www.crdc.com.au>  
<http://www.cottoncrc.org.au>  
<http://www.myBMP.com.au>  
<http://cottonaustralia.com.au>



## GUIDE PUT TO GOOD USE

Ensuring that the *Cotton Pest Management Guide* remains the key crop protection publication for the Australian cotton industry means keeping it up to date with the latest research and information available.

Susan Maas, the Cotton Industry's Development and Delivery Team Biosecurity, Farm Hygiene & Disease Management Specialist, is Technical Editor of the guide. Susan explains that good management of crop protection issues involves a lot of planning, proactive and pre-emptive management.

"By having the publication available earlier this year growers and their agronomists had access throughout the planning process to the best information the industry has to offer," she said.

"We've changed the order of the insect section so that pest-specific information, such as damage symptoms and thresholds are aligned with the tables of registered products.

## PEST MANAGEMENT GUIDE A GREAT RESOURCE



Emerald agronomist, Jamie Iker from Spackman and Associates, told *Spotlight* "It was really good to have the guide available earlier this year. It meant we could work with our growers to plan with the most up to date information. It is also a great resource to give our new staff.

"I personally use the guide as a reference tool for insect management.

"The information we use the most includes the latest Insect Resistance Management Strategy and things we haven't needed to address regularly in this area, in particular early season mite damage thresholds.

"The quick index at the front in this edition makes it easier to find information."

"Potential new pests and newly registered products have been added as well as the Resistance Management Plant (RMP) extended to include Northern Australia.

"Agronomy for pigeon pea refuges and management tactics for some key weed species have been included for the first time."



The *Cotton Pest Management Guide* is available on the CRDC website [http://www.crdc.com.au/emags/PMG10\\_11/](http://www.crdc.com.au/emags/PMG10_11/)

This version can be very quickly downloaded for reading on your computer or tablet such as iPad.



# MOVES TO MANAGE NEW THREAT

AS THE 2010-1011 COTTON SEASON GETS UNDERWAY, MEALYBUGS ARE AGAIN PRESENT IN COTTON CROPS IN EMERALD AT LOW TO MODERATE LEVELS, DEEDI SENIOR ENTOMOLOGIST DR MELINA MILES REPORTS.

The exotic *Solenopsis mealybug* (*Phenacoccus solenopsis*) was first detected in Australian cotton in the Burdekin during the 2008-09 season. In the 2009-10 season, Emerald also experienced an outbreak. In 2010 solenopsis mealybug stunted cotton plants, and in severely infested fields this resulted in the death of plants. While a high proportion of fields were infested, the area of severely damaged crop was relatively small. However, there are many questions now emerging about this new pest and its potential impact on cotton in Central Queensland and beyond in future seasons.

In response to the outbreak, the industry has swung into action in the region. Research has been initiated by Department of Employment, Economic Development and Innovation (DEEDI) entomologists, in collaboration with the Cotton CRC, CSIRO and I&I NSW to gain a greater understanding of the mealybug.

Throughout winter, entomologists surveyed five fields that had a 2009 mealybug infestation from post-harvest through to planting. In all cases, mealybug persisted on broadleaf weeds, ratoons and volunteer cotton in and around the fields. In-crop weediness over winter appears to be closely associated with the size of the infestation this season. However, there are instances where excellent weed management has resulted in a very low level of mealybug so far this season.

DEEDI Principal Entomologist Dr Melina Miles said due to the cool weather and a delayed planting in Emerald, the mealybug population was



**“In all cases, mealybug persisted on broadleaf weeds, ratoons and volunteer cotton in and around the fields.”**

not as established as it was this time last season.

“In late November when crops were surveyed, female mealybug were established on cotton plants, but there was little reproduction. In other words, the population had not begun to grow rapidly. In some fields infested plants were showing signs of stress, reddening and stunting,” Melina said.

Overseas, mealybugs are reported to move on air currents in the small crawler stage; through irrigation and tail water; and by contaminated vehicles and people entering fields. This species, also identified in Texas in 1990 and in Pakistan and India in 2004 has caused significant economic loss within those cotton industries. Native predation has reduced the significance of this pest in those countries in recent years. Species including lacewings and ladybirds and in particular in India and Pakistan, parasitic wasps have been effective.

Infestation by crawlers may be alleviated by controlling weed hosts in and around cotton fields. Managing the movement of vehicles and people in and between infested fields also needs to be a priority.

In addition to the Burdekin and Emerald, solenopsis mealybugs have also been identified throughout the Darling Downs and St George; although only individual, or small infestations have been found at these locations. Other samples of mealybug

from cotton-growing areas in NSW and Qld have been identified as the native species from the genera *Ferrisia*, *Pseudococcus* and *Planococcus*. This evidence further suggests that 2009 was a year conducive to mealybug being abundant.

In terms of research, the goal for 2011 is to gain some confidence in effectively minimising the impact of solenopsis mealybug infestations in cotton.

For information on mealybug control contact Susan Maas - 07 4983 7403  
mailto:susan.maas@deedi.qld.gov.au  
Melina Miles  
mailto:melina.miles@deedi.qld.gov.au

email us

The Cotton CRC has an information pack on pest control and details of who to contact at  
http://www.cottoncrc.org.au – search for ‘mealybug’ or go to the DEEDI

see our website

## KEY AREAS TO BE ADDRESSED INCLUDE:

- efficacy of control options
- understanding how populations develop in the field
- the impact of natural enemies on mealybug
- characterising the impact of mealybug at different stages of cotton plant growth



Susan Maas

# VOLUNTEER COTTON A KEY BIOSECURITY RISK

ROGUE COTTON HAS ALWAYS BEEN CHALLENGING TO CONTROL, AND HERBICIDE TOLERANT TRAITS HAVE ADDED TO THE CHALLENGE. SUSAN MAAS REPORTS.

There is a long list of reasons why volunteer control is so important, however it remains a challenge for the industry, particularly where there is regular back-to-back cotton and where there is dryland cotton with a glyphosate-dominated fallow weed control program.

To assess the magnitude of the problem, the 2009 early season disease survey included noting the presence of volunteers in field and on farm on 45 farms in NSW and 28 farms in Qld. As indicated in table 1, more than half the surveyed farms had volunteer or ratoon cotton present.

The advice from the industry’s Development and Delivery Team is that early season is a good time for growers to review how successful ratoon and volunteer control was over winter, and start to put some plans in place to deal with the issue as the season progresses.

Clear examples of what works best and why, are provided by two Queensland growers.

## CASE STUDY 1:

### John Cameron, 400ha dryland grower

John Cameron aims to grow 200ha each summer at ‘Kintyre’, his 400ha zero till dryland farm on Queensland’s Darling Downs.



John also sees good crop destruction as a key part of volunteer

cotton management.

“Our aim is to get 100 percent of ratoon cotton by the end of the pupae bust. We can control cotton seedlings in a fallow, but not stubs,” he said.

Post picking, the crop is mulched and root cut.

“Good root cutting is key to stub control. If done right, we can achieve 100 percent control of volunteer cotton,” John said.

“Pupae busting disturbs any remaining stubs. We pupae bust with

TABLE 1: EARLY SEASON DISEASE SURVEY – VOLUNTEER COTTON.

	1.Channels/roads/fences	2. In the current crop	TOTAL
NSW	17/45 (38%)	17/45 (38%)	17/45 (38%)
QLD	11/28 (39%)	15/28 (54%)	20/28 (71%)



CASE STUDY 2:



**Robert Ingram – Emerald double-crop producer**

Robert Ingram farms 400 hectares on the Western side of Emerald with his father Bob. They generally plant the whole farm to Roundup Ready Flex each year, with up to half the farm double-cropped depending on conditions.

For the Ingrams the key to managing volunteers and ratoons is timeliness of operations, particularly at the end of the season.

“Volunteers are hard to deal with when you let them go. I like to get everything worked straight after picking,” explains Robert.

Attention to detail during crop destruction and field preparation removes all volunteers.

“We found the mulcher was missing volunteers close to the plant line, so bought back the trash worker to ensure we got everything,” he said.

“Field control of volunteer cotton is part of our integrated weed management strategy, using cultivation and shielded spraying where required.

“Cotton is a weed when it is not making any money and just like for all weeds, it is just good practice to get in and tidy it up.”

At planting the Ingrams have gone against the trend of flushing up, finding that pre-irrigating gives another opportunity to control in-field volunteers.

“I am interested in looking at other herbicide tolerant technology, however glyphosate drift is a big concern,” Robert says.

Around the farm the Ingrams put in a similar amount of energy into control of volunteers.

“We use a mix of bromoxynil and glyphosate and you need to get in quickly after any rainfall event to ensure that plants are controlled while they are still small,” he said.

“This means you can use the lighter rate and still keep on top of the problem.

“We use the grader for problem areas such as the module pad and roadways, and remove isolated plants by hand.”

a RTK guided chisel plough with long wings under the row, side busting the plant row, and leaving the stump in the ground to break down.

“Wheat planted behind cotton gives us an opportunity to mix up the chemistry and take the edge off.

“In the fallow, field management is dependent on whether Flex has been in the system.

“If we haven’t had Flex, we aim to control any volunteers with glyphosate before the five leaf stage. If we have used Flex in the field, we use a mix of glyphosate and Starane (fluroxypyr), and if fleabane and bell vine are also present, 2,4D is added in this mix.

“It can be difficult to spray while the cotton is still small, as we will only apply when conditions are suitable with a TTI nozzle.”

At the end of the season, John removes any seed cotton from problem areas such as module pads. Roads are regularly graded and stray plants manually removed.

“If you are religious about it, it doesn’t take a lot of time. If you see a stray cotton plant it only takes a minute to pull up and remove it,” he said.

**CONSTANT THREATS WARRANT BIOSECURITY MANUAL**

**By Chrissy Brown**

With increasing risk of biological threats to the Australian cotton industry coming to the fore, Biosecurity Queensland, in close collaboration with Plant Health Australia (PHA), Cotton Australia and industry funded researchers developed the comprehensive manual to highlight information about best biosecurity practices for the industry.

Greg Kauter from Cotton Australia said this could include such measures as spotting high priority pests and diseases and other practical on-farm biosecurity measures growers can incorporate into their day-to-day operations.

The manual has an introduction with seven easy ways to protect your farm from exotic biological threats listed in the box on this page.

“The Farm Biosecurity Manual and in particular the Come Clean Go Clean message is targeted at the whole industry,” said Susan Maas.

“Anyone going on farm regularly, such as researchers, consultants and machinery contractors should be aware of biosecurity issues.

“I encourage everyone to familiarise themselves and their staff with the manual and keep an eye out for anything new or unusual. We’ve learnt most recently from *Solenopsis mealybugs* that these prob-



Greg Kauter.

The first Farm Biosecurity Manual for the Australian Cotton Industry was released at the 15th Australian Cotton Conference in August.

lems can be right on our door step.

“The sooner the problem can be identified the more chance we have to react and contain.”

Greg Kauter says that although Australia has a very effective plant health biosecurity system, all growers play an important role in protecting their own farm and the cotton industry from biosecurity threats.

For more information or to obtain a printed copy of the Farm Biosecurity Manual for the Cotton Industry contact the PHA Business Information Centre on 13 25 23 or visit [www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au)

For industry biosecurity matters contact Greg Kauter, Cotton Australia.

Mailto:[gregk@cotton.org.au](mailto:gregk@cotton.org.au)



Growers and consultants were able to 'test out' the new *myBMP* system at this year's Cotton Conference, where it was launched.

# *myBMP* PROVING READY APPEAL

THE SUCCESSFUL LAUNCH OF *myBMP* AT THE AUGUST 2010 AUSTRALIAN COTTON CONFERENCE ENSURED THE NEW SYSTEM IS ONLINE AND READY FOR GROWERS TO REGISTER. JIM WARK REPORTS.

*myBMP* offers both new and existing cotton growers access to a comprehensive industry support system that covers legal, regulatory and Best Management Practice requirements for cotton production.

The easy-to-use internet-based system was developed exclusively by the cotton industry. It has 11 modules covering key areas of cotton production and offers growers the choice of four levels of participation and a new streamlined certification process.

Since the official launch, *myBMP* has generated much interest with 103 growers accessing the extensive *myBMP* resources and documenting their progress in the system. A number of growers have already met all of the practices and are ready for auditing.

The next important step for *myBMP* is the implementation of the rejuvenated auditing function designed to streamline the *myBMP* certification procedure. Certification auditing will be undertaken by approved external auditors with the necessary training requirements, including the intensive five-day Environmental Systems Auditors course and a comprehensive two-day *myBMP* training course.

In October five auditors completed the inaugural *myBMP* training course in Narrabri and now have the training necessary to start the important mentoring and scrutineering components required prior to becoming a full *myBMP* auditor, in time for the official opening of the audit period on April 1 next year.

Meanwhile growers who have completed all Level 1 and 2 practices and want to become *myBMP* certified can contact the *myBMP* audit office to co-ordinate a certification audit.

To maximise the efficiency, audits will be conducted over a five-month period each season from April 1 to August 31 and certification is current for five years.

Growers with existing valid BMP certification will be

considered current by Cotton Australia over the transition period, however all current BMP certifications will expire by October 1 2011, therefore growers wanting to maintain BMP certification need to update to *myBMP* before the close of the audit period on August 31 2011. Grower data in the BMP system will be transferred to *myBMP* although it is important to note that there are new modules and practices in the new system, meaning additional information and input is needed to complete all Level 1 and 2 practices.

#### What is in it for me?

- 1 A dynamic easy-to-use web-based Best Management Practice system
- 2 A system that has been developed by the cotton industry for the cotton industry
- 3 The ability to tailor use of the system to meet an individual's specific requirements
- 4 Four levels of participation, from minimum legal requirements to 10


year aspirational practices allowing growers to choose their preferred level of involvement

- 5 Eleven modules covering the whole farm's cotton operations
- 6 Extensive resources with each practice including definitions, explanations, templates, calculators and additional links to even more information
- 7 A Support Desk to help with any questions on *myBMP* and how to get the best from the system
- 8 A Technical Help function with access to the extensive industry research and extension teams
- 9 Benchmarking of business performance to compare your on-farm practices relative to the industry
- 10 A risk management tool

#### How do I get on to *myBMP*?

[www.mybmp.com.au](http://www.mybmp.com.au) has extensive information explaining the principles of *myBMP*, how it can add value to the cotton industry and the benefits of moving to this new web-based system. Both the Home Page and the Grower Home contain demonstrations showing how easy it is to navigate *myBMP*.

It is highly recommended that new users review these demonstrations to help become familiar with the new system.

Access all the tools in *myBMP* by visiting [www.mybmp.com.au](http://www.mybmp.com.au) and selecting the "Register Now" button. This will step new users through the simple registration process. The service desk is available on 1800COTTON (1800 268 866) or [admin@mybmp.com.au](mailto:admin@mybmp.com.au) for more information on registration, general questions or to organise a telephone training session. 

#### KEY DATES 2011

April 2011	<i>myBMP</i> Audit Office commences conducting on-farm certification audits
October 2011	Existing BMP certifications expire and require updating into <i>myBMP</i>



# OPEN DIALOGUE GOOD FOR OUR INTEGRITY

THE COTTON INDUSTRY POST-FARM GATE SECTOR'S COMMITMENT TO BEST MANAGEMENT PRACTICES TO MAINTAIN THE INTEGRITY AND QUALITY OF AUSTRALIAN COTTON WAS EVIDENT AT A CRDC FORUM HELD AT MOREE IN OCTOBER.

The forum brought ginning, classing, transport, storage and marketing sectors together to discuss many issues that needed to be individually and collectively addressed in advance of picking.

Pete Johnson chaired and convened the forum on behalf of CRDC.

Major outcomes which have been realised since the meeting are agreement on new gin codes and bale prefixes. Standardised variety codes are also being discussed, and the industry is exploring new methods of standardised grower identification to assist with traceability.

All presenters said this type of forum was essential to ensure that pathways of communications open further and remain open between the post farm gate sectors to best deal with new and recurring issues.

CRDC Executive Director Bruce Finney also attended, and said development of best practices by these sectors is driving efficient and safe businesses as well as the integrity of Australian cotton quality.

"The forum followed a similar meeting in May where participants agreed that post farm gate sector meetings were a valuable opportunity for open discussions that would not otherwise occur," Bruce said.

"There were also some key messages which we can now get out to growers."

Heading this list was the chain of responsibility in ensuring both traditional and round modules are the correct weight and size and also load configurations on trucks, as growers may also have different ideas of how they want trucks loaded, which can unintentionally create problems unloading at the gin for transporters and ginners.

Secondly, it was clear that growers and the cotton industry need a shared understanding of changing requirements with the advent of round modules.

Namoi Cotton Systems Engineer Greg Nash said at the forum that in the company's experience different protocols were needed for handling, carting and ginning this type of module compared to conventional modules.

He said growers also need to be aware of gin requirements for tagging and the effect on traceability and efficiency, while along with transporters they will need to be aware what represents 'best practice' for round module construction, load configuration, load restraint and safety during transport.

"Some ginning companies have chosen to tag round modules with the five equals one method, that is, five round modules equal one standard module and therefore only every fifth round module is tagged," Greg said.



Namoi Cotton Systems Engineer Greg Nash, Graeme Wood - AWH National Logistics Manager and Namoi's Logistics Manager Laurie Hoad at the CRDC forum

"However, to ensure traceability, individual tagging is needed. We need traceability because growers deliver modules but are paid for bales, and also for adherence to export quality control mandates (in case of contamination etc)."

Around 50,000 round modules were ginned at Namoi's Ashley Gin last season and Greg discussed Namoi's experience with the use of radio frequency identification (RFID) tags embedded in round module wrapping, which bypasses the need for growers to apply tags.

"However growers must still advise which field each module came from," Greg said.

"Gins have also had to make the necessary adjustments to handle RFID numbering, and multiple-module deliveries.

"Namoi has installed readers at the weighbridge, and we've found they can't read the tags through metal on the trailers, while strap placement can also affect readability, which is an issue growers and transporters need to be aware of."

Taking care of cotton bales is a warehouse's main responsibility - maintaining integrity and quality of the product.

Graeme Wood of AWH spoke at the forum about country damage, and how imperative it is to minimise the risk of country damage at all times

- and with a big season looming the risk increases, when gins and storage facilities may be at capacity.


"This is a vital consideration for Australia in maintaining our reputation as leaders in terms of contamination and fibre quality," Graeme said.

"However all sectors need to be responsible for their actions and reporting in terms of best practice to ensure our cotton gets to markets in the highest possible quality.

Best management practice throughout the production chain is a key part of much of CSIRO's textile expert Rene van der Sluijs' work.

Rene said improvements to ginning and classing BMPs and the development of new BMPs for transport, storage and handling were all key steps in maintaining and improving the integrity of our product.

"If growers and all other sectors of the industry chain come under BMP then people who buy our cotton will see improvements," he said.

"Harvesting (picking) is now the only process not formally covered by a set of BMP standards." 

Pete Johnson  
Mailto: [pete.johnson@leftfieldsolutions.com.au](mailto:pete.johnson@leftfieldsolutions.com.au)



# THE SOFT ATTRACTION OF MAGNET

THE COTTON INDUSTRY HAS CONTINUED ITS SHIFT TO ADVANCE PEST MANAGEMENT (IPM) WHICH IS ENVIRONMENTALLY RESPONSIBLE AND INVOLVES PRE-EMPTIVE RESISTANCE MANAGEMENT. **CHRISSY BROWN WRITES.**

**C**lear progress in 'softer' insect management tools such as Magnet®, a newly registered breakthrough product can play a key role in managing *Helicoverpa* spp.

This product is a world first, developed in Australia by a team led by Professor Peter Gregg and Dr Alice Del Socorro from University of New England, working with the Cotton Catchment Communities CRC and Ag Biotech Australia Pty Ltd.

Magnet is a combination of insect attracting volatiles and feeding stimulants (sugars) into which specified insecticides can be added. The final mixture lures moths in the vicinity of treated rows and stimulates them to feed, leading to ingestion of the added insecticide and death of the moth. Reducing the moth population in the area of the crop greatly reduces both the number of eggs laid and larvae hatched in the crop.

Registered for use in cotton generally, Magnet's fit at this stage is in conventional cotton production where it has been found to reduce moth populations by approximately 90 percent according to Professor Peter Gregg.

"In low pressure years very little use of other pesticides is needed. The quantity of insecticide used in a Magnet application is minimal, one to two percent compared to the quantity applied in a cover crop spray," he said.

Professor Gregg says that in these low pressure seasons Magnet-treated conventional cotton should stack up economically to Bollgard II.

The product is also cost effective, as one application (applied every 144



ABOVE:  
Last season Magnet was applied to a number of conventional cotton crops in areas of NSW and QLD

metres) costs approximately \$7/ha including application and insecticide sprays. This means a five week program (35 days) of Magnet costs about the same as a single application of many foliar insecticides.

"How the economics will compare in high pressure seasons we are yet to see, it is untested," Peter said.

"Theoretically, Magnet should reduce the egg pressure and the number of sprays required, but some cover sprays with conventional insecticides will still be needed."

Ag Biotech's Marketing Director Anthony Hawes said due to the high mobility of *Helicoverpa* spp., the best fit for Magnet is in 'large' areas greater than 100 hectares.

"Magnet is ideally used under a pre-emptive strategy to provide ongoing suppression of *Helicoverpa* over a long period, or it can be used reactively as a knockdown product to limit the impact of a spike in pest numbers," Anthony said.

"There is no limit to the number of Magnet applications allowed though

## MAGNET AT MUNGINDI

Last season Magnet was applied to a number of conventional cotton crops in areas of NSW and QLD. Michael Brosnan, B&W Rural agronomist at Mungindi on the NSW-QLD border, was one consultant who included Magnet in the IPM programs he recommended for some conventional cotton crops where growers were interested in using the product.

"We followed the strategy that Ag Biotech recommended which was to start the season using cheaper suitable sprays," Michael said.

"Later in the season, when finding a suitable cost effective insecticide is difficult, we commenced using Magnet. Mixed with thiodicarb as the toxicant, it was then applied to one in 144 rows on average every five days for a window of 30 days.

"It is hard to assess how effective the treatment was because insect pressure during the season was so low."

Michael will be recommending Magnet again this season if he can get neighbouring farms to both use the technology to collectively reduce moth pressure in their area.

"We have had some early insect pressure so I think that will make growers tend towards being in favour of using Magnet to reduce that pressure," he said.

**FUTURE MAY LAY IN BUSTING MOTHS – NOT PUPAE**



Magnet lures moths in the vicinity of treated rows and stimulates them to feed, leading to ingestion of the added insecticide and death of the moth

There is more to the debate on Conventional versus Bollgard than short-term economics says Professor Peter Gregg.

“Bollgard II is great for the industry but like all pest management tools it should not be overused.

“The greatest risk for Bollgard technology is resistance, and this will be exacerbated if requirements of the Resistance Management Plans are not strictly observed.”

Even though the Bt proteins in Bollgard II are delivered in the plant tissues, there is still the selection for the survival of resistant *Helicoverpa* individuals.

“This is where Magnet may have another use - research is currently underway by the same team who developed Magnet, with funding from the Cotton CRC, Ag Biotech and Monsanto, to study the potential of ‘moth busting’ instead of pupae busting in Bollgard II as part of the resistance management strategy,” Peter said.

“The idea is that moths emerging from Bollgard could be targeted directly with Magnet late in the season or early in the following spring (depending on diapause). If this technique could be shown to be as effective as pupae busting, without unduly affecting susceptible moths emerging from refuges, growers could make better use of minimum tillage techniques for field preparation.”

users still need to be careful of insecticide use.”

Magnet is generally recommended to be used in a set program of regular applications for a window of up to 50 days.

Anthony says Magnet can make every year a low egg lay year. He said fields treated with Magnet last season around Mungindi generally recorded less than one egg per metre compared to significantly more eggs - five to 10 per metre - in fields in the same area not treated with the product.

“It’s not a ‘silver bullet’, but it is an

excellent IPM tool.”

The Insecticide Resistance Management Strategy (IRMS) for cotton this season can be found on pages 66-69 of the *Cotton Pest Management Guide 2010-11*.

This guide is a ‘pageturner’ document on the CRDC website <http://www.crdc.com.au/index.cfm?pageID=31&displayNewsID1=35> and as a downloadable PDF on the Cotton CRC website.

see our website



There is no limit to the number of Magnet applications allowed, although users still need to be careful of insecticide use and adhere to the IRMS.

For information about Magnet contact

Anthony Hawes, Ag Biotech Pty Ltd

0425 232 052

mailto: ahawes@agbiotech.com.au

email us



**“The quantity of insecticide used in a Magnet application is minimal - one to two percent - compared to the quantity applied in a cover crop spray.”**



Paul Grundy explains to Burdekin cane farmer, Murray Cannavan, the capacity of the cotton plant to compensate later in the season for yield loss incurred during early wet weather. When making decisions for nutrition, water, Pix application and in setting pest thresholds, the manager needs to consider how the plant and the environment are interacting and whether the intended action will work with the plant.

BELOW: Steve Yeates and Paul Grundy

# WINNING IN THE WET

**A RETURN TO STRONG LA NINA CONDITIONS THROUGHOUT COTTON GROWING REGIONS HAS NOT ONLY PROVIDED MUCH NEEDED RAIN FOR PLANTING, BUT LOOKS SET TO SHAPE THE MANAGEMENT CHALLENGES FACED BY GROWERS THIS SEASON.**

**D**uring October and November, cotton growing areas received between 1.5 and seven times their average rainfall. In all regions temperature was two to five degrees milder, day degrees were 10–20 percent less than average and light levels were also lower.

With the prospects of a wetter than average year in established cotton regions, the lessons from the Burdekin Region of Northern Queensland suggest that management tactics need to be flexible.

*Spotlight* spoke with DEEDI’s Paul Grundy and Steve Yeates of CSIRO for some insights into wet weather management of cotton.

Over the past three years they have been working collaboratively through

the Cotton CRC toward the development of an agronomic package for cotton in the Burdekin. The Burdekin is the first cotton production system proposed in Northern Australia that aims to grow the crop through the wet season, rather than the dry winter.

“Cotton plants grow differently in wet weather and management needs to account for this,” Paul said.

“The rainy season is a ‘package deal’. With it comes cloud, humidity and milder day but high night temperatures that create an altogether different growing environment for cotton compared to the hot, dry, sunny conditions that have normally prevailed in southern areas in recent seasons.

“Over the past three seasons we’ve shown that cotton can be incredibly adaptive, although the crop’s responses to changes in weather are not always straight forward. There’s an old saying that is quite apt in the Burdekin – to catch a fish, you’ve got to think like a fish.

“Our experience has confirmed that the same thinking applies to cotton farming – to grow a cotton plant you’ve got to think like a cotton plant.



“We have a cotton plant alter ego that we’ve nick named Herbert that helps us with decision making. Whether we’re designing a trial or offering advice to the commercial growers up here, Herbert helps us to predict the crop’s likely response to management options.

“We’ve found that what’s easy to do and what will actually keep Herbert happy aren’t always the same thing.

“The Burdekin system is being designed with almost certainty of the crop experiencing wet conditions during its vegetative development. Our cotton plant, Herbert, senses the humidity and cloud that comes with the rain and his growth responds accordingly,” Paul says as he explains the consequences of wet conditions

for plant development.

“One of the first things Herbert shared with us was that he worries more about access to light than access to water. He focuses on growing taller, particularly where plant densities are greater than six to seven plants per metre.

“His next priority is to maximise leaf area with the carbon available in his photosynthesis-challenging environment. The low evaporative demand gives him the confidence to grow thinner leaves with a less waxy coat in order to get them as big as possible and intercept what little radiation is available.”

The pace of life moves quickly in the tropics and left unchecked, row closure can occur before first flower.

“As a crop manager I’m thinking about the need to keep the vegetative growth in check. Pix is a tool that can be used to achieve this, but there is more to Herbert’s story than meets the eye,” warns Paul.

“What’s happening above ground is at the expense of root development. The lack of moisture stress gives Herbert the confidence to direct a disproportionate amount of energy into stem and leaf development.

“The roots that do develop tend to move sideways, staying close to the surface, probably due to the need to avoid the waterlogged subsoil.”

Canopy expansion can be partly tailored with small doses of Pix.

“Herbert has taught us that Pix is a tool that needs to be used with care. You never know exactly when the wet is going to stop, so small doses allow for



Cotton grown in the Burdekin responded to the prolonged wet conditions by developing a large canopy coupled with a small root system. When weather turned dry, irrigations began sooner on smaller deficits, liquid nitrogen was side banded where the small roots can access it. Inter-row cultivation and high doses of Pix were avoided.



SICOT 70



SIOKRA 24

future flexibility if things suddenly turn hot and dry, which requires a different approach,” Paul says.

As Paul and Steve experienced this year and last, the end of the Burdekin wet season doesn’t always arrive before the cotton starts flowering. Managing fruit shedding is another issue Paul discusses with his cotton plant alter ego.

“Working with Herbert has taught us that shedding is a normal physiological response to wet weather that can work in a manager’s favour. Herbert struggles to properly fill fruit that are set during wet conditions. When he retains those small bolls during the wet weather he then has difficulty finding the extra energy to set better bolls as a later compensatory top crop.

For those that have seen cotton growing in the Burdekin, shedding responses are linked with the odd appearance of the crops, “Herbert is not the most attractive of characters but it is his yield potential that is important,” Paul says.

The aerial assault from swarms of dragonflies often signals the end of the wet is imminent.

“One day you walk into the crop and dragonflies take flight, out of nowhere, they’re everywhere. It’s a sign the locals swear by as heralding the end of the wet,” Paul said.

As the researchers have found out, the way Herbert adapts to the wet presents challenges and consequences for crop management when the dry times return. Steve explains how the approach to irrigation scheduling is affected.

“When the sunshine returns and the days heat up, Herbert’s poor root development coupled with bigger, thinner leaves, means that crops initially struggle to cope with changed conditions,” he said.

“Herbert stresses earlier and more severely than expected, despite having a relatively full profile of moisture

beneath him. With wilting leaves and flowers beginning to rise to the top, Herbert’s clear message is that irrigation scheduling needs to account for the effective rooting depth.

“Irrigation may start in as little as week after the rain clears.”

Other management decisions also influence the way the crop adapts to the dry, such as the importance of avoiding inter-row cultivation during this time.

“Early lessons included the importance of starting the season with high, well formed beds. We need to be able to avoid needing to cultivate in the first weeks of drier weather as there just isn’t enough time for the already inadequate root systems to handle subsequent setbacks,” Steve says.

“For this reason side banding liquid nitrogen rather than a solid form also plays a key role in transitioning the crop from wet weather into dry.”

The basis of a successful production system is emerging in the Burdekin. It is about enduring the wet season then maximising growth and fruit set in the sunny autumn weather. Doing this reliably requires understanding of how cotton is interacting with the climate and physical environment.

Management practices are being designed to work with the plant to achieve rapid fruit set when conditions are favourable. It is about knowing both when and how to best manage a crop for good yield potential.

“In established cotton regions, most agronomic practices are based on years of R&D and hard won experience, recipes only need be tweaked,” Paul said.

“For the Burdekin we have had to go back to basics to work out which ingredients are needed and when they should be used.”

ABOVE: Variety choice also impacts on wet weather management in the Burdekin. The highly indeterminate lines Siokra 24, (right) shed more of its fruit from lower branches during wet weather, leaving it free to produce an impressive top crop. The more determinate Sicot 70, (left), retained more early fruit holding back its capacity to set later fruit. Early set fruit is likely to succumb to wet weather-related disorders, limiting its contribution to final yield. After 1600 mm of rain, Siokra 24 out yielded Sicot 70, 9.4 bales/ha to 8.2 bales/ha. The consistent temperatures experienced during fruit set in the Burdekin’s autumn produced fibre quality premiums.

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# JOANNE GRAINGER — LEADER

**MELANIE JENSON TALKS ABOUT LEADERSHIP WITH JOANNE GRAINGER WHO HAS RECENTLY STEPPED OUT OF THE CHAIR'S ROLE AT COTTON AUSTRALIA**

Joanne Grainger has emerged as one of Australia's significant rural leaders – a world away from her early years on a banana plantation at Coffs Harbour on the NSW mid north coast.

Joanne stepped down in August last year from her three-year role as Cotton Australia (CA) chair, confident her legacy of a vision for a peak industry body would continue a successful future led by capable individuals.

Joanne's ride to the CA Chair began growing cotton 29 years ago, then in 1998 as Chair of the Mungindi Cotton Grower Association, followed by election to the Board in 2002, as deputy chair in 2007 and chair in 2008. Her commitment to the bush continues as a Director of National Farmers Federation and the Primary Industries Education Foundation.

**What is it about leadership that helps personal growth?**

Taking a leadership role challenges you to think about who you are, what you believe in, what is important; to think about others and how you interact with them.

It provides opportunities to dare to do and requires self awareness, reminding you that everyone, no matter what their role/position is a person just like you with insecurities and vulnerabilities.

**You have a passion for people/human capacity and the importance of helping others achieve, where does this stem from?**

I believe that knowledge is empowerment and learning is life long, and I get great satisfaction from nurturing and supporting others to achieve their aspirations.

I have experienced my own journey of personal development and learning and I would like to think that everyone can enjoy the same opportunity if they choose. It is important to ensure that there is learning and mentoring available to encourage those who want to 'have a go' and make sure the support is there.

**In the past you have spoken about challenging yourself and stepping outside our comfort zones. Have you always had this philosophy? When was the first time (professionally) you stepped outside your comfort zone?**

I tell my children that I didn't grow up until I was 40 – it was then that I developed a sense of who I was, an awareness of the world and my place in it - until I began thinking as an individual and knowing what I wanted to do. I don't think I have always had a philosophy of personal challenge but I find the daring and doing exhilarating! Perhaps it is a confidence that comes with age and maturity!

**Can an industry shape individuals? If yes how?**

Culture of an industry can influence your approach and attitude. To be involved with people who look for solutions rather than focus on the impact, who are creative and innovative, who have a desire to challenge and influence, who want to be in control of their own lives, who have a 'can do' attitude can't help but influence your attitude.

An industry can also provide tangible support in developing individuals. At an industry level it can provide opportunities for involvement, formal or informal 'training' and experiences, support and mentoring for anyone who has an interest in contributing to the industry.

At a grassroots level it can influence the production and business practices of individuals. This can be achieved through various education and training methods and through peer support.

**Has the cotton industry shaped you in any way as a person?**

The cotton industry has been a vehicle for my learning experiences. Address-

ing the responsibilities of my role and the issues facing the industry has provided me with opportunities to engage with the wider industry and political communities at a national level. It has broadened my horizon and enhanced my awareness of myself and others and the broader issues we face. I have increased my confidence, gained focus and direction and attained a sense of accomplishment. I feel I am a more resilient and considered person.

**How have positives you have learned as a direct involvement with the industry translated to your broader life/community?**

Think more expansively, consider all perspectives, challenge the status quo, resilience to cope with personal challenges, confidence in decision making.

**How can the cotton industry improve the way it enhances/improves people's capacity to operate?**

The industry has an excellent contingent of 'elders' whose knowledge and experience could be tapped in many ways to mentor others in the industry. At an industry level mentors could be used to support and encourage involvement in the many organisations, committees, forums that representation is required. At a grassroots level mentors could work with emerging growers or secondary businesses to develop business and production skills - often it the presence of a sounding board that is so valuable.

There is also a need to develop and demonstrate clear employment and career pathways indicating the dovetailing and linkages with other industries and the wider community. Providing clear direction means security and influences people's commitment and output. It also enhances the desire to improve and develop capacity.

**Where and when did you decide to take the leadership vocation?**

In 1998 I attended a Women in Cotton Conference at Myall Vale Research

**“The cotton industry has been a vehicle for my learning experiences. It has broadened my horizon and enhanced my awareness of myself and others, and the broader issues we face.”**



CLOCKWISE FROM TOP LEFT: Giving guidance and advice to Australian Future Cotton Leader Anna Power.

Catching up with leading researcher Rene van der Sluijs at a Wincott function near Boggabri where Joanne gave a presentation on the perception and realities of the cotton industry.

At the Australian Cotton Conference in 2008 with young researcher Nicola Cottee.

With then Federal Minister for Agriculture Tony Burke earlier this year at "Keytah" Moree.

Centre and realised I could be involved and contribute to my industry at a local level. I had the time available and was looking for a future direction.

**Agriculture, especially primary production has largely been a male-dominated industry. Was that ever an issue or hindrance to you?**

Gender was not an issue and I didn't ever consider that it should be. I grew up in a family where equality was the norm and I have never had any other perspective on life. I have approached all of my relationships, both personal and business, in that way. My peers in the Mungindi cotton industry all shared the same view – women were always involved – and this view is the same across most of the cotton industry.

The challenge for me was to understand that I brought a different perspective to the predominantly male group. It was ok to think and behave differently and I think it is usually valued. Christine Campbell was the first CA chair and when I joined the Board, I was one of three women. There are none now!

**Coming into the role of CA chair, what were your aspirations, what did you hope achieve? Why would you want this job?**

I took the Chair during the worst drought in history, when the industry was facing a serious downturn. I wanted to ensure that when circumstances improved the industry would be well

positioned and capable of bouncing back. That while being focused on present issues we would not lose sight of the future.

As a cotton grower I am proud of what we do and I wanted to advocate and inform the wider community of the positives of cotton/agriculture/rural communities.

**What resources did you call on to help you in the role?**

I relied on everyone around me to play their part. The CEO, Adam Kay and I worked closely together and I think there was a great deal of mutual support. Adam has great advocacy and public relations skills that I drew on, the CA staff provided insightful policy interpretation and perspective and I drew on the support and expertise of my fellow directors and other industry representatives.

I took the time to familiarise myself with all aspects of the role of Chair and committed to addressing the responsibilities of that role. Accessed the support of a mentor and maintained a level of confidence in my capacity. I continued to be open to my own personal development.


Time to devote attention to all of these demands was challenging. I drew on the sense of satisfaction I gained in knowing that I was contributing in a positive way, that progress was being made and outcomes were being achieved. This came from the positive comments, appreciation and support that I received from other

growers and industry members. The sense of achievement also enables you to rise to the challenge. It could be said that action and experience builds confidence.

**What would you like to be remembered for in that role?**

The industry was in a state of transition from first to second generation and I wanted to make sure that the industry retained its innovation, vibrancy, enthusiasm and ability to tackle its problems head on and take control of its own destiny – all the things that made it successful originally. I didn't want it to turn into an inward looking, conservative traditional industry that could not manage its own affairs.

I wanted to ensure that the next group of leaders would emerge. I wanted to ensure succession by providing opportunities for them to develop and practice their skills and prepare them to lead.

I would like to be remembered as a grassroots grower who represented and advocated for grassroots growers and who brought a human face to the industry. By that I mean reminding the wider community and government that industry is made up of real people and that their actions and decisions impact on me, my family and my employees. I would also like to be remembered for valuing the people in our industry and for facilitating opportunities to empower them in determining the future of their industry. 

## 2nd Sustaining Rural Communities CONFERENCE 2011

### TRANSFORMING REGIONAL AUSTRALIA

The second national Sustaining Rural Communities Conference in April 2011 will focus on solutions to transform regional Australia. The Conference is a joint initiative of CRDC and the Cotton CRC.

Themed "Transforming Regional Australia" this national event is sure to attract broad interest from regional Australia.

Transforming Regional Australia will identify ways in which people can successfully address issues to sustain their communities, as well as expose the exciting new tools, technologies, infrastructure and policy changes that can effect this transformation, CRDC Communications Manager Rohan Boehm said.

Co-convenor, Paula Jones, Cotton CRC, said the 2011 conference is for people living in regional communities to hear from other communities about what works best.

Following on from a very successful inaugural event in Narrabri in April 2010, Paula said the Conference would again be set up to ensure all delegates would be free to put their ideas on the table and have them heard well beyond the four walls of the conference. Delegates will be able to network with like-minded people from regional communities all over Australia including a range of agricultural industries, small business, government, mining, manufacturing, finance, tourism, transport, science, education and health professionals, Paula said.

"The latest research and the best practical examples will again guarantee a diverse crowd of people attracted to this strongly newsworthy topic of how to transform our rural communities," she said.

The conference is free and will be held at the Crossing Theatre in Narrabri on April 5 and 6 2011.

To register or for further program details go to <http://www.sustainingruralcommunities.org.au>

Contact the Conference co-ordinator Kate Schwager at the Cotton CRC 02 6799 2447 or <mailto:kate.schwager@cottoncrc.org.au>



At this year's conference delegates worked together to gather ideas to help rejuvenate their communities and then shared them with the group as a whole



Martin Andersen of UNSW Water Research Laboratory, sampling groundwater at Maules Creek. Workshops next year will offer free water quality testing to growers and consultants

## NAMOI GROUNDWATER MONITORING AND MANAGEMENT WORKSHOPS

Cotton yields and soil quality can be dramatically reduced when irrigating with poor quality groundwater, but good news for growers is management strategies are at hand.

The Cotton CRC is delivering groundwater workshops focusing on the latest research and management strategies in Gunnedah, Maules Creek and Wee Waa between March 8 and 10 2011. These workshops will offer free water quality testing to growers and consultants, with experts available to discuss results and suggest suitable management strategies.

Guest speakers from the Namoi Catchment Management Authority, University of New South Wales' Water Research Laboratory and NSW Department of Industry and Investment will present results from current groundwater research undertaken in the Namoi Valley. This will cover management strategies for controlling soil salinity, sodicity and poor quality irrigation water.

"The negative effects of salinity are hard to recognise as there may be no obvious plant

symptoms or signs of salt on the soils surface," says Cotton CRC Catchment Officer Peter Verwey, who is organising the workshops.

"It is important to know when to avoid irrigating with saline water, for example, young cotton between two and 10 weeks is very sensitive to salinity, whereas the mature crop is relatively insensitive.

"Sourcing water with lower salinity from either rivers or bores or stored rainfall should be the preferred source of water for early season irrigation.

"We would encourage growers to make the most of these workshops to have their water tested and learn about management strategies if they have a water quality issue.

"The workshops will deliver local research outcomes and management practices that will assist groundwater users to better understand this resource and manage more effectively."

RSVP by March 1 to Peter Verwey - 6799 2476 or 0408 972 516, <mailto:peter.verwey@cottoncrc.org.au>

## WINCOTT DISCOVERY TOUR TO TAKE IN THE GREAT DARLING RIVER RUN

Wincott has planned a Discovery Tour in May 2011 taking in the 'Great Darling River Run' through NSW, SA and Victoria.

Promoted as an opportunity for people to learn first-hand how to make a difference in their own business and also influence others in their local communities, it is now open to anyone working in the cotton industry interested in making changes in their own business and also sharing this experience to benefit the broader community.

CRDC's Bruce Pyke said the tour is being supported by CRDC to enable Wincott to identify partnerships within and between rural industries delivering innovation, capacity and knowledge of farming systems.

"We hope this leads to even more innovative people within the cotton industry and community, creating a sustainable industry and viable communities," he said.

Early expressions of interest are encouraged by contacting Anne Coote as the tour is likely to book out quickly. The final itinerary will be available early 2011.

"The balance between production outcomes and environmental needs are not simple to achieve, however gaining an understanding of what others are doing allows people the opportunity to have informed knowledge before they decide what may work for them," said Anne Coote, Wincott communications spokesperson and Discovery Tour co-ordinator.

"We hope this tour can provide our industry with a raft of ideas that challenge those currently practiced, for example irrigation methods or the use of renewable energy sources."

Early expressions of interest to Anne Coote 02 6752 6510, 0427 526 510. <http://www.wincott.net.au>



# COTTON RESEARCH AND DEVELOPMENT CORPORATION ANNUAL INDUSTRY REPORT 2009–10 “FASHIONING THE FUTURE”

## From the Chair and the Executive Director

### Fashioning the Future

The 2009–2010 year commenced with the ongoing presence of the longest drought on record impacting rural Australia and the cotton industry. The good news is that on the back of above average winter rainfall and higher commodity prices, the reporting year has ended with a much improved outlook for 2010–11, and a welcome challenge in meeting the R&D needs of a resurgent industry with a mix of new, returning and continuing participants.

#### Strategic direction

The Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Joe Ludwig, tabled the CRDC Annual Report for 2009–10 in the Australian Parliament on November 24.

In this ‘Report to Industry—Fashioning the Future’, we have distilled the R&D information from the comprehensive public document to this 14-page snapshot view of R&D investment by CRDC 2009–10.

This report is not seeking to replace the comprehensive *CRDC Annual Report 2009–2010*, which is available from CRDC as a 170-page printed book. The *CRDC Annual Report 2009–2010* is also available on the website ([www.crdc.com.au](http://www.crdc.com.au)) in an e-publication format. This version can be viewed one page at a time and you will easily read it on screen, it is searchable to find what you want, or you can personally print it entirely or in parts.

For CRDC, the reporting year was the second directed by the *Strategic R&D Plan 2008–2013* in the quest for sustainable competitive advantage for the Australian cotton industry. In keeping with this quest, a major achievement for industry was the development of an industry vision. With CRDC support, leaders in the Australian cotton industry recognised the potential for improving industry per-



Back row: Kerry Adby, Bruce Finney (Executive Director), Mary Corbett, Glen Fresser and Lisa Wilson. Front row: Leith Bouilly (Vice-Chair), Peter Hayes, Juanita Hamparsum and Mike Logan (Chair).

formance, organisational collaboration and capacity through development of a shared view of the future. A 20-year timeframe was chosen in order to stretch thinking beyond the short to medium term, and ensure a longer-term strategic focus. The shared vision is facilitating greater awareness of possible future challenges, critical uncertainties and opportunities for the cotton industry, and most importantly is enabling alignment of thinking, planning and actions. In achieving the vision of ‘Australian cotton, carefully grown, naturally world’s best’, the industry can position itself to deal proactively with foreseeable emerging challenges such as peak oil, competitiveness with food crops, bio-identical cotton substitutes and new, yet-to-be-identified issues.

At the same time, CRDC’s portfolio of R&D investment during 2009–10 made progress with the strategic goals to add value to the Australian cotton industry with premium products in improved routes to market, to engender highly productive farming systems with improved environmental performance and to foster an industry that has the human capacity to apply and adopt the technologies and knowledge in which it invests.

CRDC Board of Directors meets regularly in cotton growing regions, as well as at major research institutions, so Directors can learn about local issues and how they relate to CRDC’s R&D programs.

#### Value Chain

CRDC investment in value chain R&D has facilitated new industry connections and improved market intelligence about the opportunities for cotton mills, brand owners and consumers to achieve greater value from Australian cotton. This potential was successfully demonstrated through collaborative pilot projects with local brand owners to launch 100% Australian cotton business shirts and towels that showcased the Australian cotton industry’s world best production practices and its unique fibre qualities, with the cotton traceable back to certified industry best management practice (BMP) growers, ginners and classers.

#### Farming Systems

R&D investments within farming systems have successfully targeted ongoing improvement in productivity growth, environmental performance and biosecurity. Cotton farm-

### Want to know more?

The complete *CRDC Annual Report 2009–2010* can be found at  
<http://www.crdc.com.au>



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**Australian Government**  
**Cotton Research and  
Development Corporation**

ing systems continued to become significantly more complex in response to new operating conditions such as climate change, water availability and competitiveness with other crops. Evaluations highlighted the importance of industry R&D assistance in this response through yield and water use efficiency gains, as well as better measures of the industry's environmental footprint.

## Human Capacity

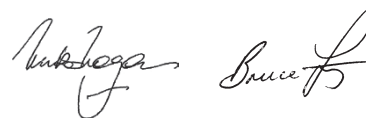
In 2009–10, the industry – with CRDC leadership – commenced the transformation of its approach to supporting the adoption of the technologies, practices and knowledge

produced by R&D. A demand-driven and commercial-like model is now in place, underpinned by the industry's BMP program, which has been redeveloped into an online environment (*myBMP*) powered by the latest R&D.

CRDC invested in industry participation in skills-related processes, particularly by young people, women and cotton communities, including indigenous members of those communities. Skills development is an important element of a strategy that seeks to result in attraction, retention and development of the best and brightest for our agricultural sector and, in particular, cotton production.

## Outcomes

The CRDC is pleased to report on the results of 2009–10, the second year of the plan. The report highlights the outcomes of the Corporation's investments in research, development and its application to enhancing the performance of the Australian cotton industry and community.



Mike Logan  
Chair

Bruce Finney  
Executive Director

# The year's highlights

## CRDC takes on new NPSI role

With support from industry, the Department of Agriculture, Fisheries and Forestry (DAFF) and the partners in the National Program for Sustainable Irrigation (NPSI), CRDC took on the role of NPSI Managing Agent in July 2009. Beyond the important research being undertaken, the program developed a vision for the future of irrigation R&D that is now informing a number of national reviews.

## Minister launches new irrigation publication

CRDC and Cotton Australia were pleased to provide the Minister for Agriculture, Fisheries and Forestry, the Hon. Tony Burke MP, with a first hand view of a thriving and innovative cotton enterprise, 'Keytah', near Moree, when he launched the National Program for Sustainable Irrigation publication, *Irrigation Essentials* in 2009.

## Recognition of CRDC support for indigenous traineeships

In May 2010, the Aboriginal Employment Strategy (AES) recognised support by CRDC and R&D Implementation Manager, Helen Dugdale, of its school-based trainee program for indigenous senior high school students at a national partnerships awards ceremony in Sydney, NSW.

Chloe Pokarier-Baker completed 800 hours of one day a week paid employment over two years at CRDC in 2009, as part of her traineeship. Helen Dugdale was on hand to represent CRDC at her 2009 graduation ceremony in Newcastle, NSW. Erika Anderson has now commenced her traineeship at CRDC.

Chloe is now working full time in a government position.

## Productivity Commission visit

In February 2010, the Australian Government announced the 'Productivity Commis-

sion Inquiry into the Australian Government Research and Development Corporations Model'. In April 2009, the Productivity Commission visited the cotton industry in Narrabri, NSW, including family farms, a tour and presentations from researchers at the Australian Cotton Research Institute, as well as attendance at the Sustainable Rural Communities Conference. The visit demonstrated the impact of R&D on productivity and environmental performance, and the connections between CRDC, researchers, growers and the community.

## Review of back office collaboration

As part of a general review on possible collaboration, CRDC and Grains Research & Development Corporation (GRDC) revisited the examination of shared back office functions in 2010. CRDC concluded that possible savings did not outweigh the benefit of having committed and available capability integrated within the business, with knowledge of the business, its stakeholders and suppliers. On the other hand, the review has resulted in ongoing collaboration with GRDC on best practices and innovation in information technology, finance and administration.

## Appointment of General Manager, Business and Finance

In June 2010, Graeme Tolson commenced in the role of General Manager for Business and Finance. Graeme holds a commerce degree and is a member of CPA Australia. He has a strong interest and capability in IT systems. His has worked in accounting, finance and administrative roles in a variety of commercial businesses across Australia.

## Cotton and carbon trading

CRDC General Manager R&D Investment, Bruce Pyke, was part of the Australian delegation to the International Cotton Advisory



Newly appointed General Manager Business and Finance, Graeme Tolson, with CRDC administrative staff, Margaret Wheeler, Elizabeth Eather and Dianne Purcell.

Committee 68th Plenary Meeting in Cape Town, South Africa, in late 2009. Bruce was a panellist during the 'The Impacts of Carbon Trading on the Cotton Industry' breakout session, which found that greater R&D investment in nitrogen management, crop rotations and soil sequestration were key parts of the same carbon measurement dilemma facing cotton globally. He told the session that the worldwide cotton industry needed to – and could – step up its capacity to measure carbon emissions but that this required standardised measurement methodologies. Research undertaken with CRDC investments places Australia in a good position to tackle these issues.



# Financial Performance

## Financial position 2009–10

CRDC reported a net surplus of \$0.23 million for 2009–10 against a budgeted deficit of \$1.03 million. This is a reflection of the combined effect of CRDC's management response to the effect of drought on forecast revenue, with fewer research applications funded, and a higher than expected project refunds from underspent research grants.

The Corporation's total equity position of \$10.53 million at 30 June 2010 is an increase of \$0.23 million from the previous year.

## Revenue 2009–10

Total revenue for 2009–10 was \$9.68 million which was \$0.468 million (5%) above budget.

2009–10 was a mixed season, with some cotton areas achieving record yields while others incurred floods and pest damage and some remained in drought. The drought continued to restrict revenue including Australian Government contributions, which are currently capped at 0.5 per cent of the three year average gross value of production.

The ABARE, June quarter 2010 forecast lint production of 1.7 million bales; 0.3 million bales lower than the CRDC 2009–10 budget of 2.0 million bales.

Interest, project refunds and grant revenue were all above budget.

## Expenditure 2009–10

Total expenditure for 2009–10 was \$9.45 million which was \$0.80 million (7.8 %) below budget. Research expenditure in CRDC's three strategic research programs and research-related corporate activities was \$7.86 million, \$0.72 million below budget. Other areas of expenditure for the Corporation included employees and operational expenditure were lower or within budget.

## 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.

## CRDC FINANCIAL OVERVIEW\*

### REVENUE

	2009-10	2008-09	2007-08	2006-07	2005-06
Grower R&D Levies collected	\$3.43m	\$2.37m	\$1.95m	\$4.17m	\$6.71m
Commonwealth matching contribution	\$3.00m	\$2.44m	\$3.13m	\$4.58m	\$4.91m
Royalties income	\$1.90m	\$1.61m	\$0.60m	\$1.29m	\$2.50m
Interest income	\$0.50m	\$0.74m	\$1.11m	\$1.05m	\$0.89m
Project refunds & other income	\$0.85m	\$0.52m	\$0.17m	\$0.42m	\$0.60m
Total CRDC revenue	\$9.68m	\$7.68m	\$6.96m	\$11.51m	\$15.61m

### EXPENDITURE

	2009-10	2008-09	2007-08	2006-07	2005-06
R&D expenses	\$7.86m	\$7.88m	\$8.70m	\$10.12m	\$11.14m
Employees, suppliers, admin, depn.	\$1.59m	\$1.53m	\$1.76m	\$1.77m	\$1.65m
Total CRDC expenditure	\$9.45m	\$9.41m	\$10.46m	\$11.89m	\$12.79m

### OTHER COMPREHENSIVE INCOME

	2009-10	2008-09	2007-08	2006-07	2005-06
Operating surplus/(deficit)	\$0.23m	(\$1.73m)	(\$3.50m)	(\$0.38m)	\$2.82m
Asset revaluation	\$0.00m	\$0.07m	\$0.00m	\$0.00m	\$0.11m
Nett surplus/(deficit)	\$0.23m	(\$1.66m)	(\$3.50m)	(\$0.38m)	\$2.93m

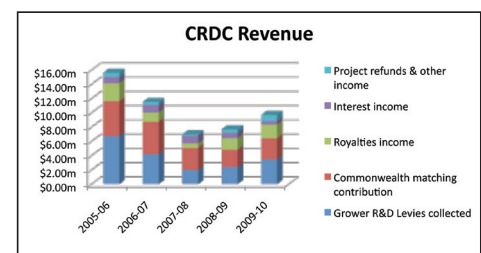
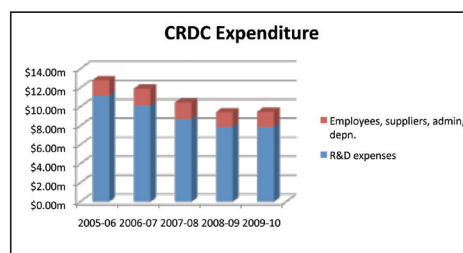
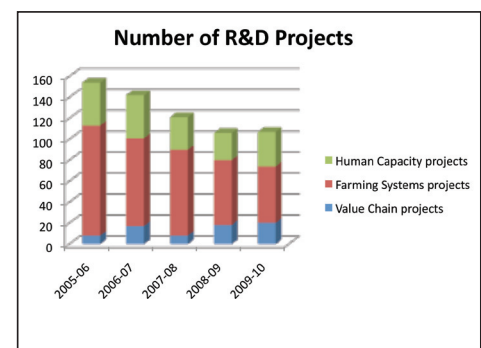
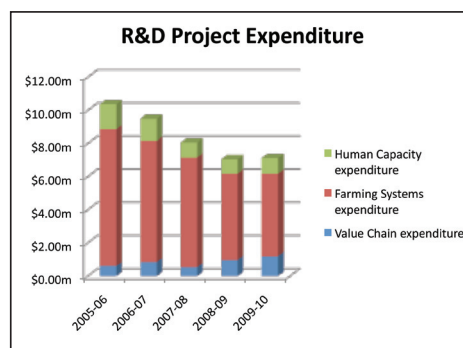
### BALANCE SHEET

	2009-10	2008-09	2007-08	2006-07	2005-06
Total Assets	\$12.84m	\$13.15m	\$13.69m	\$16.47m	\$18.63m
Total Liabilities	\$2.31m	\$2.85m	\$1.74m	\$1.01m	\$2.79m
Total Equity	\$10.53m	\$10.30m	\$11.95m	\$15.46m	\$15.84m

### PROJECT STATISTICS

	2009-10	2008-09	2007-08	2006-07	2005-06
Value Chain projects	20	18	8	17	8
Value Chain expenditure	\$1.18m	\$0.96m	\$0.52m	\$0.83m	\$0.59m
Farming Systems projects	54	62	82	84	105
Farming Systems expenditure	\$4.98m	\$5.21m	\$6.62m	\$7.32m	\$8.27m
Human Capacity projects	33	26	31	41	41
Human Capacity expenditure	\$0.95m	\$0.87m	\$0.91m	\$1.33m	\$1.50m
Total projects	107	106	121	142	154
Total expenditure	\$7.11m	\$7.04m	\$8.05m	\$9.48m	\$10.36m

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



# About CRDC

## Our vision

A globally competitive and responsible cotton industry

## Our mission

The quest for sustainable competitive advantage

## Our purpose

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

## Our 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.

## Our main research partners

- Cotton growers
- Rural Research and Development Corporations
- CSIRO
- Universities
- Cotton Catchment Communities CRC
- Cotton Australia
- Other Cooperative Research Centres
- Industry and Investment NSW
- Queensland Department of Employment, Economic Development and Innovation
- Other state government departments
- Crop Consultants Australia
- Agribusinesses

## Who we are and what we do

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.

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 many purposes including research review and progression, information sharing and technology transfer to industry.

CRDC produces 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](http://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 Cotton Industry Development and Delivery Team.

In 2009–10, CRDC became the Managing Agent for the National Program of Sustainable Irrigation (NPSI). 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.

## Vision 2029

In 2009, leaders in the Australian cotton industry recognised the potential for improving industry performance, organisational collaboration and capacity through development of a shared 20-year vision for the future. In August 2009, CRDC engaged the consulting group Emergent Futures to

facilitate development of Cotton Industry Vision 2029, launched at the 2010 Australian Cotton Conference. Key elements of the Preferred Future for 2029 envisage an industry that represents 'Australian cotton, carefully grown, naturally world's best': *An industry that is differentiated, responsible, tough, successful, respected and capable.*

Further information about Vision 2029 is available in the *Spotlight* Winter 2010 issue and the *CRDC Annual Report 2009–2010*.

## Climate change and cotton

In July 2009, CRDC and the Climate Change Research Strategy for Primary Industries (CCRSPI) co-convened a workshop to enable the cotton industry to discuss the possible implications of climate change, and to identify research, development, extension and communication priorities.

The workshop received funding from the Australian Government Department of Agriculture, Fisheries and Forestry (delivered through CCRSPI) and in-kind support from numerous cotton industry and researcher representatives.

A summary of the workshop outcomes was made available to the broader cotton industry audience at a forum on climate change held in Narrabri, NSW, in August 2010.

Further information about the industry priorities for climate change is available in *CRDC Annual Report 2009–2010*.

## National Program for Sustainable Irrigation

Following closure of Land and Water Australia in 2009, CRDC became Managing Agent for the National Program for Sustainable Irrigation (NPSI). Since 2002, NPSI has attracted \$18 million in investment aimed at improving the environmental and productive performance of irrigated agriculture and horticulture in Australia.

The Phase 2 Strategic Plan (2008–2010) focused on four key outcome areas: improved irrigation efficiency, sustainable future, improved industry capacity and R&D leadership. NPSI commissioned projects and undertook program-level activities to achieve these outcomes.

Many of the initial Phase 2 projects are now completed or nearing completion in line with contractual agreements. Phase 2

**“Key elements of the Preferred Future for 2029 envisage an industry that *is differentiated, responsible, tough, successful, respected and capable.*”**



has been extended for 12 months to allow for completion of a small number of projects in 2011.

Total planned expenditure for Phase 2 is \$7.2 million. Total expenditure in 2009–10 was \$2,053,703, which included both R&D grant liabilities and administration costs.

#### NPSI Partners

- Australian Government Department of Sustainability, Environment, Water, Population and Communities (formerly the Department of Environment, Water, Heritage and the Arts)
- Cotton Research and Development Corporation
- Gascoyne Water Cooperative and Gascoyne Water Asset Mutual Corporation
- Goulburn–Murray Rural Water 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

#### How Phase 2 has influenced practice change

Irrigators auditing centre pivot systems with a view to improving water use efficiency by 25%; irrigators in citrus and almond industries benefited from cost calculators and information packs; the Queensland Government-owned water industry company, SunWater, acted on the strategy of capacity sharing in new regions.

#### How Phase 2 has influenced capacity gains

To date, 83 farmers, consultants and R&D staff trained in reducing evaporation from farm dams; 32 citrus growers trained in tools to reduce fertiliser costs; 40 participants in master class modules on solute management; 113 participants of Watersmart Cotton and Grains workshops, eight university students undertaken summer scholarships; four industry travel fellowships awarded.

# Value Chain

#### Program goal

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

#### Outputs/ measures of success

- Markets, risks and opportunities for Australian cotton products are clearly defined and understood within the industry
- New partnerships between industry, researchers and end-users
- Post farm-gate best management practices are developed and adopted
- New and improved products, processes and measurements.
- Assessments of the competitive advantage of the Australian cotton industry

#### Outcome

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

## Highlights

#### Post-farm gate forum

The second forum in CRDC's Value Chain series, the Post-Farm Gate Forum, held at the Cotton Collective in Narrabri in August 2009, was attended by merchants, ginners, warehousemen, classers and trucking company representatives, along with leading Value Chain researchers. Discussion of a range of research initiatives affecting the post-farm gate sector and issues potentially requiring further work and investigation helped in the process of forging a new vision for preserving fibre quality through the various post-farm gate processes.

As Cotton Ginners Association chairman Jeff Ballentine pointed out, this was the first opportunity for all members of the sector to sit together and gain an understanding of the industry activities and pressure points throughout the value chain.

#### Domestic brand owners on board

CRDC has established links with a number of local brand owners to promote Australian cotton and BMP cotton to consumers. The Australian brand owner, Fletcher Jones, and manufacturer, Australian Weaving Mills, have launched products in 2010 under a new premium Australian cotton/

BMP brand. 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.

#### International spinning mills survey

In 2009–10, activities conducted by CRDC, Cotton Australia and the Australian Cotton Shippers Association (ACSA) have shown that a number of new premium market opportunities exist for Australian cotton as a whole and for BMP cotton.

These opportunities were identified through surveys conducted at two levels of cotton use – the initial mill processing stage and the final brand owner stage – to identify some of the building blocks required for a cohesive industry strategy for value-added placement of Australian cotton in suitable textile markets. Among the messages delivered through the survey was a clear trend toward more casual wear.

#### Wool and cotton collaboration

CRDC and Australian Wool Innovation (AWI) are collaborating to make the most of the natural advantages of both wool and cotton by investing in the development of new fabrics combining the two fibres. Leading international cotton shirt producer, Esquel, has already produced samples of an 80 percent cotton and 20 percent wool thermal shirt for cold climates, which is gaining interest from retailers in the US, Europe and Japan. Australian cotton grown under the *myBMP* program and wool grown under the Verification of Australian Merino program offer consumers quality assurance to support the natural fibre story.

## Key investments 2009–10

#### Premium Cotton Initiative

CRDC is 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.

The PCI brings together CSIRO-bred varieties—that 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.

The PCI is the major focus for the Value Chain Program.

The key tangible and intangible intellectual property assets the industry can use to develop partnerships with mills and brand owners can be grouped under three key elements:

- the fibre and its properties
- the technology and know-how to support use of the fibre and the Australian Cotton Story, and its relation to production efficiency
- implementation of BMP for overall environmental and processing management.

The PCI was established to understand the market opportunities for new premium quality varieties: if a new premium class of cotton could be defined, it should be marketed not just as a commodity but as a separate premium line of cotton.

In defining a new premium class of cotton, it was recognised that the industry's BMP program also provided a range of tangible and intangible benefits for the promotion of Australian cotton, so it is important for BMP to be an inherent component of any premium class of cotton. By combining fibre quality and BMP, the PCI targeted three core outcomes for the industry:

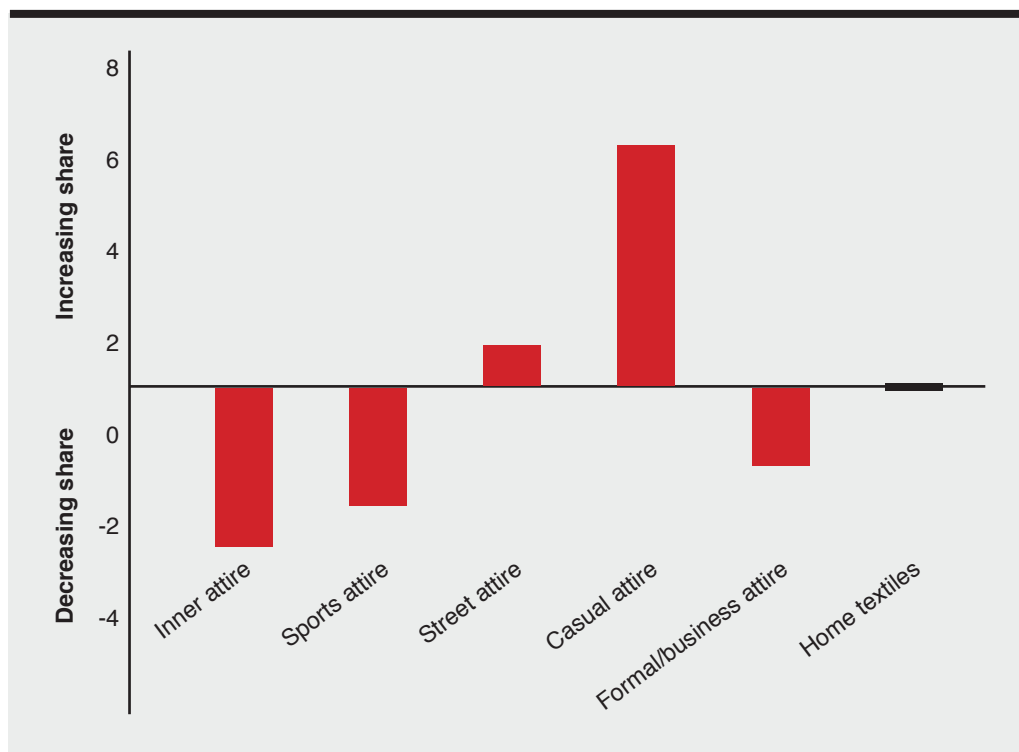
- strengthening the industry's reputation for quality
- promoting industry values in production
- providing value across all key aspects of the value chain.

### Expert Paper: The future for Australian cotton in global markets

The focus of CRDC's post-farm gate R&D in recent years has been to understand customer trends and demands. In 2009–10, a survey of mills and brand owners identified a number of new premium market opportunities for Australian cotton as a whole, and for BMP cotton in particular.

With regard to growth markets, the message derived from a survey of international spinning mills was clear. Formal and business apparel achieved the lowest growth ranking of all sectors with a trend towards more casual wear.

The surveys also showed that full vertically integrated mills and major brand owners see value in programs such as the BMP program, which fits well with their own corporate social responsibility goals. However, fabric and related garment quality remained critical to achieving any premium market, with environmental and social responsibility secondary considerations for the end consumer.



**Figure 1** This graph demonstrates clearly that casual attire is showing not only the strongest overall growth compared with other key textile uses for cotton but also the strongest growth in terms of cotton's share of the segment. Textile sector growth was measured by asking mills to rank sectors 1 to 6 in either direction of growth: increasing or decreasing market demand.

### Classing, Ginning and Warehousing BMPs

Over the past 12 months, draft BMPs for transport, storage (warehousing) and handling have been developed. Key topics covered within the new BMP guidelines include bale integrity related to shape, moisture, coverings, ties and identification; loading techniques; transport standards; and storage and stacking guidelines.

From the perspective of storage, handling and marketing, uniformity of bale packaging will add value to the entire crop, creating efficiencies throughout the supply chain and providing 'delivery confidence' for customers.

In continuing to refine BMPs for the ginning sector, 26 gins were assessed to determine their compliance with the *BMP Handbook for Ginning* version 6.0, dated March 2010. As a result, Cotton Australia recommended 16 gins for recertification and six gins for first-time certification.

### Market potential for modified cottonseed oils

CRDC investments in CSIRO research into healthier cottonseed oil have centred on the potential for commercial development of 'healthier' high oleic cottonseed oil derived from genetically modified cotton plants. Seeds harvested from the Australian Government's Office of the Gene Technology Regulator-approved field trial in 2009 will be processed in 2010 for use in cottonseed oil trials and food service sector trials, such as frying tests.

Recent research in the US has developed cottonseed with reduced levels of the plant toxin, gossypol. Cottonseed that combined high oleic levels with low levels of gossypol would have significant market potential and could be used as a protein source for livestock, poultry, aquaculture and humans. This would benefit farmers in developing countries by providing a source of food and marketable protein grain as an addition to the income from cotton fibre. CRDC is working with CSIRO and Cotton Incorporated in the US to investigate opportunities to combine the Australian and US technologies.

### New markets for Australian cotton with novel spinning technology

CRDC is developing initiatives to examine nano or micro particle treatments that may be used to achieve product improvements. Deakin University researchers have developed a number of technologies that may offer a competitive advantage in developing new fabrics made from Australian cotton.

One technology uses a nano-structured photochromic coating to achieve novel colour changing effects on cotton fabrics. Coated fabrics exhibit very fast photochromic colour change and provide additional ultraviolet protection, which could expand the use of cotton in premium high fashions, summer clothes and sportswear.

As well as nano treatments, different structural fabric finishes can improve the function of fabrics. Collaboration with an



international mill, CSIRO, Deakin University and Australian Wool Innovation will examine the development of thermal fabrics designed for different markets sectors through the development of different thermal rating. Market research has indicated a growing demand for such new fabrics, particularly for casual business-style clothing.

#### **Agronomic management to optimise textile performance**

A major collaborative project with the Cotton Catchment Communities CRC has investigated the key agronomic factors that affect fibre development and subsequent spinning efficiency. One important component assessed in 2009–10 was the effect on fibre quality of crop conditions at harvest. Defoliation of a crop with more than 50–60 per cent immature bolls was shown to increase nep levels and reduce fibre micronaire, fibre fineness and crop yields. Nep content is an area where Australian cotton must improve its performance, and this project provides valuable knowledge about possible on-farm causes.

#### **Industrial testing and commercial development of sensors in cotton gins**

As cotton dries during the ginning process, 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, in a joint investment with CRDC in a Cotton Catchment Communities CRC project, have developed a new moisture sensor. A provisional patent has been lodged for the technology and preliminary discussions have taken place with a potential commercial developer.

An opportunity exists to combine the sensor with a new cotton flow system being developed as part of a project investigating changes to the lint cleaner. A change in the method of the flow of cotton from the gin stand may enable more effective techniques to be developed for adding moisture to cotton prior to cleaning. The new sensor is expected to play a key role in automating any new moisture management system developed for gins.

#### **Investigate new SFC measurement in Australian cotton**

While Australia has a reputation for high quality cotton, the levels of neps and short

fibre content (SFC) remain a concern for the industry. Funded by CRDC, CSIRO, analysed some 1200 cotton samples in 2009 using different ginning techniques and, where possible, traced back to individual farms and growing regions. The survey found higher than expected nep levels. This data will provide better guidance on the key causes and where to best target future research.

#### **Investigate the relevance of classing grade on textile processing and quality**

The subjective classification of cotton according to established standards or grades, such as US Department of Agriculture grade boxes, is based primarily on colour (colour grade), visible trash (leaf grade) and preparation (degree of smoothness or roughness of the cotton sample), and often forces the gins to over-clean the fibre to achieve a higher grade and a better price for the cotton grower. This is often to detrimental to fibre quality, processing performance and the value of cotton as a raw material for textiles. Subjective grades are often such a poor indicator of the true spinning value of the fibre that some spinning mills offer price premiums for cotton that is harvested, ginned and shipped to their strict specifications.

A project established in 2009–10 with CMSE aims to build on the results of an earlier study, to clarify our understanding of the affect of classing grade on processing performance in relation to yarn and fabric quality. Two lots of cotton bales purchased from two commercial cotton ginners will be processed into yarn and fabrics. One with classing grades ranging from colour grade of 21–31–41 with a trash grade of two, and the second with classing grades ranging from a colour grade of 51–41–31 with a trash grade of five.

#### **Objective assessment of Australian cotton fibre, and technical support of SiroMat in the Australian market**

CRDC has invested more than \$1 million in the development of two new objective fibre measurement 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 partners, BSE Electronics, have combined the technologies into one machine and released its first prototype in

mid-2010 under the name 'Cottonscope', and will promote it to local and international classing houses and mills. The technologies will offer an additional objective measurement to mills and dyeing houses.

The development of improved spinning software technology by the Cotton Catchment Communities CRC uses the new measurements, and the new fibre fineness values have been shown to improve the prediction of yarn evenness and strength better than values by other methods such as AFIS (Advanced Fibre Information System) or HVI (High Volume Instrument) micronaire measurement.

**“One important component assessed in 2009–10 was the effect on fibre quality of crop conditions at harvest.”**

# Farming Systems

## Program goal

Cotton in a highly productive farming system with improved environmental performance

## Outputs/ measures of success

- Climate and natural resource management risks and opportunities for Australian cotton producers are defined and understood
- Climate and natural resource policy implications are interpreted
- Collaborations and partnerships within and between rural industries delivering innovation, capacity and knowledge for farming systems
- Benchmarking, assessing and reporting on productivity and environmental performance of cotton farming systems
- An industry capable of managing its biosecurity responsibilities

## Outcome

- A more resilient, profitable and competitive cotton farming system

## Highlights

### Cotton Life Cycle Assessment

The final report on a CRDC-commissioned Life Cycle Assessment (LCA) of a 100 percent cotton t-shirt confirmed preliminary findings that its production has a significantly lower carbon footprint than polyester. The LCA looked at the relative impacts on climate change, ozone layer depletion, mineral resources depletion and fossil fuel depletion, and found that cotton has a lower footprint in each category.

The LCA findings confirm what most consumers intuitively presumed: cotton's much more environmentally friendly than polyester and less prone to collecting odours and stains

### Cotton and greenhouse gases

Research into nitrous oxide and greenhouse gas emissions indicates that emissions from soils and fuel/electricity use in cotton production appear to be equal, and therefore need equal attention. CRDC is seeking to undertake further work on soil carbon, energy use efficiency and greenhouse gas emissions.

CRDC organised a climate change workshop in Sydney in July 2009, funded by the Climate Change Research Strategy for

Primary Industries (CCRSPI). The workshop looked at R&D coordination, gaps, opportunities and priorities. Outcomes from the workshop were presented at an industry forum on climate change in Narrabri in August 2009.

### Spray drift campaign

The area of cotton damaged by spray drift in the 2009–10 season was less than half that of the previous year, aided by CRDC-supported initiatives. A new, holistic project, established in 2009–10, delivered workshops on best practice spray application, tailored to the specific needs of growers in local areas. It's complementary to a GRDC investment that covers grain growers. The project also collaborates with the Vocational Education Training sector to increase the technical competence of trainers delivering spray application workshops across the agricultural sector.

As a means of informing neighbours of where nearby cotton crops are located, CRDC, GRDC, Nufarm and Cotton Australia launched CottonMap ([www.cottonmap.com.au](http://www.cottonmap.com.au)) in time for the 2009–10 season. The website enables cotton growers to mark their cotton fields on a regional map, which can then be printed and distributed to neighbours or viewed on-line. In its first year, more than 85 percent of cotton acreage was mapped, and maps were widely distributed by agribusinesses, crop agronomists and growers themselves.

### Assessment of herbicide resistance risks

In 2009–10, the on-line Glyphosate Resistance Toolkit for growers and their advisors was launched ([www.dpi.qld.gov.au](http://www.dpi.qld.gov.au)). Funded by CRDC, Queensland Department of Employment, Economic Development and Innovation (DEEDI), GRDC and Monsanto, it can be used to quantify the risk of glyphosate resistance developing in any field, on any farm and in any cotton-growing region. It is relevant to the full range of cotton and grains farming systems in Queensland and NSW. The tool draws upon knowledge gained from CRDC-supported PhD studies and research projects during the past eight years.

### Stopping mealybug in its tracks

The presence of the Solenopsis mealybug (*Phenacoccus solenopsis*) was confirmed for the first time in Australia in January 2010, in cotton crops in the Emerald region. (There



are no registered insecticides for control of mealybugs on cotton in Australia.) Within a month, CRDC, Cotton CRC and Cotton Australia created a working group of all interested parties to coordinate a local and industry-wide response. As a result of open and effective communication, monitoring protocols and hygiene measures to prevent the spread of infestations, severe crop infestation was confined to 88ha within one area of the Emerald growing region.

### Understanding diseases: an important part of biosecurity

Understanding the prevalence and spread of diseases is an important part of protecting the industry – and the nation – against invasive pests. Supported by CRDC, cotton pathologists from Industry and Investment NSW (I&I NSW) and DEEDI surveyed endemic disease problems across all cotton growing regions in the early and late stages of the growing season. Survey results show 2009–10 was a mixed season. Some diseases such as boll rots caused higher production losses than average, however the outcome was primarily due to unusual seasonal conditions.

Despite positive signs from this season's survey, soil-borne fungal diseases are some of the most recalcitrant problems facing the Australian cotton industry. This has driven new investment with I&I NSW, which aims to generate greater understanding of the ecology of these pathogens in cotton farming systems, to bring about improved management practices. In its first season, the project team gathered information about the diversity of spore production and survival of spores under differing soil conditions, investigated capacity of repetitive spore germination events and evaluated the effects of different winter crops on pathogen survival in field conditions.



### Grains and cotton collaboration

While many grain growers do not grow cotton, almost all cotton growers grow grain, which presents potential R&D synergies. In 2009–10, many activities arose from a formal investigation by CRDC and GRDC of collaborative opportunities. This included a program to map the location of farms where cotton is grown to help prevent spray drift damage, spray application management training workshops, resistance monitoring in helicoverpa to a range of pesticides commonly used in cotton and grains, soil nutrition in cotton and grains in Northern NSW and Queensland, silverleaf whitefly control (as part of the National Invertebrate Pest Initiative) and a weed management program in southern Queensland.

## Key investments 2009–10

### Measuring greenhouse gas emissions in irrigated cotton–grain farming systems

The Australian Government's Nitrous Oxide Research Program aims to develop knowledge, monitoring tools and management strategies to assist agricultural producers to reduce their greenhouse gas emissions without loss of productivity. It will also develop nationally standardised methodology for the collection of data on nitrous oxide emissions from agricultural soils.

CRDC is a member of the Steering Committee, along with Nitrous Oxide Research Program member agencies, that will monitor and evaluate implementation of the research program on behalf of the investing agencies.

As part of this program, a detailed field experiment assessing nitrous oxide emissions across a range of irrigation scheduling treatments is underway at Kingsthorpe, on the Darling Downs, Queensland. This builds on earlier CRDC investments into the study of greenhouse gas emissions in irrigated cotton systems at other research sites.

A project to benchmark and reduce greenhouse gas emissions and improve resource use efficiency has found that nitrous oxide losses from a wide selection of cotton growing soils of Australia is still broadly within the emission factor determined by the Australian Government for cotton systems. The project has developed a relatively simple way to estimate a field's nitrous oxide emissions in the laboratory or, at the very least, identify soils that have a high potential to lose nitrous oxide. Benchmarking can be done in two days, compared to the full 17-day assay.

The project also found that the increased inputs of carbon into soil from grain-based

crops, whilst essential for soil structure and soil carbon sequestration, also increase the potential for gaseous nitrogen losses. This demonstrates that mixed cotton–grain systems require sophisticated management of nitrogen fertiliser to minimise losses.

In July 2009, CRDC worked with the National Climate Change Research Strategy for Primary Industries (CCRSP) to organise a workshop on the impact of climate change on the cotton industry. A key outcome was a set of priorities for future R&D and communication on climate change for the cotton industry.

CRDC researcher, Dr Ian Rochester (CSIRO), will publish a paper, 'Sequestering carbon in minimum-tilled clay soils used for irrigated cotton and grain production', in the journal *Soil Biology and Biochemistry*. It contributes new information on carbon sequestration in modern high-yield cotton and grain production systems in Australia, and provides insight into how farm managers can improve their soil fertility by adopting better management practices to conserve stubble and sequester carbon. A provisional patent has been prepared within this project that will allow growers to adjust their fertiliser management according to their cottonseed nitrogen analyses.

### Understanding soil–water balance and deep drainage

CRDC has invested in research, development and extension to understand and reduce deep drainage (the loss of water beyond the root zone) for more than a decade. As a consequence, Australian cotton growers better understand that it is essentially a natural process that helps to move salts through the soil profile and thus must be allowed for within water budgets. Research has shown that inefficient irrigation management or poor positioning of on-farm water storages can lead to drainage in excess of natural events. On the other hand, adoption of highly efficient irrigation systems can lead to limited drainage and, depending on the quality of water applied, could, in the long term, lead to accumulation of salts in the subsoil.

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

Investments seek to ensure that the cotton farming system continues to evolve. The capacity to respond and adapt to changes in environmental conditions and soil and water resource constraints using new R&D-driven knowledge, practices and technology underpins resilience, and helps to maintain the Australian cotton industry's competitive advantage as an efficient, environmentally

responsible producer of high yielding, high quality cotton.

### Dynamic deficits – matching irrigation to plant requirements in a variable climate

Newly completed research into the most efficient way to irrigate Bollgard II has demonstrated that irrigation deficits can be varied to improve yields and water use efficiency (WUE) when measurements of plant stress are available to assist in making irrigation decisions. Changes in vapour pressure affect the level of stress cotton plants experience, irrespective of the level of soil moisture. Stress will be less during periods of lower vapour pressure deficits, allowing irrigations to be delayed without impacting yield under these conditions, and resulting in higher WUE. The need to avoid water stressing of Bollgard II varieties during late flowering has also been confirmed. Yield losses per day of stress were double those of the conventional variety at the same growth stage.

CRDC, together with CSIRO, is investing in a new project to continue to explore the feasibility and reliability of using evaporative demand as a trigger for dynamic deficit irrigation scheduling. The project seeks to identify predictive means of applying this knowledge, needed to enable broad commercial adoption. The 2009–10 season was characterised by long periods of low evaporative demand, providing excellent conditions to evaluate the magnitude of water savings from dynamic deficit strategies.

### Crop Consultants Australia annual survey

CRDC supports this survey as an important means of ascertaining 'on the ground' conditions to help determine the directions for future agronomic research. Conducted in 2009–10 but relating to the 2008–09 season, the qualitative survey received 23 responses from consultants, representing about 50 percent of total hectares planted and 379 growers, with at least one consultant from each valley.

Integrated pest management (IPM) has been an R&D and extension focus for CRDC for some years and the survey found that approximately 68 percent of these growers have implemented IPM in that season. IPM uses a locally appropriate combination of agronomic non-chemical tools with the aim of reducing insecticide use while maintaining profitability, yield and fibre quality.

Significant improvements were evident in practices to improve soil quality and health, including the use of soil management best practice, minimum or zero tillage, and the use of leguminous crop rotation to improve soil nitrogen.

The survey found that improvements

to irrigation efficiency have mainly been made in pumping efficiency, reducing storage seepage and evaporation, scheduling techniques, storage surveys and EM surveys (which ascertain salinity levels).

The survey found that mirids were less prevalent in 2008–09 compared to the 2007–08 season, but silverleaf whitefly and stinkbugs were more prevalent. *Helicoverpa* spp. levels remained much the same. While *Helicoverpa armigera* and *H. punctigera* were the principal insect threats to profitability prior to the introduction of GM Bt cotton varieties; sucking pests not controlled by the Bt genes, such as mirids and whitefly, are now the main insect threats.

Although fusarium wilt prevalence remained mainly unchanged in 2008–09, it remains the most common disease threat to profitability. Black root rot was less prevalent.

Volunteer (self-sown) cotton levels were about the same as the previous 12 months, while fleabane weed was more prevalent and remains the principal weed threat to profitability. The use of all weed control methods had reduced compared to five years ago, except for glyphosate used in-crop. This is almost certainly explained by the widespread adoption of Roundup Ready® and Roundup Ready Flex® cotton varieties.

### Big Day Out: helping the industry build adaptive and resilient farming systems

The CRDC/Cotton Catchment Communities CRC Big Day Out in Cotton, held in March 2010 on the Darling Downs, Queensland, showcased the role innovation

plays in building adaptive and resilient cotton farming systems.

Hosts Jamie and Susie Grant, of 'Keilli', were winners of the 2009 Innovative Cotton Grower of the Year Award. The day followed the successful format of last year's Big Day Out, with key industry researchers present to explain the scientific principles behind various aspects of this farming system.

Irrigated cotton producers from Central Queensland and the Macquarie, Namoi, Gwydir and MacIntyre valleys attended, interested to see how the Grants achieved consistent, profitable yields at 'Keilli' without irrigation.

A follow up survey of participants, several weeks after the event, has helped CRDC to understand exactly how an event such as this adds value to the industry.

### Continued improvement of cotton nutrition diagnosis and nitrogen use efficiency

Over several seasons, cotton extension officers, in collaboration with Dr Ian Rochester, CSIRO, have collected nitrogen use efficiency (NUE) data, from Emerald (4 sites), Darling Downs and Goondiwindi (13 sites), Warren (9 sites) and Hillston (3 sites).

Results – presented at an industry forum in August 2009 and in the *Spotlight* and *Australian Cottongrower* magazines – showed an opportunity to improve NUE significantly in the cotton industry, and additional resources have been allocated to the Cotton Industry Development and Delivery Team to achieve this. This includes the provision of data from both research and the NUE monitoring sites to assist the

revision of the NutriLOGIC decision support program. This new information will allow crop managers to more easily assess soil and plant tissue test data with accepted nutrient levels derived from high-yielding cotton crops.

Work has continued on the field calibration of a new test for cottonseed nitrogen, which can be correlated with NUE. If successful, a commercial service would provide a simple measure for cotton growers to obtain estimates of NUE to make decisions for subsequent crops.

### Defining critical soil nutrient concentrations in soils supporting irrigated cotton in northern NSW and Queensland

Soil nutrients, in particular phosphorus (P) and potassium (K), are being depleted in the clay soils supporting the grains and cotton industries of northern NSW and Queensland, especially in the deeper layers of the soil profile. Current commercial soil tests used to measure these reserves do not detect some of these changes because previously unrecognised pools of nutrients have been replenishing those measured by the extractants.

A small preliminary project conducted in 2009–10 assessed the potential of new diagnostic tests to clearly identify sites with low levels of available P and K where future fertiliser trials could be conducted. The project was also part of an initial assessment of the variability in P and K reserves in different soils and cropping systems across the region. Findings will feed directly into a joint GRDC and CRDC project in which laboratory, field and glasshouse studies will develop new guidelines to ensure profitable use of P and K fertilisers, as well as long-term sustainability of grains and cotton farming systems.

### The development of sustainable cotton farming systems for coastal north Queensland

In recent years, research conducted by DEEDI, through the Cotton Catchment Communities CRC, found that cotton could be grown in the Burdekin region of north Queensland, with significant yield potential. Cotton would represent a new crop in the sugarcane cropping system that dominates irrigated agriculture there.

CRDC is working with the original project partners and CSIRO to expand research to include managing the risks that annual cropping could pose to the region's natural assets and maximising both water and nutrient use efficiencies. Experiments have been established on clay and sandy textured soils in the region, measuring nitrogen efficiency in cotton following sugarcane,



Big Day Out host Jamie Grant with the large crowd who came to see how the industry's Innovator of the Year does it.



maize, mungbean cover crop or millet cover crop. The first year experiments concluded in July 2010, with sites used for quantifying farming systems impacts kept active for the duration of the project.

### The ecology and sustainable management of soil-borne fungal diseases

Supported by CRDC, cotton pathologists from I&I NSW and DEEDI surveyed endemic disease problems across all cotton growing regions in the early and late stages of the growing season. Survey results show 2009–10 to have been a mixed season. Some diseases such as boll rots caused higher production losses than average but the outcome was primarily due to unusual seasonal conditions.

For other diseases, such as fusarium wilt, the survey revealed very encouraging results, with the incidence of disease lower in all growing areas. Rather than a seasonal response, this appears to be closely linked to management changes led by R&D. In the worst affected region, the Darling Downs, sowing was delayed between two and four weeks to minimise the likelihood of cold stress exacerbating disease. Across the industry, widespread use of varieties with high F-ranks denoted the level of fusarium resistance. Bion seed treatment, developed with the support of CRDC, was used on more than half the crop area.

The pathogens causing black root rot, verticillium wilt and fusarium wilt all survive for long periods in the soil. In order to realise the gains that can be made through varietal tolerances for the wilt diseases and seed treatments over the long term, the industry needs complementary management practices. This has driven new investment with I&I NSW to gain a greater understanding of the ecology of these pathogens within cotton farming systems, and provide a basis for improved management practices. In its first season, the project team gathered information about the diversity of spore production and survival of spores under differing soil conditions, investigated capacity of repetitive spore germination events and evaluated the effects of different winter crops on pathogen survival in field conditions.

### Managing weeds and herbicides in a genetically modified cotton farming system

Years of work by the DEEDI weeds research team culminated in 2009–10, with the



Researchers Stephen Yeates (CSIRO) and Paul Grundy (DEEDI) in the Burdekin region

launch of the on-line Glyphosate Resistance Toolkit for growers and their advisors, collaboratively funded by CRDC, DEEDI, GRDC and Monsanto.

As cotton and grain farming systems have become more integrated in the past decade, cotton growers have adopted minimum tillage practices of dryland systems, so much has changed in weed management. While the availability of Roundup Ready Flex technology has simplified weed management in the crop, greater complications have arisen in herbicide choices for fallow management and weed control in rotation crops. Occasionally, cotton crops suffer herbicide damage when different farming systems intermingle, and the industry has only limited knowledge of how crops are likely to respond once damaged, and how management could be altered to reduce the impact of such damage. New investment with I&I NSW seeks to expand knowledge of cotton response to herbicide damage through a study of symptoms displayed by cotton following applications of low doses of herbicide, to determine whether impacts can be reduced.

### Developing industry capacity for BMP in spray application

Previous investments in this area have sought to address problems of spray drift in recent seasons with some success. A new, more holistic project established in 2009–10

delivered workshops on best practice spray application tailored to meet the specific needs of growers in a local district or on a regional basis. CRDC's investment is complementary to an investment by GRDC that covers grain growers. A CRDC–GRDC steering committee ensures synergies exist between the two industries, including consistency in communication to farmers. The project also collaborates with the Vocational Education Training (VET) sector to increase the technical competence of trainers delivering spray application workshops across the agricultural sector.

### Continued investigations to improve management of emerging pests and integrated pest management (IPM) in Bollgard II cotton

Within a month of the identification of solenopsis mealybug in January 2010, CRDC, Cotton CRC and Cotton Australia brought together a working group of all interested parties to coordinate the activities occurring locally and across the industry in response to the issue. As a result, severe crop infestation was confined to 88ha within one area of the Emerald growing region.

CRDC provided support for DEEDI to conduct research trials in the Burdekin during the winter to seek more information about how mealybug populations can best be managed in subsequent seasons.

Since the discovery in 2001 of a single mirid carcass cocooned by fungal hyphae in a cotton field, the I&I NSW research team have worked to turn this unusual and isolated incident into a mainstream control option for the cotton industry. Early demonstrations of efficacy of the new product

**“As cotton and grain farming systems have become more integrated in the past decade, cotton growers have adopted minimum tillage practices of dryland systems...”**

helped to secure the commercial backing of Becker Underwood.

In the past two seasons, northern NSW has been infested by silverleaf whitefly, and it now appears certain that whitefly will be a routine inclusion in the pest complex in NSW, not just the central Queensland and St George regions where it was found previously. Opportunistic trial work carried out in 2008–09 indicated some efficacy of the experimental biopesticide against whitefly. In 2009–10, trial work was more extensive, and consistent results have provided the opportunity for label claims for the control of silverleaf whitefly to be included in the registration submission.

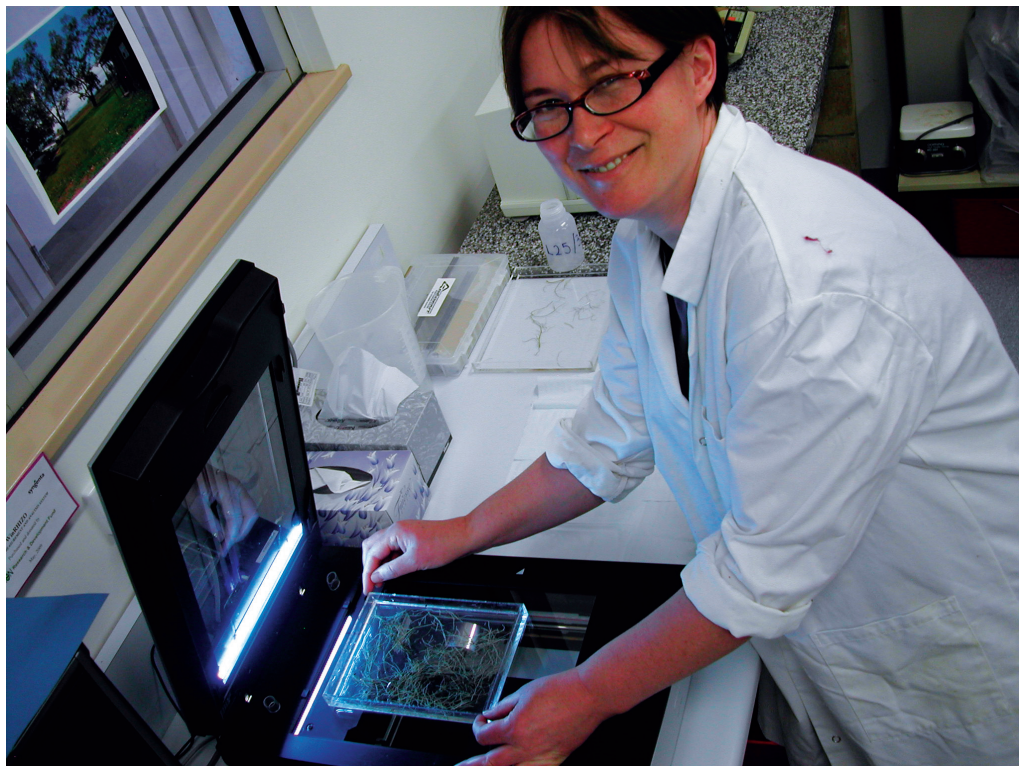
The new biopesticide, currently named BC639, offered equal control to the commercial standard, Admiral®. This new control option will be of particular significance to the cotton industry, as there are currently very few control options and those available have very limited windows for use during the season due to the very high risks of resistance. The biopesticide will carry a much lower resistance risk.

Within the CRDC-funded Integrated Pest Management (IPM) research project conducted by CSIRO Plant Industry is a ‘response to emerging pest problem’ clause. This clause was activated in 2009–10, with planned work on jassids and aphids postponed to accommodate the urgent need for new information on the behaviour of silverleaf whitefly populations in cotton in northern NSW. Experiments were conducted to validate the management recommendations originally developed in central Queensland.

Results showed that, as in Central Queensland, an IPM approach to management of all pests is required to reduce risk of whitefly infestation. Where broad-spectrum chemistries were used mid-season for mirid control, subsequent whitefly infestations were more severe. The relevance of other aspects of whitefly management recommendations will be considered in the 2010–11 season.

GRDC invited CRDC to a strategic planning workshop to assist in setting the future direction for IPM research in the grains industry. The workshop highlighted opportunities for the strengths in IPM research and adoption in the cotton industry to be replicated for some grains IPM issues, and for both industries to share in capacity building for IPM research and extension.

**“Results showed that, as in Central Queensland, an IPM approach to management of all pests is required to reduce risk of whitefly infestation.”**



Dr Allison Seyb, I&I NSW, analyses cotton roots using a WhinRhizo, which measures diameter, volume, surface area, length and branching to differentiate between healthy and diseased roots

To realise these opportunities, GRDC has invited CRDC to participate in the National Invertebrate Pest Initiative (NIPI). CRDC is working with its investment partners and the NIPI partners to negotiate the inclusion of two CRDC projects in the NIPI network.

#### Continued studies monitoring and managing resistance to insecticides and Bt crops

Programs to monitor *Helicoverpa armigera* and *H. punctigera*, *Aphis gossypii*, *Bemisia tabaci* b-biotype and *Tetranychid mites* for changes in the occurrence of resistance to insecticides and to the Bt toxins contained in Bollgard II cotton continued in 2009–10. Results across all programs show either no, or very minor, change from last season, meaning there will be no amendments to the industry’s voluntary Insecticide Resistance Management Strategy for the coming season. The industry has now shown long-term decline in resistance to a number of key chemistries used for *helicoverpa* control. The Resistance Management Plan (RMP) for Bollgard II will, however, change in the coming season as a consequence of the elevated resistance frequency in *H. punctigera* detected in the year previous and regulatory timeframes delaying opportunity for re-

sponse. The RMP will no longer allow the use of corn or sorghum as refuge crop options, as neither of these crops is a host for *H. punctigera*.

#### Enhancing the efficiency of Bt refuge crops within a changing cotton environment

The use of refuge crops and pupae busting carry significant direct costs for growers using cotton varieties incorporating Bollgard II technology, with additional indirect costs specific to the grower, the season and the farming system. A new project established with CSIRO is researching ways to enhance the RMP for Bollgard II through the continuation of long-term data collection on seasonal abundance of *Helicoverpa* spp., monitoring networks of refuge crops across the landscape, evaluating new, cheaper options for refuge crops and exploring options for refuge management.

#### Map cotton fields as communication tool to minimise off-target herbicide application

CRDC, GRDC, Nufarm and Cotton Australia launched an industry-wide web-based field mapping tool in time for the 2009–10 season. CottonMap ([www.cottonmap.com.au](http://www.cottonmap.com.au)) enables cotton growers to mark their cotton fields on a regional map, which can then be printed and distributed to neighbours. In its first year, over 85% of cotton acreage was mapped, and maps were widely distributed by agribusinesses, crop agronomists and growers themselves.



# Human Capacity

## Program goal

A culture of innovation and learning

## Outputs/ measures of success

- Industry and R&D capacity needs identified and gaps being addressed
- An industry with the capacity to deliver our future R&D innovation needs and their adoption
- The adoption of a shared vision for the cotton industry's future
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- The adoption of a shared vision for the cotton industry's future
- Assessments of industry capacity to innovate, lead and adapt

## Outcome

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

## Program highlights

### Moving best practice forward with *myBMP*

The Best Management Practices program, which has brought environmental credibility to the Australian cotton industry for more than a decade, has undergone a complete metamorphosis. *myBMP* is the result of industry-wide consultation with growers, researchers and industry bodies, taking into account the requirements of the cotton

## HOW IS *myBMP* DIFFERENT?

Aspect	Former BMP Program	New <i>myBMP</i> System
Format	Paper-based manual	Dynamic, interactive, web-based
Original purpose	To reduce pesticide off target movement. Later, a broader range of environmental standards for farm hygiene; land and water management and pesticide storage and handling were added.	To improve cotton farm business management (production, human resources and environmental) by providing direct access to the best information and latest R&D
Links to R&D	Strong initially with pesticides but researchers less directly involved with later modules included on the <i>myBMP</i> website.	Researchers have provided input to all modules. Links to information and knowledge assets and tools are
Scope and Flexibility	Limited: focus was on a grower completing all modules and meeting either legislative requirements or industry 'standards'. Success was measured by a farm achieving certification by demonstrating it had met or exceeded all industry standards.	Considerable: growers can use the system to work on any individual production performance issue or environmental risk management issue, or can choose to complete all modules. If required, a grower can choose to be audited. <i>myBMP</i> allows growers to identify whether they have met legislative requirements (Level 1); industry standards (Level 2) or set about achieving higher level performance and/or aspirational goals (Levels 3 and 4).

industry now and into the future.

A clear message from growers was that any new BMP system must be flexible to allow for the many and varied farming operations across the industry. The result is an innovative, flexible, web-based system, structured to offer cotton growers extensive access to cutting edge research and management tools while allowing them to choose how they wish to incorporate *myBMP* into their farming operations. The structure is completely new, the knowledge is up to date and the process is more streamlined.

### Innovative knowledge delivery

Over the past decade, the Australian cotton industry has benefited from a unique industry-wide extension network, the Cotton Catchment Communities CRC-coordinated Australian Cotton Extension Team, sup-

ported by extensive CRDC investments and involvement. In 2009–10 industry consolidation and investigation of new approaches by CRDC to supporting R&D adoption led to the formulation of and transition to a new demand driven and 'commercial-like' model, to be executed by an industry-wide Development and Delivery team. The new model recognises the importance of supporting adoption of R&D through multiple delivery pathways, underpinned by the redevelopment of the BMP program into *myBMP*.

### Sustaining Rural Communities

CRDC and the Cotton Catchment Communities CRC collaborated to hold a three-day Sustaining Rural Communities Conference in Narrabri in April 2010 to learn more about how the cotton industry can best invest in supporting its regional communities.

The organising committee offered 10 individual \$1000 bursaries to delegates willing to undertake a project to help sustain or rejuvenate their local communities. The bursary holders will share their outcomes at the second Sustaining Rural Communities Conference, to be held in March 2011. Presentations from the conference are available for download at [www.cottoncrc.org.au](http://www.cottoncrc.org.au). Find more information in the Winter 2010 edition of Spotlight (at [www.crdc.com.au](http://www.crdc.com.au)).

### Farming systems initiatives

Jamie and Susie Grant of 'Kielli' Jimbour, in Queensland, hosted the 2010 field day, the Big Day Out in Cotton, to demonstrate their 'low risk agriculture' strategy and the



A *myBMP* team was established to prepare for the August 2010 launch of *myBMP*, and to roll out the initiative to the broader Australian cotton industry. Left to right: Rohan Boehm and Bruce Pyke (CRDC), James Houlahan, Jim Wark, Ken Flower and Stuart Higgins.

keys to its success. Dryland cotton production is now an important part of the cotton industry, with prospects of greater dryland production in the 2010–11 season. Jamie and Susie have been keen collaborators in trial work with private consultants, state agriculture departments, CSIRO and many commercial agribusinesses.

Approximately 140 irrigation and dryland farmers from the northern to southern-most cotton growing regions attended and received a range of presentations in diverse areas such as soil health, rotation crops, row spacing in dryland systems, integrated weed management and growing quality cotton. They were able to inspect the Grants' very uniform cotton crop, grown using zero tillage, in combination with careful glyphosate resistance management.

### Harvesting cotton safely

Picking cotton is the most labour intensive part of the industry and each year involves a number of inexperienced employees. In an effort to reduce the risk of injury during this busy time, CRDC produced a Harvest Safety DVD in time for the 2009–10 season. CRDC has encouraged growers and contractors to help train their people at harvest time using this succinct induction to the dangers at harvest and the strategies needed to avoid accidents. The video is comprehensive, covering worker site inductions, communication, powerlines, maintenance, night work, fire hazards, transport, machinery and equipment.

Development of the DVD involved broad industry collaboration, aided by a widespread awareness within the industry of the onus on employers to provide proper training and a safe workplace.

### Ensuring leadership and research capacity

CRDC continued its endeavours to increase leadership capacity within the cotton industry and wider agricultural sector with support for the Future Cotton Leaders Program. Five women and five men, who won competitive entry to the program, completed the course in mid-2010.



Northern NSW growers inspecting the crop at "Kielli" with Big Day Out host Jamie Grant (third from left).



Participants at a Field to Fabric course held at CSIRO Materials Science and Engineering, Geelong.

Barb Grey and Arthur Spellson received CRDC support to participate in the Australian Rural Leadership Program, with Barb finishing the course in 2010 and Arthur to finish in 2011.

Participation in the Aboriginal Employment Strategy school-based traineeships program is a first step by the cotton industry to increase capacity in local indigenous communities and provide a bright future for the trainees, with one trainee based at CRDC and one at Cotton Catchment Communities CRC.

A study of national trends shows that the number of students studying science and agriculture at school and university is declining. To help reverse this trend, CRDC and the Cotton Catchment Communities CRC have a joint investment over three years with the Primary Industry Centre for Science Education (PICSE), an initiative hosted by the University of Tasmania. PICSE directly encourages students to continue with school science and move to university science. As a result of the PICSE initiative, both The University of New England and University of Southern Queensland had a surge in enrolments in agricultural science in 2010.

### The Field to Fabric course

An evaluation survey of participants in 2009–10 found that:

- 97% of respondents regarded the course positively
- 92% had implemented changes in their workplace as a result of the course
- 97% have recommended this course to others, or would do so.

### Comments from participants:

'Great course, good insight into the whole procedure from start to finished product.'  
'It gave me a better understanding of agronomic practices and how these influence the final product. This enables more focus on these practices to ensure quality products post-farm gate, especially in relation to fibre quality.'

Detailed descriptions of the key investments in 2009–10 for the Human Capacity Program are available in the *CRDC Annual Report 2009–2010*.

