COTTON RESEARCH & DEVELOPMENT CORPORATION

Spotlight on Cotton R&D

WINTER 2012

CRC'S $1 BILLION VALUE

FEATURE: OUR FUTURE PEOPLE

Best Practice

CONTENTS WINTER 2012

IMAGE MELANIE JENSON

The cotton industry recognised the end of an era and the achievements of all three CRCs at the 2012 Science Forum in Narrabri recently.

IN THE SPOTLIGHT

Congratulations to all those involved in bringing the harvest of the largest Australian cotton crop in history to fruition. A record production that may reach five million bales and be worth in excess of $2.5 billion before considering the flow on benefits to rural, regional, state and the national economy.

It's a reflection on the commitment and capability of the people in the industry. This stands out whether you're a plant breeder, researcher, grower, farm worker, local service provider, crop consultant, ginner, truck driver, classer or merchant working hard to sell our product to our customers.

To think that this has been achieved in a challenging season of climate impacts, not least of which was another year of disastrous flood events is remarkable. This season's crop losses may well exceed 600,000 bales, which is worth remembering as this was the total level of industry production only four years ago during the worst of drought. We should also not forget the personal, business and regional impacts of these events.

Our industry Vision 2029 speaks of being a "tough" industry. One that is resilient and equipped for future challenges. No doubt these harsh experiences are building upon our understanding of volatility, risks and opportunities. Certainly the partnership between government and industry in cotton R&D is focussed on assisting industry to innovate and drive changes that best prepare it for the future.

Yet as our industry reaches a pinnacle of the largest crop ever, we find that the people we need to continue to succeed are yet to be found. Like many primary industries, we need more people, with studies commissioned by CRDC providing evidence of the problems. In this edition of *Spotlight*, we bring you a snapshot of how the industry is working together to alleviate the 'people shortage'.

Improving human capacity within the industry is a current CRDC strategy that has seen significant investment. There are many CRDC and industry initiatives underway that show great results in attracting capable people to cotton and related agribusiness. The industry is currently considering the merits of a cross-industry approach to leverage the most benefit from these programs. CRDC's Bruce Pyke convened a meeting in Narrabri during May to discuss how we can best utilise our resources to alleviate the impending people shortage and we have included the outcomes of this meeting in this edition.

What has become obvious through the "Our Future People" feature in this issue is that education and attraction are inextricably linked. We cannot expect people young or old – to consider a future in an industry if they know nothing about it; much less understand it and what it offers. The saying "you only know what you know" stands true. Educating young people about agriculture and cotton is the first step to opening a world of possibility to them while at the same time instilling positive attitudes toward agriculture and an understanding of the importance it plays in their everyday life.

The understanding that young people can influence what they eat and wear is a powerful one and often quoted by our PhD students and scientists, farmers and agri-business consultants as the reason they do what they do.

As this edition is focussed on the importance of people I would also like to pay tribute to the capable team at the Cotton CRC for their leadership and enormous contribution to industry R&D. CRDC has been working closely with them to ensure both important research and researcher capacity is sustained as best possible. On behalf of CRDC we suggest that the recent assessment of the Cotton CRC's economic impact of near $1.1billion over the next 15 years is only an indication of the total benefit that has been created. Well done.

Bruce Finney

Australian Government
Cotton Research and Development Corporation

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CRDC is a research and development partnership between the Australian cotton industry and the Australian Government.
Cotton Research and Development Corporation
ABN: 71 054 238 316
Our vision: A globally competitive and responsible cotton industry

Our mission: Invest and provide leadership in research, innovation, knowledge creation and transfer.
Our outcome: Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community.
Corporate background: CRDC was established in 1990 under the Primary Industries and Energy Research and Development Act 1989 (PIERD Act.) which outlines its accountability to the Australian Government and to the cotton industry through the Cotton Australia. CRDC is responsible to the Australian Government through the Minister for Agriculture, Fisheries and Forestry, Joe Ludwig.
CRDC is committed to fulfil its legislated charter to: Invest in and manage an extensive portfolio of research, development and extension projects to enhance the ecological, social and economic values associated with cotton production systems and to benefit cotton industry participants, regional communities and the Australian community.
Postal: PO Box 282, Narrabri NSW 2390
Offices: 2 Lloyd Street, Narrabri NSW 2390
Tel: 02 6792 4088; Fax: 02 6792 4400
Email: mailto: spotlight@crdc.com.au
Web: www.crdc.com.au
Editor: Rohan Boehm
Editorial coordinator: Melanie Jenson
Editorial Contributors:
Melanie Jenson, Tristan Viscarra Rossel, Mark Hickman, Brooke Summers.
Additional photography Tim Boehm.
Layout, composition: Deacon Design

CRC INVESTMENT YIELDS $1B PLUS

AFTER SEVEN YEARS, THE WORK OF THE COTTON CATCHMENT COMMUNITIES COOPERATIVE RESEARCH CENTRE (CRC) GENERATED MORE THAN ONE BILLION DOLLARS IN ECONOMIC, ENVIRONMENTAL AND SOCIAL BENEFITS FOR AUSTRALIA, ACCORDING TO MODELING BY THE NSW DEPARTMENT OF TRADE & INVESTMENT.

"When the CRC was established in October 2005, the goal was to achieve $1 billion dollars of economic, social and environmental outcomes," said Cotton CRC Chief Executive Officer, Philip Armytage.

"Now that the CRC's operations are coming to a close, we're very proud to report we managed to exceed that expectation, in spite of the impacts of the worst drought on record which saw the industry shrink to just 15 percent of average cotton production.

"During its seven-year term, the Cotton CRC's 11 core participants, 43 supporting partners and the Australian Federal Government have invested a total of $184.6 million dollars in cash and in-kind contributions. This investment will now deliver $1.067billion in value over the next 15 years to the Australian cotton industry, representing a $6.80 return on every dollar invested through the Cotton CRC.

"The Australian cotton industry, regional communities and the nation will now reap the environmental, social and economic rewards of the CRC's innovation and dedication to the pursuit of high quality research, education and adoption activities."

The area of water use efficiency, new technologies and practices developed by the Cotton CRC has resulted in a 40 percent increase in water use efficiency, creating annual cost savings and productivity gains of up to $108 million.

The Cotton CRC has created myriad new products and technologies that are making the cotton industry more productive while constantly improving environmental sustainability. Several new products are now commercially available for use, including Magnet selective pesticide technology, Quick Test technology to almost instantly detect chemical residues, and Cottonspec software to optimise fibre quality in the textile sector.

Many projects are not so easy to quantify in monetary terms, but invaluable to rural communities, for example research on the impact of water scarcity on our regional communities, and the connectivity between surface and ground water systems.

After seven years the Cotton Catchment Communities CRC will come to a close on June 30, but the organisation leaves a legacy of innovative and extremely valuable tools and technologies that will play a key role in ensuring the future viability and sustainability of the Australian cotton industry.

"The Cotton CRC has achieved significant social and financial outcomes both for the cotton industry and the regions in which it operates. We can confidently say we have created prosperity through innovation," Philip Armytage said.

The Cotton Catchments Community CRC Management team – Farm Program Leader Dr Lewis Wilson, Accountant Belinda Graham, Administrator Robyn Smith, Program Director Paula Jones, CEO Philip Armytage, Communication, Education and Adoption Manager Yvette Cunningham, Chief Scientist Prof Peter Gregg, Project Management Linda George, Business Manager Kym Orman, Farm Program Leader Graham Harris, Catchment Program Manager Jane Trindall and Product Program Leader Dallas Gibb.

COTTON CRC GIVES RECOGNITION AND THANKS

THIS YEAR'S COTTON CATCHMENT COMMUNITIES SCIENCE FORUM WAS THE FINAL FOR THE CRC AFTER 17 YEARS OF OPERATION.

Titled "Putting the pieces together", the forum highlighted research from the current and previous two Cotton CRC's, and was an ideal opportunity for research and extension /development officers to review achievement of Cotton CRC research and to learn of future opportunities. The forum was held at Narrabri's Crossing Theatre from March 19 and concluded with the awards dinner on March 21. The awards were as follows:

SCIENTIFIC PAPER
Dr James Quilty and Dr Stephen Cattle, University of Sydney
Use and understanding of organic amendments in Australian agriculture: a review. Soil Research Vol 49 Pg 1-26

IMPACT IN ADOPTION
Sandra Williams, CSIRO Plant Industry

SCIENCE AND INNOVATION
Dr Nancy Schellhorn, CSIRO Ecosystem Sciences

COLLABORATION & CORPORATE CITIZEN
Extension Bid Team:
Dr Michael Bange, CSIRO Plant Industry
Mark Hickman, Qld DEEDI
Jane Trindall, Cotton CRC
Dr Anthony Hogan, Australian National University
Dr Guy Roth, Roth Rural & Regional
Prof Peter Gregg, UNE/Cotton CRC

CRC COMMERCIAL PARTNERSHIP
Peter Glennie (BS Glennie & Son) and Dr Robert Mensah (NSW DPI)
Growth Agriculture, AgBitech, Quick Test Technologies, BSE Electronics

EXCEPTIONAL CONTRIBUTION OVER THE LIFE OF THE COTTON CATCHMENT COMMUNITIES CRC
Dr Lewis Wilson, Kym Orman
Lynda George, David Anthony
Kathryn Adams, Prof Peter Gregg


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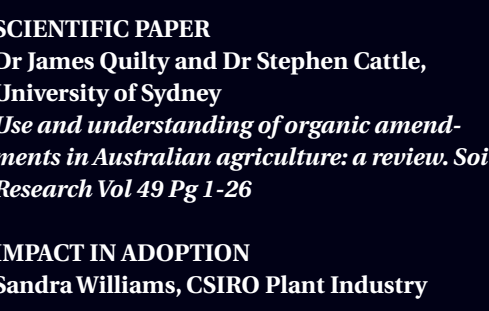
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[1] Paula Jones accepts thanks from CRC deputy chair John Herbert.

[2] Collaboration & Corporate Citizen winners were the CRC Extension Bid Team of Guy Roth, Michael Bange, Jane Trindall, Peter Gregg and Mark Hickman. (absent Dr Anthony Hogan, Australian National University.)

[3] CRC Commercial Partnership Award winner Robert Mensah, for his Plant X breakthrough.

[4] Exceptional Contribution Over The Life Of The Cotton Catchment Communities CRC co-winner Lewis Wilson.

[5] Nick Watts, Growth Agriculture, CRC Commercial Partnership winner with Dr Robert Mensah for 'Plant X'.

[6] Exceptional Contribution Over The Life Of The Cotton Catchment Communities CRC Award co-winner Lynda George accepts her award from CRC CEO Phil Armytage.

[7] Exceptional Contribution Over The Life Of The Cotton Catchment Communities CRC co-winner Kathryn Adams.

[8] Peter Gregg was co-winner of the Exceptional Contribution Over The Life Of The Cotton Catchment Communities CRC Award.

[9] Sophie Gulliver, AgBiTech, CRC Commercial Partnership winner for Magnet with Prof Peter Gregg.


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[10] *Australian Cottongrower* publisher Dave Dowling.

[11] CSIRO's Steve Yeates and Anthony Ringrose-Voase.

[12] Precision Cropping Technology's Brooke Sauer and Graham Harris Cotton CRC, QLD DAFF.

[13] Alice Del Sorocco UNE and Renee Anderson, Cotton Australia CQ representative.

[14] Cotton CRC Education Officer Trudy Staines, pathologist Karen Kirkby NSW DPI and CSIRO's Loretta Clancy.

[15] CRDC Chairman Mike Logan and Director Mary Corbett ran the Future Directions session on behalf of CRDC.

[16] Jungi Miyazaki, CSIRO Plant Industry, Narrabri and weed scientist David Thornby, DAFF QLD.

[17] CSD Managing Director Peter Graham and CRDC Director Richard Haire, Olam International.

[18] CRDC Farming Systems Investment Manager Tracey Leven and Namoi grower Phil Firth.


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[19] St George consultant Dallas King, Cotton CRC and Stephen Allen, CSD.

[20] CRDC Communications Manager Rohan Boehm and CRC CEO Phil Armytage.

[21] Grower and Cotton Australia Board member Cleave Rogan, St George with Lorraine Stephenson.


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AS THE COTTON CRC BEGINS TO CLOSE ITS BOOKS, IT REFLECTS ON A NUMBER OF PROJECTS THAT HIGHLIGHT ITS SUCCESS AS TRISTAN VISCARRA ROSSEL REPORTS.

QUICK TESTS OFFER MASSIVE SAVINGS

RAPID TESTS HAVE BEEN DEVELOPED TO DETECT ENVIRONMENTAL THRESHOLDS OF THE HERBICIDES DIURON, FLUOMETURON AND PROMETRYN.

AT LEFT: Quick Test is a breakthrough in environmental analysis of water resources and (inset) a Quick Test example showing Diuron levels.

Professor Ivan Kennedy from the University of Sydney, explained the rapid tests used immunogold labelling, a similar technology to that used in store-bought pregnancy tests.

"Three or four drops of a water sample flow laterally in the device. If the sample is clean, the test line will bind the gold that contains the antibody, and the control line will bind the rest of the gold particle; two lines will appear.

"If the sample is contaminated, it will pass the test line and only the control line will be visible. If we only get one line, we are confident that the sample is contaminated above a certain level."

The delivery of 10,000 kits from the China-based laboratory of Quick Test Technologies Pty Ltd is the culmination of 20 years of background research, initiated by Ivan in the 1990s.

The CRC has transferred intellectual property rights to Quick Test Technologies, operated by Ivan and Dr Shuo Wang (also worked on the project).

"At the moment, we're using Quick Tests for research which includes reviewing the acceptability of the Quick Tests for field use. We hope they'll be used to identify safe practices so that they can become part of *my*BMP and the cotton eco brand," Ivan said.

"We see them as a great advantage in environmental analysis, as collecting and analysing samples in a laboratory costs hundreds. People may save up to 90 percent of their costs simply because they will choose not to analyse samples that Quick Tests detect as negative.

"While can't give an actual price yet, it does cost $150 – $300 to get samples done in labs, and these kits should be available for around 10 percent of that cost."

The Quick Test kits may be sold commercially mid-year.

Professor Ivan Kennedy 02 8627 1046
ivan.kennedy@sydney.edu.au

email us

FUTURE BIOCONTROL SOLUTIONS FOR AUSTRALIAN GROWERS

WITH THE ADOPTION OF TRANSGENIC COTTON, GROWERS ARE FACING INCREASED PRESSURE FROM SUCKING PESTS, SUCH AS GREEN MIRID.

Nick Watts of Growth Agriculture and Dr Robert Mensah.

Furthermore, control of sucking pests often reduces numbers of beneficial insects, leading to outbreaks of other pests such as spider mites, aphids and whitefly.

Research funded by CRDC and Cotton CRC-led by Dr Robert Mensah from the NSW Department of Primary Industries – offers two potential solutions to this problem. A naturally occurring fungi and an extract from a common plant show potential to help economically manage Helicoverpa, whiteflies, mirids and other pests, with low risk to beneficial insects.

In the course of his recent work, Robert discovered a naturally occurring Australian fungus from an infected green mirid adult. In collaboration with commercial partner Becker Underwood Pty Ltd, he developed it into a stable, biological spray that effectively controls sucking pests.

Robert also identified a useful plant species prevalent in Australia (codenamed 'Plant X'), and produced a semiochemical (a substance that modifies the behaviour of insects) from the plant's extracts that can deter pest feeding and egg laying, as well as causing direct kill of a number of insect pests.

"I have found that both the fungus and the plant extract can kill mirids, aphids, green vegetable bugs, white flies and the small larvae of heliothis, which are all major pests in cotton now," he said.

These technologies, which may have applications in many industries, including organic agriculture.

"Development of biopesticides is very important, not only to control sucking pests, but to minimise on-farm use of insecticides, support IPM by conserving beneficial insects and reduce the high cost of producing cotton in Australia," he said.

Funded by the CRDC with in-kind contribution from Becker Underwood, Robert is collating efficacy and regulatory data for commercial registration of the fungus product to provide farmers with a biological to control sucking pests and heliothis.

The intellectual property for Plant X extract has been sold to Growth Australia, based in Wee Waa, for further development and chemical registration. It is in the early stage of commercialisation; Innovate Agriculture Pty Ltd (a Growth Agriculture Pty Ltd subsidiary company) has a Commercialisation Australia grant to assist with this process.

Robert expected the plant extract to be registered before the fungus product, and said growers could expect to hear more about both products in 2013.

Dr Robert Mensah 02 6799 1500
robert.mensah@dpi.nsw.gov.au

email us

DEEP DOWN INSIGHT FROM 3D MODELS

DEVELOPMENT AND USE OF 3D GEOLOGICAL MODELS IS HELPING THE COTTON INDUSTRY IMPROVE AQUIFER MANAGEMENT AND IS INFORMING DISCUSSIONS SURROUNDING WATER-SHARING PLANS AND CHANGES IN LAND USE.

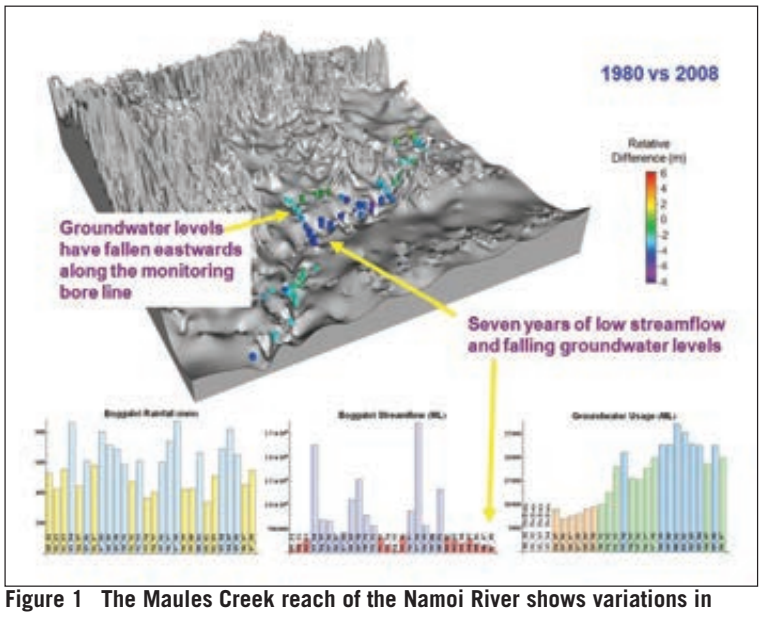


Figure 1 The Maules Creek reach of the Namoi River shows variations in groundwater levels during the recent drought. Groundwater levels are recovering in this catchment due to recent flooding.

Funded by the National Water Commission and the Cotton CRC, the research by Associate Professor Bryce Kelly and his colleagues from the University of NSW and the University of Technology Sydney has dramatically increased our understanding of the way water moves through the landscape and into groundwater storage, enabling us to make better decisions about the volume and timing of water extraction.

"The 3D geological models of the alluvial aquifers let us map out the pathways of the ancient migrating rivers, and geological structures that affect the volume of groundwater available to farmers," Bryce said.

"Knowing this complex architecture helps us to understand why one grower might have a very high-yielding bore and other growers less than one kilometre away will have really low-yielding bores."

The researchers can also analyse the groundwater levels in 3D.

"By looking at how the groundwater levels rise and fall throughout the pumping season, we can map which bores are placed in the same paleochannel belt at depth. We can also see how the aquifers respond to floodwaters," Bryce said.

"This lets us map which locations are connected to river and flood recharge, and which locations have limited recharge."

Figure 1 shows how groundwater levels declined during the drought in the Maules Creek reach of the Namoi River, due to the combination of groundwater extractions and low streamflow. This reach recovers when flooded via passive recharge, and demonstrates how we could bank water in our aquifers if we actively used managed aquifer recharge as part of water management strategies.

The NSW Office of Water, the Namoi and Gwydir catchment management authorities, and Geoscience Australia are already using information from the models. Dr Kelly said he was also keen to help raise awareness among growers.

"Our information will keep growers informed in their discussions surrounding the Murray–Darling Basin plans and water-sharing plans," he said.

"We're trying to raise the level of understanding within the grower community, on how the groundwater systems are all connected to the surface water bodies, from the rivers to mountain-front recharge, how pumping is mixing the water within the aquifers, and where the flood recharge occurs during large floods."

bryce.kelly@unsw.edu.au
www.connectedwaters.unsw.edu.au

email us | see our website

FUTURE BIOCONTROL SOLUTIONS

IN 2009, AGBITECH REGISTERED MAGNET, THE WORLD'S FIRST COMMERCIAL ATTRACT-AND-KILL TECHNOLOGY BASED ON ORGANIC CHEMICAL COMPOUNDS KNOWN AS PLANT VOLATILES.

Magnet allows for the selective poisoning of *Helicoverpa* moths before they lay eggs that hatch into destructive caterpillars, without harming beneficial predator insects.

Magnet represents a decade of research funded by three successive cotton CRCs, led by Professor Peter Gregg from The University of New England.

"In the past couple of years, Magnet has had reasonable use on conventional cotton, which is now only a small segment of the market," Peter said.

"We are looking at a number of possibilities of using Magnet on other pests and in other plant species, such as sweet corn, canola, grain crops and potatoes.

"We are also investigating Magnet-like products with different blends of plant volatiles to attract different pests. Magnet was developed to specifically attract *Helicoverpa*, and we can probably create more effective products for other pests."

AgBiTech's Managing Director, Anthony Hawes, said that a second formulation called Magnet Px ('Px' stands for '*Plutella xylostella*') is being used in South East Asia to control diamondback moth in high-value brassica crops.

Anthony said Magnet offered great potential, but the experimental work had its challenges.

"The product itself is easy to work with; it's easy to spray, it's safe, without containing insecticide, and it's relatively stable," he said.

"But it's a challenging product to develop because of its mode of action; it needs more large-scale fieldwork – which is expensive – compared to the typical pesticide. It is a difficult product to evaluate and register."

AgBiTech has commenced trials in the United States to register Magnet for *Helicoverpa* control in sweet corn, and is undergoing a regulatory process for Magnet Px in the Philippines.

CRDC recently funded a project to investigate using Magnet as a tool in resistance management.

"We are looking at using Magnet to selectively target moths coming out of Bollgard cotton, which are potentially resistant," Peter said.

"Having a source of mortality in the moth population that is not related to Bt will help to reduce the selection pressure."

***Helicoverpa armigera* moth with extended proboscis feeding on Magnet.**

Peter Gregg
Chief Scientist, Cotton Catchment Communities CRC
02 6799 2451
peter.gregg@csiro.au

email us

HELP STOP THIS INVADER

WORK IS UNDERWAY TO HALT THE SPREAD OF ONE OF THE WORLD'S MOST INVASIVE FISH INTO THE MURRAY DARLING BASIN AND LOCAL COMMUNITIES CAN HELP.

Keep eyes of open for and report sightings of the Mozambique tilapia. This is the male of the species, the female is inset below.

The introduced tilapia (*Oreochromis mossambicus*) is listed as a noxious species right across Australia and although not currently known to occur in NSW or Murray Darling Basin (MDB), they have been recorded as close as three kilometres from the MDB boundary in Queensland. This presents a significant risk that tilapia may end up in the waters of the basin, and subsequently NSW.

Mozambique tilapia is a hardy fish, tolerating a wide range of temperatures and surviving in water with high salinities and low dissolved oxygen. Consequently they have colonised a variety of habitats including reservoirs, lakes, ponds, rivers, creeks, drains, swamps and tidal creeks. They usually live in mud bottomed, well-vegetated areas, and are often seen in loose aggregations or small schools.

Potential impacts of this pest include competition and a possible decline of native species, altered water chemistry and reduced recreational, environmental and conservation value of the water body.

Debra Doolan of the NSW DPI Aquatic Biosecurity Unit says tilapia were first detected in Queensland waterways in the 1970s.

"Native to southern Africa, it is believed they were introduced to Queensland through accidental or deliberate releases of aquarium fish and now inhabit catchments in South East Qld," Debra said.

"Threat of spread to the MDB and NSW is only restricted by physical boundaries, including the Great Dividing Range."

In an effort to prevent tilapia from establishing in the MDB, the NSW DPI Aquatic Biosecurity Unit and the QLD DAFF, have been working on a project with the MDB Authority.

Debra says the project found that the highest risk for translocation of tilapia into the MDB is from human activities.

"To minimise this risk, we needed to look at an education campaign to raise awareness of the danger of this pest and encourage people to keep their eyes out for them in rivers, dams and other waterways," she said.

"Firstly we needed to gain a better understanding of community knowledge and attitudes towards tilapia and pest fish is generally through surveys which were also used to develop a series of tilapia educational publications.

"In addition, tilapia 'train the trainer' workshops were developed to give MDB communities information on how to identify tilapia, what the potential impacts of the species could be and what to do in the case of a suspected sighting.

"We are really relying on the community to help us protect our waterways from this devastating species.

"Tilapia would pose a significant threat to our native fish species if they were to establish in our waterways."

Workshops were held for the communities of Brewarrina and Moree in NSW and Warwick and Dalby in Qld. These communities were chosen to participate in the workshops as they are considered to be in areas of high risk of a tilapia incursion.

Additional workshops were held in Narrabri, Walgett, Gunnedah and Tamworth with funding from Namoi CMA.

Namoi Catchment Officer Peter Verwey attended the Narrabri workshop, and said the importance of spreading knowledge about this pest to these areas was vital because this fish has the potential to change our waterways forever.

The invasive characteristics of tilapia include a successful breeding strategy, producing up to 1200 eggs per year and protection of the young in their mother's mouth for up to 14 days before they are released.

"Their breeding strategy and ability to tolerate very poor quality water allow them to thrive where native fish struggle and they aggressively compete for resources," Peter said.

"Cotton farmers live in close harmony with their rivers and water supplies and they are perfectly positioned to help in the early detection of this pest fish."

Anyone who catches or finds a tilapia should take a good quality photo and call NSW DPI Aquatic Biosecurity Unit on 02 4916 3846 immediately so its identity can be confirmed.

"If it is a tilapia we ask that the fish is humanely destroyed and disposed of appropriately and not returned to the waterway," Debra Doolan says.

Debra Doolan
Aquatic Biosecurity Officer
02 4916 3846
debra.doolan@dpi.nsw.gov.au
www.dpi.nsw.gov.au

email us

see our website

"COTTON FARMERS LIVE IN CLOSE HARMONY WITH THEIR RIVERS AND WATER SUPPLIES SO ARE PERFECTLY POSITIONED TO HELP".

FILLING THE INCREASING VOID BETWEEN THE NUMBER OF JOBS AND THE SEEMINGLY DWINDLING NUMBER OF CANDIDATES IS OF MUCH CONCERN TO INDUSTRY.

FUTURE WORKFORCES

WHERE ARE ALL THE WORKERS?

In a CRDC "future issues" forum held during the Cotton CRC's Science in March this year, finding people to fill jobs was at the core of most participants' concerns and is indicative of a broader concern to industry.

This concern has been actualised in a study commissioned by CRDC into the human capacity needs of the agribusiness sector alone that support the industry over the next five years. It had a very sobering conclusion – "unless more is done we are going to run out of people".

It found that from present to 2016, an extra 65 agronomists will be needed alone, and at least total 110 people across the industry. This figure does not fully take into account those retiring or departing the industry or the need for senior/strategic professional management staff, farm managers, business advisors, IT and electronics staff or company directors. So this basic figure can be added to quite significantly, says CRDC's Bruce Pyke, which means great implications for how the industry handles its workforce requirements from now onward.

Bruce says the question is now 'how do we start attracting more university graduates and non-graduates to the industry – quickly?'

"We are looking at a genuine people shortage in our industry, the issue of the problems in attracting and retaining staff keeps cropping up again and again," he said.

"CRDC included Human Capacity as one of its three R&D program investment areas in its 2008-13 Strategic Plan and while we have made in-roads with this investment we recognise that we still have a long way to go to more effectively address human capacity crisis.

"In 2012-13, CRDC will channel more resources into programs and projects to address this important issue and as result I'm sure it will be a focus for the next plan as well."

At a meeting convened by CRDC last November, industry representatives commenced focussed discussions around workforce and human capacity development. Four key issues were identified as areas of potential action.

These were:

- Lack of data regarding workforce needs.
- The need to develop a clear value proposition for investing in workforce and human capacity initiatives.
- The impact of current initiatives is not known.
- Co-ordination for strategy development planning and implementation needs improvement.

The outcomes from the meeting were the starting points for the discussions at a second CRDC-convened meeting on May 24 and will help inform how industry develops it workforce and human capacity plan.

Bruce Pyke said the May meeting discussed the progress made in initiatives and thinking since last November and considered the next step in how to progress a broader industry plan that will clarify the interconnection between different organisational activities and ensure any major gaps are discussed from a strategic point of view and addressed in due course.

"It was concluded that there is a need for key stakeholders to come together soon to discuss issues of workforce and human capacity strategically and to build this into an 'industry plan' for this important area," he said.

"It has been suggested by some that there is a need for the establishment of an industry working group to collectively progress workforce development and human capacity issues. The proposed stakeholder should help to clarify whether an additional group or existing committees and arrangements for communication and collaboration will be best placed to maintain progress on an industry plan.

"All participants agreed that Ruth Nettles' project looking at the workforce development system at the farm unit level would be very important in informing an industry plan." (See Ruth Nettle article p11).

Cotton Professional Development Manager Mark Hickman says while not a new issue, new solutions to creating a future workforce are needed.

"Industry has been facing the challenge of building firstly: the workforce and secondly: the technical expertise for a significant period of time, however this challenge has been playing second fiddle to larger policy issues around structural adjustment such as water reform or climate change," he said.

"This is not a new problem, evident in a key outcome of 2008 Australian Cotton Conference hands-on research sessions addressing labour management.

"The key outcomes from these discussions significantly mirror the outcomes from more recent November industry discussions which found despite all the innovative work to date, the problem is not a simple one.

"It is very important to note that this forum was the start of the industry conversations and that industry investment to date has demonstrated numerous innovative and beneficial programs. The challenge now for industry is to quantify the demand for the programs and foster the industry coordination which is required.

"To develop a truly sustainable solution that will grow as industry expands and retracts will require a unilateral industry approach across the whole supply chain."

SIGNIFICANT TASK AHEAD

A WORKFORCE SUPPLY CHAIN TARGETS CURRENT AND FUTURE NEEDS, AS MARK HICKMAN EXPLAINS TO SPOTLIGHT'S **MELANIE JENSON**.

Secondary school is seen as an intervention point for the industry when recruiting graduates. CRC Education Officer Trudy Staines has been giving such students a first-hand look at research in the cotton industry.

Numerous generic reports are available for the agricultural sector outlining the significant disparity between existing workforce levels and future workforce projections. In 2014-2015, employment in the Australian Agriculture, Forestry and Fishing sectors is expected to grow at a rate of 1.5 percent – equating to 27,100 new full time jobs.

It is expected that beef and grain farming systems will be the second fast growing sector (increasing by 2.6 percent), with livestock farming system occupying the first position – increasing by three percent *(Employment Outlook, Department of Education, Employment and Workplace Relations. 2011*).

The 2010 Australian Council of Deans of Agriculture found that the existing demand for agribusiness positions was 4500 graduates per year. At the time of the survey, universities were producing 300 agricultural graduates annually and when these graduates were combined with all related agricultural courses, the total was still well short of demand at 700 graduates per year (*Pratley, 2012*).

Recently, CRDC commissioned Gordon Stone and Associates to investigate the requirements of the agribusiness sector associated with the cotton industry. The study revealed: 34 percent of participants were 41 years or older, 63 percent of participating agribusinesses did not have a succession plan and industry growth was requiring 100 plus agribusiness professionals within the next five years.

Considering the time lag of attracting and educating these professionals, it means industry has a significant task. Hence, developing an industry workforce solution must be an industry priority to ensure the innovation and growth curves of historical years.

When developing an industry workforce solution, a holistic systems approach is required. Currently the industry is considering the workforce as a supply chain which must target the current and future industry needs.

Within this continuum, there are intervention points where research, development and industry engagement can have an influence. For this reason, the Human Capacity program of CRDC, Cotton CRC's Adoption and Community programs and Cotton Australia's policy and educational activities have been targeting three intervention points; the attraction, retention and life-long learning of individuals within the workforce.

In addition to industry lead initiatives, many strategic partnerships: Agrifood Skills Australia, PISCE, PIEF, universities, vocational providers, other state and federal departments, have been cultivated. Table one outlines the various initiatives that the three industry organisations have been contributing towards.

As reported in the Autumn edition of *Spotlight*, industry leaders met in November 2011, to review these initiatives, resulting in numerous recommendations. Of particular note was the acknowledgement that, despite the significant and successful level of post and current activities, industry would benefit from the development of a more holistic industry workforce strategy which would enhance the connectivity of the various organisational programs.

Another recommendation concerned cotton developing robust, industry specific, workforce data to help inform and evaluate future directions.

If you would like to contribute more to this conversation and perhaps contribute to an industry task force in this area contact Mark Hickman mark.hickman@deedi.qld.gov.au with your expression of interest.

email us

Area	CRDC, Cotton CRC and CA Initiatives
Primary and Secondary Schools	Primary Industries Education Foundation (PIEF), Primary Industry Centre for Science Excellence (PICSE), Agribusiness Gateway Schools, Enviro-readers, Industry / school engagement programs, Career forums and vocational programs, and Agrifood Skills Australia AgCAPs program.
Undergraduate	Primary Industry Centre for Science Excellence (PICSE), Horizon Scholarships- RIRDC and Cotton Production Course UNE, Summer Scholarships
Post Graduate	PhD and support programs, and the Cotton Production Course UNE
Workforce Retention & Life-long Learning	Human Resource *my*BMP module, Grower support program for HR with professional expertise, Cotton Safety program, E Learning program, Recognition of Prior Learning, target skill set training, Agribusiness roundtable, Indigenous traineeships program, Make It Work Initiative and Industry funded human capacity research – eg: Stone, Nettle, Waters and Hickman
Leadership development	Australian Rural Leadership Program sponsorship, Industry Vision 2029, National Cotton RD&E sector plan and Engagement with water, climate and extension sectoral plans for the National RDE framework
Capacity Building	D & D team, *my*BMP program, Big Day Out, Cotton Grower of the Year Annual field day, Australian Cotton Conference, Sustaining Rural Communities Conference and Cotton Growers Association capacity building grants

PUSHING THE BOUNDARIES

MACINTYRE VALLEY COTTON GROWERS ASSOCIATION IS ADDRESSING FUTURE CAPACITY NEEDS BY RUNNING A MENTORING PROGRAM FOR BOTH STUDENTS AND TEACHERS TO KEEP KIDS IN THE BUSH AND IN AGRICULTURE.

The program called "Pushing the Boundaries II" addresses two different issues with the same solution. The issues are a shortage of both on-farm staff and university graduates and the solution is showing high school students employment opportunities in agriculture and then assisting them in their journey whether they are keen for vocational on-farm training or to attend university – or both.

According to Goondiwindi farmer and Macintyre Valley CGA (MVCGA) President Nigel Corish, the depth of support they have received speaks volumes as to how serious the issue is being taken.

He says it is important to show young people what opportunities exist and not assume country kids will stay to work in their home towns or regions.

MVCGA has had a long standing ethos of opening the cotton industry up to students and started the original program, Pushing the Boundaries 10 years ago with Goondiwindi Training and Technology and Goondiwindi State High School.

"It was a time when the cotton industry had a bad name for using to many insecticides and using too much water," Nigel said.

"It was decided by the MVCGA that new teachers that come to Goondiwindi should spend time on a farm to gain better knowledge, taking away any negative perception of the cotton industry.

"However these last couple of years the program has changed to promote the local cotton industry as a career path. MVCGA realised that we had to change the teachers' perception that a career in the industry was limited to a farm hand or agronomist."

The program was conducted over a three day tour of a local farm, Goondiwindi businesses, then Narrabri or Brisbane, however the drought throughout the last decade meant the program had to be scaled back.

Good news is the funding from the CRDC Small Capacity Grants has allowed the program to be improved and extended again. This has involved a recently held "familiarisation" barbecue at David and Kim Coulton's property "Morella", Goondiwindi. This was followed by a day visiting local farmers David and Kim, Glen Smith and Anna Power, Shane and Annabelle Boardman and Peter and Irene Fletcher.

On farm the students were able to do a range of activities from starting irrigation syphons, bug checking and looking at a new pump site being installed. Local business houses including Namoi cotton gin, Proclass, Chesterfield, Goondiwindi Cotton and Hayes Spraying opened their doors so the students could gain a greater understanding of agriculture-related services the industry relies on and what opportunities are on offer with these types of businesses.

An out of region tour to examine other tertiary career options between Goondiwindi and the Brisbane port associated with the industry is planned for August.

"It's not just the cotton industry which will suffer due to future staff shortages, it will also be the communities who rely on agriculture," Nigel said.

"MVCGA believes spreading awareness is the key – from the range and type of jobs available in agriculture to other messages such as improvement in salaries and conditions. After all we are competing with a range of industries for good people, so we need to sell the positives.

"We are trying to get away the perception that agricultural jobs are poorly paid and work long hours, we have to take into consideration the extra packages workers on farm get.

"Pushing the Boundaries is also about educating teachers so they understand the needs of agriculture in their own communities and understand agriculture in general."

Interest in the Pushing the Boundaries is increasing in other areas as the model could be rolled out by any CGA.

For more information contact Macintyre Valley Cotton Growers Association – (07) 4671 1693

Goondiwindi State High School students (from left) Hollie Faulkner, Georgia Truman, Monica Collins, Meg Prior, Molly McCosker, Liam McNaughton, Dillon Grose, Damon Bulmer, Callum Hobday, and Jardie Dillon experienced life on a cotton farm as part of an initiative by the local CGA.

BECOME AN EMPLOYER OF CHOICE

THE NOTION OF EMPLOYER OF CHOICE IS NOT NEW TO THE COTTON INDUSTRY, SO HOW CAN YOU BECOME ONE?

At the 2008 Australian Cotton Conference the issue of labour shortage was high on the agenda of topics and that same year CRDC included Human Capacity as an investment area in its five-year strategic plan. Becoming an employer of choice (EOC) was flagged as a way to better attract and retain staff.

More recently, employer of choice was identified by the North West Advisory Group (NWAG) in recognition that businesses needed to improve employment practice if they were to prosper in an increasingly competitive job market. The group has now developed tools to help regional and rural employers to become "one of choice".

NWAG was formed as a result of the North West Regional Jobs Summit in Narrabri in July 2009, jointly hosted by AgriFood Skills Australia. "Fixing the regions from the regions" is its mantra. The major outcome of the NWAG group has been the success of the Make it Work brand and the programs contained in it in sourcing and retaining skilled labour in the regions it is operating.

"We needed individual tools for businesses and employees, free of charge, to retain good people in the bush," says NWAG Development Manager Russell Stewart.

There are two ingredients to the group's successful Employer of Choice initiative: awareness raising workshops and the Make It Work EOC survey system.

The workshops allow employers to develop a shared understanding that promotes positive human resource practices to improve a firm's performance, which in turn helps secure, develop and retain people. Achieving effective skills utilisation strategies is a key factor in realising latent potential that often lies dormant within an enterprise and improving employee engagement fosters greater productivity.

A key platform of the EOC program is to assist businesses develop attributes to become employers of choice so that they may:

- identify and deploy the skills that are already within their workforce
- provide leadership and develop a coaching style of management
- manage the workload by delegating, leaving more time to work on the business rather than in the business
- motivate employees and foster a culture of innovation
- communicate effectively with employees and positively influence people.

In addition to the workshops the Make It Work EOC survey tool was developed by AgriFood Skills Australia.

"The most significant challenge for businesses now and into the future will be in securing, developing and retaining their workforce," says Dr Mike Rafferty, Senior Research Analyst – Workplace Research Centre at Sydney University.

"Employer of Choice is not about self-proclamation and certificates on the wall. Your employees are the ones who know and can tell you. This is why the Make It Work survey was designed to help businesses become real employers of choice."

The survey engages employees, managers and business owners through a unique blend of questionnaire, technology and facilitation identifying issues across such areas as attraction and retention; support and mentoring; job design, workflow and procedures and skills and professional development

"Businesses that undertake the survey quickly find areas for improvement, set realistic and measurable goals that put them on the path to becoming employers of choice," Russell Stewart said.

"The aggregated responses provide a clear picture of how the business is tracking. This helps identify areas for improvement and allows goals to be set that are realistic and measurable.

"In Narrabri in particular there has there been an improvement in staff retention in participating businesses. Better workplaces are being created through the employee survey as complacency levels of employers are reduced in relation to the satisfaction, attitudes feelings and needs their employees."

The EOC survey won the Education and Research category at the Northern Inland Innovation Awards in 2010. The program is undergoing final refinements and will be made available to businesses everywhere.

To find out more about EOC workshops or the EOC survey, contact

Russell Stewart, Development Manager
North West Advisory Group
Phone (02) 6792 6192 Mobile 0457 922 878
Email: fourstewarts@bigpond.com
Niel Jacobsen, General Manager
Regional Strategies
AgriFood Skills Australia
Phone (02) 4325 0424 Mobile 0428 674 822
Email:
niel.jacobsen@agrifoodskills.net.au

email us

Narrabri businessman Greg Morris with valued employee Jack Bailey. Greg has implemented the philosophies of the Employer of Choice program and says it has changed his business for the better.

CREATING A POSITIVE WORKPLACE

Greg Morris has run his auto-electrics business in Narrabri for 30 years and has implemented the Employer of Choice initiative saying it is brilliant and no doubt helped his business.

Greg said it highlights the fact that people are a business's most valuable resource.

"I've been in business a long time and it is the most powerful thing I've seen in relation to creating a workplace people want to be in," he said.

"It is important how employees feel when they are at work. Being a part of this EOC initiative makes employees feel valued and part of the business, so binds into a positive mentality.

"As an employer you have to ask yourself 'how valuable is that person (employee) – and do they know it?'

"We are facing increasing competition for staff from many angles, and most farms and businesses like mine find it challenging to compete with increasing costs, so the way we attract and retain our people has to be through the quality of life we offer in the workplace.

"Employees need to know the employer appreciates them and the customers appreciate them."

Greg said the old adage 'measure to manage' was true of the EOC Survey, but just doing the survey isn't enough more importantly, employers need to act on the results.

"What you get out of it will depend of how much you put into implementing recommendations," he said.

"This program is receiving terrific reviews from many industries, including cotton and will definitely help a lot of people."

A LIFETIME OF LEARNING THROUGH RPL

MANY PEOPLE ASPIRE TO BECOMING AN 'EMPLOYER OF CHOICE' WITHIN THE COTTON INDUSTRY, BUT WHAT DOES THIS MEAN AND HOW CAN IT BE ACHIEVED THROUGH RPL?

Cotton Professional Development Manager Mark Hickman.

Cotton Professional Development Manager Mark Hickman says a significant start is to create a work environment that people want to work in.

"The time spent at work by staff is a significant proportion of their day, so this time needs to be rewarding to them financially and personally. The human element is central to any business's growth or productivity," Mark said.

"At the individual business level, there are many aspects that need to be considered to achieve this aspiration.

"At a pragmatic level, your management style, the opportunities you create for the employee to contribute to the business's direction and activities and your attitude / budget allocation towards that individuals development are all critical aspects."

Rewarding individuals

Mark says one element of a professional development program that should be implemented in your business that will reward individuals and help develop skills for the advancement of the business is recognition of prior learning (RPL).

"The utilisation and promotion of RPL opportunities within the workplace is imperative for an employer of choice," Mark said.

"Professional development is appreciated by employees – a feeling of being valued personally and or for skills and knowledge is important to all employees, and improving skills improves the business."

RPL is an assessment process used by the vocational education sector to determine how an individual's formal, non formal and informal learning, compare to the skilling standards contained within training standards (competency units).

These competency units are then packaged into national qualifications which are endorsed by industry. The information and required skill level outlined by each of the cotton competency units have been developed in partnership with the cotton industry, ensuring the skills developed reflect the requirements of the workplace. These RPL assessments are conducted by either a public or private registered training organisation (RTO) and normally occur in the workplace.

Recognising skills and knowledge

There are numerous advantages for undertaking an RPL assessment.

"For the individual, this process provides them with a nationally recognised qualification (for example Diploma of Agriculture) which acknowledges the skills and knowledge they have developed throughout their life," Mark said.

"This acknowledgement builds self-esteem, confidence and encourages future learning to be considered. For some people without any formal qualifications this recognition is a significant personal achievement.

"For others, the process helps refine their skill sets for increased efficiencies."

For those wishing to further their educational studies, the competency units or qualifications gained by an RPL could be used (subject to the institution's approval) as credit points for a university course, an apprenticeship or industry accreditation.

Building staff morale

From a business perspective, sponsoring staff to undertake an RPL program builds staff morale and effective relationships on the farm. These are all positive signals you want to provide as an employer of choice.

An RPL assessment provides a skills audit that can be used by the business to ensure future development programs are well targeted for budgetary purposes. In addition, a business will then understand the skill base within the team, so new opportunities can be capitalised to grow the business. A skills audit will ensure that the necessary skills for the workplace are in place, reducing the risk of accidents, mistakes or reduced productivity.

"Industry leadership has seen the benefits of RPL assessments, and increasingly more training courses and extension field days are being aligned to vocational units of competencies," Mark said.

"The Certified BMP Farm Manager Award (aka Diploma of Agriculture) is a good example. Developing and implementing a *my*BMP program within the business allows you to obtain an educational outcome as well as an industry endorsed accreditation."

"INDUSTRY LEADERSHIP HAS SEEN THE BENEFITS OF RPL ASSESSMENTS".

For more information on RPL assessments contact Mark Hickman, Professional Development Manager.
mark.hickman@daff.qld.gov.au

email us

GET YOUR DIPLOMA OF AG ON-LINE

Tocal College also has available on-line courses, enabling farmers and those wishing to enter the agricultural workforce at management level to study for a Diploma of Agriculture. Of particular interest to cotton growers is the Certified Cotton BMP Manager accreditation program based in the Diploma of Agriculture. This qualification aligns to BMP Certification of a cotton farm, with a focus on the management skills required for certification. Many farmers or their employees may already be eligible for the Diploma based on their current skills and knowledge, which means no study is required. Read more at www.dpi.nsw.gov.au/agriculture/profarm/online

see our website

INDEPENDENT CONSULTANT **WARWICK WATERS** HAS RECENTLY UNDERTAKEN A PROJECT FOR CRDC TO BETTER UNDERSTAND THE VALUE OF TRAINING ON-FARM STAFF AND HOW THESE SKILLS CAN BE BETTER UTILISED.

WHAT VALUE TRAINING?

What return do you expect from investing in off-farm training employees? It's pretty easy to put a cost on providing training for employees; the up-front dollars, travel and the time spent off farm, but putting a value on the benefits of training is more difficult.

This is partly due to quantifying the number of potential benefits such as increased farm productivity, employee income, less accidents, career progression and staff retention for example. It is also difficult because the benefit of an individual improving their performance can easily be lost in the complex system of cotton production.

A recent CRDC project has wrestled this issue. It looked at questions such as:

- What does the vocational training system look like for cotton employees and where are the opportunities to improve the value of the system?
- What measurable difference does the ability of an employee have on farm business productivity?
- How do we describe the level of ability of employees at each stage of the production system (planting, crop maintenance, harvesting, farm and machinery maintenance)?
- Can we put a value on shifting the capacity of an employee?

Mapping the vocational training system identified the importance of the connection between the farm employer and the training provider. Regardless of the quality of training, its value is significantly reduced if the employer has not been involved in identifying and prioritising the need for the training or if they do not allow the employee to apply and reinforce the training once back on the farm.

Warwick Waters says the value of staff development will not be realised simply by sending employees off to do more courses.

The second step was to explore the options for measuring the benefit of training to the employee, the farm business and the wider industry. Analysis of industry financial data identified that more profitable farms were paying more per labour unit but could farm more hectares per labour unit.

This also showed there is significant diversity in the labour productivity metrics such as area per employee (174ha to 290ha per employee), bales per employee (1260 to 2290) and cost of labour per bale ($23 to $36).

While the financial data suggests significant returns from improving the ability of employees, the project identified this value will not be realised simply by sending employees off to do more courses. The development of employees needs to be driven by both the employer and employee, and utilise a range of on-farm, industry extension and formal vocational education and training (VET).

The project is recommending the next phase of understanding the benefit of employee training should include on farm case studies that test the productivity metrics on individual farms and continue to develop industry standard descriptions of employee ability at each stage of the production cycle.

*my*BMP OFFERS GROWERS SUPPORT MODULE

Successfully managing staff and creating a positive working environment is achievable with the right tools and information. Australian cotton growers are first and foremost farmers, and for most, hiring, maintaining and teaching staff is also a necessary part of an operation.

The *my*BMP program has a dedicated Human Resource module and has been included in order to assist growers in harnessing one of the most valuable assets of a farm business – the people.

"Within this module is the guidance to help you firstly meet your legal obligations around employing staff, and secondly identify and put in place procedures to help you optimise employee productivity," *my*BMP Business Manager Jim Wark said.

"This module focuses on all aspects of employee relations, whether they are family members, employees or contractors. It offers practical ways to improve your ability to attract, retain and manage your team."

The information in the HR module can be used as a mentoring tool, giving suggestions, recommendations and ideas on how to manage staff all the way through to templates for writing job advertisements and descriptions or conducting interviews and reviews. All of the practices come with explanations and an extensive array of support resources to help make managing staff on farm as easy yet successful as possible.

"So if you need information from a copy of the national Pastoral Award 2010 through to a template for an employee induction course, it can be found at *my*BMP," Jim said

"Any business is only as good as its employees, so developing management skills which include being able to find and keeping the right people is really important."

The *my*BMP program is free to all Australian cotton industry people and can be used by growers whether intending to be officially *my*BMP certified or just access the information.

To access go to the *my*BMP website and register. www.mybmp.com.au

see our website

WORKFORCE RESEARCH BEGINS

A CRDC PROJECT IS BEING LAUNCHED TO HELP MEET THE FUTURE NEEDS OF THE COTTON INDUSTRY BY FINDING OUT MORE ABOUT THE COTTON SECTOR WORKFORCE AND HOW PEOPLE ARE ATTRACTED, RETAINED AND DEVELOPED.

The *Innovative Work: cotton workforce development for sustained competitive advantage* project is the brainchild of Associate Professor Ruth Nettle from the University of Melbourne and colleagues from the Workplace Research Centre at the University of Sydney who have worked for years with the dairy sector and other primary industries in this area.

Ruth says the aim of the research is to help the cotton sector better understand and address their workforce needs over time.

"Addressing workforce issues for a sector's ongoing productivity is not just about filling immediate gaps in supply and demand, it requires an understanding of local labour markets and how they are changing, changes in skill needs and job roles in cotton production, how people experience work – in particular any hindrances to people developing their careers and addressing obstacles for people in being attracted and trained in the sector," she said.

The dairy sector calls this "industry workforce planning and action" and although the cotton and dairy sectors have little in common from a production point of view, both sectors see the importance of thinking longer-term in how their sectors best address human capacity issues. CRDC are supporting this project for three years.

"We know if people are attracted and retained on individual farms, businesses and in communities, there is a direct dollar benefit for farms in terms of cost-savings and for the industry in increasing returns from the dollars spent on training," Ruth said.

"This project will help the industry to be in a better position to address their workforce needs over time.

"The first phase of three to six months will involve gathering data and information about the current system of workforce planning and action and what could be improved. We will be carrying out analysis and intend working in a couple of cotton production valleys to help groups plan and track action around priority issues.

"We will identify priority issues through the first phase plan through talking to a range of people both within and outside the cotton sector itself, who are affected by or influence the cotton workforce system. The project is very exciting and is just beginning."

The farm work force and the contracting workforce will be studied first.

"We are aware that the cotton sector is also concerned about the future service provider and post-farm gate workforce issues, so we will co-ordinate our project to explore some of these issues – alongside what the industry is already doing in these areas," Ruth said.

Dr Ruth Nettle is undertaking research to help the cotton sector better understand and address its workforce needs over time.

"By mid-year, an industry steering group will be established to ensure the research and development efforts in this project match with industry needs. We will also attend the Australian Cotton Conference later in the year to talk with as many growers as possible about their workforce needs.

"We will be conducting interviews, group discussions and surveys across the cotton sector and in cotton producing regions.

"By working with cotton farmers themselves, one aim of the project will be to feed their needs back to other groups that can support the sector in their workforce issues like government and training organisations and employment services. The research can also be used to influence future policy and funding decisions."

THE WAY TO GO

MELANIE JENSON

CAUGHT UP WITH YOUNG AGRONOMIST MEGAN HAMILTON TO FIND OUT HOW ATTAINING HER REWARDING JOB IN AGRICULTURE WAS MADE EASIER BY MAKING LINKS IN THE INDUSTRY WHILE STILL AT UNIVERSITY.

Megan grew up on a farming property north of Moree and after finishing school was accepted to study a Bachelor of Agricultural Science at The University of New England in Armidale. However she decided to take a year off first and was offered an administration job at B&W Rural Moree. While in this role, B&W proprietor Peter Birch asked Megan what she was looking to do in the future.

"I said 'agronomy', so he put me in the field," Megan said.

"B&W then supported me throughout uni by giving me work in the holidays. I was then lucky enough when I finished university that a position opened up and it was offered it to me."

Megan said the experience gained through having an association with an agriculture while still studying was crucial for any aspiring agronomist.

"I really recommend anyone studying agriculture or thinking about doing agronomy should do a season of bug checking," she said.

"Not only does it give you a foot in the door of the industry, it allows you to see what the job entails from the ground up.

"It really gives you a first-hand look at what agronomy is all about, it introduces you to other agronomists and people in the industry, creating great networks when looking for employment after university is very important."

Megan said she felt a gap existed between university and the work force which could also be filled through holiday work.

"Graduates often lack in-field experience going into a job after uni, because it can only prepare you so much. There are many variables in the workplace and a lot of responsibility rests on you to make the right decisions – you have to be sure of what you are doing.

"Working through university holidays helps fill that gap and prepares you better."

Employer of Choice?

"Fundamental to a workplace of choice for new agronomists is support," says Megan

"I was and still am encouraged to ask questions.

"Your bosses need to be supportive and the more experienced agronomists mentor younger ones and offer advice and support the better.

"Here at B&W there is a great support network with many long term staff. Four agronomists have been here more than 15 years and another five have been here for around seven years so it proves that it is a great place to work.

"Getting a good workplace is also fundamental to you being good at your job.

"Being surrounded by people who are passionate about what they do is inspiring and are great models to aspire to."

Industry of choice?

Megan said there are many attractive aspects to the field of agronomy and the cotton industry.

"If you're from a farm but not on a farm yourself, being an agronomist you're still in agriculture and get to see crops through from sowing to harvest.

"Cotton is a great industry because of the amount of networking that goes on, it's a friendly industry to get information in.

"Research, field days and new technology means agriculture is far from being a single man show, people are trying their absolute best to be at the top of their game.

"That means we also have to be at the top of ours, and working with the cotton industry provides great support through research to help us do that.

"Development of good technology means that very few farmers (in this area) are relying on what Grandad did."

NEED FOR

A PROPOSED COTTON INDUSTRY-WIDE SUCCESSION AND PROFESSIONAL DEVELOPMENT PROGRAM HAS BEEN IDENTIFIED AS A NECESSARY INNOVATION TO ADDRESS MARKET FAILURE IN THE FUTURE DEVELOPMENT OF THE COTTON AGRIBUSINESS SECTOR WORKFORCE.

This was a major finding in a report commissioned by CRDC. The report inquired into employer and industry needs in the agribusiness sector.

"We found that looking five years out to 2016, an extra 65 agronomists alone will be needed, and in total at least 110 professional people will be sought across the industry," said Gordon Stone, Director of the Corporate Development Institute who undertook the study.

"This figure is actually likely to be higher as it did not take into account those retiring or departing the industry, the need for senior/strategic professional management staff, farm managers, business advisors, IT and electronics staff or company directors.

"It is important that the industry moves swiftly as it is clearly on a very tight timeline to address these outstanding issues.

"Until people do the maths they simply don't realise that it takes at least six years for a student to go through uni and hit the ground running and eight years if you aim to change their focus at school from non-cotton to a cotton career."

Gordon said immediate closer engagement with universities, and two industry support programs run by PICSE and RIRDC was regarded as the most critical issues.

Gordon Stone says there are ways to approach attracting and retaining people in the industry, and work must start now.

STUDENTS NOW

"The good news though is that there is strong industry support and buy-in as a result of this project," he said.

"The proposed Action Plan developed in this study provides a way of checking in on the level of real buy-in early in the process, to ensure the agribusiness sector commitment remains high and they take a real stake in the successful outcome of the proposed program."

Respondents in the study included cotton processors, larger family farming operations, merchandise and equipment suppliers, consultant and advisory services, and specialist cotton industry suppliers.

"As the industry diversity makes developing a cohesive professional development and succession strategy a potentially relatively complex task, access to good demographic data would support a more comprehensive understanding of the extent of cotton agribusiness sector," Gordon said.

A key recommendation of the report was that the cotton industry moves swiftly during 2012 to create strong relationships and partnerships with suitable universities to secure the 100-plus undergraduates needed in the next five years.

However some agribusinesses expressed concern about the capacity of current universities to supply the present staffing needs.

"While data on graduates accessible by the cotton industry is difficult to access, the potential for those courses to supply the over 100 personnel likely to be required to 2016 is highly unlikely and further work on this issue is required," Gordon said.

"There is added urgency because degree courses required by the cotton industry are three or four years, meaning action is required this year to start securing Year 11 and 12 students to enter those degree courses in 2013 or 2014 at the latest.

"Added to the complexity is the likely increase in competition from banks, mining companies, and other employers and industries for graduates."

Gordon said the overarching key finding was the need for a more industry based strategic approach to professional development (and industry succession), as "there appears to be a strong cultural interest and desire to support cotton agribusiness professional development". However, he said, this must recognise the disparate needs of the sub-sectors of the cotton agribusiness sector.

Agribusiness keen to support

The study showed there was strong support for the development of, and investment in, a targeted and relevant industry wide program that would focus on succession and professional development in the cotton agribusiness sector. Close to half the respondents were prepared to pay directly to access the services of such a program, providing it was practical and relevant and half were prepared to supply specific in-kind support.

The respondents proposed that such a program would focus on the following issues, including (in order of priority):

- Creating a supply chain of young people into the industry;
- Changing their perceptions of the industry;
- Understanding the industry implications of an ageing current workforce;
- Establishing a mentoring program for key personnel;
- A coordination / sourcing role for training opportunities; workplace placements and creating a source of HR and training resources.

"Developing and strengthening relationships with aligned universities is clearly a significant priority," Gordon said.

More information
Bruce Pyke
bruce.pyke@crdc.com.au
02 6792 4088

email us

COTTON-SPECIFIC AT UNIVERSITY

STUDENT NUMBERS ARE ON THE RISE FOR THIS TERTIARY DEGREE IN COTTON PRODUCTION.

The University of New England (UNE) Cotton Production course has been running since 1994 and despite drought which resulted in falling numbers, things are now looking up for future training in cotton production.

Course co-ordinator and lecturer Brendan Griffiths has been a field cotton agronomist and consultant for 21 years and is very optimistic about the future of the training program.

"We have been in drought for 10 years until last year, and throughout that period student numbers steadily decreased," Brendan explains.

"But since it has rained, the numbers have been increasing and we have around 50 students this semester.

"The two-year course is a production-based applied agronomy course with four subjects delivering content specific to cotton production, the environment, and the farming systems relevant to the cotton industry . We have a mix of under graduates and post grads in the four subjects.

"The current semester runs until mid-June and the next semester will be from late June until mid-October.

"Since its inception it has been the only cotton industry specific, academic based course available.

"We are trying to offer a scientific based course, delivered in an applied manner to equip students with the knowledge and skills to hit the ground running, or generally broaden their knowledge of the cotton industry, and cotton production."

While a large percentage of the students are applied agronomists looking to widen their knowledge-base relating to cotton production, the course is also attracting students from a range of other industry sectors including farm management and agribusiness.

Students come from a wide range of cotton growing regions, principally in NSW and Queensland. The Cotton CRC has funded the course since its inception, and after June of this year CRDC will continue to fund the program.

Brendan Griffiths UNE
bgriffi2@une.edu.au

email us

UNE Cotton Production Course Co-ordinator Brendan Griffiths.

"STUDENT NUMBERS HAVE BEEN INCREASING".

EASY MOVE INTO AGRICULTURE

DEVELOPING SKILLS IN AGRICULTURAL PRODUCTION WHILE AT SCHOOL IS HELPING STUDENTS MOVE INTO FARMING WITH EASE AND PROVIDING PEOPLE AT A LOCAL LEVEL.


All seven Goondiwindi State High School students who participated in the Gateway Schools to Agribusiness Program were later employed locally.

Seven Goondiwindi High School students who received training and skills in agricultural production have now all moved into agricultural employment in the local area. The students were trained and mentored through the Agribusiness Gateway Schools Program which moves to entice school students to recognise the importance of primary industries and the role they play in what they eat and wear, with the ultimately aim of attracting them into industry positions.

The program has forged links between farmers, agribusiness and schools to create better access to career opportunities through strong industry-school partnerships, explains Mark Hickman, Professional Development Manager (Cotton) Department of Agriculture, Fisheries and Forestry Queensland.

"The program allows students to undertake work placements as well a variety of options such as school-based apprenticeships and traineeships with local employers," he said.

"Students can experience an industry first hand and decide if it is the path they would like to follow. If they choose to pursue that path, Gateway Schools gives them a foot in the door to employment in agriculture."

Gateway is a state-wide initiative between the Cotton CRC, Skills Queensland and the DAFF Qld. State-wide co-ordinator Geoff Johnston said there are now eight Gateway Schools to Agribusiness in the southern Queensland region.

"The Gateway School model is not solely focused at the agricultural classes, rather the philosophy is to contextualise the learning of all subjects using agribusiness examples and not simply a production focus," he said.

"This whole-of-school approach enhances the connections between agribusiness and industry that supports the local communities."

A prime example of how the program is opening up opportunities is at Goondiwindi State High School.

"The school has enjoyed a long term relationship with local agricultural industries, however as part of the Gateway initiative, in 2010, training provider AgTraining delivered commercial scale machinery training to seven students, all of whom were later employed locally," Geoff said.

"In Pittsworth, a further eight students were trained and all achieved employment – this really shows that the programs works."

Mark Hickman said a number of new initiatives are now underway to enhance and broaden the program.

"Queensland DAFF's Gateway Schools' co-ordinator will work with local schools to develop a series of national curriculum accredited examples of how cotton research and development could be taught in the local schools as a pilot," Mark said.

"Once the pilot is completed it will be extended across NSW and QLD."

*A number of farming associations, careers organisations and rural industries including Cotton Australia, plus Queensland universities and government departments are linked to the project.

see our website

www.gatewayschools.qld.gov.au/agribusiness/

PIEF TAKES COTTON INDUSTRY TO SCHOOLS

Primary school students today are the workforce of tomorrow so a better understanding of the cotton industry naturally breaks down barriers to its attractiveness to them for a career.

Primary Industries Educational Foundation (PIEF) CEO Ben Stockwin says the foundation has been working hard to educate young people about primary industry.

"There are a lot of misconceptions out there and my role is to convince young people that, in this case, cotton is a worthwhile industry to go into by promoting the benefits of cotton as a natural, sustainable fibre," he said.

PIEF involves the Australian Government, primary industry organisations and the education sector. It was formed two years ago to provide credible, relevant and factual information on all matters relating to agriculture, fisheries and forestry to Australia's teachers, students and the community. The cotton industry became involved in 2011/12.

Based on the recently released PIEF report of a survey by the Australian Council for Education Research of 1000 students from years six to 10 and teachers all over Australia, Ben says there is a lot of work to be done.

"The survey showed that 75 percent of students think cotton socks were an animal product and 45 per cent could not identify that everyday lunchbox items such as a banana, bread and cheese originated from farms," he said.

"Perhaps more worryingly still, less than half of the students saw primary industries as a research sector and 40 percent of Year 10 students feared it damaged their environment.

"What shows us is that student and teacher knowledge is at an all-time low, perceptions of the industry are dated and stereotypical and at present it is not seen as an innovation, research-driven, sustainable industry."

In a positive, 100 percent of primary and 91 percent of secondary school teachers surveyed felt it was very important that they teach students about food and fibre production.

"Teachers overwhelmingly felt it was necessary, what is required is a new way of engaging teachers, as the old way clearly isn't working," Ben said.

Also encouraging is PIEF's liaison with the cotton industry to increase public confidence in Australia's primary producers as it is beginning to have a positive influence on student and teacher perceptions.

"Schools have been fantastic, acknowledging the importance of PIEF, recognising that it is a wonderful resource for teaching and learning programs," Ben said.

"Children love it and find it fascinating. Every student who eats, wears clothes and lives in a house has an everyday connection with primary industries."

PIEF have launched www.primezone.edu.au, a one-stop web portal of primary industries resources for schools and the community. The site is expanding and will be searchable by the Australian Curriculum once it is finalised.

Primary Industries Educational Foundation
www.primezone.edu.au
www.primaryindustrieseducation.com.au
Australian Council for Educational Research
www.acer.edu.au

see our website

PICSE OFFERS COTTON INDUSTRY TASTER FOR STUDENTS

Young people, especially in years 10 to 12 are getting a chance to 'taste' what it is like to work in the cotton industry through the Primary Industry Centre For Science Education's (PICSE) program.

By engaging students in school years and early university, PICSE 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.

"PICSE acts as a supply chain that provides the next generation of researchers and industry scientists," said Associate Professor David Russell of the University of Tasmania, and National Director of PICSE.

"The primary industries targeted by PICSE focus on the sciences of agriculture, aquaculture, ecology, horticulture, fisheries, water security, sustainability, climate change and the environment.

"Students are exposed to cutting edge scientific research and exciting opportunities for science graduates in their region, with examples of the application of science in local primary industries.

"PICSE also has a teacher professional development program, student scholarships, science induction camps for selected Year 11-12 students and a five-day student industry placement for scholarship students with a team of scientists in specific local industries or research organisations."

PICSE Science Education Officer Trudy Staines is based at Australian Cotton Research Institute (ACRI) praised the effectiveness of the program, citing the example of Alana Johnson, a 17-year-old from Calrossy Anglican School in Tamworth who was drawn further into the industry through the program.

In Year 10, Alana decided she wanted to be an agronomist and spent two weeks with work experience in Gunnedah. Shortly after, her school sent selected students to the Australian Cotton Conference through the support of CRDC. Alana met Andy and Georgie Carrigan from Boggabri who invited her for holiday work during picking.

Alana Johnson in the cotton fields during her PICSE Industry Placement.

In 2011 Alana was selected for the PICSE Industry Placement Scholarship through UNE and worked in the laboratory and field covering with CSIRO Plant Scientist Michael Bange.

Alana was very impressed with her PICSE experience which she said gave her an insight into the cotton industry, and she made many contacts in an industry she could see herself involved with in the future, Trudy says.

WINCOTT BUILDS CAPACITY

WINCOTT CHAIR ANNE COOTE SHARES THE GROUP'S PHILOSOPHY ON WHAT 'PEOPLE' MEAN TO THE INDUSTRY.

WinCott was initially formed by a passionate group of women in 2000 to share their experiences, assist others to develop their skills and increase knowledge in an industry they share, to initiate change to be better able to support their families, business and grow their own confidence. In 2012 we now call this 'human capacity building', WinCott chair Anne Coote says.

What is human capacity building?

Anne says on an individual level it is to build and enhance existing knowledge and skills, at the same time engaging individuals in the process of learning and adapting to change.

"WinCott encourage the extension of these skills to our communities and industry to develop an interactive resource in our community which is responsive and accountable," she said.

"As the cotton industry has changed over the past 10 years, so too has WinCott's vision to support the extensive network of its current 350 members and be able to deliver effective and relevant resources.

"The key fundamental of WinCott's philosophy is to ensure that the support provided continues to focus on human capacity building, empowerment, knowledge and leadership skills which allows individuals to become more involved in industry issues, business opportunities or just simply to build confidence."

John Watson, Alison Benn, Julianne Rogan, Heike and Andrew Watson, Georgie Carrigan, Anne Coote (at back) Mat Barton and Peter Gainsford at Mat Barton's (the Carbon Cocky) Wellington NSW property where he is recycling tractor emissions into cultivated soil to boost carbon and nitrogen levels.

WinCott has a particular interest in building future capacity by involving secondary students in the industry, through farm visits and work experience and attendance to industry events such as the Australian Cotton Conference.

Just a few of many examples include publication of the WinCott Starter Kit with information for people new to the industry, Natural Resources Survey and 'Voices in Agriculture' workshops to improve leadership skills. Last year WinCott led an eager group of travellers over and along the country's most productive river systems to explore how climate change is being mitigated in other areas.

www.wincott.net.au
Anne Coote 0427 526510

see our website

HORIZON SCHOLARSHIP

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

This includes a $5000 bursary per year of their 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.

CRDC is currently supporting Rebecca Dunsmuir and Naomi Marks. Rebecca is studying for a Bachelor of Agricultural Science and Business at La Trobe University and Naomi a Bachelor of Agribusiness at University of New England.

Two new students have been recently sponsored. Kirsty McCormack has begun a Bachelor of Rural Science at the University of New England and is a graduate of the PICSE program. Billy Browning is determined to contribute to increasing the sustainability of the agricultural sector and is interested in a career in agricultural finance, commodity marketing and farming. He is studying a Bachelor of Agricultural Economics at the University of Sydney.

CRDC sees investment in this scholarship as a way to expose students to the world that is the cotton industry, of course in the hope they will later join us, but the opportunities for them in the industry are many, according to CRDC Human Capacity Program Manager Bruce Pyke.

"We need to support these students so we can sustain our world-class research against the backdrop of an increasingly competitive labour market," he said

SMALL GRANT PROGRAM YIELDING RESULTS

COTTON GROWER ASSOCIATIONS ARE MAKING THE MOST OF A NEW GRANT SYSTEM BY INVESTING IN INITIATIVES TO SECURE A BRIGHT INDUSTRY FUTURE.

Network Development Officer Kirilly Blomfield has been employed by Upper Namoi CGA to help utilise the experience of leading Upper Namoi growers to educate the increasing number of growers in the valley. She is pictured with Sally Hunter from FundBase who is helping CGAs navigate the world of grants and funding.

CRDC's Small Capacity Building Grant Program is designed to stimulate grower-led projects to build the capacity of industry players and improve the communities in which they operate. A key objective is to empower Cotton Grower Associations (CGAs) to be able to address issues themselves through effective project planning and partnership building.

There have already been a broad scale of projects implemented, from the Menindee and Lower Darling CGA's feasibility study into utilising a biomass burner at Tandou Gin, to Macquarie CGA's 'Welcome Back' project in response to a resurgence and increase in new growers and a lack of engagement in the industry.

Helping CGAs make the most of the grant scheme is Sally Hunter of FundBase, who under a separate CRDC project is charged with providing some skills around the grant seeking process.

This assistance has achieved impressive results and been received well by the CGAs.

"Initial steps involved workshops throughout cotton regions to impart key project planning and funding principles and to inform participants about projects in other regions," Sally said.

There are some major trends and issues emerging as to what CGAs deem important areas in which they should invest.

"The issue of recruiting and retaining staff is critical, especially in rural and remote areas that struggle to attract the right level of employees," Sally said.

One approach has been to assess the feasibility of an employment website to not only attract new employees but to give existing industry workers options for a career path or change of employers.

There are a number of initiatives in the industry focussing on school students, including Macintrye CGA's "Pushing the Boundaries" project. This focuses on high school teachers as well as the students, teaching them about the cotton industry and demonstrating to them the range of exciting and rewarding careers all along the supply chain (see Page 11).

In the Upper Namoi a unique partnership has been formed between the CGA and AgVance Farming Systems with the help of the CRDC support. Upper Namoi CGA has employed a Network Development Officer in Kirilly Blomfield.

"This initiative will not only facilitate the flow of information from research to create on-farm change in practices, but to utilise the experience of leading Upper Namoi growers to educate the growing number of new growers in the lower end of the valley," Sally said.

"This information exchange is further enhanced by the cropping experience of the growers in the lower end to informally educate cotton growers about wheat and other crops as rotation alternatives."

Many other CGAs have seen a rapid increase in the number of new or returning growers and are addressing this through educative and entertaining events to try and engage these growers. Sally has now run workshops in most growing regions of NSW and will continue into the Lachlan Valley and Queensland.

The CRDC small grants program continue in the 2012/2013 financial year and CGAs are invited to consider what industry or community issues they would like to address. Grants are a maximum of $10,000 and CGAs are encouraged to develop partnerships in their communities and/or consider projects with a broader industry impact.

To make a grant application to CRDC contact Sally Hunter – 0459 944 778. sally@fundbase.com.au

email us

WORTHWHILE TOUR OPENS EYES

OVER TWO AFTERNOONS, 100 NON-COTTON INDUSTRY PEOPLE BOARDED BUSES FOR AN "EVENING WITH COTTON" FARM AND GIN TOUR THANKS TO GWYDIR VALLEY COTTON GROWERS ASSOCIATION.

The groups were made up of locals and tourists, young and old, all with an interest in 'having a look around' and learning more about the cotton industry. Held during the recent school holidays, both tours were booked out in advance and many people were turned away.

Gwydir Valley Cotton Growers Association (GVCGA) Secretary Zara Lowien said most pleasing was every person said they learned something and most were amazed at what the industry had achieved and contributed economically to the region and the economy in general.

"This great feedback means we fulfilled the aim of the initiative, which was to broaden people's views and educate," Zara said.

The tour involves a farm visit to see cotton picking, with talks from the farm owner and picker driver.

Participants can walk through the fields and touch the cotton, something many people never have the opportunity to do. At the gin participants go inside the control room to see the workings.

The CGA's tours started six years ago with one tour per year. This year, GVCGA capitalised on feedback from Tourism Moree, who had received many enquiries from travellers who were 'looking for things to do and see locally. The Small Capacity Building Grants offered to CGAs by CRDC made the second bus tour a reality.

"The tours were initially started to give local people who were unfamiliar with the industry a first-hand look at what growing cotton does and does not involve," Zara said.

"The CGA thought that by educating the local community as to the myths and truths about the industry and give them an appreciation of the work that goes into growing this crop.

"This has now grown to talking about the industry nationally and adding more topics to the tour. This year an environmental aspect was added, with linkages to a local business initiative that is recycling the plastic wrap on round bales (modules). Technological, research and development advancements over the last five to 10 years are also outlined.

Each participant was given the Cotton Australia "How to grow a pair of jeans" pack, which were very popular, showing the route cotton takes from paddock to a final product.

"We talked about cotton in the context of a pair of jeans throughout the whole tour, and people respond well to that, we hope they spread the message," Zara said.

Zara said the groups were made of approximately 25-30 percent locals and the rest were visitors to the valley and the groups were 80/20 adults and children.

"We were surprised at the large number of tourists," she said, "it was really encouraging though, because we know our positive messages will be taken and spread far and wide that way.

"Now this funding is available to CGAs, it would be really helpful to get together representatives from other CGAs who have also undertaken projects, to hear how they have used their grants, ideas and what has been working for them.

"For a long time GVCGA has been operating on our own, working 'in isolation' and I think the opportunity is now to work with other CGAs and industry bodies to utilise the resources already available to improve our initiatives."

Zara Lowien 02 67521399/0427 521399
gwydircotton@gwydircotton.com.au
Follow them on Twitter: @gwydirvalley

email us

Locals and tourists alike jumped at the chance to be part of an educational tour of a cotton farm and gin in the Gwydir Valley. The group is pictured at Peter Glennie's "Norwood" learning about cotton picking and the new round bale picker from the driver.

APPLY NOW

CRDC's General Manager R&D Investment Bruce Pyke said CRDC had decided to go ahead with the Cotton Grower Association (CGA) Small Capacity Grant initiative in recognition of the role CGAs can play in research and development in the industry.

"For years many CGAs have been undertaking projects to develop partnerships in their communities or address industry needs, often specific to their respective region," he said.

"CRDC sees these grants as a way to help those associations continue or expand their great work and build capacity. It also opens up possibilities for others to start new projects and initiatives or address new issues as they arise, such as an influx of new growers in Southern NSW and how best to get industry and agronomic information out to them.

The grant criteria are deliberately broad to encourage a range of projects from CGA's across the regions and we have been very pleased with number and quality of projects underway.

"From education to innovation, there has been a broad scope of work covered in the variety of projects benefitting from this grant. Also with Sally Hunter's help, CRDC is keen to see these small grants work to complement other CGA initiatives or grants from other bodies.

"We look forward to seeing how the CGAs' projects unfold and to receiving many more great ideas in 2012-13."

Starting from July 1, CRDC is prepared to consider applications at any time in 2012-13. Bruce encourages CGAs with any queries about what is involved, how to apply or project ideas, to contact him or Sally Hunter directly.

"CGAs are encouraged to develop partnerships in their communities and projects which will also have broader industry impact," Bruce said.

Bruce Pyke
02 6792 4088
bruce.pyke@crdc.com.au
sally@fundbase.com.au

email us

DEMAND FOR AG CAP GROWS

AG CAP IS BEING UNIVERSALLY RECOGNISED AS AN INNOVATIVE PROGRAM AND AN OPPORTUNITY FOR A HEAD-START IN DIVERSE AGRICULTURAL CAREER PATHS.

An exciting new initiative being rolled out in the North West and New England of NSW to stem the labour and brain-drain from rural and regional Australia is gaining interest from across the country as students, schools, employers and industry line up to get on board.

The AgriFood Career Access Pathway (AG CAP) program was launched at Farrer Memorial Agricultural High School in April. AG CAP is a holistic preparation for primary industry careers, from school based trainee vocational education and training (VET) to technical and tertiary qualifications.

The North-West's 'Make it Work' group, AgriFood Skills Australia and the NSW Department of Education & Communities developed the program, linking with The University of New England, local schools, VET bodies, CRDC and employers in the region's primary industries' sector. Participants start as early as Years 9 and 10, working their way through to agricultural college, TAFE or university.

The inaugural 21 AG CAP students are from Walcha, Bingara, Narrabri, Wee Waa and Farrer (Tamworth). The demand for the program has already followed, with an estimated 100 students indicating interest or waiting to enrol next year. Interest from employers wanting to be a part of AG CAP has already exceeded demand but will change when more students come on board.

Russell Stewart of Agrifood Skills Australia said a lack of opportunities for young people in the regions was initially identified by the Make it Work group, and the response had been overwhelmingly positive.

"A group of employers got together and said 'what is it we require of young people?' They came up with a group of skill sets. We spoke to young people and asked what kind of future they want," he said.

The region-wide pilot program is expected to be rolled out nationally.

"This is an Australian first and we know from the support we have that it will be at least NSW-wide next year. It will be rolled out nationally from there – QLD and WA are already on the doorstep," he said.

UNITED FRONT ON EDUCATION

COTTON AUSTRALIA HAS A NEW FOCUS ON COTTON EDUCATION AND HUMAN CAPACITY.

Cotton Australia (CA) has this year ramped up efforts in community education and human capacity, following industry concerns that highlighted the need to attract and retain a cotton workforce.

"The bigger picture is about developing a whole of industry human capacity framework and plan to address the industry's needs in the medium to long term," CA CEO Adam Kay said.

"This will have broad industry input and be based on data generated by a number of current CRDC research projects.

"In the shorter term, both CRDC and CA plan to continue funding some existing industry initiatives as well as co-funding a number of new projects in the areas of school education, curriculum development, career path development and industry leadership."

In the area of school education, CA and CRDC have committed to a number of initiatives including support for the Primary Industry Education Foundation (PIEF). PIEF will be reviewing CA's education resources, working to ensure cotton information is included in the national curriculum and making cotton resources available to educators and students through a web-based platform.

CA has also started to rebuild its education resources with the reinvigorated "How to Grow a Pair of Jeans" fold-out brochure which illustrates how a pair of jeans are made, from seed to finished product and includes samples (eg seed) from some of the production stages. A complementary resource *Pocket Guide to Cotton* is also now available, containing all the basics about the Australian cotton industry, from where it's grown, issues of water and biotechnology and an A-Z of Cotton-Related Careers.

CA plans to build an up-to-date and practical suite of education resources this year that will be available through a new "Cotton Classroom" section on a revamped CA website, as well as to the regional cotton network that is already active in cotton education.

The Art4Agriculture Program is a popular, school based competition open to primary and secondary schools. CA this year is a major sponsor, with at least nine entrants using cotton as a focus for their activities during the year. These schools in NSW and Queensland will be armed with a range of cotton resources and information and will undertake a major project examining the industry and then developing student resources to tell the cotton story.

"In 2012, CA will again team up with CRDC to boost investment in the Nuffield scholarships, Australian Rural Leadership Program, Trail Blazer Scholarships and Future Cotton Leaders Program," Adam said.

"The need to attract and retain a skilled workforce is an issue that growers have consistently reported to CA through its General Meeting process. While a small start, CA is excited about the prospect of working closely with CRDC to further strengthen our work in this area, and to promote the positive story about the industry to the younger generation."

Adam Kay adamk@cotton.org.au

email us

A NEW FACE IN EDUCATION

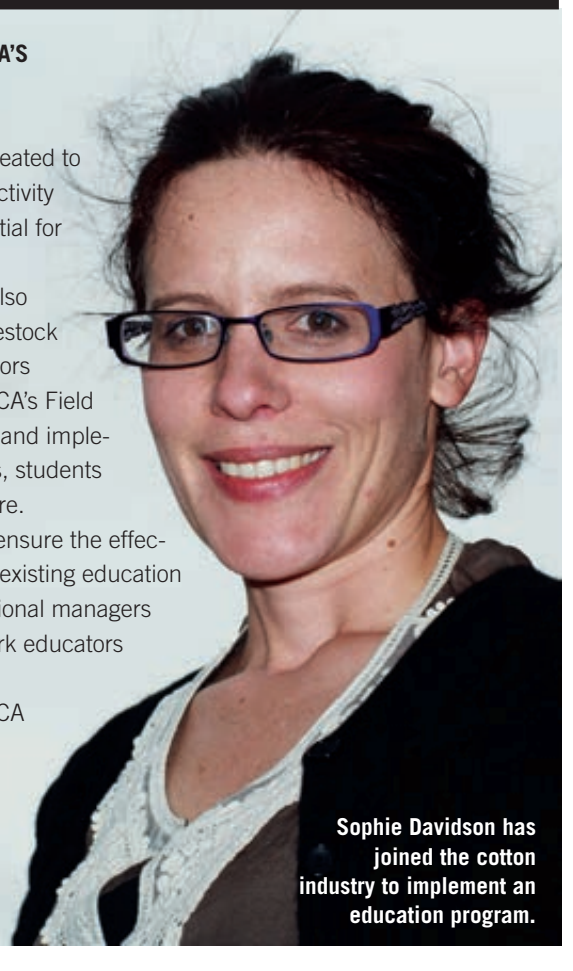
SOPHIE DAVIDSON BEGAN AS COTTON AUSTRALIA'S EDUCATION COORDINATOR IN LATE MAY.

The education coordinator position has been created to service the needs of an increased program of activity around education about the industry and potential for further reach and impact.

Sophie was a primary school teacher and has also worked as a communications officer for the Livestock Health and Pest Authorities and Moody's Investors Service. She is looking forward to working with CA's Field Officers and stakeholders to formalise, develop and implement an education program to engage teachers, students and learning institutions in cotton and agriculture.

CA CEO Adam Kay said this extra capacity will ensure the effective management and delivery of CA's new and existing education initiatives and resources, support work with regional managers on their regional education activities and network educators and key people in the cotton industry.

"The co-ordinator with revitalise and distribute CA resources, audit CA activity and endeavour to resource it while looking to link to other cotton resources," he said.



Sophie Davidson has joined the cotton industry to implement an education program.

Dr Grant Herron and Kate Marshall are investigating aphids' resistance to neonicotinoids at Elizabeth Macarthur Agricultural Institute.

EYE ON APHID RESISTANCE

PROTECTING THE INDUSTRY FROM A CONTINUING PROBLEM OF NEONICOTINOID RESISTANCE AMONG APHID POPULATIONS IS A PRIORITY FOR THIS RESEARCHER.

Two pot trials simulating field conditions and testing responses of two individual classes of insecticide against cotton aphid (*Aphis gossypii*) have recently been completed at the Elizabeth Macarthur Agricultural Institute (EMAI) near Camden by PhD student Kate Marshall.

Neonicotinoids are one of the most widely use groups of insecticides and resistance in aphids across the NSW cotton industry increased from five per cent in 2007-08 to 96 per cent in 2010-11. Kate's research aims to help restore neonicotinoid efficacy.

In one pot trial, Kate tested the residual efficacy of Cruiser 350FS and Cruiser Extreme against susceptible and resistant cotton aphid.

"Cruiser Extreme was more effective than Cruiser 350FS against a resistant population but resistant aphids are not always controlled," Kate said.

"Knowing that resistance exists is important, but we need to know the relationship between resistance and product efficacy and whether current insecticide treatments knock out resistant aphids or cease to be effective.

"Of particular concern and perhaps the most important finding of this first study was the low level of control each insecticide seed treatment provided against resistant aphids.

"From week two, resistant aphids were found on both seed treatments, and each week thereafter."

Leader of the research at EMAI, Dr Grant Herron, says restoring neonicotinoid efficacy against aphids should be seen as an industry priority, as part of an integrated program to better manage sucking insect pests in Australian cotton.

Grant and his team established that high level neonicotinoid resistance in Australian cotton posed an emerging threat to the industry.

"Resistance across the NSW industry increased from five per cent in 2007-08 to 96 per cent in 2010-11," Grant said.

World-wide neonicotinoids are one of the most widely used groups of insecticides, due to their high degree of effectiveness and low toxicity to non-target organisms. This group includes Cruiser as the mainstay cotton seed treatment and the cost effective foliar spray is Shield Systemic Insecticide.

Kate is about to start a second pot trial to investigate the effectiveness of Thimet as a pre-germination treatment against a Pirimor and Rogor resistant cotton aphid.

Rogor and Thimet are similar organophosphate insecticides belonging to a subgroup known as the phosphorodithiolates. As their chemical structure is alike cross resistance between the two is possible and Thimet may not control Pirimor resistant strains. However, if the trial shows this not to be the case then Thimet may potentially be used as an alternative to neonicotinoid seed treatments.

Kate has always had an interest in the field of entomology and during her final year at University of Sydney, completing a Bachelor of Animal and Veterinary Bioscience opted to do her honours project at EMAI. This project investigated pyrethroid resistance in the cotton aphid (*Aphis gossypii*) and was completed in the Insecticide Resistance Group, run by Grant Herron.

"I loved the work I did during that year and so was very happy to take on a role as Technical Officer within the same group once I had graduated. I was than very fortunate when a PhD opened up to study neonicotinoid resistance, also in the cotton aphid."

Kate Marshall
Elizabeth Macarthur Agricultural Institute 02 4640 6389
kate.marshall@dpi.nsw.gov.au

email us

PROFILE – ENTOMOLOGIST KATE MARSHALL

From a young age Kate was interested in the field of entomology and during university developed a particular focus for integrated pest management and its application in agriculture. After completing her university honours project investigating pyrethroid resistance in the cotton aphid at Elizabeth Macarthur Agricultural Institute Kate gained further experience working as a technical officer assisting with sustainable resistance management of mites, aphids and mirids. Kate has begun a PhD focused on the characterisation of neonicotinoid resistance in the cotton aphid.

What's the PhD about?

"Neonicotinoid insecticides have offered a valuable option to control secondary pests, however the growing reliance on this class due to its high specificity and low toxicity to beneficial insect species has led to resistance outbreaks and control failures. The sustainable management of aphids in Australia is therefore at risk and through this PhD I hope to be able to contribute to restoring neonicotinoid efficacy. I aim to identify the causing mechanism of resistance. This knowledge will allow us to investigate any cross resistance implications and provide the first step in development of a molecular based test for neonicotinoid resistance monitoring."

What are the most interesting science challenges?

"Molecular genetic techniques used to investigate resistance are extremely valuable; they are rapid and can be used to detect several different mechanisms of insecticide resistance in one sample test. However translation of this knowledge to the field is often delayed, meaning growers can still be using insecticides which are no longer providing effective control. I think bridging the time lag so knowledge can be used promptly is one of the most interesting challenges."

Your future with cotton?

"I am very eager to further my experiences within the industry and I hope during this PhD I will develop the skills and knowledge necessary to support sustainability of cotton production in Australia."

MAINTAINING SUPPORT FOR RESEARCHERS

KATIE BROUGHTON AND DR REBECCA HALING ARE LOOKING FORWARD TO WORKING WITH THE COTTON INDUSTRY INTO THE FUTURE.

IMAGE COURTESY STEVE KEOUGH PHOTOGRAPHY

Katie Broughton, CRDC's Bruce Finney, Executive Director and Rebecca Haling at the presentation of their Science and Innovation awards recently.

The Department of Agriculture, Fisheries and Forestry's Science and Innovation Award provides young people with grants of up to $22,000 each to undertake a project exploring an emerging scientific issue or innovation. The awards are open to those working or studying in rural industries aged between 18 and 35. This year co-ordinated by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), each award category is supported by leading industry organisations such as CRDC.

Exploring how cotton may be affected by projected changes in climate is the focus of Katie Broughton's research, while Rebecca Haling is aiming to improve yields of crops grown on sodic soils.

Katie is a PhD student studying cotton physiology through the University of Sydney (USyd) and is based at the Australian Cotton Research Institute (ACRI) near Narrabri. The science award project will improve the industry's knowledge on how cotton responds to water deficits, rising temperatures and rising CO2 levels.

Delivering new technology

"I will travel to America to work with leading plant physiologists and learn to operate Whole Plant Chambers currently under development there and then bring this technology back to Australia to work with scientists at CSIRO, University of Western Sydney and -USyd to investigate integrated climatic change impacts on Australian cotton varieties in local agricultural systems," Katie said.

"This aspect of my PhD project would not be possible without support from the CRDC."

Katie grew up on a mixed farming property at Young in south-west NSW and was always interested in biological sciences which led to a Bachelor of Agricultural Science, majoring in Agronomy at USyd. During this time Katie formed an association with the cotton scientific community through the opportunity of a summer scholarship working with CSIRO's Dr Mary Whitehouse at ACRI, looking at the behaviour of mirids in response to their predators. For her fourth year honours project, she worked with NSW DPI's Dr Nilantha Hulugalle also at ACRI studying root growth and turnover and microbial biomass in Bt and non-Bt cotton.

"While at Narrabri for these projects I witnessed the collaboration between the cotton industry and research organisations," Katie says.

"The cotton industry and the challenges that it, and other agricultural industries are facing, inspired me to undertake my PhD researching how the changing climate will affect cotton physiology and productivity."

Industry support and the opportunity to be involved in research throughout her undergraduate course have already encouraged Katie to continue postgraduate research in the industry.

"As a young agricultural scientist, it is very encouraging to work on projects which benefit an industry that enthusiastically supports the research."

Increasing grower profitability

Rebecca Haling's award project will recommend ways growers can better manage fertiliser use and promote root growth to maximise profitability. Rebecca's research at The University of New England in Armidale NSW has had a particular focus on growing cotton in sodic soil.

Sodicity affects nearly one third of the soil in Australia, which includes large tracts of cotton growing regions. It is a poorly understood issue facing the cotton industry, but what is known is that sodicity restricts root growth which in turn affects yield by constraining the plant's access to water, nutrients and fertiliser.

"It is a major constraint to national production," Rebecca said.

"I'm investigating whether it is possible to increase nutrient uptake by modifying applications of phosphorus fertilisers and/or by using soil ameliorants such as gypsum to improve soil structure."

Win-win situation

Originally from Sydney, Rebecca studied a cotton related degree because she has always been interested in agronomy and soil science, and the chance to pursue her latest project with the help of the award is a win-win situation for both researcher and industry.

"This project combines my key interests in what I think is a very exciting and dynamic industry," she said.

"This support from the CRDC provides me with an excellent opportunity to investigate solutions for real issues facing cotton producers. It will also allow me to pursue my research interests in agronomy and soil science, and develop further skills.

Another encouraging aspect of this award is that, like Katie, Rebecca is keen continue working in the industry.

"The support from CRDC will definitely encourage me to consider future work in the cotton industry – I am hoping that this project will serve as a catalyst for future research projects with cotton," she said.

"THE SUPPORT WILL DEFINITELY ENCOURAGE ME TO CONSIDER FUTURE WORK IN THE COTTON INDUSTRY".

NEW DEVELOPMENTS BOOST FARMER PRODUCTIVITY

A DEVICE TO HELP FARMERS CALCULATE LABOUR NEEDS IS JUST ONE OF A NUMBER OF CAPACITY PRODUCTS EMERGING FROM TOCAL COLLEGE.

Thanks to the innovative drive of Charlie Bell, Education Officer at Tocal, a new application (app) for mobile phones is being developed for farmers, to help them to calculate seasonal labour needs and budgets. Also soon to be available is an on-line skills audit, offering a specially tailored benchmarking system for farmers and their staff. This tool will deliver an industry-wide audit of skills and help identify training needs and, at the same time, give managers a tool to evaluate the skills of their staff.

Charlie explained some of the new innovations.

"The new app allows farmers to test different scenarios and looks at monthly and weekly labour budgets, enabling them to draw up weekly calendars via their mobile phones. The new app will be available free of charge from the CRDC.

"Additionally, the college is developing a benchmarking system. This is a tool whereby a farmer can register with a system and carry out a skills audit of staff, analyse training needs and generate reports for management purposes."

The cotton on-line skills audit will soon be available via links from the CRDC website and the *my*BMP website.

Tocal College also has available on-line courses, enabling farmers and those wishing to enter the agricultural workforce at management level to study for a Diploma of Agriculture, for further details see Page 9.

Tocal College's Manager, Continuing Education Darren Bayley (left) and Education Officer Charlie Bell test the new mobile phone application that will be free to growers.

SOUTHERN GROWERS IN THE KNOW

SHARING INFORMATION IS PROVING VITAL IN THE SUCCESS OF EMERGING COTTON GROWING REGIONS AS GROWERS FORGE A NEW INDUSTRY.

New cotton growing areas in NSW are flourishing with the help of specialists such as NSW Department of Primary Industries District Agronomist Kieran O'Keeffe, who has nothing but praise for the local workforce in areas such as Coleambally in the Riverina district.

Working with local cotton growers, Kieran feels that farmers have picked up cotton agronomy very quickly. He has worked over the last two years with irrigated cotton crops and is focusing on projects to support growers and help them get together for discussion and feedback.

"In all the areas of agribusiness that I deal with I have found that farmers have picked up cotton agronomy very quickly," Kieran said.

"And while there may be a severe people need in some areas, things have not been too bad in this area.

"However there is room for improvement, as well as potential for more people to be employed over time.

"There is a good opportunity for a monthly get together of advisors in the new areas linking to researchers from Northern NSW. We have begun these this season, and they have proven very successful."

Kieran said new growers in the district all had private agronomists to look after their crops.

"We are making good progress with them, in getting them together to talk and exchange ideas," he said.

"I think to help us further we need more local research here and need people to conduct or co-ordinate research. Cotton has only come on board in my area of responsibility in the last two years so I think it is important to link researchers with the people on the ground."

James Hill, Industry Development and Delivery Team New Grower Specialist and Cotton Australia Regional Manager added that farmers in the area were busy learning how to grow cotton.

"It is a developing crop in the region, so we will continue to organise field days in the area, offering growers and consultants support and advice. While we are making good progress in this area, there is still a way to go as people are so busy with their own operation, often finding it difficult to make meetings."

James Hill organised a recent cotton walk with reseachers from Narrabri at Mat Stott's Point Farms, Darlington Point which attracted around 80 people.

AUSTRALIAN COTTON GROWING BETTER ALL THE TIME

COTTON CONFERENCE LAUNCHED

The Gold Coast Convention and Exhibition Centre – home of the Australian Cotton Conference.

SOME OF THE WORLD'S MOST EMINENT AGRICULTURAL SCIENTISTS WILL COME TOGETHER WITH THE WORLD'S BEST COTTON GROWERS AND THE AUSTRALIAN COTTON INDUSTRY'S LARGEST GLOBAL CUSTOMERS TO PAVE A WAY FORWARD FOR AN INDUSTRY THAT'S "GROWING BETTER ALL THE TIME."

That's the theme that's been revealed for the 2012 Australian Cotton Conference to be held on the Gold Coast from August 14-16 – an event that will challenge, test and share the world's best knowledge in cotton production with an industry that's on the rise again.

Despite recent floods wiping 500,000 bales off this year's crop the 2012 cotton harvest will be the biggest in Australia's history and organisers are hoping for the largest attendance in the Conference's 32 year history.

"Australia's cotton industry has been buoyed by the floods over the last few seasons that have filled dams and allowed us to plant a crop again after years of drought," Cotton Conference Chairman and Moree cotton grower Lyndon Mulligan said.

"There's no better time for all cotton growers who've stayed pretty quiet during the drought to come along with their staff and families to improve their farm business by accessing the best knowledge and the latest innovations in cotton farming.

"The Conference is the place to get hold of the best available science and data from the world's leading experts, learn from the cotton growers who are leading the pack and network with fellow growers to share ideas and solve issues on the farm."

Cotton Conference Chairman and Moree cotton grower Lyndon Mulligan

A comprehensive program of speakers is being developed across a broad range of topics including Future Farming Innovations, Coal Seam Gas, Round Module Roundup, 21st Century Pests and A Better Workforce for Cotton. There's also sessions called Cotton 101 for new growers and Dryland Directions for dryland growers.

Some exceptional presenters are already confirmed, with the Conference shaping up to be world class in terms of topics covered by expert panels of speakers.

Among the big names are International Cotton Association President Antonio Esteve who'll give a picture of the global cotton market, internationally renowned authority on herbicide resistance, Professor Stephen Powles and Madam Zhang Fang Chun of the China National Cotton Group Corporation who is part of the "Focus on China" session.

As a special offer to growers who support Cotton Australia by paying their voluntary levy, the Australian Cotton Conference will this year offer these great industry supporters a $100 discount on their registration costs, as "a way to express thanks to those growers who keep our peak industry body strong, and whose financial support has allowed Cotton Australia to influence policy and public opinion for 40 years".

see our website

The 2012 Australian Cotton Conference has been officially launched, with a new website for more information and registrations at www.australiancottonconference.com.au. You can also get updates by following us on Facebook at www.facebook.com/cottonconference or checking out a series of serious and not-so-serious videos on our YouTube Channel at www.youtube.com/cottonconference

CONFERENCE CATERS FOR ENTIRE SUPPLY CHAIN

DELEGATES FROM ACROSS THE AUSTRALIAN COTTON INDUSTRY SUPPLY CHAIN ARE PREPARING TO DESCEND ON THE GOLD COAST IN AUGUST FOR THE 16TH AUSTRALIAN COTTON CONFERENCE, WITH EARLY REGISTRATIONS ALREADY COMING IN FROM GROWERS, SERVICE INDUSTRY AND INTERNATIONAL CUSTOMERS.

Major cotton logistics player, AWH – who warehoused more than 25 percent of Australia's 2011 crop – will send at least four delegates to the conference this year, with national cotton manager, Graeme Wood saying the conference was a "must attend" event for his organisation.

"Cotton is part of our core business – and for anyone whose involved in the Australian cotton industry, you've just got to be there," Graeme said.

"There is no other place where you can see all of your clients, meet potential new customers and hear from all other sectors of the industry.

"For us, it is a great place to gauge the mood of the industry, and to pick up information that helps us plan for the future."

Graeme said consecutive years of record production meant planning was becoming increasingly crucial for the logistics industry.

Australia produced almost 4.1 million bales of cotton in 2011, with growers currently in the middle of a record harvest of around 4.5 million bales. Good irrigation water availability suggested production was likely to top four million bales again in 2013.

"From our perspective, we need to plan storage for those crops, we need to train our workforce, and we need to ensure the transport infrastructure is available to efficiently move the crop from gin to warehouse, and then warehouse to port," he said.

"By networking with all sectors of the industry – including growers, merchants, shipping lines, seed companies, fertiliser companies, spinning mill customers… you name it… we can get a really good idea of what is going on, and importantly what the mood in the industry is.

"And apart from that – if you don't have fun at the Cotton Conference, you're not really trying!"

16th australian COTTON conference

AUGUST 14-16, GOLD COAST, QUEENSLAND

FOR DETAILS AND REGISTRATION GO TO www.australiancottonconference.com.au

see our website

AWH Brisbane's Tony Crebbin and Brian Bush are looking forward to the 16th Australian Cotton Conference on the Gold Coast, August 14-16.

Multi-award winning pro photographer Jack Atley will judge Cotton Australia's Click! Photo Competition.

PHOTO COMPETITION

To celebrate 40 years of service to the cotton industry, Cotton Australia has launched a photo contest, designed to collect and preserve images of our contemporary cotton industry.

"We are looking for creative and beautiful images that tell the story of cotton, from farm gate to fashionista, and the comp will be judged by world-renowned and multi-award winning photographer, Jack Atley," organiser Brooke Summers said.

"Jack has won the Australian Press Photographer of the Year and the coveted Moran Prize for Photography – the world's richest photography competition."

There are three categories, entry is free to professional and non-professionals, with no restrictions on how many images you can enter.

CA will award over $14,000 in prizes to the winners including a Canon EOS 1D camera for the overall winner and the runner up will take home a Canon EOS 5D Mark II camera. The best images will form part of an exhibition at the Australian Cotton Conference, 14-16 August 2012 and will also star in a Wincott 2013 Calendar.

To enter Click! email your images to click@cottonaustralia.com.au, along with your name, contact phone, address, the category you are entering and a caption for each image.

email us

Competition closes at midnight July 13 2012.

The efficiency of diesel gas pump conversion at "Kurrawombi Downs", Baan Baa has impressed Warwick Wannan.

IMAGE COURTESY STUART BRAY

DIESEL TO GAS CUTS BILLS

STUART BRAY SPOKE AN UPPER NAMOI FARMER WHO HAS CONTINUALLY LOOKED FOR WAYS TO DECREASE DIESEL USE.

Reducing pumping costs by $10 an hour with a diesel-gas mix has put money in the pocket and a smile on the face of irrigated cotton farmer Warwick Wannan.

Warwick, who now farms at Baan Baa, has always looked for ways to reduce his energy costs. Twenty years ago he had to have fuel delivered by road train to his irrigation farm at Collarenebri. Since then he started using reduced tillage techniques, which reduced his fuel use by at least 50 percent and a few years ago he introduced rubber tracks on his tractors to reduce wheel slip which in turn reduced fuel intake.

Now he is converting his diesel engines pumping irrigation water from diesel to a mix of diesel and gas. The aim is to replace 30 percent of diesel with LPG, saving 15 percent of the total fuel bill. Installation is relatively straight forward with components mounted on a box close to the engine. Adding to his joy over reducing pumping costs with the switch, simplified technology in the conversion process recently cut the cost of installing a diesel-gas system by 40 percent.

"Savings per hour are around 10 dollars, so over a thousand hours pumping at current conversion costs is approximately a six month payback period," Warwick said.

"And the increasing price of gas won't affect the operation too much.

"It's tied to the price of diesel – the first one we did five years ago the price of gas was half the price of diesel, now it's gone up but the price is still roughly half the price of diesel."

While Warwick has experienced relatively high savings to his pumping costs, they are unique to the Wannan's operation and will vary between farms.

According to Brad Pollard of DieselGas Technologies, the dollar savings for any engine fitted with this system are between 10 and 15 percent.

"The actual savings will vary depending on the price difference between LPG and diesel," he said.

"The payback period is determined by the amount of diesel consumed and the number of hours the engine does. So a big engine working hard for six months of the year will have a quicker payback than a small unit doing less than 1000 hours per year."

With support from CRDC, Janelle Montgomery (NSW DPI) has been working with Gary Sandell and Craig Baillie of National Centre for Engineering in Agriculture (NCEA) to help irrigators benchmark their on-farm energy use. The purpose of the energy use assessments is to quantify energy use on farm. This involves an assessment to identify where and how efficiently energy is used and to explore ways to reduce energy use and costs.

Janelle Montgomery says it's a really good index of performance, akin to water use efficiency.

"However, benchmarking on-farm energy use is in its infancy. Initially our CRDC funded project, Promoting Water Smart Infrastructure Investment, will concentrate on increasing awareness of on-farm energy assessments and promote energy record keeping on-farm," Janelle said.

"An energy assessment just involves recording what you are doing on farm and the energy consumed for different activities. It can be as simple as some detailed measurements from the meter box or the bowser, keeping a log of tractor operations and pumping, how much fuel you have used and how many megalitres you have pumped and then being able to compare this with industry figures.

"For meaningful comparisons between farms energy benchmarks must be standardised and defined. NCEA have developed an on-line tool, Energycalc that does just that."

For more information or to take part in assessments contact:
Janelle Montgomery, NSW DPI Moree
0428 640 990
janelle.montgomery@dpi.nsw.gov.au

email us

CottASSIST's Loretta Clancy, CSIRO, has helped upgrade the web tool for easier access on tablets and mobile phones.

EASIER ACCESS TO ON-LINE TOOLS

COTTASSIST WEB TOOLS ARE READY FOR THE CHALLENGES FACED BY GROWERS ANY TIME OF THE SEASON.

In keeping with the changing face of information technology CottASSIST is now available to use on all internet browsers such as Google Chrome, Saffari, Firefox and Internet Explorer. This means that CottASSIST can now be used on a larger range of mobile devices.

The CottASSIST team are also currently working with the industry's *my*BMP team to develop a seamless connection between the two systems. In future a *my*BMP user who uses CottASSIST, may be automatically credited for many of the *my*BMP practices.

Based on research the 10 CottASSIST web tools are ready to help with a range of cotton crop decisions – even during the off season.

Was it colder or hotter than last year?

The Day Degree Report in CottASSIST can help answer this in a flash. This tool uses an extensive database of climate information dating back to 1957. Using the Day Degree Report is easy. Select the location, the date range and click on 'calculate'. Information generated includes the accumulated number of day degrees, which days experienced a cold shock (min temp under 11°C), and the number of hot days.

Thinking about fertilisers for next season?

Pre-season soil tests to assess the nutrient status of each cotton field are important when deciding on the optimal amount of fertiliser to use.

NutriLOGIC provides an independent assessment of soil and plant analyses that is based on many years of cotton nutrition research. These recommendations may differ appreciably from those provided by other sources that may not be based on nutritional research.

http://cottassist.cottoncrc.org.au has been developed by CSIRO Plant Industry supported by the Cotton Catchment Communities CRC and CRDC.

see our website

Loretta.Clancy@csiro.au 02 6799 1547
Sandra.Deutscher@csiro.au 02 6799 1585

email us

WINTER MANAGEMENT PRIORITY

PADDOCKS TURNED AROUND QUICKLY INTO A WINTER CROP SHOULD BE CONSIDERED HIGH RISK OF HARBOURING RATOONS AND VOLUNTEER COTTON.

Planning to control volunteers and ratoons is a key part of an integrated weed management strategy that should consider issues such as herbicide resistance risk as well as the risks of pest and disease carry-over associated with their poor control.

Ratoons are particularly insidious as they host all pests of cotton and have the potential to be hidden over winter, acting as a source of pests and disease for next season.

It is advisable growers and consultants know their weeds and familiarise themselves with which weeds host which pests.

"Particular areas to look out for when scouting are where machinery has broken down during or after harvest and also areas out of crop. Weeds and rogue cotton along channels, roads and along fence lines also require attention," says industry Biosecurity and Disease Specialist Susan Maas, who is keen to ensure growers clean-up to manage any risks.

In-field, cultivation and herbicides can be effective in controlling volunteer cotton.

"Effective cultivation will only occur if the implement cultivates both the furrow and hill avoiding strips being left uncultivated," Susan said.

"Cultivation is an excellent non-chemical control to include within an integrated weed management program. The disadvantage is it only controls established seedlings, is slow and can cause moisture loss or soil damage if done at the wrong time."

There are a number of effective herbicides registered for use on seedling cotton and Susan said choice should be considered carefully.

Once again growers are being urged to keep farms clean of volunteer and ratoon cotton in and around fields.

"Once volunteers are bigger than 10 nodes they can be problematic, as control with herbicides is less reliable, although some double knock techniques can be successful," she said.

Controlling volunteers outside fields (along channels, roads etc) is even more challenging as broader herbicide control is not always possible. Manual chipping and spot spraying is the only effective option, particularly with well-established plants

While this is an intensive strategy, it is a good investment when taking in to account the potential costs and losses caused by pests such as silver leaf whitefly, aphids and mealybugs as well as cotton bunchy top.

THINK NEXT SEASON NOW

CHOICES OVER SEED TREATMENT FOR NEXT SEASON ARE NOT FAR AWAY AND THERE ARE SOME FACTS TO CONSIDER.

All insecticidal seed treatments contain a chemical from the neonicotinoid group. They are renowned for their activity against a range of key pests but resistance has become widespread in cotton aphids.

Resistance has been inadvertently selected in two ways. The first has been through the widespread use of seed treatments generally targeting thrips, and secondly through the use of foliar applied products targeting mirids.

As a result, the industry recommends that where a seed treatment is used, all early season uses of foliar neonicotinoid products are avoided, including sprays targeting mirids.

Without neonicotinoids, there are very few soft options for mirids, making the decision of what to use for their control particularly challenging after a seed treatment. Fipronil can be a useful alternative, especially if low rates are able to be used and beneficial insects conserved. Dimethoate is an economical alternative. However with this choice, aphid management is again affected, as dimethoate will select cross-resistance to pirimicarb in the aphid population.

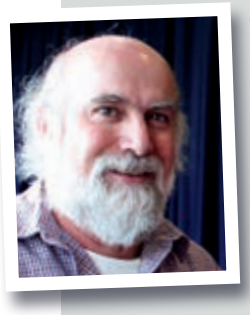
"The problem with seed treatments is we're not just targeting populations that could damage the crop, we're targeting everything and the longer into the season the seed treatment lasts the more severe the selection pressure," says CRDC Farming Systems Investment Program Manager Tracey Leven.

More information: Cotton Insecticide Resistance Management Strategy and the *Cotton Pest Management Guide,* (published August 2012) will contain all industry recommendations for the upcoming cotton season.

Tracey Leven CRDC
02 6792 4088
tracey.leven@crdc.com.au

email us

GET RATE RIGHT TO SAVE



Undertaken by CSIRO principal research scientist Dr Ian Rochester (pictured left), his economic analysis found under-use of nitrogen (N) fertiliser reduced gross margin by $725/ha and over-use reduced gross margin by $265/ha. Where the N application rate was more than 100kg/ha above or below the optimum the gross margin was reduced by more than $400/ha.

Ian said these results emphasised the importance of getting N fertiliser management right.

"We clearly understand the response of cotton to applied N and we know crops need within 50 kg N/ha of the optimal N fertiliser rate to maximise cotton yield and profit," he said.

"Some growers use consultants or fertiliser reps, and tools such as NutriLOGIC to calculate crop nutrient requirements, but unfortunately, most growers apply their traditional N rates, without accounting for the fertility of the soil.

"Many growers don't go through that important decision-making process, and that is costing them money."

A 2011 CRC survey of 177 growers (20 percent of growers that season) indicated the average N fertiliser application was 217 kg N/ha, and ranged from 534 kg to 30 kg N/ha. In Ian's field experiments, he has very rarely observed economic responses to N above 200 kg N/ha.

Another recent three-year study assessed nitrogen use efficiency in 80 crops across the Macquarie, Namoi and Gwydir valleys. The results showed about 61 percent of fields were potentially over-fertilised with N, only 30 percent received optimal rate and nine percent were under-fertilised.

Dr Ian 'Rocky' Rochester
02 6799 1520
ian.rochester@csiro.au

email us

STEP-BY-STEP TO NITROGEN SAVINGS

CSIRO PRINCIPAL RESEARCH SCIENTIST DR IAN ROCHESTER (PICTURED LEFT) IN HIS ECONOMIC ANALYSIS FOUND UNDER-USE OF NITROGEN (N) FERTILISER REDUCED GROSS MARGIN BY $725/HA, WHILE OVER-USE REDUCED GROSS MARGIN BY $265/HA.

Dr Ian Rochester and DEEDI extension specialist, Duncan Weir recommend following a clear decision-making process to optimise nitrogen (N) fertiliser use.

"First, determine the level of N you already have in the soil by sampling and analysing the soil. You can then calculate how much N fertiliser is required to supply sufficient N to the crop for that season," Duncan said.

"This calculation is easily done using the CottASSIST tool, NutriLOGIC. It determines the optimum N fertiliser rate by assessing the N fertility of the field (ie soil nitrate level) and takes the previous crop and soil condition into account."

Step 1: Test the soil before planting

Sample and analyse soil routinely to determine soil nutrient (N, P, K and S) status before applying fertiliser. Nutrient levels vary within fields; ideally, sample the same area each time. Consider using precision agriculture technology to obtain a soil variability map of your fields. Use a laboratory accredited to Australian Standards and registered by the Australian Association of Testing Authorities.

Step 2: Calculate crop nutrient requirement

Determining how much fertiliser to use depends on your field's chemical fertility.

To use NutriLOGIC, growers input soil test data, farm location, sampling time, previous crop or fallow and some soil factors (texture and compaction). The program indicates which nutrients will limit cotton production and application rates for each nutrient. You can find NutriLOGIC at www.CottASSIST.cottoncrc.org.au.

Step 3: Develop a fertiliser use plan

To write your own plan, carefully decide which fertilisers to apply and their rates, and timing of application, while trying to minimise nutrient losses from the soil.

LEAF NUTRIENT ANALYSIS

Leaf analyses provide information about the nutritional status of a crop and can identify nutrient imbalances, deficiencies and toxicities. This analysis has been calibrated for cotton. Critical concentrations of all nutrients have been identified at all stages of development, so leaves can be sampled throughout the growth of the crop. Leaf analyses can indicate how effective the fertiliser management has been for that crop or field, and in conjunction with soil testing, can help fine-tune a fertiliser program.

Sample leaves when the crop is not stressed (eg between irrigations).

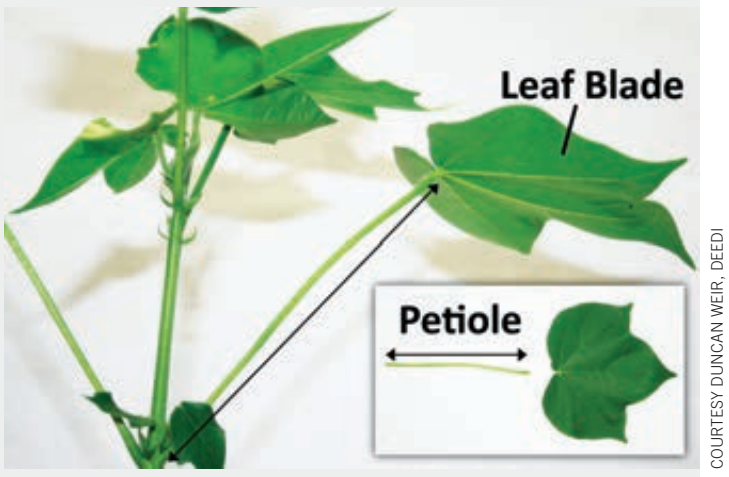
Sample the youngest mature leaf (normally the 4th or 5th unfolded leaf from the top of the plant).

Collect samples systematically across the field.

30–50 leaves should supply sufficient material for analysis.

Sample healthy and unhealthy leaves separately to help identify a suspected nutritional problem.

Avoid sampling plants stressed from waterlogging or lack of water, where insects or disease problems are severe, or after recent spraying with a pesticide or foliar fertiliser. Leaves can be sampled from early squaring until the crop is defoliated.



COURTESY DUNCAN WEIR, DEEDI

Collect leaf samples with clean, dry hands or use gloves. Avoid contaminating samples with salt (from sweat) or zinc (from sunscreen products/plastic bags). Send samples to the laboratory as quickly as possible or oven-dry samples at a low temperature (less than 70°C). Fresh samples should be loosely packed in a paper bag and stored in a cool place (refrigerator).

You can use organic materials, such as manures and composts, in preference to chemical fertilisers, where they are available. These materials may also increase soil carbon (as organic matter).

Timing

Composts and manures need to be spread and incorporated well in advance of planting. Ammonia-forming fertilisers (urea, MAP, DAP) may damage seedlings and should not be applied too close to sowing.

Applying N fertiliser before spring reduces nitrogen-use efficiency due to greater losses from the soil. Split applications may not improve nutrient use-efficiency. While it makes sense to apply nutrients just before the crop needs them, N losses may be higher when applied to warmer soil. Rain can hamper timely applications, increasing the risk of crops being nutrient deficient at critical times.

Application

N can be lost to the atmosphere through ammonia volatilisation and should be applied below the surface. Huge N losses can occur when urea is applied to moist soil; applying urea to dry soil and incorporating it with cultivation or irrigation overcomes this problem.

Fertiliser plans need to be flexible. Be prepared to modify your plan during the season if conditions change, or when crop analyses (leaf or petiole) identify a nutritional problem.

The industry's Cotton Nutrition and Soil Health Specialist Duncan Weir says there are clear steps which can be followed to optimise nitrogen (N) fertiliser use.

Step 4: Monitor your crop

To avoid nutrient deficiencies, monitor crop nutrient status during the season. Leaf analyses can be done from flowering to defoliation to assess the nutrient status of your crop. Petiole analyses can be done in the early season for nitrate, but leaf tissue analyses are more reliable and allow all nutrients to be assessed.

If nutrient deficiencies are not identified until symptoms appear, it's likely that yields have been reduced. NutriLOGIC can interpret your leaf analysis results and make allowance for the stage of crop growth throughout the season. It will also interpret petiole nitrate analyses.

"BE PREPARED TO MODIFY YOUR PLAN DURING THE SEASON IF CONDITIONS CHANGE..."

Step 5: Develop a management plan to improve crop nutrition and soil health

To continue growing high-yielding cotton, avoid allowing crops to become nutrient deficient. Use fertilisers with greater efficiency by applying the optimum amounts of the nutrients required to achieve these yields.

Compaction, sodicity, poor soil structure, low fertility and salinity are just some of the factors that can limit productivity. Arresting the decline of soil carbon is essential to long-term sustainably of cropping soils, and incorporating stubble is critical for this. The 'Soil Health' module in *my*BMP contains useful information to support crop nutrient management.

Duncan Weir
07 4688 1602 / 0410 518 214
duncan.weir@deedi.qld.gov.au

email us

STAY ON TOP OF RESISTANCE THIS WINTER

AN ONGOING PROJECT BETWEEN CRDC AND GRDC AIMS TO BEAT THE SPREAD OF GLYPHOSATE-RESISTANT WEEDS AND MANAGE THEIR CONTROL MORE EFFECTIVELY.

The project is co-ordinated by Ian Taylor of Taylored Agricultural Systems—began in July and will run to 2014. Ian said of the factors contributing to resistance, the most prevalent was over reliance on glyphosate for weed control, particularly in fallows.

"Weeds present growers a huge challenge and during higher rainfall periods large and continuous flushes of weeds can take growers by surprise and they have to fight quite large weed populations that compete with their crops," he said.

There is no evidence of glyphosate-resistant weeds in the irrigated cotton system, but over reliance of glyphosate on some dryland hectares has led to resistant weed populations. A significant management issue is that glyphosate resistance remains for many years until the seed bank is depleted of all resistant weed seeds.

Ian said it was crucial to follow these guidelines for effective management of potentially resistant weed populations.

- All herbicide treatments should aim to achieve maximum control.
- To help manage the seed bank, stop seed set and control survivors to prevent replenishment.
- Monitor and respond to (or test) the success of your control tactics.
- Treat flushes with a diversity of in-crop and fallow management tactics.

"Most importantly, don't automatically reach for glyphosate," he said.

"It's important to think long term, about how your actions now might affect your weed potential issues."

In Australia, we already have 309 confirmed populations of glyphosate-resistant annual ryegrass, as well as populations of glyphosate-resistant barnyard grass (18), liverseed grass (3), windmill grass (2) and fleabane (8) in the project region.

Growers are encouraged to use the QLD DAFF Online Glyphosate Resistance Toolkit, an easy-to-use and informative website to assess the level of risk for developing glyphosate-resistant weeds on farm.

Dr Ian Taylor
ian@tayloredagriculturalsystems.com.au
Glyphosate Resistance Toolkit
http://bit.ly/glyphosate

email us

see our website

OUR ENVIRONMENTAL PERFORMANCE IN A GLOBAL CONTEXT

CRDC EXECUTIVE DIRECTOR BRUCE FINNEY AND CRDC'S NEW PROGRAM MANAGER ALLAN WILLIAMS TAKE A LOOK AT THE WORLD'S REPORT CARD.

As the Australian cotton industry undertakes its third environmental review it's interesting to reflect on "how does Australia compare internationally, what future goals should we set and more broadly how or should the Australian cotton industry engage in international initiatives underway to drive improvements in cotton production practices?"

Sourcing credible information on negative and positive impacts of cotton production is not a straightforward exercise.

While environment life cycle assessments for a typical cotton textile indicate that the consumer use phase accounts for at least 70 percent of the ecological impact there is much to be understood and that can be improved at the production phase. In recognition of this the International Cotton Advisory Committee (ICAC) established an expert panel on Social, Environmental and Economic Performance of Cotton Production (SEEP) in 2006. This committee is chaired by Allan Williams who has held many important roles within Australia cotton industry and who CRDC is pleased to advise, has recently joined its R&D team.

SEEP released three reports in April addressing pesticide use in cotton production, production efficiency and energy use in cotton production, and the components of labour costs in major producing countries.
The reports are available at http://tinyurl.com/dx3fkrw.

Interestingly SEEP report that worldwide, the annual sales of crop protection chemicals on cotton rose from $2.6 billion in 1999 to $3 billion in 2009, but the actual application of active ingredient per hectare has fallen. The use of pesticides on cotton peaked in the 1990s when cotton accounted for about 20 percent of all insecticides used in agriculture. With the implementation of Integrated Pest Management (IPM) programs and biotechnology, cotton's share of world insecticide sales fell to 14 percent by 2009. Within the countries studied Australia had one of the lowest reported insecticide uses, of one kilogram active ingredient per hectare in 2007.

Reportedly agriculture accounts for about three-fourths of human water consumption, and cotton production accounts for about three percent of the volume of water used for global crop production, proportional to cotton's share of arable land use.

The amount of energy required in cotton production varies primarily because of differences in yields and the use of irrigation. Energy efficiency in cotton production ranges from a high of 0.071 kilograms of fibre per megajoule to 0.016 kilograms per megajoule in countries studied. Energy efficiency in Australia was rated at 0.048 kg/MJ. However, when the energy contained in cottonseed is considered, many cotton production systems, including Australia, are energy neutral to energy positive.

SEEP estimated 110 million households produce cotton in more than 80 countries. When family labour, hired labour and employment in ancillary industries such as transportation, ginning and warehousing are included, total employment in the cotton industry reaches more than 200 million each season. Employment in the Australia cotton industry is reported to be 10,000 persons or about two percent of agricultural employment.

The report also highlighted the types of expenses incurred by employers in the cotton production sectors of major countries. These reports highlight Australia's relatively strong position for a few key performance indicators and therefore the opportunity for the industry to demonstrate its performance to the community and the market, as well as identifying areas for continued improvement.

The systematic collection of an agreed set of key performance indicators by the Australian industry is crucial to provide the assurance that Australian cotton is produced responsibly. There are very strong signals about the growing importance of "sustainably produced" cotton. Leading brands are publicly setting targets for the proportion of "sustainably" produced cotton used in their products, and they are partnering in a multitude of industry, government and non-government programs aimed at defining and delivering "sustainable cotton" through the entire supply chain, including the farm.

The Australian cotton industry BMP program equally establishes a process for growers, ginners, classer and merchants to document a commitment to continuous improvement and therefore formally demonstrate its sustainability credentials to the market.

Based on the importance that retailers of cotton products are placing on sourcing more sustainably produced raw materials, the need to demonstrate the environmental performance of cotton may well become the norm. What is now emerging is growing interest in how to credibly measure and compare the "sustainability" of cotton production, given the range of conditions in which cotton is grown. As a leader in the development of an industry-wide sustainability program, the Australian experience would be an important contribution to this discussion.

Growers were surveyed as part of the industry's current environmental assessment. Ken Moore from Inovact Consulting undertook the interviews, he is pictured with new grower, Rodney Grant, Breeza.

"WITHIN THE COUNTRIES STUDIED AUSTRALIA HAD ONE OF THE LOWEST REPORTED INSECTICIDE USES..."