

COTTON RESEARCH & DEVELOPMENT CORPORATION



# Spotlight

WINTER 2014

on Cotton R&D



**PEOPLE:  
OUR NUMBER  
ONE ASSET**

*Best Practice*







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## IN THE SPOTLIGHT



In this edition of *Spotlight* we are pleased to bring you a focus on our people.

Depending on the season and market conditions, the Australian cotton industry employs up to 14,000 people, in an incredibly diverse range of roles and responsibilities.

As our immediate past Chairman Mike Logan said of our industry: "it is really a collection of like-minded people who all want to grow good cotton well. That is what I see when I stand back, a group of really committed people who want to do what they do, grow, research, gin, support and deliver cotton at a standard that is better than anyone in the world. It is people working together". Ensuring our industry remains this way is vital to its future success.

For this reason CRDC adopted human capacity as a new and discrete area for investment in 2008. Today we have the "People" program within CRDC's 2013-18 Strategic Plan with the goal of 'capable and connected people driving the cotton industry'. CRDC is committed to investing in the skills, strengths and occupational health and safety of the human resources of the cotton industry and its communities.

In this edition of *Spotlight* we have brought together a selection of articles to

showcase just some of the ways we are working to achieve this goal.

Also in this edition we draw attention to the importance of controlling rogue cotton, both on and off farm, to preserving the effectiveness of biotechnology as well as protecting against diseases and pests. The work of growers at St George in tackling off farm volunteers is an example of what can be achieved.

In terms of the latest research news we have included stories about innovative new research into silverleaf whitefly management using similar ground-breaking technology to that used to successfully control dengue fever. Meanwhile in Central Queensland researchers have had success in the first year of trials looking at growing cotton under biodegradable plastic film to better take advantage of the region's climate to improve cotton yields and lint quality.

The industry is also gearing up for the Australian Cotton Conference, a major highlight on the cotton industry calendar, and this year promises to be no different.

To finish off this edition we ask the question: is cotton the new silk? CRDC R&D Manager Allan Williams shares insights into the role cotton will play in a textile market which is increasingly dominated by man-made fibres. We look forward to exploring this issue in more depth in coming issues.

Bruce Finney

### CRDC LAUNCHES NEW WEBSITE!

CRDC has recently launched its new user-friendly website, with new functionality for growers and researchers. The site [www.crdc.com.au](http://www.crdc.com.au) tells the CRDC's R&D story in an interactive way, allowing all visitors to the site to explore CRDC's investment in R&D through the five key program areas: farmers, industry, customers, people and performance. It also has a dedicated For Researchers section - where researchers and research students can find out what funding is available through the CRDC's annual funding round, plus scholarships, travel grants and scientific exchanges. In For Growers, there's an outline of R&D's key achievements, CRDC's involvement in industry programs myBMP, CottonInfo and CottASSIST. There is also information on funding opportunities available for growers from CRDC's Grassroots Grants to the Future Cotton Leaders Program.

**For this, and much more, check out the new site today! [www.crdc.com.au](http://www.crdc.com.au)**



IMAGE COURTESY USQ



University students Johanna Nielsen and Stirling Robertson are considering a career in the cotton industry thanks in part to a CRDC-funded program.



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

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**Our vision:** A globally competitive and responsible cotton industry.  
**Our mission:** To invest in RD&E for the world-leading Australian cotton industry.

#### Our outcomes:

**Farmers:** Cotton is profitable and consistently farmers' crop of choice.  
**Industry:** The Australian cotton industry is the global leader in sustainable agriculture.  
**Customers:** The Australian cotton industry captures the full value of its products.  
**People:** Capable and connected people driving the cotton industry.  
**Performance:** Measured performance of the Australian cotton industry and its RD&E drives continuous improvement.  
**Corporate background:** CRDC was established in 1990 under the Primary Industries Research and Development Act 1989 (PIRD 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, Barnaby Joyce.

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# INDUSTRY RESEARCHER'S NATIONAL AWARDS

EARLIER THIS YEAR COTTON INDUSTRY RESEARCHER DR ALISON MCCARTHY RECEIVED TWO PRESTIGIOUS NATIONAL AWARDS FOR HER WORK ON THE DEVELOPMENT OF AN INTEGRATED IMAGE SENSING SYSTEM FOR SOIL-WATER AND NITROGEN LEVELS IN COTTON CROPS.

**A**lison was awarded the 2014 ABARES Science and Innovation Award for Young People in Agriculture, sponsored by CRDC, as well as the Minister for Agriculture's Award. The combined award will provide Alison with \$41,000 to pursue her research ideas. The Awards aim to encourage science, innovation and technology in rural industries and help to advance the careers of young scientists and innovators through national recognition of their research ideas.

"Irrigation control using soil-water measurements can lead to 12 percent water savings and 10 percent improvements in yield, while on average about one third of applied nitrogen is lost, which costs the cotton industry \$32 million each year," Alison said.

"Growers need a reliable, low cost method of estimating soil-water and nitrogen status across their fields.

"Current soil-water and nitrogen sensors are typically expensive or only measure a small number of fixed positions in a field.

"A soil-water and plant nitrogen estimation system will offer growers potential savings by optimising irrigation and fertiliser management, and crop productivity."

Alison's idea for a camera-based system will enable non-contact, high spatial resolution estimates of soil-water and nitrogen that is convenient and cost-effective.

"The camera system can be mounted on a tractor or irrigation machine for real-time measurements that could inform farmer decision-making processes, or even feed directly into an automated variable-rate irrigation and fertigation system."

*Spotlight* caught up with Alison to find out about the impact this support will have on her research and how the cotton industry will benefit.

## How did it feel to be given this award?

*It was an honour to receive the cotton industry and Minister for Agriculture's Award – the premiere award of the night. I am excited that my research is contributing to the development of future agricultural production systems, a key area of research for the USQ's National Centre for Engineering in Agriculture where I am a Research Fellow. At the Centre, we focus on*

*delivering practical, profitable solutions that make a big difference to agricultural productivity.*

## What does it mean for you - and your research?

*My ultimate vision for the Australian cotton industry is autonomous irrigation and fertiliser application systems that switch on only when and where they are needed. Crop and soil sensing is essential for the full benefits of automated irrigation to be realised. My projects for the Science Awards are focused on achieving ideal cotton crop yields through optimisation of both water and nitrogen application. My idea for the Science Awards was to develop a novel, low-cost camera-based method to estimate irrigation and fertiliser requirements of crops. The Awards will enable development of a sensing system that combines crop image data with weather data to estimate variability in soil-water and nitrogen status across fields.*

## Where to from here?

*The research will be conducted between July this year and June 2015. Following evaluation of the sensing system findings and performance for the Awards, I hope to evaluate the proof-of-concept system under a range of conditions, investigate possible extension to other industries, and explore commercialisation opportunities so that growers can access the technology and gain improvements in productivity.*

## Minister's award

Federal Minister for Agriculture Barnaby Joyce presented the awards at a gala dinner as part of the ABARES Outlook 2014 conference. He said the awards showcased the talents and ingenuity of our young scientists to the world.

"Since it started 13 years ago, the Science and Innovation Awards have helped advance the careers of more than 190 young scientists, researchers and innovators.



"These awards show our appreciation by helping turn ideas into reality through funding.

"Optimal cotton crops need a balance of both water and nitrogen and Alison's work will be valuable in helping improve monitoring and application of fertiliser and water for Australian cotton growers."

CRDC Executive Director Bruce Finney said CRDC supports young scientists through the awards to explore concepts and novel solutions in the pursuit of scientific breakthroughs and new knowledge.

"An exciting aspect of the Awards is that these relatively small scale projects have the potential to make huge impacts to how cotton is grown in the future and its value to end users."

Applications for the 2015 award open in August, for more information go to [www.daff.gov.au/abares](http://www.daff.gov.au/abares) or contact CRDC Executive Director Bruce Finney - 02 6792 4088.

**CRDC Chair Dr Mary Corbett and Dr Alison McCarthy with her awards at the ABARES Science and Innovation Award for Young People in Agriculture.**







# TOP SCIENTIST AND RURAL LEADER

THE COTTON INDUSTRY SUPPORTS PARTICIPANTS IN THE AUSTRALIAN RURAL LEADERSHIP PROGRAM (ARLP), A UNIQUE 17-MONTH PROGRAM THAT DEVELOPS HIGH-LEVEL LEADERSHIP CAPABILITIES AS WELL AS BUSINESS, STRATEGIC PLANNING AND VALUABLE INTERPERSONAL SKILLS.

**S**haron Downes has been named as the latest CRDC-Auscott sponsored participant. Sharon is well known in the industry for her groundbreaking and vital research which has helped keep helicoverpa resistance at bay in Bollgard cotton.

As a scientist with CSIRO Ecosystem Sciences based at the Australian Cotton Research Institute in Narrabri, Sharon leads a team studying the ecology and evolution of resistance in *Helicoverpa* spp. to Bt-cotton. She is a long-standing member of the Bt Technical Panel of the Cotton Australia Transgenic and Insect Management Strategies Committee (TIMS) which develops, reviews and oversees the Australian cotton industry's pre-emptive strategies for managing insect resistance to Bt-cotton.

Sharon sees the opportunity to participate in the ARLP as an important step in future preparedness for her career within the industry.

"The ARLP not only brings together a team of leaders from diverse backgrounds but also educates outside of the confines of industry and organisational boundaries, and particularly as someone who lives and works outside of a metropolitan area, I'm looking forward to networking with peers from a range of professions, backgrounds and organisations.

"Secondly, while its teachings are broadly applicable, the ARLP is one of few programs that focus on improving effectiveness of leadership in - and for - rural Australia, which is a focus of mine.

"It also aims to transition participants from conventional leadership (where I see myself now) toward post-conventional leadership (where I would like to be)."

Sharon's motivations for undertak-



MELANIE JENSON

**2014 ARLP recipient Sharon Downes with CRDC Executive Director Bruce Finney, who is also part of the ARLP alumni. Sharon Downes has played a pivotal role in the cotton industry's successful management of Bt technology and resistance management.**

ing this program further extend to facets of her personal and community life.

Sharon's passion for rural Australia is grounded in her love of the rural lifestyle and landscape. Having studied in Melbourne and Sydney she is aware of opportunities afforded to city residents which are lacking in many rural communities. She is strongly motivated to use her skills to improve rural Australia and the nation as a whole.

"I want to use my skills to create future contexts for rural, regional and remote Australians which ensure their lifestyles and livelihoods," she said.

"I'd like to inspire a focus on whole of landscape productivity and innovation across commodities to build an integrated and sustainable approach to agriculture.

"I want to attract and retain industry workers and their families to rural Australia by creating communities that have affordable access to quality and diverse arts and cultural experiences.

"I'm looking forward to the course to engage with and learn from other leaders that share a similar passion, with a goal to collectively transforming rural Australia."

CRDC Executive Director Bruce Finney says support for leadership development is a long standing commitment by the cotton industry.

"This commitment takes many forms, the most obvious of which are programs like the ARLP, Nuffield, Peter Cullen Trust and

Future Cotton Leaders," he said.

"Having capable leaders throughout our industry whether it be at farm, business, community or industry scale is critical to the future.

"The reality is that this becomes most evident when they are absent!"

It has long been CRDC's strategy to support a diverse range of people with opportunities to develop as leaders. This goes back to the inception of the ARLP in 1993 when CRDC and other contributors (Cotton Seed Distributors, Cotton Australia, Auscott, Namoi Cotton, Twynam and Cotton Grower Services) provided for two cotton scholarships per course. During the drought support was necessarily reduced with CRDC and Auscott continuing to provide funding for one scholarship. In 2012, CRDC with support from Cotton Australia resumed funding of a second scholarship per year.

ARLP Participants are eligible for a Graduate Certificate in Australian Rural Leadership from James Cook University upon completion.

Applications for the next ARLP course (22) close August 29.

For more information contact Communications Officer Claire Delahunty (02) 6281 0680 / 0448 010 496 or [www.rural-leaders.com.au](http://www.rural-leaders.com.au)





WHEN IT COMES TO AN ORGANISATION'S ABILITY TO ACHIEVE IMPACT, OUTSTANDING PEOPLE MAKE THE DIFFERENCE.

# A FUTURE OF CAPABLE AND CONNECTED PEOPLE

In this special 'People' feature, we outline some of the ways in which CRDC is working with industry to address workforce needs and improve human capacity - to ensure the industry has the right people to stay at the top of its game in world cotton production. Depending on the season and market conditions, the Australian cotton industry may employ up to 14,000 people.

While investment in people was already occurring, the inclusion of CRDC's new People investment area, was in response to direct requests and feedback from industry through its grower panels which identified building capacity in the industry's people/workforce as a priority. It was on this pretext that Human Capacity was added to the investment program in CRDC's 2008-12 Strategic Plan for the first time as a stand-alone investment area.

The commitment has extended to the current (2013-18) Strategic Plan. Complementing the three RD&E programs for Farmers, Industry and Customers are two integrating programs, People and Performance. The People program's aim is to ensure we have 'capable and connected people driving the cotton industry'. CRDC is committed to investing in the skills, strengths and occupational health and

safety of the human resources of the cotton industry and its communities.

For CRDC, this involves a two pronged approach, to support initiatives to upskill current people, as well as support research and initiatives to find better ways to attract and retain new, talented people in the industry. This relates largely to the on-farm and research domains. CRDC has also funded a number of studies into labour markets and workforce research through partnerships with universities and consultants.

"This has given us a picture of where the industry is now in terms of its workforce, and also what our research priorities are to meet future requirements," CRDC General Manager R&D Investment Ian Taylor said.

"Previous CRDC studies confirmed that we are facing a people shortage that is likely to persist at least into the near future.

"As an industry we need to encourage a good inflow of capable people who want to compete for available positions, adding to our industry.

"CRDC's investment and support for initiatives over a number of years is something we are very proud of, however we still have challenges to overcome in attracting and retaining people on farms, and competition with



**People are any industry's main asset. CRDC is committed to investing in the skills, strengths and occupational health and safety of the human resources of the cotton industry and its communities.**

other organisations for top scientists is as strong as ever.

"We do feel however that by proactively investing in programs to address these issues we are starting to have an impact in attracting people to the industry in key sectors."

**"MAKING SURE OUR INDUSTRY CONTINUES TO BE MADE UP OF SMART, INNOVATIVE PEOPLE IS VITAL FOR THE INDUSTRY'S FUTURE SUCCESS."**

## POTENTIAL EXISTS TO LEARN FROM OTHER INDUSTRIES ON HUMAN CAPACITY ISSUES

### CRDC IS WORKING WITH OTHER RESEARCH AND DEVELOPMENT CORPORATIONS TO JOINTLY ADDRESS THE WORKFORCE

Over the past year a series of cross industry meetings initiated by Dairy Australia involving other Research and Development Corporations (RDCs) have discussed opportunities for collaboration in the

people, workforce and extension areas.

"The dairy industry commenced a more integrated and strategic approach to workforce development nearly a decade ago and so have established a more whole of industry approach to workforce data, training and professional development than just about any other industry," CRDC's General Manager R&D Investment Ian Taylor said.

This includes Dairy Australia's People in Dairy website and the Diploma in Human Resources (HR) offered through the industry.

A new cross-RDC group led by Dairy

Australia has identified potential value in having a "People in Agriculture" website containing generic agriculture HR and industrial relations information and resources, modelled on the People in Dairy website. CRDC is supporting this initiative and also looking into the development of a cotton-specific HR course modelled on the dairy industry Diploma of HR.

[www.thepeopleindairy.com.au](http://www.thepeopleindairy.com.au)  
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# PhD STUDENTS TOUR THEIR FUTURE INDUSTRY

IN 2014-15, CRDC WILL INVEST MORE THAN \$500,000 TO DEVELOP FUTURE RESEARCH CAPABILITY THROUGH ITS SUPPORT OF PhD STUDENTS.

In May, 18 PhD and postdoc students received a behind-the-scenes look at the cotton industry around Narrabri, visiting dryland and irrigated cotton farms, exploring the cotton seed, ginning, and classing processes and hearing about the range of research underway at the Australian Cotton Research Institute (ACRI).

The students are all funded by CRDC and are at various stages of completing their studies. They are researching a diverse range of cotton-related topics, from improving the length, strength and fineness of cotton fibre to understanding human capacity needs and management; and from under-

standing more about green vegetable bugs to mapping the impacts of herbicide drift on cotton and developing self-guided drones for tracking irrigation in a cotton field.

The tour was a paddock to processing look at the industry to help the students understand the life cycle of cotton and how their research may help the industry.

The tour, hosted by CRDC, also included a visit to the Norrie's farm "Mollee," Auscott farm and gin, Cotton Seed Distributors' breeding lab and seed plant, Australian Classing Services' facility and Cotton Grower Services at Wee Waa.



RUTH REDFERN

PhD student Kate Marshall, NSW DPI, examines a helicoverpa moth at the Australian Cotton Research Institute, Narrabri, during CRDC's PhD tour. Kate is researching molecular genetic methods to detect neonicotinoid resistance in cotton aphids.

# SHARPENING LEADERSHIP SKILLS

From a strong field of candidates, 15 future industry leaders have been selected to participate in the industry's fourth biennial Future Cotton Leaders Program, recognised as the premier leadership development program for the cotton industry.

The program, an initiative of Cotton Australia in partnership with CRDC, provides participants the opportunity to hear from industry leaders, get advice and information to help guide their future from inspiring speakers, and meet likeminded people from within the industry, helping them build their networks and relationships. They will also complete an industry leadership project.

The participants were selected by a panel from Cotton Australia, CRDC and former program participants based on their leadership aspirations, contribution to the industry, skills and experience.

The course runs from May to October with participants meeting face to face in Toowoomba in June and at the Australian Cotton Conference in August.

The 2014 Future Cotton Leaders are (pictured from left to right) Ben Dawson, B&W Rural Moree; Tom Galbraith, Independent Commodity Management Toowoomba; Ross Harvie, ECOM Commodities, Nericon; Renee Anderson, Cotton Australia Regional Manager Emerald; Alex Harris, ECOM Commodities



RUTH REDFERN

The 2014 crop of Future Cotton Leaders met for the first time in Toowoomba recently.

Rowena; Allyse Morris, Queensland Cotton Dalby; Alex North, Cotton Seed Distributors Goondiwindi; Lauryn Riordan, Koramba Ginning Moree; Alex Roughley, Tandou Limited Menindee; Elizabeth Lobsey, Meteor Pty Ltd Dalby; Heath McWhirter, Elders Griffith; Nicola Cottee, CSIRO Plant Industry Narrabri; Tom Quigley, Quigley Farms Trangie;

Georgie Krieg, Glen Royal Farms Brookstead; and John Smith, CottonInfo Toowoomba.

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# BRINGING UNI STUDENTS TO COTTON

NEW INTERNSHIPS IN COTTON INDUSTRY ORGANISATIONS HAVE GIVEN TWO UNIVERSITY OF SOUTHERN QUEENSLAND STUDENTS AN IMPORTANT INSIGHT INTO THEIR FUTURE CAREERS.

**J**ohanna Nielsen and Stirling Robertson recently finished their placement at a number of cotton industry establishments around Narrabri, NSW, organised through the Primary Industry Centre for Science Education (PICSE), which is supported by CRDC.

Johanna, a second year Bachelor of Science student, spent a week at the Australian Cotton Research Institute (ACRI) receiving one-on-one mentorship from researchers.

"My preferences were plant pathology, nutrition and agronomy and so I spent my week with NSW DPI Biosecurity plant pathology team at the ACRI in Narrabri," Johanna said.

"I worked primarily on black root rot (*Thielaviopsis basicola*) and through the process of isolating the pathogen to producing clean cultures.

"I found my time in the world of plant pathology fascinating and as a result I'm now rearranging my enrolment pattern so I can study USQ's microbiology courses as part of my biology major."

Johanna said the internship reinforced the fact that scientific research takes time and patience.



"It may take years to find solutions to a problem - it's a long-term career," she said.

"The fact that you are contributing to amazing research that will lead to a positive change for the future of agriculture in Australia makes it worthwhile."

Third year Agricultural Engineering student Stirling Robertson's industry experience was more varied.

"I was exposed to different areas of the industry, including Namoi Cotton's Yarraman Gin, Aquatech Consulting and Cotton Seed Distributors (CSD)," Stirling said.

"While at Aquatech I developed an understanding of how crucial it is to be able to design systems which improve

water efficiency, especially in times of drought.

"At CSD I saw the latest in genetic innovations in Bollgard III while in its development stage."

Stirling said his internships have given him the opportunity to see how different areas of the industry interrelate and contribute to make the cotton industry more sustainable and viable into the future.

"After the internship I realised how much career potential exists within the industry which is very exciting for me as an aspiring agricultural engineer," he said.

"I am looking forward to becoming more involved in the industry, whether it is through further experience or through my fourth year engineering research project."

The internships are just a part of the PICSE program, which also engages students at primary and secondary level. The program provides a national strategy of collaboration between universities, their regional communities and local primary industries to attract students into tertiary science and increase the number of skilled professionals in agribusiness and research institutions. The cotton industry hopes to attract more high quality young people into science based primary industries through the program, which is supported by CRDC.

Trudy Staines (part time CottonInfo Education Officer) also provides support for the PICSE program.

**Johanna Nielsen and Stirling Robertson are part of a program in which CRDC invests to promote students to consider careers in the cotton industry.**

"PICSE encourages years 9 -12 students to consider a science related career. It provides a selection process for interested students and then organises events, contact with industry including placements and, once students have chosen a science related course at university, internships can be awarded to successful candidates," says CRDC Program Manager Bruce Pyke.

"PICSE is partly responsible for an increase in students being interested in science and then in regional areas being steered towards agriculture.

"Jim Pratley (Secretary of the Council of the Deans of Agriculture) has recently indicated that we are seeing an increase in students enrolling in ag courses. More than 50 percent of the successful Horizon scholars have come through the PICSE program somewhere.

"CRDC hopes to be able to exert more influence, via PICSE, over students' career choices by giving them positive experiences with the cotton industry.

"We don't expect to capture the hearts and minds of every student, but if we do nothing to showcase our great industry to the next generation we may end up going backwards."

For more information about PICSE programs visit [www.picse.net](http://www.picse.net)

Information about USQ's science programs at [www.usq.edu.au/sciences](http://www.usq.edu.au/sciences)



Namoi Valley cotton grower Brendon Warnock (second from right) and CRDC Natural Resource Management R&D Manager Jane Trindall were immersed in water talk as part of the Peter Cullen Trust Science to Policy Leadership Program.



## UNDERSTANDING LEADS TO IMPROVED PRACTICE AND PRODUCT

THE FIELD TO FABRIC COURSE GIVES ATTENDEES AN INSIGHT INTO THE ROLE EACH SECTOR PLAYS IN THE PRODUCTION OF WORLD CLASS COTTON.

Have you ever wondered whether agricultural practices, ginning, handling and storage of cotton have an impact upon the quality of the end product? Then the Field to Fabric training course is for you.

Run by CSIRO's Dr Rene van der Sluijs with funding from CRDC, the course looks at cotton quality and how it is managed at all stages of the cotton pipeline: from on-farm to the finished fibre product. The course is designed for all people involved in cotton, from growers to technologists, and demonstrates how all sectors of the industry operate and relate to each other.

The course program covers global perspectives, variety selection, agronomy, fibre properties, harvesting, ginning, classing, marketing, yarn manufacture, fabric formation, dyeing, finishing and printing, and environmental issues.

To support cotton growers and industry representatives to attend the course, CRDC is offering subsidies of up to \$2000 to a limited number of recipients to help cover registration, travel and accommodation expenses. It is hoped recipients will extend the knowledge and benefit from the course to wider industry.

The 2014 course will be held at CSIRO's Textile and Fibre Technology facility in Victoria from August 25-27 2014. A course program and registration form is available for completion. Places are limited and questions regarding the course can be directed to Dr van der Sluijs via [rene.vandersluijs@csiro.au](mailto:rene.vandersluijs@csiro.au).

For more information, or to request a CRDC application form, please contact Helen Dugdale on 0417 064 507. Applications close on Friday July 11 2014.

email us

email us

## SKILLING GROWERS IN NRM POLICY AND MANAGEMENT

CRDC AND COTTON AUSTRALIA SUPPORTED COTTON GROWER BRENDON WARNOCK AND TANDOU LIMITED'S WATER MANAGER BRENDAN BARRY TO ATTEND THE PETER CULLEN TRUST'S SCIENCE TO POLICY LEADERSHIP PROGRAM.

The Trust brings together stakeholders from across sectors of water management from around Australia to strengthen stakeholder understanding between science and policy in water system management.

The Trusts' mission "Bridging Science, People and the Environment" reflects its philosophy that respectful, informed and meaningful collaboration is the key to responsible and sustainable water management, now and in the future. The Trust promotes informed exchange and debate on important water management issues.

Brendon Warnock, who farms at Narrabri in the Namoi Valley, says he continuously seeks ways to challenge his abilities in his professional life and the program presented an opportunity to articulate the views of irrigators in the water debate and engage with alternate points of view.

"All the other participants were from environmental protection, natural resource management, scientific and political backgrounds," he said.

He said the lessons learned in this course will remain with him for life.

"The experiential learning activity showed me how people behave under stress and how to manage my own behaviour.

"I now understand the importance of speaking up, to make myself heard and also to ensure that I listen to what others are trying to say.

"I met some great people I remain in touch with and learned a lot about myself, leadership and improved my understanding of our political process.

"This personal growth has put me in good stead to perform my role as a farm manager and represent our industry where possible."

Tandou Ltd Water Manager Brendan Barry also says the experience provided the opportunity to put cotton's story forward to

the 14 participants.

"I made connections with a group of people in water who I would not normally cross paths with," Brendan said.

"It was helpful to gain an insight into how irrigators and farmers are viewed by the policy process and the people involved in those processes.

"Conversely, I was able to help other participants better understand how the irrigation industry manages water, rivers and riparian areas.

"Our mission at Tandou Limited is sustainable and profitable water investment and agribusiness, and I believe the participants gained a better understanding about that.

"By engaging in discussion, we could give other participants a better understanding of our industry's issues and achievements, from someone at the coal face of irrigated agriculture, rather than them perhaps sticking to entrenched positions.

"It is essential to remain engaged with other natural resource management stakeholders and put your credentials and view on the table in a constructive and coherent way."

CRDC Natural Resource Management R&D Manager Jane Trindall said supporting the trust participants is a valuable investment for CRDC.

"The personal connections made will be important professional connections, improving communication, understanding and giving new insights and fresh perspective which all help to increase the influence of cotton R&D on water policy," Jane said.

### More information

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# INSIGHT INTO INDUSTRY WORKFORCE NEEDS BEFORE THE COTTON INDUSTRY CAN TACKLE ITS EMPLOYMENT NEEDS, IT MUST KNOW WHAT THEY ARE...

A REVIEW HAS RECENTLY WOUND UP OF CURRENT INDUSTRY, REGIONAL AND FARM WORKFORCE DEVELOPMENT ACTIVITIES AND HUMAN RESOURCE PRACTICES ON FARMS.

**W**hile there was anecdotal knowledge about labour needs and issues in the cotton industry, prior to the CRDC's Innovative Work Project, these needs, gaps and the successes had never been formally quantified. The Innovative Work Project aims to help the cotton industry better understand and address its workforce needs over time. The study involved interviews and case studies with growers, agribusiness and other industry sectors in the Gwydir, Emerald and Lachlan-Murrumbidgee production valleys.

Undertaken by the University of Melbourne and The University of Sydney, it showed staff shortages of: 20 percent in Emerald, 16 percent in the Gwydir and 11 percent in the Lachlan-Murrumbidgee areas.

Outgoing CRDC Program Manager Bruce Pyke has overseen the Innovative Work Project and says the major findings wouldn't surprise many: there are some regional differences, yet essentially all regions are experiencing difficulties in attracting the full complement of staff they need. There is a shortage of experienced staff available in particular and much of the gap in casual or seasonal on-farm work is being filled by backpackers. And while backpackers are mostly regarded as good workers and quick learners they are transitory, hence the constant turnover.

"Although we don't have any data on this, the high turnover probably costs growers more than it benefits them," Bruce says.

"To gain some solid data on this, CRDC is funding a further study into the cost of staff turnover which will start in July.

"The high-reliance on backpackers could also cause a flow-on effect by

**"MUCH OF THE GAP IN CASUAL OR SEASONAL ON-FARM WORK IS BEING FILLED BY BACKPACKERS."**



failing to train up local people so they are available to the industry over time.

"This could come about if the ready supply of backpackers discourages the growers who use them from seeking locals to fill seasonal and casual positions.

"Given that a percentage of locals who entered the industry as casuals or seasonal workers have become full time experienced and valued employees, then if this flow of local employees stops due to the employment of backpackers, over time it will affect the numbers and quality of experienced staff.

"Furthermore, because there is a reliance on backpackers, if the supply dries up for some external reason (eg economic recovery in the EU) there appears not to be a 'Plan B', which raises the question of whether the industry should be working on one and who should be driving it? Or do we just leave it up to growers to do their best to fill the gap as has been the case up to now?"

The study from the Lachlan-Murrumbidgee follows those at Emerald and the Gwydir, which show the unique factors influencing recruitment and retention each area. In Emerald it is competition with the mining sector, in the Lachlan-Murrumbidgee the rapid expansion of

the industry that has led to a deficit of cotton-experienced employees. The low unemployment rate (2.8 percent) for that region also affects ease of recruitment.

It also emerged in the Lachlan-Murrumbidgee grower survey that a larger workforce is required for cotton than other cropping activities, with most demand being for experienced staff.

"Now we have this information we are in a better position to consider why and how a workforce development plan can be established to assist growers in addressing their workforce employment challenges," Bruce said.

The researchers' analysis suggested four strategies for action:

- Identifying/developing a sustainable source of labour (short term)
- Promoting best practice in employment relations (short/mid term)
- Developing skill and career pathways (mid/long term)
- Developing a national and/or regional capacity to take action on workforce (mid/long term)

The researchers are now focusing on programs being rolled out in Emerald and workforce meetings are planned in cotton growing areas, with the first in Griffith.

**Innovative Work Project researchers Dr Jennifer Moffat, Gail Power and Dr Ruth Nettle have been working with the cotton industry to address workplace and employment issues.**





Riverina cotton growers are being given help to overcome workforce challenges with the 'Your future agricultural workforce: my options, what to do, who can help me' event in July as part of CRDC's Innovative Work Project.

## GRIFFITH TO HOST MAJOR AG WORKFORCE EVENT

GROWERS IN THE RIVERINA WILL HAVE THE OPPORTUNITY TO LEARN PRACTICAL WAYS OF MANAGING WORKFORCE CHALLENGES AT THE GRIFFITH WORKFORCE EVENT, WHICH IS FOCUSING ON 'YOUR FUTURE AGRICULTURAL WORKFORCE: MY OPTIONS, WHAT TO DO, WHO CAN HELP ME'.

**T**he event is being held on July 17 in conjunction with Regional Development Australia – Riverina, and sponsored by CRDC as part of the Innovative Work Project.

The event will bring together regional people who provide services and support in workforce in the Riverina, so that the local cotton farming and agricultural community can meet them and learn what is occurring locally. Where necessary, speakers will be brought in from outside the region.

This event builds on existing interest and activity in the Riverina to address the agriculture workforce skills and shortages, and has the potential to help develop the momentum needed

**"THE EVENT BRINGS TOGETHER REGIONAL PEOPLE WHO PROVIDE SERVICES AND SUPPORT THE WORKFORCE IN THE RIVERINA".**

for regional action to occur.

Preliminary topics include:

- Agriculture training that is happening in the Riverina and how training can help your business.
- Initiatives to ensure that we have regional workers tomorrow: attracting, training and recruiting.
- Labour hire: what you need to know; what is available; what you can expect.
- International workers: visa options for agriculture; overview of the process; challenges and solutions.
- Are you interested in having overseas students working on your farm?
- About to start employing, or just employ casuals? The basics on what to do, and your responsibilities.
- Farmer stories about training and visas: lessons learned and happy endings.

### For more information

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## GROWING CAREERS IN COTTON

Developing a local plan and then identifying the top priority for workforce action was a recommendation of the CRDC's Innovative Work Project undertaken by researchers from the University of Melbourne and the Workplace Research Centre at the University of Sydney, who have been investigating workforce issues impacting the cotton industry.

The researchers said this could involve working with workforce stakeholders like regional training organisations to form local groups that continue to identify workforce priorities and undertake action locally.

Through the Innovative Work Project, Central Highlands cotton organisations have teamed up to roll out the 'Grow a Career In Cotton' initiative to attract high quality job seekers interested in developing skills and diplomas through paid full time or part time traineeships in the cotton industry.

Emerald cotton grower and Cotton Australia Regional Manager Renee Andersen has been appointed as project officer through the Innovative Work Project to oversee the Grow a Career in Cotton trial, which involves group training organisation (MRAEL), local cotton growers and the Emerald Agricultural College. This forms the core of a local workforce development group.

"We are recruiting high quality job seekers interested or passionate about agriculture, and assisting them achieve a Certificate II and/or Certificate III in Agriculture," Renee said.

"We have recently undertaken interviews with 22 quality applicants, with three recipients to be selected soon.

"The trainees will work on-farm and spend five weeks per year at Emerald Ag College to complete a Certificate III in Agriculture.

"We are really pleased with the interest, and that we have growers who are willing to participate in this program."



# SUPPORTING INNOVATORS

CRDC INVESTS IN THE NUFFIELD FARMING SCHOLARSHIP AND OTHER LEADERSHIP AND DEVELOPMENT PROGRAMS TO PROVIDE CAPACITY BUILDING OPPORTUNITIES FOR INDIVIDUALS AND THE INDUSTRY.

**N**uffield Australia is an organisation providing opportunities for Australian primary producers and managers to travel overseas to study their agricultural topic of choice.

Nuffield has been awarding primary producers scholarships for over 60 years. Scholars are people who are committed and passionate about farming, are at the leading edge of technology uptake or are potential future leaders of their industry.

CRDC and Cotton Australia support individuals to participate with the aim that the awardee will bring this knowledge from their research tours back to better the industry as a whole.

The current scholar is Nigel Corish, a cotton grower at “Yambocully” Goondiwindi in South East QLD.

Previous scholars have included Andrew Watson and Dave Brownhill.

Nigel Corish says the biggest benefit of the scholarship is the ability to share and communicate with like-minded farmers outside the cotton industry that aren’t afraid to challenge the things you are doing.

As part of Nigel’s scholarship he will extend on research he is currently undertaking on his own farm looking at soil nutrition and fertiliser use efficiency in irrigated cotton when he travels to the UK, USA, China and Japan.

“I expect this trip could lead to change in my farming techniques to improve nitrogen use efficiency and



then share this with the rest of the industry,” he said.

“I am wanting to look outside the box.

“I want to gain a better understanding of nutrition requirements of the cotton plant to maintain the high yields we are seeing in the cotton industry, however making sure it is sustainable into the future.

“I also want to investigate if farmers are using fertiliser to mask soil constraints or other factors that are limiting yield.

“I have a focus on nitrogen, as this is the nutrient that is in highest demand for the plant, and is the nutrient that is least efficient. I think we are losing nitrogen through application timing and types.

“There are always going to be inefficiencies through fertiliser applications but I am sure we can do things better.

“I am going to travel around the world and talk and see how other farmers are approaching nutrition requirements on their farm, and will report back to the Australian cotton industry how they do it and if there is better ways of doing it sharing it as well.

There are 300 Nuffield scholars in Australia and 1250 worldwide, providing a unique agricultural network. The learning process is continues with state, national and international tours and conferences. There are 25 scholarships on offer for 2015 and applications close June 30 2014.

For more information

[www.nuffield.com.au](http://www.nuffield.com.au)

<http://tinyurl.com/nm65fud>



**Dave Brownhill** (1998 scholar), **Nigel Corish** and **Nuffield Australia Chair Terry Hehir.**

“My main goal is to bring back an idea that can be adapted by farmers to improve something on their farm, and the second goal is to bring back an idea that will hopefully improve the industry.”

Nigel travelled to China at the end of May on the first leg of his scholarship journey, with five other Australians and four international scholars as part of the Global Focus Program. While in China the group plans to visit a cotton mill, before travelling on to the Philippines, Canada, Netherlands, France and Ireland. Nigel will then join a group organised by Cotton Australia and Monsanto to look at weed resistance in the US.

**“MY MAIN GOAL IS TO BRING BACK AN IDEA THAT CAN BE ADAPTED BY FARMERS TO IMPROVE SOMETHING ON THEIR FARM...”**





# BUILDING CAPACITY AT GRASS ROOTS

THE COTTON COMMUNITY WILL CONTINUE TO FEEL THE BENEFITS OF THE SUCCESSFUL GRASSROOTS GRANTS PROGRAM, AS CRDC EXTENDS FUNDING.

The Grassroots Grants Program will continue in 2014-2015 with a commitment of \$75,000 from CRDC.

"We have been really pleased with the outcomes of the Grassroots Grants Program," said CRDC Program Manager Bruce Pyke, who oversaw the initial roll-out of the program.

"Cotton grower associations and growers have accessed more than \$215,000 over the last three years to undertake a range of capacity building projects which have seen real results," he said.

With more than 25 projects undertaken, CRDC expects the next round of funding to attract more advanced projects.

Program Administrator Sally Hunter said the purpose of the grant program was to build the capabilities of CGAs and growers to identify priority needs, develop, plan and implement projects as well as to be able to fulfil funding requirements.

"We have seen the level of understanding of the granting process grow and seen CGA committee members put forward better and better projects," she said.

"They are getting a feel for what is needed for their growers and how best to fulfil those needs; some find informal education where growers learn from other growers work well, such as the Research and Rugby Tours.

"Others find formal workshops are more suitable, such as those hosting forklift and first aid training courses."

During 2013-2014 a few of the projects dealt with mental health issues at the community level. Health Empowerment Days in Mungindi, Dirranbandi and St George and Goondiwindi received an overwhelming response to their support and education day targeting wives of growers during picking time.

Projects that engage local communities and particularly schools have been highly successful. Two Theodore high school teachers attended the Field to Fabric course last year and have been able to develop a well informed and engaging cotton program for their students. Tandou is building a relationship with their local high school through providing a small spray rig and their agronomy staff to assist with the development and maintenance of the school ag plot whilst educating students about chemical use and the broader cotton industry.

**Applications for the 2014-2015 round will open July 1 and close November 30 2014 for projects up to the value of \$10,000 that can be implemented within the financial year. Funding may be provided on a first in first served basis so be sure to contact Sally Hunter on 0459 944 778 soon to discuss your project and receive the guidelines and application form.**

# KEEPING INDUSTRY FOR A SECURE

RE-ACQUAINTING COTTON GROWERS AND CONSULTANTS WITH RESEARCHERS AND INDUSTRY LEADERS BUILDS BETTER CAPACITY FOR A MORE RESILIENT INDUSTRY.

The "Research and Rugby" tour, funded through CRDC's Grassroots Grants Program, took growers, their staff and agronomic consultants from Walgett and Namoi in Northern NSW on a two-day 'acquaintance' tour of the industry.

Co-ordinated by CottonInfo Lower Namoi regional development officer Geoff Hunter, the aim was to give participants a broader understanding about research, how research funding is allocated, who manages it and what happens outside the farm gate.

"As part of my role I talk to a lot of younger growers and consultants which led me to realise there was a gap in the link between them, researchers

and industry leaders," Geoff said.

"The new generation of growers, staff and consultants have their whole (farming) future in front of them - they are the future of the industry, and as such need to know what goes on in a broader across-industry sense and to understand where, how and why research is/was generated and undertaken."

The tour visited a local farm, Australian Cotton Research Institute (ACRI), Auscott Gin, CRDC and Cotton Seed Distributors (CSD), meeting with the people behind these businesses, with the opportunity to engage or re-engage with the industry's integral organisations and people. The event was capped off with a trip to a local

## KNOW YOUR INDUSTRY – WHAT'S IN IT FOR YOU?



Narrabri cotton grower Matt Norrie says with many new people coming into the cotton industry, and even though technology and social media has allowed people to be more connected than ever, we're still not "as connected as we used to be".

"These days it can be hard to get people off farms to move out and gain further knowledge of how their industry works, but is such an important aspect of cotton farming," Matt says. "Being involved results in awareness and being better informed, which can only be good for business, the security and sustainability of our industry.

"This Research and Rugby Tour provided that as well as the opportunity to get to know fellow growers or consultants and network between us all."

Furthermore, Matt says, the meeting with researchers and industry leaders provided a valuable opportunity not just to gain information, but to also offer it.

"Demand always determines supply, and the research arena is no different," he said. "As growers we need to be involved so the decision-makers are aware of our needs and priorities.

"Through interaction with research providers, researchers and industry leaders we can be reassured that their priorities are aligned with what cotton farmers are doing on-farm, our challenges and issues.

"In this way we can ensure that our priorities are successfully fed into the research machine."



# INDUSTRY CONNECTED TO THE FUTURE



On the Research and Rugby Tour, growers from around the Namoi and Walgett region met with researchers from the Australian Cotton Research Institute including CSIRO plant breeder Dr Warwick Stiller.

rugby match in Narrabri.

At Paul, Lissa and Matt Swansbra's "Lammermoor" at Merah North, near Wee Waa, participants saw how these innovative growers use different row configurations to better manage water use efficiency in times of dry or low allocation.

The tour of ACRI included discussions with cotton researchers including CSIRO's Lewis Wilson, Mike Bange and Warwick Stiller about current and past research in their respective fields of entomology, crop physiology and plant breeding.

## Reconnecting the link

This was a particular eye-opener for the participants according to Geoff, and crystallised the reasoning behind the tour.

"There were a lot of younger guys who didn't know much about ACRI," Geoff said.

"This is in stark contrast to previous generations of growers and consultants who often had close working relationships with the research community.

"Everyone there was keen to talk to the researchers about the progress of their own crops and issues they were facing. With the wealth of knowledge from researchers and growers alike we covered a range of topics.

"Researchers also get to see and

understand the scale of issues that farm managers and owners are dealing with and identify where knowledge is lacking. This certainly helps give some perspective to all parties."

## Learning from the past

Moreover, says Geoff through re-establishing these links, the industry's capacity to identify any future issues early is enhanced.

"Ten or 15 years ago, all growers knew researchers," Geoff said.

"There were some big issues being tackled by everyone in the industry which facilitated the links between growers and researchers, irrespective of age and experience.

"While many growers and consultants are involved in instigating and promoting research, there are relatively few among this group from the younger generations, as there has not been a catalyst, or perceived 'need' or opportunity to engage with researchers and industry leaders.

"We need to have new and young growers and consultants thinking about the next big issues so we can be strategic rather than reactive in research and management priorities – and we don't want their good ideas to get lost in the back blocks."

## Meet and greet industry leaders

To further facilitate this, a meeting with CRDC investment managers informed the group how research was prioritised and undertaken.

Cotton Australia CEO Adam Kay joined the group via video link and talked through Cotton Australia's role and the role of grower research panels. CSD's Phil Armytage and Chairman James Kahl along with Rob Dugdale from Cotton Grower Services were on hand to meet with the group.

"The gathering at CSD with industry leaders offered the chance to introduce the group to people who have the future of the industry in their hands, so they then feel more comfortable about contacting them with issues or ideas," Geoff said.

"Strengthening these links can only strengthen the industry."

With the help of further Grassroots funding and the local CGA, Geoff extended this initiative to continue to build on the capacity of these growers with a trip to Griffith to meet local growers and inspect bankless channel and overhead irrigation systems.

## More information

Contact Geoff Hunter, CottonInfo 0458 142 777.





# LINK TO RESEARCHERS VITAL FOR SUCCESS

THE IMPORTANCE OF FORGING STRONG CONNECTIONS BETWEEN COTTON INDUSTRY RESEARCHERS, GROWERS AND AGRONOMIC CONSULTANTS CANNOT BE UNDERESTIMATED, ACCORDING TO ONE OF THE INDUSTRY'S LONGEST STANDING AND MOST WELL RESPECTED RESEARCHERS.

**G**enerational change and high turnover of agronomic consultants during drought years has contributed to a relative “disconnect” between them and researchers, however this is being reinstated with initiatives like the Research and Rugby Tour, according to CSIRO entomologist Lewis Wilson.

Based at the Australian Cotton Research Institute (situated between Narrabri and Wee Waa), Lewis has been working with the cotton industry for 28 years in the field of insect management. By working closely with consultants, growers and agronomists, he helped the industry overcome issues through some of its most challenging days, and was at the coal face when resistance to the likes of endosulfan and pyrethroids threatened to derail the emerging industry in Australia.

“During the desperate times through the late 1980s and 1990s there developed a very strong connection between the research community and the consultants, agronomists and growers, driven by the need to manage *Helicoverpa* against the backdrop of increasing resistance,” Lewis said.

“Growers and consultants worked closely with researchers to develop resistance management plans and integrated pest management guidelines to tackle the problems we faced, and we got to know each other well.”

Now a whole new crop of young people have entered the industry during the ‘Bollgard era’ and post-drought.

“The use of Bollgard technology has resulted in less focus on the pest management issues that used to dominate and has also given crop managers more time to focus on crop agronomy rather than pests,” Lewis says.

“The resurgence and popularity of cotton growing post-drought and the expansion into new areas has also brought a lot of new faces. But there have been fewer issues really driving the connectedness of research and industry which means that many researchers don’t know the new faces and vice versa.

“In the past researchers had good connections to what are now the older



**“WE NEED TO FOSTER THE TWO-WAY ENGAGEMENT BETWEEN RESEARCHERS, GROWERS, CONSULTANTS AND AGRONOMISTS SO WE CAN BETTER TACKLE FUTURE ISSUES...”**

Lewis Wilson

growers and consultants and it is these strong connections that make the industry so great.

“We don’t want to see a ‘gap’ or disconnect forming now.”

Not surprisingly, Lewis had high praise for the Research and Rugby Tour, which aimed to bring this new blood into contact with the research community, to forge relationships and better understanding.

He described it as “a great initiative” and a way to kick start these imperative new connections.

“Everyone on the tour seemed to like getting the information ‘straight from the horse’s mouth,’” he said.

“They also seemed to appreciate hearing the history and science behind some of the practices that older researchers and consultants take for granted, such as pupae busting.

“For me, the new growers, consultants and agronomists will gain a lot by hearing about current research and understanding the background and science behind management recommendations. This will help them to be more comfortable with these recommendations and more able to adapt

them to their own situations.

“Conversely talking with growers and consultants is good for us as it gives us a finger on the pulse, to know where they are having issues - and successes, and where research can help provide answers.

“This is important for researchers especially those new to the industry looking for opportunities to develop their research directions, work on-farm with growers and have their research adopted.

“The industry is well served by new initiatives such as the CottonInfo team targeting extension messages to industry.

“We also need to foster the two-way engagement between researchers, growers, consultants and agronomists so we can better tackle future issues and maintain the strength of these connections we are so proud of as a research community and industry as a whole.”

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email us





## LOVE WHAT YOU DO

TRUDY STAINES IS PASSIONATE ABOUT HER ROLE AS COTTONINFO EDUCATION OFFICER, WHICH IS SUPPORTED BY CRDC.

"I love what I do," Trudy says, "I love going into schools talking to students from kindergarten to high school, showing them our cotton industry, what we can do with cotton, where their socks and undies come from and how innovative our industry really is."

Based at the Australian Cotton Research Institute, the role is supported by CRDC, and aims to:

- Offer support for students and teachers in an agricultural / science landscape
- Promote science and agricultural careers in the cotton industry
- Improve the reputation of the cotton industry
- Facilitate interactions between schools, industry and rural communities
- Support the integration of the cotton industry, agriculture and science into educational resources

In primary schools this includes co-ordinating the 'Enviro Stories' readers written by children for children, visits and workshops and the Science and Engineering Investigation Awards. At secondary level Trudy oversees the PICSE program, Career Expos, Field to Fabric for schools and work experience placements.

University undergraduates through PICSE Internships, Horizon Scholarships, PhD Tours and Summer Scholarship are also helped navigate their way through the industry under Trudy's enthusiastic mentorship.

"I enjoy being able to have university students come and have real life experiences in our industry whether it be working with ag consultants or having one-on-one time with a researcher"

"Getting feedback from internship students that they have rearranged their subject line to pursue a possible career in cotton after gaining experience in the industry is really rewarding.

"We as an industry can see the benefit in taking the time to host students and see it as avenue to attract them to a career in the industry."



Trudy (fourth from left) with Horizon scholars Billy Browning, Kirsty McCormack, Jessica Kirkpatrick, Paul Sanderson, Alana Johnson, Charlie French and Emily Miller.

CRDC BEGAN SUPPORTING THE HORIZON SCHOLARSHIP WHEN IT WAS A PILOT PROJECT IN 2010, STARTING WITH ONE STUDENT. AS IT DID LAST YEAR, CRDC WILL SPONSOR FIVE STUDENTS IN 2014.



Billy Browning says Horizon has been a fantastic help for him and other young people wanting to stay in the agricultural sector.

The Horizon Scholarship is an initiative of the Rural Industries Research and Development Corporation that, in partnership with industry sponsors like CRDC supports undergraduates studying agriculture at university.

CRDC and other sponsors of the Scholarship are responding directly to an urgent need to increase the number of graduates in agricultural science and related disciplines in order to maintain the Australian agricultural industry's competitiveness.

Participating industries are able to showcase their industry to students of high potential through the provision of mentors, industry placements and workshop engagement.

Along the way, the sponsors are creating strong links with high potential individuals who act as ambassadors for careers in agriculture and are well placed to pursue a career in their sponsor's industry.

The scheme has been well supported, with the response from students continuing to be positive with strong numbers of applicants. The scholarship is open to students going into their first year of tertiary study and provides:

- A bursary of \$5000 per year for the duration of the degree
- Mentoring partnerships with university faculty members and industry leaders
- Professional development workshops
- Annual industry work placements that give students first-hand exposure to modern agricultural practices, and
- Opportunities to network and gain knowledge at a range of industry events.

The Horizon Scholarship addresses the main issues facing agricultural industries' labour shortages.

- It facilitates industry participation in education and training.
- It works to increase the number of graduates in agricultural science.
- Through the provision of mentoring and industry placements, it makes those graduates work ready.
- It raises the profile and awareness of agricultural career pathways.

Billy Browning is a fourth generation farmer from Narromine studying a Bachelor of Agricultural Economics at the University of Sydney.

As part of his CRDC-sponsored Horizon scholarship he spent his work placement at the Australian Cotton Research Institute at Myall Vale near Narrabri and at the Cotton Australia office in Sydney.

Billy said that the scholarship has given him the opportunity to study at tertiary level and he has taken the opportunity with both hands.

"Horizon has been a fantastic help for me and also for other young people wanting to stay in the agricultural sector," he said.

"Being from a cotton farming background we only see the production of the crop, so it was a good experience for me to see the research and development side as well.

"Horizon has helped the young people involved in agriculture to stay passionate and motivated about the industry.

"It has also given me great insight into the future of youth in agriculture."



# SCIENTISTS SHARE PASSION FOR RESEARCH

A SUCCESSFUL INITIATIVE TO ATTRACT STUDENTS TO SCIENCE IN THE COTTON INDUSTRY HAS ENLIGHTENED A GROUP OF NARRABRI HIGH SCHOOL STUDENTS.

**N**SW DPI Cotton Pathologist Dr Karen Kirkby has teamed up with CottonInfo Education Officer Trudy Staines to create the Careers for Kids by Kids program, to highlight local exciting and rewarding careers in agriculture/science and showcase some of the great facilities and careers in the Narrabri district.

Karen successfully applied for a grant offered by the Sustaining Rural Communities Conference in Narrabri last year, which carried the stipulation that projects must benefit the community.

"Trudy and I are passionate about science, research, education and our community, so this was a perfect fit," Karen said.

"So we approached Narrabri High's Year 10 students and were thrilled to get 20 on board."

The students were required to research three cotton-related careers: researcher, technical officer and technical assistant - to make a short film to educate other students and promote these career opportunities.

This involved visits to the Australian Cotton Research Institute to interview Karen, CSD Senior Plant Pathologist Stephen Allen, NSW DPI Technical Officer Peter Lonergan and technical assistants Bethany Cooper



IMAGE: MELANIE JENSON

**Narrabri High School students Jack Hardy and Liam Parker take a closer look at cotton at the Australian Cotton Research Institute.**

and Sharlene Roser.

Students then wrote, edited, interviewed, filmed and acted in their films to outline these career options, which they then presented to the Narrabri and District Chamber of Commerce, who had also supported the initiative.

According to Karen, the Chamber was suitably impressed and posted the films on its website ([www.narrabrichamberofcommerce.com.au](http://www.narrabrichamberofcommerce.com.au)) and students uploaded their work to the Career Harvest website [www.careerharvest.com.au](http://www.careerharvest.com.au) in the hope others will take an interest in local career opportunities in science and the cotton industry.

"We've just had such a great response from these students, they certainly made the most of this opportunity to learn, and hopefully we will see some of them coming back to the

industry in years to come," Trudy said.

"They were generally surprised at the range of activity going on out here and the scope of opportunity that our industry offers - from actually growing the cotton to looking at how we combat disease in the lab.

"We feel we achieved what we set out to do, which was getting school students interested in agriculture, science and cotton and showing them the wonderful opportunities on offer here in Narrabri."

The partnership between NSW DPI and CSIRO also received support from local businesses.

[www.careerharvest.com.au](http://www.careerharvest.com.au)  
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see our website

email us

## COTTON MAKES A COMEBACK IN THE TERTIARY SECTOR

MORE THAN 70 STUDENTS ARE ENROLLED IN THE COTTON PRODUCTION COURSE.

CRDC has funded the Australian Cotton Production Course delivered through The University of New England since 2012 with the cessation of the Cotton CRC.

Course convenor, Goondiwindi based agricultural consultant Brendan Griffiths, said the numbers were very encouraging, and the latest crop included a group of enthusiastic, interested students. Now in its 17th year, the course has enjoyed resurgence in popularity, after suffering a downturn in numbers during the 2002-2010 drought. Since then the course

has been modified and improved to reflect the changing needs of the industry.

"We have spent considerable time updating the 'cotton and the environment' notes for this year, reviewing the modules on natural resource management, climate change and climate variability, water reform, nitrogen use, plant physiology as well as the inclusion of new teaching material on soil carbon," Brendan said.

"The material was very well received at our last residential school, with students interacting well with the key industry experts all delivering material on their respective areas of expertise."

"Demand for the Cotton Production Course has been very strong over the last three years

and Brendan has been proactive in engaging with other universities seeking to broaden the reach of the course," CRDC's outgoing Program Manager Bruce Pyke said.

"The introduction of the new dual VET/Tertiary sector degree Bachelor of Agrifood Systems will see students able to select all four of the cotton course subjects from 2015 and this is expected to bolster the value of the course to undergraduates."

CRDC offers half-scholarships annually to support applicants with course costs. For more information or to apply contact Ian Taylor at CRDC on 02 6792 4088.

Brendan Griffiths 0427 715 990  
[bgriffi2@une.edu.au](mailto:bgriffi2@une.edu.au)

email us



## COME FOR SUMMER, STAY FOR LIFE

THIS INITIATIVE AIMS TO PROVIDE DIRECT RESEARCH LINKAGES BETWEEN INDUSTRY, RESEARCHERS AND UNIVERSITY STUDENTS.

CRDC sees the Summer Scholarship education program as an important capacity building initiative, encouraging many to further their association with the cotton industry in a research capacity after university.

The cotton industry has been supporting university students to work with cotton researchers since the inception of the first Cotton CRC. CRDC now supports this program, to provide students work experience in the R&D environment, CRDC General Manager R&D Investment Ian Taylor said.

"The scholarships enable university students to conduct short research, extension or industry projects under the direct supervision of a researcher or extension officer from either the public or private sector.

"We aim for the student to benefit from the experience, while the applicant should benefit from the proposal and its outcome."

Any CRDC research partners, researchers or extension officers may apply and students can undertake their project at any location but must be under the direct supervision of the applicant.

Applications from non university organisations must have agreement from the student's university demonstrating the willingness of at least one member of the academic staff to co supervise the project. It is not necessary to have identified a student before submitting an application, but those applications where a suitable student has been identified are also likely to be given priority.

CRDC offers students a stipend of up to \$4000 (for eight weeks employment) and a total of \$1000 towards operating funds. If the student is based at the Australian Cotton Research Institute (ACRI) in Narrabri an onsite supervisor must be identified. ACRI may be able to assist with accommodation in Narrabri for projects based there.

Applications close annually in October and new applicants are encouraged to discuss applications with the relevant CRDC R&D Manager before submission. Projects can also be discussed with Ian Taylor (02 6792 4088) [ian.taylor@crdc.com.au](mailto:ian.taylor@crdc.com.au)

email us



Local growers attend a myBMP- Work Health and Safety update organised by Cotton Australia and Wincott at Sally and Philip Knight's "Warrenbri" near Wee Waa.

## BE A BETTER MANAGER WITH myBMP

FINDING GOOD STAFF, MANAGING THEM WELL AND KEEPING THEM SAFE IS A MAJOR PRIORITY FOR AUSTRALIAN COTTON GROWERS – AND myBMP HAS BEEN DESIGNED TO HELP.

**D**on't know where to find a copy of the national Pastoral Award 2010 or looking for a template employee induction plan or safety training? myBMP is a great place to start.

The program can be used as a mentoring tool by giving suggestions, recommendations and ideas on how to manage staff and farm safety from templates for writing job ads, job descriptions or conducting an interview following a probationary period all the way through to how to conduct a safety assessment.

"A lot of effort has gone into the myBMP HR & WHS module so it covers the areas of industrial relations and worker safety assisting in managing one of the most valuable assets of a farm business - the people," myBMP Manager Jim Wark says.

"The module focuses on all aspects of employing staff, whether they are family members, employees or contractors.

"From legal obligations around employing staff to putting in place procedures to help optimise employee productivity in a safe environment it offers practical ways to improve a farm's ability to attract, retain, manage and protect staff.

"It's a case of building capacity among growers/farm managers to improve their human resources skills for the betterment of their business through better relationships with their employees."

This module is packed full of templates and resources you can download to make the job of staff management a lot easier. These include:

- Summary of current employment legislation

- Draft position descriptions
- Templates for recruitment ads and interview questions
- Guidelines on what questions you cannot ask during interview (discrimination)
- Templates for advising unsuccessful job candidates
- Induction templates
- Probation periods and reviewing performance templates
- Guidelines on and templates for conducting (and recording) a performance review
- A workplace Health and Safety Plan and Policy
- Training requirements
- Risk assessment to eliminate hazards in the workplace
- Record keeping



Nicole Scott (left) has been appointed to the position of the myBMP Customer Service Officer, coming from 18 years with DAFF QLD. Nicole looks forward to

assisting all growers in using myBMP to maximise its potential for their business. For assistance contact Nicole on 07 4639 4807/0418 775 726, 1800COTTON (1800 268 866) or [nicoles@cotton.org.au](mailto:nicoles@cotton.org.au)

The myBMP program is free to all growers and getting access is as simple as registering at [www.mybmp.com.au](http://www.mybmp.com.au) or call toll free on 1800 268 866 for more information.

email us

see our website





# CONNECTING GROWERS WITH RESEARCH

COTTONINFO IS THE INDUSTRY'S JOINT EXTENSION PROGRAM, BRINGING GROWERS AND CONSULTANTS THE LATEST NEWS, INFORMATION, EVENTS, RESEARCH AND BEST MANAGEMENT PRACTICE ADVICE.

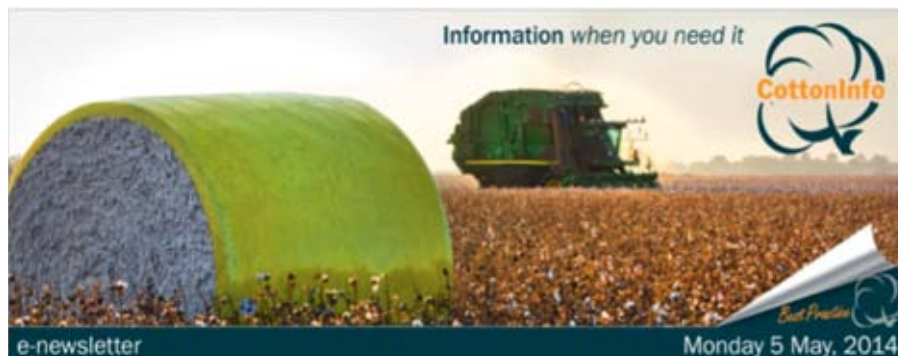
**T**he CottonInfo team of regional development officers, technical specialists and myBMP experts are standing by to help you with the latest information on everything from nutrition, soil health and water management to pesticide use efficiency, energy use, carbon, biosecurity, disease and insect management, natural resource management, Bt stewardship, weed control, human resources and more.

The CottonInfo team have been working to make it easier for growers and consultants to access the latest research, news and events with an array of exciting new tools like the CottonInfo e-news and the on-line events calendar.

## CottonInfo e-news

Each fortnight the CottonInfo team delivers subscribers an electronic newsletter of weather forecasts, regional updates, news, research outcomes and coming events.

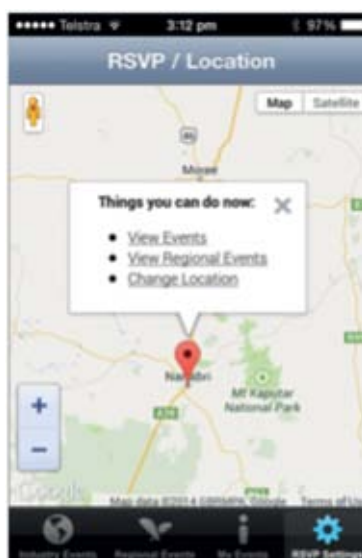
Did you know that a leading climatologist recently watered down the severity of the predicted El Niño for 2014, offering some hope for spring rainfall? Or that the head of the Australian Bureau of



Meteorology's forecast unit visited at cotton farm at Boggabri during April to talk climate research and its impact on-farm?

Perhaps you'd like to know more about what impacts on cotton fibre quality; whether your round module picker is causing soil compaction; or what the recommended nitrogen application levels for your region are? Then sign up to receive the CottonInfo e-newsletter today!

To register, simply type this link <http://tiny.cc/cotsubscribe> into your web browser, check the CottonInfo e-news box and complete your details.



## Cotton calendar

Never miss an important industry event again! The CottonInfo on-line events calendar provides growers with a one-stop-shop to find out what cotton events are happening in their local area.

Visit [www.mybmp.com.au](http://www.mybmp.com.au) and log on, then click on the Events Calendar button to go directly to the calendar. The calendar uses

your registered locations to bring up events relevant to you. You can view the event details and location, or add a new industry event. And, for growers on the go, you can also download the CottonInfo Events Calendar via the Apple app store or Google Play, so you can stay up to date on what's happening from your ute or tractor.

## What's the team working on?

Right now, as picking wraps up for another season, there's a huge amount of activity happening within the team, from assessing on-farm energy use to wrapping up nitrogen trial work and facilitating end of season meetings.

## What's on-farm energy use costing?

Energy costs, particularly electricity and diesel, are major input costs for Australian cotton farms due to highly mechanised farming systems.

As a grower, how efficient is your on-farm energy use? A project funded by the Department of Industry and CRDC to improve energy efficiency on cotton farms sees experts from the National Centre for Engineering in Agriculture join forces with the CottonInfo team to perform energy assessments for growers.

Make energy work harder for you by requesting an on-farm energy assessment from your local CottonInfo regional development officer today.

## FOR MORE INFORMATION, CONTACT YOUR LOCAL REGIONAL DEVELOPMENT OFFICER:

<b>Upper Namoi</b>	Sarah Clift	<a href="mailto:sarah.clift@cottoninfo.net.au">sarah.clift@cottoninfo.net.au</a>	0439 602 023
<b>Border Rivers/St George/Dirranbandi</b>	Sally Dickinson	<a href="mailto:sally.dickinson@cottoninfo.net.au">sally.dickinson@cottoninfo.net.au</a>	0407 992 495
<b>Gwydir</b>	Alice Devlin	<a href="mailto:alice.devlin@cottoninfo.net.au">alice.devlin@cottoninfo.net.au</a>	0427 207 167
<b>Southern NSW</b>	Kieran O'Keeffe	<a href="mailto:kieran.okeeffe@cottoninfo.net.au">kieran.okeeffe@cottoninfo.net.au</a>	0427 207 406
<b>Namoi/Bourke/Central QLD</b>	Geoff Hunter	<a href="mailto:geoff.hunter@cottoninfo.net.au">geoff.hunter@cottoninfo.net.au</a>	0458 142 777
<b>Darling Downs</b>	John Smith	<a href="mailto:john.smith@cottoninfo.net.au">john.smith@cottoninfo.net.au</a>	0408 258 786
<b>Macquarie</b>	Amanda Thomas	<a href="mailto:amanda.thomas@cottoninfo.net.au">amanda.thomas@cottoninfo.net.au</a>	0417 226 411

RUTH REDFERN HAS MOVED BACK TO HER HOME TOWN OF NARRABRI TO TAKE UP THE ROLE AS CRDC AND COTTONINFO COMMUNICATIONS MANAGER.

# COMING BACK TO COTTON

**R**aised on a cotton farm, Ruth has always had a great interest in cotton and agriculture more broadly, along with a love of language and communication.

"I've always wanted to help ag tell its story," Ruth says.

"It's fantastic to be able to have such an interesting and diverse role in communications, in cotton and based in my hometown."

Ruth has a Masters degree in media from USYD and more than a decade's experience in agricultural and rural/regional communication.

Ruth was most recently working as the national public affairs manager at the National Farmers' Federation, and says cotton has always stood out to her as an extremely progressive industry, "one that is really leading the way".

"While many other industries are just discovering the concept of 'social licence' (or a licence to operate), cotton has long been at the forefront of this – recognising the need to improve practices in order to exceed society's expectations. It's something the industry has been doing – and doing well – since the 70s," Ruth said.

"Research and development has been a driving force behind some of the enormous improvements the cotton industry has made, in yield, in water use efficiency, in the reduction in chemical use – helping growers improve production and profits and also demonstrate to the wider community that cotton is a responsible industry.

"Through CRDC, growers and the government will invest some \$22 million in cotton R&D this year – my role with both CRDC and CottonInfo is about making sure growers know about the outcomes of this investment, and through the team, helping them adapt R&D findings for their farms.

"It's about delivering valuable information to growers, when and where they need it.

"There's a lot of work to do – it's an exciting challenge and I hope that collectively as a team we can make an important difference for growers.

"For me personally, it's great to be working back in an industry and a town that I grew up in – and being able to spend more time on the family cotton farm."



MARGOT PALMER

New CRDC and CottonInfo Communications Manager Ruth Redfern - "I've always wanted to help ag tell its story".

## COTTONINFO WELCOMES NEW MANAGER

**WARWICK WATERS IS THE NEW PROGRAM MANAGER OF COTTONINFO, THE AUSTRALIAN COTTON INDUSTRY'S JOINT EXTENSION PROGRAM.**

Warwick takes over from Ian Taylor, who has taken on the CRDC General Manager of R&D Investment role.

Warwick brings extensive experience in extension and research to the CottonInfo team, having worked as an advisor, project manager and researcher in agriculture for many years.

"I worked as a dairy advisor and project manager within Queensland DPI for 14 years, before moving to New Zealand to take up a research and development role in a social research team.

"In 2008, I moved back to Queensland and started Waters Consulting, conducting research on the adaption of technology and development of people resources, and provided training for rural professionals.

"CottonInfo is a program that provides the link between the research community and cotton growers. I will be working with the team to enable relevant information to flow freely between the two."

CRDC Executive Director Bruce Finney says Warwick's skills in research, development and extension are an ideal fit for the CottonInfo team, ensuring research findings are delivered to growers.

"Warwick is no stranger to the cotton industry, having undertaken research on behalf of the industry – in fact, he is currently



New CottonInfo Program Manager Warwick Waters brings extensive experience in extension and research to the team.

completing a CRDC-funded research study now," Bruce said.

"His knowledge of the sector, combined with his people development skills and RD&E experience will be a valuable addition to the CottonInfo team.

"On behalf of the CottonInfo joint venture partners, we welcome Warwick. We also thank former program manager Ian Taylor for his leadership over the past 18 months."

Warwick will lead the 25-strong CottonInfo team, which includes on-ground regional development officers across the cotton growing valleys, researchers who are technical specialists in specific fields and myBMP support staff. Warwick, whose role is funded by CRDC, will be based in Toowoomba.

[Warwick.waters@crdc.com.au](mailto:Warwick.waters@crdc.com.au)  
02 6792 4088



**CottonInfo is a joint initiative of Cotton Australia, Cotton Seed Distributors and CRDC. It is a unique industry partnership that aims to communicate the outcomes of research, encourage grower adoption and improve industry practices.**





# TOP FORECASTER VISITS COTTON COUNTRY

THE HEAD OF THE AUSTRALIAN BUREAU OF METEOROLOGY'S FORECASTING UNIT VISITED BOGGABRI AND NARRABRI IN NORTH-WEST NSW FOR A FIRST-HAND LOOK AT COTTON GROWING.

**O**n his first visit to the region, Dr Oscar Alves had a close up look at cotton growing at the Watson family's "Kilmarnock" at Boggabri. Accompanied by CottonInfo Carbon and Climate Specialist Jon Welsh, Oscar met with grower Andrew Watson.

The aim of the meeting was to bring climate researcher and farmer face to face to discuss climate application to irrigated and dry land farming systems. Jon says growers understanding climate drivers and processes at a given farm or location goes a long way toward understanding the risks around climate variability.

"There are high expectations of technology, more specifically, computer generated guidance on weather

and climate forecasting," Jon said.

"Farmers are used to technology being accurate in most facets of their business but in this case we need to understand the input drivers or ingredients into the models to better understand the element of risk.

"A common theme of the Managing Climate Variability program, CRDC Strategic Plan and the Carbon Farming Initiative is to bridge the gap between climate research and growers, ultimately leading to higher efficiency of farm inputs, better crop decision making and resilience in farming systems.

"By the same token the researchers at the Bureau of Meteorology acknowledge the need for higher accuracy and are working to improve forecasting for end users.

"In general, the layperson is not aware of the complexity involved in simulating and predicting a constantly evolving climate."

During the farm visit, Andrew and Oscar were able to discuss how the longer lead time forecasting (greater than six months) was particularly useful in strategic decisions such as designing crop rotations, exploring farm and water leasing opportunities

and running scenarios on potential irrigation water availability.

With the main driver of wet or dry being El Niño Southern Oscillation, Andrew said he does try to keep up with commentary on what phase it is in and what the forecasts are telling him. Weather forecasts are used regularly for shorter term decision making in Andrew's operation such as spraying and planting procedures and of course irrigating in summer.

"Shorter term weather forecasts are taken into consideration, but with storm tracks sometimes channelling through different areas of the ranges here, managing for more or less rain during a growing season can be a real challenge," he said.

"Weather and seasonal issues are a hot topic in rural areas and farmers really are looking for an insight into better managing risk to account for purchasing inputs and marketing produce.

"New websites, computer modelling and who got under the latest storms features in nearly every conversation with other growers.

"Most people are intrigued by the weather as it's the greatest variable we have in our business."

With an El Niño event forecast this year the conversation soon shifted to asking Oscar how the year ahead looks to be shaping up.

Oscar said the predictive skill of El-Niño is quite high out to six months.

"It is more the flavour or intensity of the event that will most impact on winter and spring rainfall," he said.

"At the moment the signal is quite strong so our current focus is monitoring the distribution of the Sea Surface Temperature warming through the Pacific, which may determine whether it is a severe event like 2002 or an event like 1997 where near-average rainfall occurred through eastern Australia."

Bureau of  
Meteorology's  
Oscar Alves and  
Andrew Watson  
at "Kilmarnock"  
Boggabri.



IMAGE MELANIE JENSON



# MANAGING WHITEFLY IN THE MACQUARIE

**CONSULTANTS IN THE MACQUARIE ARE FULLY PREPARED TO FIGHT SILVERLEAF WHITEFLY, AGREEING IT TAKES A YEAR-ROUND APPROACH.**

Crop consultants in the Macquarie have been concerned about the steady rise in silverleaf whitefly (SLW) numbers over the last three to five seasons. As a result, CottonInfo regional development officer, Amanda Thomas, took action to help locals better understand and control the pest.

Using video conferencing, growers and consultants in Warren were able to speak directly with peers in Emerald who have had much longer experience with SLW as a pest in their system. Crop consultant Dave Parlato and DAFF QLD's Dr Richard Sequeira, who developed the Threshold Matrix for managing SLW in cotton, combined to offer practical insights and explain the science behind the industry's management recommendations.

"We had held meetings previously to discuss the impacts from rising numbers and found that no one was comfortable using the matrix, particularly the sampling guidelines," Amanda said.

"Typically people were seeing low pest numbers on the fourth to fifth leaf, where sampling was recommended, but sensing that larger numbers were lower in the canopy because honey dew was present."

In the video link-up, Richard explained that during the season SLW change preference for location within the canopy, with the bulk of the population typically lower in the canopy in pre-flowering and flowering stages and gradually moving upward until cutout.

"It was interesting to hear the background behind the strategy and how the sampling strategy is a compromise," Amanda said.

"Richard's threshold work was originally determined based on sampling the eighth or ninth node, however based on advice from consultants about how difficult it was to check that low in the plant without disturbing adults, a compromise position was found.

"To help consultants out, Richard calibrated the matrix for sampling at the fifth node, also coinciding with mite and aphid checking.

"Dave was also able to add practical guidance on this including how time of day and temperature can affect sampling."

Amanda said one of the key take home messages was that it was vital to think about SLW from the start of the season.

"The discussions really highlighted for me the importance of early season Integrated pest Management and how that can play such a pivotal role later in the season," she said.

"With a shorter season here, early season pest management is important. Using thresholds and selecting products that are softer against SLW parasitoids and predators is clearly a key strategy.

"SLW control is really an all-year consideration, with Richard also highlighting the importance of over-winter management of hosts such as bladder ketmia and rogue cotton."

The consultants in Warren also received practical advice about use of SLW insecticides from Dave's personal experience with the different products and how and when each is most effectively used. For example, the group heard that diafenthiuron (Pegasus) is best used in warm, sunny conditions, but is not as effective in cloudy conditions.

"It was pretty clear that the use of broad spectrum chemical options such as bifenthrin (Talstar) only provides short term knockdown and has a very limited role in SLW management," Amanda said.

Dave also explained insect growth regulators (IGRs) such as Admiral, and their great success rate in Emerald controlling high populations. He assured consultants that its slow activity doesn't mean that it hasn't worked.

"Because it interrupts the life cycle it takes time, 10 to 14 days in our climate, but this may be even longer in Macquarie depending on weather conditions".

Jim Bible, manager of Agriland at Narromine, said good discussions were had about the timing of IGR use, and how to make the most out of the long residual effectiveness of the product.

"We were also not really clear on what an outbreak actually looked like, when we needed to take action and when we needed to keep monitoring," Jim said.

Dave also discussed how long into the season he continues to monitor the pest.

"If you are only a week or so away from defoliation there still could be a few weeks until the leaf is off completely in some cases, so it might be worth taking this into consideration," he said.

Since the meeting Amanda has followed up with participants who have said they will now have a lot more confidence in managing SLW going into next season.

"From this meeting we were all able to get a good grasp of the importance of early season IPM, what control measures are needed from a practical point of view, and felt much more comfortable with the sampling and control options and now understand the science behind the matrix a lot better," she said.

Auscott Macquarie General Manager Bill Tyrwhitt said "For me it was valuable talking to an experienced consultant who has been through it all before, and obviously they are winning the battle up there in Emerald.

"It was good to hear that we have tools to get on top of this, however it will mean changing a few things we were doing earlier in the season, and having a better understanding of the pest will mean we can be more proactive."

Following on the success of this meeting, Amanda has now invited CSIRO entomologist Dr Lewis Wilson to the Macquarie to explain more about the ecology and population dynamics of SLW.

"This will give an even better understanding of what we need to do control whitefly next season and how to control some other pest such as mirids, thrips or green vegetable bug and not leave ourselves open to SLW at the end of the season," Amanda said.

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David Parlato 0408 771 848

email us





INVESTIGATING THE INTRICATE RELATIONSHIPS BETWEEN SILVERLEAF WHITEFLY AND ITS 'SYMBIOTIC' BACTERIA COULD OFFER NEW WAYS TO MANAGE THIS DAMAGING PEST.

## CUTTING EDGE RESEARCH UNDER WAY FOR WHITEFLY CONTROL

**M**anipulation of symbiotic bacteria (endosymbionts) is cutting-edge science that has previously been used by researchers at Monash University to formulate ways to control dengue fever in mosquitoes.

Silverleaf whitefly (SLW) (*Bemisia tabaci*) is a major pest of Australian cotton systems because it contaminates cotton lint with honeydew. The adult insects (which are actually tiny bugs with piercing mouthparts and not flies at all) are highly mobile, can develop insecticide resistance quickly and populations can expand rapidly when natural enemies are reduced by insecticides. SLW also vector the exotic plant virus complex that causes cotton leaf curl disease, a significant biosecurity threat to Australian cotton.

This new CRDC-funded research is focused on examining the symbiotic relationship that SLW shares with bacteria (endosymbionts) that are harbored in the insects' body and cells. Clarifying the influence that these endosymbionts have on the biology of SLW may reveal opportunities for new pest management approaches.

The project is being undertaken by Sharon van Brunschot, a Postdoctoral Research Fellow at The University of Queensland (UQ) in association with Dr James Hereward (UQ), Dr Cherie Gambley (DAFF QLD) and Dr Paul De Barro (CSIRO), under the supervision of Associate Professor Gimme Walter (UQ).

"Bacterial endosymbionts can influence a diverse range of processes in their insect hosts, including reproductive capacity, thermal tolerance, lifespan, susceptibility to insecticides, and plant virus transmission," Sharon said.

"This study of endosymbiont-whitefly interactions aims to determine the influence of these microbes on key processes such as fitness, insecticide resistance, and plant virus transmission, to explore possibilities for manipulating these processes to control SLW populations in the future."

### Cotton leaf curl

Another component of Sharon's research is aimed at improving the industry's capacity to prevent and respond to any

**"THE STUDY MAY REVEAL OPPORTUNITIES FOR NEW PEST MANAGEMENT APPROACHES"**



Postdoctoral Research Fellow Sharon van Brunschot is investigating the control of silverleaf whitefly using similar science to that used to successfully control dengue fever in mosquitoes.

- Research hopes to close a knowledge gap that exists in our understanding of the complex interactions that occur between whiteflies and the bacterial endosymbionts that reside within the whitefly's body and cells. These endosymbionts can influence diverse processes in their insect hosts including reproductive capacity, thermal tolerance, lifespan, susceptibility to insecticides, and plant virus transmission.
- Cotton leaf curl disease (CLCuD) can decimate production and is spread by the whitefly (*Bemisia tabaci*). CLCuD exists across Africa and Southern Asia.
- Currently, we have no knowledge of the ability of whitefly in Australian cotton to transmit viruses of the CLCuD complex, however research is now underway.

incursion that may eventuate of the exotic Cotton leaf curl disease (CLCuD).

CLCuD is a major biosecurity threat to Australia as it causes serious economic losses to cotton production where it occurs overseas, particularly on the Indian Subcontinent.

Sharon will be developing new diagnostic tools to enable the quick and reliable detection of the virus in infected plants and also in SLW vectors. She will also be examining the capacity of SLW populations in Australian cotton to transmit viruses that cause CLCuD.

"We do not know if the SLW in Australia are competent vectors of the viruses in the CLCuD complex," Sharon said.

"We need to test these specific virus-vector interactions to understand more accurately the risks of introduction and establishment of this disease.

"This important aspect of my research is timely as CLCuD has recently been identified in China, which represents a movement of this virus out of its previously limited home range of South Asia/Africa, a move that brings the disease even closer to Australia."

Sharon will perform virus transmission experiments with virus sourced from the Indian Subcontinent, using Australian whiteflies and cotton cultivars. These experiments will be performed in the secure quarantine facilities of The University of Greenwich (London), in collaboration with Professor John Colvin and Dr Susan Seal.

**More information**  
susan.maas@crdc.com.au





# COTTON'S NRM CREDENTIALS IN NATIONAL SPOTLIGHT

Earlier this year CRDC Natural Resource Management R&D Manager Jane Trindall made a presentation at the 5<sup>th</sup> National Natural Resource Management (NRM) Regions Knowledge Conference in Launceston, Tasmania.

Jane outlined the programs and investment made by the Australian cotton industry over the past decade to reduce the environmental footprint of cotton farms.

She said research outputs are not serving their purpose unless their outputs are delivered to end users and put into practice.

"Today, as a result of these efforts, the cotton industry can be proud of a 40 percent increase in water productivity over the last decade; a 95 percent reduction in the use of pesticides over the past 15 years and the rich and diverse riparian landscapes which can be found on cotton farms.

"The positive feedback we received about what we were able to bring to this conference in terms of a better understanding of the cotton industry's commitment to NRM and sustainability was very encouraging.

"The Cotton Industry Sustainability Report which the industry's Environmental Assessment Working Group is busily preparing to be launched this year will be of great interest to many more people to better appreciate how far this industry has come."

CottonInfo NRM technical special-



Jane Trindall represented CRDC at a Cross-sectoral Water Use in Agriculture RD&E Strategy meeting hosted by Dairy Australia recently. The meeting was held to identify collaborative opportunities for precision irrigation RD&E. The group visited Bill and Jill Chilvers' irrigated dairy farm 'Oakdene', near Launceston to see a newly developed pivot fitted with variable rate irrigation and talk to Bill, a soil scientist, about the irrigation investment decisions on his farm. Pictured are Water RD&E Strategy Implementation Group members Guy Roth (convenor), Stephen Taylor (Department of Agriculture), Jane Trindall, Brenda Kranz Horticulture Australia Ltd and Dairy Australia's Cathy Phelps.

ist Stacey Vogel made an impact at conference, outlining specific examples of projects delivered in partnership with NRM bodies, focusing on the activities undertaken, products developed and environmental outcomes achieved.

"The presentation really opened

the eyes of audience members to achievements of the cotton industry with many comments being made about what an innovative and progressive industry it is," Stacey said.

The abstract and presentation can be found at:

<http://tinyurl.com/k8abyhf>



## WINCOTT WORKING FOR BETTER NRM OUTCOMES

THE WINCOTT NATURAL RESOURCE MANAGEMENT (NRM) SURVEY COVERS MORE THAN NATURAL RESOURCE ISSUES, IT ALSO HIGHLIGHTS THE MOST PRESSING CONCERNS FROM THE PERSPECTIVE OF WOMEN IN THE COTTON INDUSTRY.

The survey found that the rising cost of on-farm inputs, cotton markets/pricing, climate variability and skilled labour shortages were viewed as major issues.

As the second survey by Wincott, (the first was in 2011) it also sought to determine if and what NRM measures had been implemented in the time between the surveys and whether attitudes to NRM had changed.

It found the most notable change was a greater emphasis on carbon, energy costs and water use, and all participants indicated they had implemented NRM practices. Other issues that featured strongly were labour and mental health.

Consultant Helen Dugdale undertook the survey and subsequent focus groups in four cotton growing valleys and said the entire

process was intended not only as a tool to help the industry understand what women are doing or can do for the industry, but also to communicate what the industry can do for them, in terms of providing support, resources, information and action.

There were a number of recommendations from the focus groups, which included workshops that are women-focused and cover multiple topics, with suggestions of *myBMP*; mental health; climate change; use of social media and water policy issues. The groups also saw a need for more positive publicity about the industry and a premium for cotton grown under *myBMP*.

Improved communications to farmers about water policy, better information and advice on fuel saving practices and feral pig

control were other recommendations.

In response to the interest shown in Wincott's NRM surveys, CRDC is supporting the "Getting back to Nature" program, with plans for an industry-wide roll out of the project by CottonInfo NRM Technical Specialist Stacey Vogel with the support of the group.

A series of Getting back to Nature kayak trips and evening spotlight nights have already been held in the Namoi Valley (See Summer 2013-14 *Spotlight*) with Wincott's support.

"By using this approach to bring rural families and social networks together in a fun outdoor activity we will increase participation not only in our events but also foster and cultivate their own relationship with their local environment leading to better stewardship of natural areas in cotton farms," Stacey said.

For more information on Wincott: President Bec Fing 0427 107 234, or Natural Resource Management: Stacey Vogel [staceyvogel.consulting@gmail.com](mailto:staceyvogel.consulting@gmail.com) or 0428 266 712.







The St George CGA has worked to remove off-farm volunteer cotton from the area. Pictured is CGA President Scott Armstrong "Cooinda Cotton" who is pleased with how the effort has succeeded.

# LOOKING PAST THE FRONT FENCE

## ST GEORGE GROWERS ARE WORKING TO MANAGE OFF-FARM VOLUNTEER COTTON.

Combined efforts by cotton growers to clean up off-farm volunteer cotton in the St George region have paid off, highlighting the benefits of area-wide action.

DAFF QLD researcher Paul Grundy completed a survey of off-farm volunteer cotton in northern cotton growing regions in July 2013 to assess the incidence and biosecurity risk posed by this cotton.

St George was part of the survey and when Paul again surveyed the areas this year for volunteers he could not help but observe the changes in the numbers.

"St George is notably improved with far fewer volunteers on roadways and adjacent farm areas," he said.

"It is clear that people have made an effort to tidy volunteer plants up."

St George CGA President Scott Armstrong said that while a hot dry summer may have contributed to a fall in volunteer numbers, it was the efforts of growers who not only ensured their own farms were clean, but also the areas around their properties.

"This is our issue, so the responsibility is for us to take action," Scott said.

"Off-farm volunteer cotton can have negative impacts on our crops so it is in our best interest to do what we can to manage them."

St George/Border Rivers CottonInfo Regional Development Officer Sally Dickinson said the cotton commu-

nity strongly supported an integrated approach to addressing the issue.

The local CGA and enthusiastic growers organised a meeting in August 2013 to discuss the area's volunteer cotton issue, which was also attended by local agronomists and consultants, SunWater, QLD Department of Transport and Main Roads, Balonne Shire Council, the transport industry and local gins. CRDC and DAFF QLD presented information about the risks posed by rogue cotton.

"Paul Grundy's observations during the last season are very encouraging for the St George area, however diligence doesn't stop there and I look forward to working with local groups to build on these results," Sally said.

With volunteer and ratoon cotton known to play a significant role in the incidence of many pest and disease threats to individual growers and the industry, it is critical that these plants be removed both on and off farm.

Paul found in his survey that numbers in Central Queensland were largely the same as last year with low numbers of rogue plants in the usual places

along water ways and drainage lines.

"The Darling Downs has a surprising number of volunteers along most local roadways servicing cotton districts," he said.

"It would appear that the mild winter of 2013 has enabled continued survival of plants into this season.

"The key thing is be to be mindful of areas adjacent to fields that are likely to receive spilt seed cotton in particular field margins, local road ways, fences and drainage lines, as these areas were frequently found to harbour long term perennial plants.

"Our survey results indicate that high levels of cotton bunchy top disease are present across all regions and all habitat types.

"We also found that the closer a long term volunteer was to a field area or farm the more likely it was to harbour cotton bunchy top disease.

"Hence aphid vectors do not have far to travel after winter to bring this disease back into a field near you."

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email us

### CONTACTS

For more information on managing off-farm volunteer cotton through community action, contact your local CottonInfo Regional Development Officer.

Upper Namoi	Sarah Clift	0439 602 023
Border Rivers/St George/Dirranbandi	Sally Dickinson	0407 992 495
Gwydir	Alice Devlin	0427 207 167
Southern NSW	Kieran O'Keeffe	0427 207 406
Namoi/Bourke/Central QLD	Geoff Hunter	0458 142 777
Darling Downs	John Smith	0408 258 786
Macquarie	Amanda Thomas	0417 226 411



# MANAGING SEEDLING DISORDERS IN HOT, DRY YEARS

## CRDC FUNDS QLD DAFF AND NSW DPI PATHOLOGISTS TO UNDERTAKE DISEASE SURVEYS AT THE START AND END OF THE SEASON.

Last season's very dry start contributed to establishment issues such as poor emergence, poor root growth and seedling stunting. QLD DAFF Pathologist Dr Linda Smith says that in many instances the likely cause was allelopathy, which is the suppression of plant growth and development by the release of toxic substances from the roots or residues of another plant (commonly sorghum residues). Pathologists also saw an increase in seedling diseases such as black root rot and Rhizoctonia.

The conditions contributed to a reduced incidence of Fusarium and Verticillium wilts in some valleys, with the exception of areas with high rates of back to back cotton.

### Managing back to back cotton

The risk of disease increases when growing cotton back to back. Results from the Macquarie Valley in NSW reflect this.

"More back to back fields coupled with older fields being planted contributed to a higher incidence of disease there," NSW DPI Pathologist Dr Karen Kirkby said.

"The incidence of black root doubled from 50 to 100 percent of fields surveyed in the Macquarie Valley from the previous year.

"Last season Verticillium and Fusarium wilt were recorded in five percent of fields compared to 32 and 16 percent (respectively) this season.

"Back-to-back cotton allows build-up of inoculum in soil-borne diseases especially if susceptible varieties are used, hence the reason crop rotations are recommended as an integrated disease management strategy."

Karen said some research suggests the greatest benefit from rotation is when the rotation is initiated early, before inoculum builds up to high levels in the soil.

"Use fallows or rotation crops that are not hosts for any pathogen present, for example most legume crops are hosts of the black root rot pathogen, while non-host crops for Fusarium include grain crops," Karen says.

"Care must be taken when selecting rotation crops as Verticillium dahliae has a wide range of hosts and growers in regions at risk should check the F Rank and the V Rank of their variety choice."

### Prevalence of wilts

CRDC funds QLD DAFF's pathology team to provide diagnostic facilities for Fusarium wilt.

In November last year the pathologists received plant samples from the Central Highlands with concerns they were infected with Fusarium. The team confirmed the second only report of Fusarium in the Central Highlands, and the first in the Emerald Irrigation Area.

"Fusarium oxysporum was identified and we confirmed the isolate belonged to VCG 01111, or the 'Darling Downs' strain," Linda Smith said.

"Field transects determined the spread was low, and annual transects will now monitor its spread."

In NSW, in most regions there were lower or no detections of Fusarium and Verticillium, however this could be attributed in part to the dry, hot season.

"The Macintyre Valley saw dry conditions into January



The risk of seedling disease increases when growing cotton back to back, with disease survey results from the Macquarie Valley in NSW this season reflecting this. Back-to-back cotton also allows the build-up of inoculum in soil-borne diseases like Fusarium and Verticillium wilt.

IMAGE MELANIE JENSON

and February which may have contributed to lower levels of Verticillium and Fusarium and similarly in the Bourke/Walgett region where although previously detected, neither was recorded this year," Karen said.

"These conditions were not conducive to Verticillium but if we get a wet, cool end to next season it could be quite severe."

### Temperature and planting

For diseases to occur, three factors are needed: a host plant; a virulent pathogen; and suitable environmental conditions.

When it comes to conditions conducive to seedling diseases, temperature at planting is a big factor.

"Low temperature causes slow emergence and leaves the plant at greater risk of infection," Karen said.

"Generally in NSW last season day temperatures were above average, yet were at or below average at night, which prevented many crops from growing away early.

"In the Gwydir, these conditions along with high evapo-transpiration contributed to an increase in seedling diseases, particularly Pythium and black root rot which was up from 86 to 100 percent. It was a similar story in the Namoi Valley."

### Volunteer cotton

The pathologists also raised concern over the prevalence of volunteer cotton.

CottonInfo Disease, Pest and Biosecurity Specialist Susan Maas encourages growers to adopt a zero tolerance attitude towards volunteers.

"Volunteer (and ratoon) cotton provide an excellent host or green bridge for diseases such as cotton bunchy top and pests such as whitefly, aphids, mites and mealy bug to survive on-farm from one season to season," Susan says.

"They host reniform nematode, allowing them to continue reproducing through the season, building up populations in the soil and provide the perfect green bridge into cotton crops if we get an exotic virus incursion."

The disease surveys monitor for the exotic diseases and Susan encourages all growers to keep biosecurity a priority.

"When it comes to biosecurity, on-farm practices such as controlling hosts and Come Clean. Go Clean. are proactive and pre-emptive strategies.

"If the disease survey does detect an exotic disease, we are much more likely to be in a better position if farm hygiene is already practised.

"The Farm Biosecurity Manual for the Cotton Industry outlines on-farm biosecurity practices to reduce the risk of spread of exotic disease and pests threats."

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# RENIFORM NEMATODE: WINTER FARMING PRACTICES AFFECT POPULATION SIZE

THIS MICROSCOPIC ROOT PATHOGEN (*Rotylenchulus reniformis*) WAS CONFIRMED AS A NEW PEST TO AUSTRALIAN COTTON LATE IN 2012. WITH SUPPORT FROM CRDC, QLD DAFF'S COTTON PATHOLOGY TEAM IS NOW CLOSER TO FINDING EFFECTIVE CONTROL METHODS.

Senior Plant Pathologist Dr Linda Smith and her team investigated and surveyed cotton fields around Theodore and Emerald immediately after the 2012-13 harvest.

Mapping the location and density of nematode populations established that distribution was widespread in the sampled fields. Continued sampling has aimed to understand the impact of rotations, management practices and climatic variation on these plant parasites over time.

Soil samples were again taken just prior to cotton planting/emergence in October 2013 from fields in the Theodore area which represented a range of pest pressures and winter crop rotations (wheat, chickpea and fallow). Nematode extraction, identification and quantification allowed a direct comparison of population size at the beginning and end of the 2013 winter period. Samples were taken again post-cotton harvest 2014 for comparison.

## Overall trend of increasing populations

The scientists found that reniform populations declined through winter and increased through the cotton season as expected. Of concern is an overall trend of increasing populations (Figure 1) commonly associated with back-to-back cotton.

As expected, fields planted to wheat (non-host crop) had similar population levels to the fallowed fields in spring. An unexpected result was the recognised host crop, chickpea, also had population levels similar to fallowed fields.

"Chickpea is generally considered a host plant, however there was no evidence of females in the roots," Linda Smith says.

"Although the data set is relatively limited at this early stage, it suggests the selection and management of Central Queensland chickpea cultivars needs to be examined with respect to status as a reniform nematode host."

## Impact of fallow and rotation choice

Strip trials undertaken on commercial fields comparing nematode decline on bare fallow and wheat (Figure 2) has further substantiated the similarity of results obtained for these two rotation options in the survey.

Linda says there has been some debate on the merits of a non-host winter crop among cotton pathologists in the United States, as some believe the right rotation may have advantages over a clean fallow under the right conditions.

"In a dry winter as soil moisture decreases, reniform nematodes can undergo anhydrobiosis - an environmental adaptation which allows the adults to lose most of their body moisture and enter a state of suspended animation," Linda said.

"This can last for years and when favourable conditions return they can resume root infection and reproduction.

"In theory, in such a dry year, growing an irrigated winter crop may prevent reniform nematodes from utilising this



QLD DAFF plant pathologists Linda Smith, Linda Scheikowski and John Lehane collecting wheat root samples as part of their reniform nematode research to confirm the non-host status of cultivars grown around Theodore.

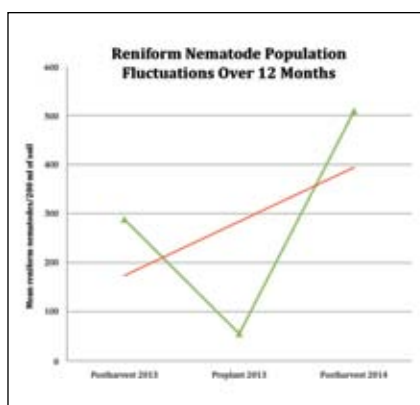


Figure 1. Average reniform nematode populations sampled from representative areas of Theodore pre-plant and post-harvest cotton.

survival mechanism.

"Although last winter finished very dry, some reasonable rainfall events coincided with planting of the strip trials in autumn.

"This may partially explain the similar population reductions recorded for wheat and fallow in 2013."

The researchers say that while such a population decrease between cotton crops seems encouraging from a management perspective, it is important to understand that populations are capable of growth at a similar rate in the presence of cotton or another host crop.

"It is also possible that fluctuations within the 15 centimetre soil sampling depth do not represent all the dynamics of this pest," Linda said.

"The deep, vertical migration that reniform nematodes are known for may be partially responsible for the lower densities measured at the end of winter."

## Continuing research

The researchers will continue data collection to quantify the impact of rotation crops and crop management practices on nematode populations. By integrating yield data, the researchers will develop economic thresholds to

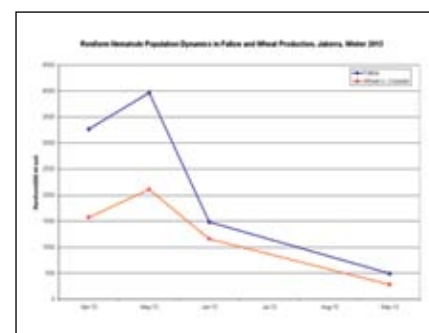


Figure 2. Both the clean fallow and winter wheat treatments in a strip trial at Theodore reduced reniform nematode populations greatly.

The stark contrast between population growth during cotton production and the rapid decline of populations in the root zone in the absence of a host serves to illustrate the importance of farm hygiene, clean fallow management and non-host rotation crops. Rogue cotton and a number of host weed species can provide significant reproduction sites. Together with the protocols associated with the Come Clean. Go Clean. campaign, these practices remain the most important focus for grower management of this pathogen at this time.

assist with decision making and preparations are being made for the evaluation of potential treatments such as seed dressings and bio-controls in the 2014-2015 season.

"We would really like to thank growers and consultants at Theodore and Emerald for their support of our research, as well as CRDC," Linda said.

The QLD DAFF Cotton Pathology Team is Linda Smith, Bartley Bauer, Wayne O'Neill and Jennifer Cobon (EcoSciences Precinct Brisbane) with John Lehane and Linda Scheikowski (Toowoomba).

## More information

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# RESEARCH INTO EARLY PLANTING HEATS UP

**INNOVATION IS LEADING TO IMPROVED QUALITY AND YIELDS IN CENTRAL QUEENSLAND. CHRISSY BROWN REPORTS.**

**B**iodegradable plastic film has produced some promising results in its first year of trials in Central Queensland where researchers are exploring ways to better take advantage of the region's climate to improve cotton yields and lint quality.

After a string of seasons that have challenged the region with either heat waves or wetter than average conditions during summer, researchers decided to take a look at producing cotton in the area with fresh eyes.

With funding from the CRDC, researchers Paul Grundy, Gail Spargo and Ngaire Roughley from Queensland Department of Agriculture, Fisheries and Forestry, Steve Yeates from CSIRO, and Jamie Iker from Spackman and Iker Ag Consulting, are collaborating on a project working to develop tools and tactics for managing cotton production in what can be a highly variable climate.

A survey conducted by the local Cotton Grower and Irrigators Association in 2011-12 with assistance from CRDC revealed that among the 25 growers surveyed, it had been

observed that earlier harvested fields tended to have better yield and quality outcomes. Growers also reported that with unfavourable weather conditions over extended periods, it is very difficult to mitigate crop impacts through agronomic management.

"An analysis of CQ's long term weather records highlighted that spring and early summer has a very favourable temperature, rainfall and radiation profile for cotton photosynthesis with greatly reduced variability" says Paul Grundy.

"Currently, this window of opportunity is largely untapped. Crops planted from mid-September onwards do not flower until November; so while square production and early boll retention might be maximised, crops still remain hostage to more variable conditions for boll filling in January and February. Fruit shedding, reduced boll size and high losses from boll rots occur commonly."

It was clear from the historic climate analysis and anecdotal evidence that a valid approach would be to test tactics that could enable crops to



IMAGE PAUL GRUNDY

make better use of the spring conditions for boll production. In order to do this, flowering would need to be brought forward to October which would mean sowing in August for the plant to have adequate day degrees to commence its reproductive phase of development.

However, with temperatures in August being two to three degrees celcius too cool for reliable establishment, researchers looked for options to warm things up a little which brought about the focus on the potential use of plastic film.

"Biodegradable plastic film had been trialed in cotton previously, by Michael Braunack, CSIRO and subsequently Heath McWhiter from Elders near Darlington Point, for similar reasons – to aid early season cotton establishment under cool conditions," explains Paul.

**TOP (MAIN IMAGE):** Cotton seedlings emerging under the film. Plants generally grow through the film within a week of emergence.

**ABOVE:** The larger plant on the right was grown with film; the plant at left was without.





“Their work showed potential for films to enhance early development, but also highlighted challenges with ensuring seedling emergence through the plastic.

“We concluded that with Emerald’s warm days but cool nights, a plastic film may sufficiently solarise the soil during the day and retain enough heat during the night to reduce the incidence of cool temperature related establishment issues. The key would be to slot the film in such a way that seedlings could emerge easily and the heat still be retained.”

The first trials were carried out during the 2013-14 cotton season with encouraging results. A relatively large number of replicated small plots (three rows by 15 metres) were set up to evaluate different films and deployment techniques over a series of planting dates from the beginning of August through until the commencement of the current Central Highlands planting window on September 15.

This set up also allowed researchers to collect data for a preliminary analysis of the effects of early establishment on the later stages of crop development; boll filling, maturation and yield.

“These trials were very much a series of pilot experiments so that we could quickly narrow down the field of options for ongoing larger scale, intensive evaluation,” Paul says.

“As the trial plots were located within a commercial field, the plots all received the same agronomic management, similar to the rest of crop. There was limited scope to tailor management according to individual treatments - this said, the trial plots still performed well.”

The preliminary trials identified two films that performed very favourably, providing suitable solarisation of the soil during the five to six weeks before their degradation.

A range of film perforation techniques were tested. Adding short slots



running at an angle to the planted row when the film was laid was highly successful at allowing seedlings to emerge. This method kept the slots mostly closed after laying which helped retain heat without cooking the seedlings during the three to four days it took the seedlings to emerge above the film. The slotted film raised overnight minimum soil temperatures by about two degrees celcius at five centimetres depth within the plant row.

“This season we will be scaling up the comparisons of promising treatments. Field length plots will provide the opportunity to tailor the agronomic management for each scenario,” Paul says.

Crop development was recorded and compared to the expected day degree crop development rates. Actual crop development was similar to the predicted values with the early sown August planting flowering in October and being ready to defoliate by January 10. The mid September sowing matured about 10 days earlier than predicted due to the hotter than average conditions experienced during a heatwave from late December to early January.

For the 2013-14 season, the early plant trial plots produced promising

results. Most of the bolls had matured by the time the nine-day heat wave started in late December. In contrast, the September-sown plots were more seriously affected by the heatwave, with shedding of some upper canopy bolls coinciding with the time of cut-out. This resulted in lower overall boll numbers and reduced yield compared to the August sowings. The climate analysis indicates that heat wave conditions are not unusual in the region at that time of year.

Trials will be carried out for several seasons to build a profile of likely crop responses under the varying influences of weather experienced in each season. The picture built over time will determine whether this tactic is likely to be agronomically viable for commercial use. Another factor that will be considered is the potential for added benefits in reducing the incidence of volunteer cotton close to the planting row and whether plastic film can also assist in preventing establishment of rogue cotton plants.

“The success of early planting with biodegradable plastic film will depend on a number of factors, in particular yield benefits and the final cost of film and its installation,” Paul said.

“Preliminary data suggests it is likely to be an economically viable option for early planting in the region.

“It will not completely avoid the risk of variable conditions in January and February but its reasonable to expect that a reduction in the length of time crops are exposed during this period could be positive over a continuum of seasons.”

#### More information:

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**ABOVE RIGHT:**  
What’s left of the biodegradable film after six weeks.

**BELOW:**  
To test different films on different row spacings necessitated laying the films by hand.







## CONFERENCE AN OPPORTUNITY NOT TO BE MISSED FOR RESEARCHERS



**The Australian Cotton Conference is a welcome opportunity for researchers to connect with cotton growers and the broader cotton industry, according to Narrabri-based CSIRO researcher Dr Warren Conaty.**

"The Conference provides a space for researchers to understand the current concerns of cotton growers and presents an important medium to present findings to growers and the broader cotton industry," Warren said.

"The new 'Three Minute Thesis' format provides researchers with an opportunity to distil and convey the significance and outcomes of their research in a short time period, a skill that all researchers can refine!"

"Unlike scientific conferences, opportunities to give conventional presentations are limited, however research extension opportunities at the Australian Cotton Conference also include master classes, e-posters and short research papers included in proceedings.

"It also provides us with an opportunity to see the industry holistically and view presentations on topics of broad interest to the industry and cotton research. I find this helps to place the significance of my research in the context of the industry as a whole.

"The conference is also an excellent forum for networking with people, particularly those who researchers may not be directly involved with on a day-to-day basis, including potential research funding bodies.

"It's also a terrific social event where you can meet and catch up with industry colleagues and friends – what more could you want!"

## VICTORIA CROSS MEDAL RECIPIENT TO OPEN CONFERENCE WITH LEADERSHIP ADDRESS

**SAS soldier and one of only nine living recipients of the Victoria Cross, Ben Roberts-Smith will open the Australian Cotton conference with a keynote address titled "Leadership for success – you and your team".**

As a former commander and key planner for special operations missions, Ben has fascinating insight into the processes and protocols critical in producing success in competitive environments. Using real life examples from the frontline, Ben provides insight into leadership and success that will strengthen your team's procedures and give them the focus to excel.

Ben will not only drive your team to succeed but will provide the vision of a leader who has been charged with providing the Australian Government with positive strategic outcomes in some of the world's most dynamic environments for 17 years.

Ben is a gifted and inspirational speaker who engages audiences with his vivid depictions of modern warfare while always maintaining focus on the topic. He is a rare and motivational individual who has the ability to talk at all levels as one of this nation's proven leaders.

Ben was on his second operational tour of Afghanistan in 2006 when he was awarded the



Medal for Gallantry for his actions as a patrol sniper in the Chora Valley. It was on June 11, 2010, on his fifth tour of Afghanistan, that he was involved in his Victoria Cross action.

Ben will open the Australian Cotton Conference in the first session on August 5.

## BRING A MATE AND PICK UP A PRIZE

**Any delegate who introduces a "new" cotton grower, researcher or agronomist to this year's Cotton Conference will take home a \$50 Visa gift card and go in the draw to win a free registration at the 2016 Australian Cotton Conference.**

"We're always conscious that for people who haven't attended before, the Conference can seem a little overwhelming. That's why we've got in place a whole lot of supports to make it easy, like a special welcome drinks to introduce industry leaders and extra support from the conference team," Committee Chair, Barb Grey said.

"This year we're also offering incentives for delegates to bring along a new grower, researcher or agronomist who's never attended the Conference before.

"We're keen to extend our delegate base and to make sure that everyone in the industry is welcome and feels they belong at the

Conference. We really are a friendly bunch and we usually find that once people attend, they come back every time."

Registering and arranging accommodation at the Gold Coast is also a simple, pain free process that's all done for you, if you choose. The on-line registration process takes you through some simple steps and you can speak to the organisers at any time if you have concerns.

"We want the Cotton Conference to be accessible to everyone, and we love to see more delegates attending each year. If you know of a grower, researcher or agronomist who hasn't attended before, talk to them today and once they've registered you can claim your \$50 voucher," Barb said.

To register, please go to [www.australiancottonconference.com.au](http://www.australiancottonconference.com.au)

see our website





# STRONG RESPONSE TO CALL FOR CONFERENCE RESEARCH PAPERS

**The Australian cotton research community has responded to a call for Cotton Conference research papers with great enthusiasm, with strong interest across all of the categories.**

A total of 73 expressions of interest have been received, covering topics as broad as irrigation and water use efficiency, energy use efficiency, biosecurity, pests, weeds, diseases, carbon, managing climate risk, soils, fibre quality, nitrogen, people capacity and on-farm safety.

CRDC now has a major task ahead to assess and sort the applications and prepare them for publication.

To ensure the broadest possible participation from the cotton research community, three category opportunities were offered this year, with individuals able to nominate for all three categories.

The Three Minute Thesis presentations are designed to give researchers an opportunity to outline their research findings in a succinct, engaging way for a non-specialist audience.

Participation is open to all Post Graduate, Post Doctorate, mid-career and senior researchers and topics must have a research and development focus.

Short Research Papers are invited from cotton researchers, with all those accepted published in the proceedings on the Conference website and available via the Conference App.

Formerly known as a research poster, the Research e-summary provides an opportunity for researchers to provide concise information via an electronic medium.

Research outcomes will remain a key focus of the Conference this year, with many sessions and topics contributed by CRDC and individual researchers.

While submissions for the three minute thesis category have closed, CRDC will be accepting content for the research papers and e-summaries until COB Monday June 30. Any researcher wishing to submit should contact Ruth Redfern at CRDC on (02) 6792 4088.



The Australian Cotton Conference is a world-class event which attracts leading speakers and researchers.



## WHO DOES THE NEXT GEN THINK THEY ARE?

**Are you aged 18-35 and going to the Australian Cotton Conference? Then who do you think you are? That's the question we'll be asking you on day two of the Conference at the big Bacon and Berocca Breakfast, kindly sponsored by CRDC and Tilco and taking place in Foyer E/F at the Gold Coast Convention and Exhibition Centre.**

After what will no doubt be a big night on the first night, we're offering free bacon and egg burgers, berocca and coffee for the young (and young at heart) to get you up and going at 7:15am before we get into the big questions.

So, who do you think you are? That's what we'll be investigating in a session with Julia Telford at 8am into personality types: understanding who you are, and what makes you tick. It might just answer why you and your mates get on so well, or why you really struggle to see eye to eye with that particular person at work.

We're then going to take a look into the cotton industry - it's our industry, after all. So where do we think it's going, and how are we going to take it there? From 9am, Ian Plowman will help us get to back to basics and take a good look at the issues, and opportunities, for the industry. Just think, by 2029, we'll be running the show (now that's worth getting out of bed for!).

Interested? Numbers are limited, so RSVP to Tracey by July 25: [cottonshippers@bigpond.com](mailto:cottonshippers@bigpond.com)



## EARLY BIRD REGISTRATIONS CLOSE JUNE 30

**Delegates who register before 30 June will benefit from substantial savings, particularly for group bookings.**

"The Australian Cotton Conference already offers incredible value for money, and is far more cost effective than most other ag conferences. This is due to the support of our sponsors who underwrite the event and help subsidise registration costs, particularly for growers," Conference Chairman, Barb Gray said.

To take advantage of early bird discounts, register on-line at [www.australiancottonconference.com.au/register](http://www.australiancottonconference.com.au/register)



# MONSANTO'S GLOBAL LEAD IN RESISTANCE MANAGEMENT TO ADDRESS CONFERENCE

**DR Graham Head is the global lead for Monsanto Company's insect resistance management programs, with responsibilities spanning across crops and locations all over the world. With over 17 years at Monsanto, over 60 peer-reviewed publications and the current chair of the US Insecticide Resistance Action Committee, there is perhaps no better person in the world to address Australian cotton growers on issues of insect resistance.**

Committee member Brooke Summers interviews Dr Head as he prepares to address the Australian Cotton Conference for the first time.

*Could you please describe your role with Monsanto?*

I lead a group of scientists at Monsanto who are responsible for our insect resistance management programs across crops and geographies. We work with other technical and commercial groups at Monsanto to design and implement these programs, and the next-generation technologies for insect control.

*What relationship do you have with the cotton industry?*

One of Monsanto's "core" crops is cotton and I work on resistance management

programs and issues wherever our Bt cotton technologies have been commercialised. I have been involved with Monsanto's programs in Australia for over a decade.

*Please briefly explain the topic you'll address at the conference?*

I will speak about the global status of insect resistance and resistance management for Bt crops, and Bt cotton in particular, and the implications for Bt cotton in Australia.

*What can our delegates expect to learn from your presentation?*

They will learn about the primary factors that have led to cases of resistance to Bt crops at a global level, what has been done to address these factors, and what role different stakeholders (growers, public sector scientists and technology providers) need to play for IRM to be successful.

*Why is this important to our industry in the next 3-5 years?*

Resistance and resistance management is one of the greatest on-going challenges for the cotton industry in Australia. Effective IRM is essential to sustained profitability and the active involvement of the Australian cotton



industry in resistance management is critical to its success. Everyone has to understand their role and be willing to do their part.

*How does your topic relate to the theme "Our Fibre, Our Focus, Our Future"?*

Resistance management needs to be part of everyone's focus because it is very much a collective activity. Done right, it will ensure that Bt cotton technologies remain effective in the future.

## A NIGHT NOT TO BE MISSED

**Following a very strong response to the call for nominations for the 2014 Cotton Industry awards, the finalists have been announced and the Cotton Awards Taskforce is busily preparing for the Awards Dinner.**

Organiser Sally Hunter says she expects an equally enthusiastic attendance at the Awards Dinner, to be held in conjunction with the Cotton Conference at the Gold Coast on Thursday evening August 7.

"Having received 48 nominations for the five categories the finalists and ultimately the recipients are of a very high calibre," Sally said.

"The judging panels had their work cut out narrowing down the finalists, who will all be recognised throughout the Conference with final award recipients announced at the dinner.

"The Awards highlight and share the quality practices, innovation and business management skills of the best of the cotton industry and the dinner is an opportunity to hear what these people are doing, as well as a great chance to network and celebrate," Sally said.

This year the dinner will be hosted by ABC Television presenter James O'Loughlin, best known for his role as host of *New Inventors* and entertainment will be provided by Gold Coast cover band Kick with Casey Barnes.

"We are really excited about our secret entertainment as well that will add to the excellence and elegance theme for the evening," Sally said.

"Don't miss this fantastic event and be sure to book your table when booking your attendance at the Conference."

### FINALISTS

**Monsanto Grower of the Year, and AgriRisk High Achiever of the Year:**

- "Wyadrigah" - Anthony Barlow Mungindi, NSW
- "Macintyre Downs" - Michael Castor Goondiwindi, Qld
- "Nandina" - Peter and Diana French Theodore, Qld
- Auscott Namoi Valley - Martin Mead - Narrabri, NSW
- "Warilea" - "Curra" Brendan and Jack Warnock Narrabri, NSW

- "Lanes Bridge" - Tim and Sally Watson Hillston, NSW

**Chris Lehmann Trust Young Achiever of the Year, sponsored by Bayer CropScience**

- Zara Lowien, Executive Officer Gwydir Valley Irrigators Association, Moree, NSW
- Matthew McVeigh, grower, McVeigh Brothers Partnership, Dalby, Qld
- Heath McWhirter, Senior Cotton Agronomist, Elders, Griffith, NSW

**Cotton Seed Distributors Researcher of the Year:**

- Dr Stuart Gordon, Project Leader, Cotton Textile Research Unit - CSIRO Materials Science and Engineering, Geelong, Victoria
- James Quinn, Gwydir Valley Extension and Development, Cotton Seed Distributors, Moree, NSW
- Dr Linda Smith, Senior Plant Pathologist, QLD DAFF, Theodore, Qld

For more information, go to [www.australiancottonawards.com](http://www.australiancottonawards.com)  
To book your Awards Dinner tickets: [www.australiancottonconference.com.au](http://www.australiancottonconference.com.au)





# IS COTTON THE NEW SILK?

COTTON WAS DECLARED THE 'NEW SILK' BY A COTTON SPINNER AT THE BREMEN INTERNATIONAL COTTON CONFERENCE. CRDC R&D MANAGER ALLAN WILLIAMS LOOKS AT THE IMPLICATIONS OF THIS FOR THE AUSTRALIAN COTTON INDUSTRY.

Organised by the Bremen Cotton Exchange and Bremen Fibre Institute, the biennial event brings together diverse perspectives from across the supply chain, with sessions on cotton production, textile processing, new products, measuring cotton properties, consumer expectations and water use across the cotton supply chain (which I chaired). There was even a demonstration on the first day by a group opposed to forced labour and genetic engineering.

However throughout the event a recurring theme was the ongoing challenge posed by man-made fibres (MMF) to cotton. As an apparel industry consultant pointed out: polyester is cheaper, requires fewer chemical inputs (eg dyeing), has consistent quality, stable price and no labour issues leading to boycotts. For clothing retailers, polyester reduces both price and reputational risk.

While not all MMF are cheaper than cotton, its main competitor polyester, is. Switching a 100 percent cotton shirt to 40 percent polyester reduces the unit price by about 13 percent, while switching to 100 percent polyester reduces the unit price by nearly 20 percent.

It seems clear the market for cheaper clothing will be dominated by polyester and cotton cannot simply

CSIRO'S Dr Stuart Gordon says man-made fibres (MMF) can be produced as a filament (continuous strand) or staple fibre. Both forms are used in textile (apparel and home furnishing) and industrial (composite, non-woven, packaging, canvas, film and rope) applications. MMF production has increased at the expense of natural fibres (cotton, wool, silk and bast fibres) in both textile and industrial markets (see Figure 1). Cotton's percentage of the world fibre market in 1991 was 49 percent. In 2013 it was estimated to be 31 percent.

The non-cellulosic fibre proportion shown in Figure 1 is largely polyester (terephthalic acid and ethylene glycol) production. The yearly growth in polyester filament production is predicted to be seven percent over the next three years to 2016; compared to 4.1 percent for staple fibre production. New sources of polyester feedstocks will be from plants. Large brand owners (eg Pepsi, Coke, Heinz) are leading research in the formulation of bio-sourced feedstocks for polyester films and fibres.

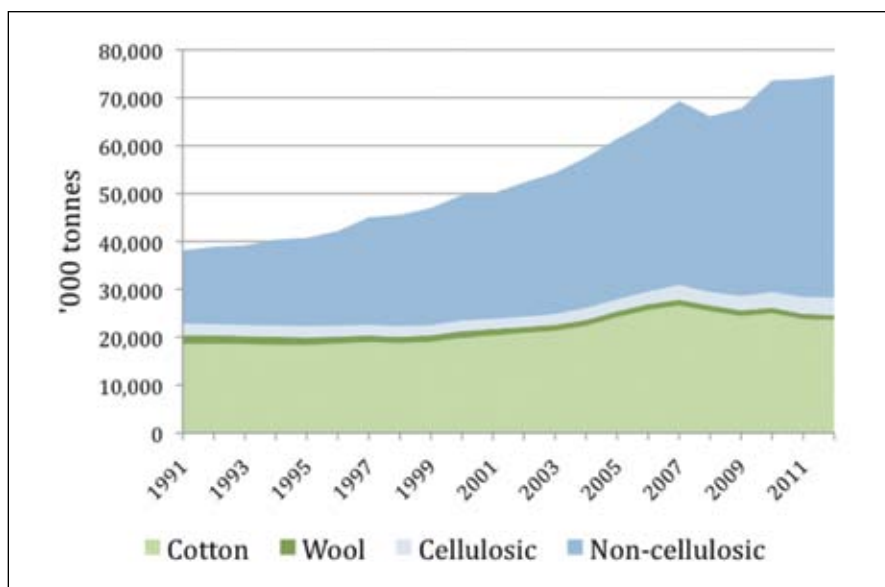


Figure 1. World fibre production 1991-2013 (OECD-FAO Agricultural Outlook 2013)

rely on population growth and increasing affluence in developing countries to sustain market share. As highlighted during the 2013 International Cotton Advisory Council plenary meeting, increases in income are associated with declines in market share of cotton in low per capita income countries.

If cotton is being pushed out of the lower end of the clothing market, the fine, high quality end becomes a natural alternative and a number of speakers highlighted the implications of focusing more on the high quality clothing market: on cotton becoming the "new silk". Two aspects of this market immediately come to mind: the quality of the cotton required to produce fine, soft yarns and fabrics required for high quality clothing; and the expectations of the consumer regarding how the cotton was produced.

The highest quality yarn and fabric is made with the extra long staple (ELS) Pima variety. But global production of ELS is declining, with 2013 the lowest in three decades, the result of a significant drop in Chinese production and to a lesser extent US production. So the opportunity exists for Australian cotton to be a replacement fibre in the high quality yarn market.

A representative of a large European department store advised us that customers are developing "a stronger sense of 'right to know'" while the International Wool Textile Organisation (IWTO) claimed "discerning customers will not pay a premium for goods of dubious provenance". Therefore to meet the needs of customers for high-quality cotton products, the cotton itself has to be

produced under socially and environmentally responsible conditions and its source clearly identifiable.

In response, clothing brands and retailers are seeking ever more information about how cotton in their products is grown; and greater transparency around where it was grown. An increasing focus on this market would likely require the Australian industry to provide more data regarding on-farm practices.

Cotton Australia is preparing for this potential requirement through its Cotton to Market efforts, which includes Cotton LEADS and the Better Cotton Initiative. These programs both provide data to brand owners and retailers on the responsible production practices in Australia. (See pp31-32 Autumn 2014 *Spotlight*).

One of cotton's strengths, highlighted by a spinner at the conference was its 'blendability' in the laydown (where the fibres enter the spinning process). Where this has been a focus for quality and input cost management by spinning mills there is a new trend for blending to create "functionality" in fibres. Changes in the use of cotton and MMF in sports apparel is evidence of this broader trend.

A new market opportunity for cotton could be to identify how cotton could be used in blended yarns for novel functionality. This presents an interesting choice. Should marketing of cotton focus on it as the major component of a yarn, or should there also be a focus on identifying blending opportunities - or 'watering the gin' as the IWTO speaker would have it?

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