

COTTON RESEARCH & DEVELOPMENT CORPORATION



Spotlight

WINTER 2011

on Cotton R&D



WINTER WAR ON WEEDS

PROTECTING OUR INDUSTRY

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IN THE SPOTLIGHT



As picking comes to a close for many growers, others are just beginning to harvest their crops in a year that could be described as 'big' but 'variable'. The season has thrown much

our way in terms of variability and we well understand the conditions under which we farm will continue to evolve. This season has surely reminded us of all of the need to continue developing our preparedness for change and skills in managing risk.

The cotton industry is no newcomer to pest and disease threats and the recent explosion in cotton bunchy top and the associated issues of pest control is the latest challenge. We are making a plea to growers to be diligent in removing weeds and volunteer cotton from farms this winter to collapse the 'green bridge' that allows pests of cotton to survive to the next season. It is one of the most effective, yet basic methods of protecting our industry, not just from bunchy top, but other diseases that can be transmitted by insects.

With resistance levels to chemical controls rising amongst pests, the back to basics method of weed removal is the clearest chance we'll get to control these pests coming into next season. Australia is still free of exotic viruses like blue disease, which has much greater potential for damage than bunchy top. Our ability to manage current diseases is vital as it puts us in good stead for the future.

The industry's ability to respond to unforeseen events was also clearly put to the test after severe and widespread flooding this year. And while it's not new for researchers to take to the field and talk directly to growers, the value of this approach to industry has again been clearly demonstrated throughout the R&D support response. The industry through R&D has attempted to mitigate crop loss and improve yield potential across affected regions. A valuable 'cross-pollination' of research occurred when results from trials in the Burdekin were able to be applied to manage flood-affected crops around

Emerald/Theodore. Research was also initiated into how best to manage crops post-flood, with the aim that the results will realise better preparedness for these type of events.

In this edition we also congratulate and profile people who exemplify the best aspect of the Australian cotton industry – its people.

This includes Johno and Katie Haire, the first growers accredited under *myBMP*, RIRDC Rural Woman of the Year Runner-Up Barb Grey, our UNE Cotton Production Course scholarship winners and also Guy Roth, who has contributed to the industry on many levels. We are fortunate to have such committed and capable people in the industry. Equally the industry works hard to support people to grow in their capacity. I encourage people to take advantage of these opportunities. As English novelist George Eliot said "It is never too late to be what you might have been".

Judging by feedback from the Sustaining Rural Communities Conference, there are also many who have a real interest in the health of their community. This CRDC/Cotton CRC initiative aims to give people the skills, enthusiasm and ideas to promote this. Please enjoy our pictorial of the event and if you have a great idea to sustain or invigorate your community, please make contact with the CRC for information on grants.

In closing I note that while we cannot predict the future we can set goals for what we wish to achieve, we can seek to understand the issues that will drive change and we can monitor emerging issues. As an industry we have established Vision 2029 (see *Spotlight* June 2010) for this purpose and with concerted effort perhaps we might even find we can create our preferred future. Arguably the strategy for marketing premium cotton is the first industry strategy that explicitly seeks to support the industry to achieve its vision. CRDC looks forward to reporting on the outcomes of a review it has recently initiated to assist with the future direction of this strategy.



COVER PHOTO: ROHAN BOEHM
QLD DEEDI Virologist Murray Sharman and Cotton Industry Development and Delivery Biosecurity Specialist Susan Maas inspect plants affected by cotton bunchy top in the Emerald region.



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

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

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MILESTONE FOR MANAGERS

THE FIRST GROWERS TO BE ACCREDITED UNDER *myBMP* HAVE ENCOURAGED OTHERS TO GET ON BOARD.

Johno and Katie Haire from Craig Doyle Rural Holdings' "Undabri" Goondiwindi along with Auscott Ltd Namoi Farm Manager Martin Mead and agronomist Bill Back were on hand at the Australian Cotton Trade Show held in Moree in May to receive their certification.

"I personally believe managers and growers who get involved by completing the *myBMP* program will be pleasantly surprised regarding the support and relaxed, yet professional approach to the auditing of the system," Johno Haire told *Spotlight*.

"More cotton growers getting involved in the program will help ensure the Australian cotton industry can promote to the world that Australian farmers are committed to producing environmentally friendly cotton that is sustainable for future generations.

"In addition, *myBMP* can help cotton growers maintain an environment where we can grow cotton with multiple neighbours which may have other agricultural interests whether they are cereal growers or graziers."

Johno and Katie manage "Undabri", a mixed farming enterprise of 1800 hectares of irrigated and 1000 ha of dryland cotton rotated out of wheat or barley stubble, and a 8100ha of grazing country.

Sustainability was one of the main motivators to become part of the *myBMP* program.

"It is important to us to be sustainable farmers for the future and *BMP* helps us manage what level we are at," they say.

"Most importantly, the program



ABOVE: Katie and Johno Haire "Undabri" Goondiwindi with myBMP Manager Jim Wark and CRDC's Rohan Boehm at the Cotton Trade Show.

BELOW: Auscott Ltd Namoi Farm Manager Martin Mead and agronomist Bill Back (far right) receiving their certification.



highlights aspects we can improve on and hopefully reach the top classification in all the modules."

Katie completed the initial assessments and said any doubts about it being time consuming or difficult were quickly put aside.

"I thought *myBMP* would be pretty time consuming but I was surprised at how flexible the program was, allowing me to do bits and pieces at a time and work at my own pace," Katie says.

"I found the system to be extremely user friendly and the links supplied with the questions made it easier to source the relevant information. Furthermore, we didn't need any special software to run the program or even have a high level of computer literacy operate it.

"*myBMP* is 'compact' - I didn't have huge amounts of paperwork to trawl through. In addition, due to the data that I had uploaded during the course of *myBMP*, the assessment was a lot quicker than expected."

Meanwhile, implementing *myBMP* on-farm meant that Johno and Katie needed to get everyone working with them on board too.

"I took the approach to get all the staff involved in one way or another as *myBMP* was always going to be an ongoing matter and was part of the day to day running of the farm, from staff meetings to implementation, which included welding tasks, fabrication of fuel quick fills, belt guards and installation of signs to rehabilitating vegetation," Johno says.

"Now we can ensure the safety of the employees as we are now confident

that they have the desired knowledge regarding safety issues like pesticide handling and so on.

"We also have the benefits of labour efficiency regarding time, for example low level fuel points with sight gauges, silos have cable lids and sight glasses. In general, all who were involved have a good sense of satisfaction and this also helps us to maintain staff morale.

"Our agronomist Iain MacPherson helped myself and Katie with a wide range of questions he had knowledge of and had a positive influence in helping us complete *myBMP*."

The completion of *myBMP* has also resulted in a "great recording keeping system" which allows the Haires to quickly look back for any references required, for example spray records or paddock fertiliser history.

"We are also confident we comply with the legal requirements in the agricultural industry and now have access to the latest agricultural information," Johno said.

"Furthermore, *myBMP* brings the cotton industry up to a certain standard and is educational for all members who participate in the program."

The Doyle Group is continuing to make improvements to reach the goal of the top classification in all modules.

"The next steps for us are constructing a larger chemical shed and we are currently developing flood irrigation country into laterals and pivots that will increase our water efficiencies," Johno said.

<http://www.mybmp.com.au>

Phone 1800 COTTON to speak to Bec Rogan about using the system.



ALARMING POTENTIAL FOR CBT DAMAGE

COTTON CROPS WITH 70 PERCENT OF PLANTS AFFECTED BY COTTON BUNCHY TOP (CBT) HAVE SUFFERED SERIOUS YIELD LOSS. ALARMINGLY, THE PROBLEM COULD BE WORSE NEXT YEAR IF ON-FARM VOLUNTEERS AND WEEDS AREN'T CONTROLLED OVER WINTER.



MURRAY SHARMAN

LEFT: This image taken earlier this season shows a field with upwards of 70 percent infection with cotton bunchy top. A lone healthy plant is visible in the bottom left hand corner of the photograph.

such as marshmallow are hosts but the biggest problems are volunteer and ratoon cotton,” Murray said.

“Volunteer cotton and ratoon plants are not only a source of virus, but also create a green bridge that allows aphids to survive season to season.”

Worryingly, plants may often be hosting the disease but show no visible signs of infection, reiterating the need for total weed and rogue cotton destruction.

Recent field testing of five ratoon plants by DEEDI senior virologist Dr Cherie Gambley at a site where there was widespread CBT in the adjacent cotton crop showed all the ratoons were positive for the presence of the disease though none of them showed clear symptoms.

“Because there is a latent period from initial infection to the presence of visual symptoms, cotton plants such as volunteer and ratoons may appear symptomless and because they are infected, they can be a source for a CBT problem in next year’s crop,” Cherie said.

Industry Development and Delivery Team Specialist Duncan Weir, based on the Darling Downs, co-ordinated a field walk there in early April with researchers and consultants at the outset of the CBT threat.

Cherie, along with Murray Sharman and well known CSIRO entomologist Dr Lewis Wilson with support from NuFarm’s Frank Taylor attended the field walk to discuss the CBT threat.

Lewis Wilson echoed concerns about volunteer and ratoon management over winter.

“Growers should not rely on aphid control as the primary means of preventing infection,” he stresses.

“Aphid management has become particularly challenging in recent years due to growing insecticide resistance issues. Overuse of insecticides to control aphids will make this situation worse.

“To reduce the CBT disease risk, the best strategy is to control potential cotton aphid hosts during winter, especially volunteer and ratoon cotton, and this should be done well before cotton planting.

“Controlling volunteer and ratoon plants after the cotton crop has emerged runs the risk that aphids will leave the volunteers and ratoons and infest the crop. This can result in a sudden and widespread infestation of CBT-carrying aphids and a risk of high yield loss.”

Cotton Industry D&D Biosecurity Specialist Susan Maas said this season’s industry-wide pathology survey, conducted post flowering, confirmed the widespread increase in incidence of the CBT virus.

“CBT was present on 50 percent of



IMAGE COURTESY OF STEPHEN ALLEN

PREPARE NOW FOR FUTURE RISKS

“Cotton blue disease (above) is very similar to cotton bunchy top (CBT) in that it is an aphid vectored virus, however international experience suggests that it is even more damaging than CBT,” Cherie Gambley says.

“Our experience with CBT will help prepare the industry for biosecurity risks posed by exotic cotton viruses such as cotton blue disease.

“If there is an incursion, farm hygiene will be the key to slowing its spread.

“Removal of volunteer and ratoon cotton is a key management strategy for controlling bunchy top and will also be for blue disease.

“Furthermore, it will be vitally important to control another extremely devastating exotic virus, cotton leaf curl disease, which is vectored by the silverleaf whitefly.”

the surveyed fields spread across all regions in 2011. This compares with only a few isolated cases of the disease at very low levels last year.

“With CBT, an infection rate of one percent is a big number. In this year’s survey CBT infection rates in the Macquarie, Namoi, Gwydir and Bourke growing regions were 1.3 to 6.9 percent.

“We are extremely concerned that the impact of CBT will be more severe next year if the industry doesn’t respond.

“There is particular concern about ratoon cotton where growers are planning to double crop into winter.

“Growers should take particular care during crop destruction and pupae busting to reduce the chances of ratoons getting through.

“We urge growers to discuss volunteer and ratoon management with their consultants now.”

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“With so much pathogen now present in the environment, management of cotton aphid host plants during winter will be crucial to ensure that we don’t see more fields with severe CBT impacts next year,” DEEDI Virologist Murray Sharman warns.

CBT is spread by cotton aphid and causes stunting in the plant, reduced leaf and fruit size, reduced internode and petiole length and distinctive mottling of leaves.

Furthermore, insecticide resistance in aphids now means that farm hygiene, not insecticides, is the primary means of control.

“A number of broadleaf weeds

GROWERS WARNED TO ACT NOW AGAINST NEXT SEASON'S DISEASE & PEST THREATS

THIS SEASON SEVERAL PESTS AND DISEASES HAVE REARED THEIR HEADS AND ARE OF HUGE CONCERN TO THE INDUSTRY. FARM HYGIENE OVER WINTER IS CRITICAL IN THE FIGHT TO CONTROL THEM NEXT SEASON



INSET: Resistance to control methods is growing in aphids, so spraying should not be relied on as a control method – removing weeds in winter is paramount.

LEWIS WILSON

Good farm hygiene over winter is critical to insect pest control and the biosecurity of the cotton industry. Weeds and rogue cotton provide the “green bridge” for pests to survive over winter and then infest the following cotton crop.

According to Industry Development and Delivery (D&D) Pest Management Specialist Sally Ceeney (pictured), of all the weeds, rogue cotton (volunteer and ratoon) is the biggest problem. It is a host for all cotton insect pests, is difficult to control and as a host for disease is a potential biosecurity risk.

“Allowing volunteer and ratoon cotton to survive over winter also carries a risk for



Bollgard II resistance,” Sally warns.

“By having weeds on farms, growers are hosting insects and are effectively increasing their base population of pests at the start of the next season.

“At the farm level this can be costly as it may lead to having to control these pests early in the season, and potentially numerous times during the season.”

However spraying early with broad spectrum insecticides may flare other pests (such as silverleaf whitefly) and lead to more costly

EFFECTIVE PEST CONTROL THROUGH FARM HYGIENE MEANS:

- Smaller ‘base’ population at the start of the season;
- Lower risk of resistance
- Reduced cost of in-crop insect control, by reducing number of sprays.

sprays later in the season.

“At an industry level, weeds hosting insect pests can increase chances of insecticide resistance developing. For example, by spraying aphids in-crop last season the survivors may be resistant individuals,” Sally said.

“Neonicotinoid resistance in aphids is widespread and very high, and cross resistance to carbamate and organophosphate in aphids is also still of concern.

“Resistant individuals survive on weed hosts over winter and infest the following cotton crop, breeding a larger population of resistant aphids.

“The risk is highest in a wet, mild winter, as not only does it encourage weed growth and insect reproduction, it also makes it difficult to get on to country to control weeds.”

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INSECT PEST

Cotton aphids
Spider mites
Silverleaf whitefly

Green vegetable bug

Solenopsis mealybug

OVERWINTERING HOST WEEDS

Marshmallow, capeweed, thistles, cucurbits, ratoon or volunteer cotton.
Turnip weeds, marshmallow, deadnettle, medics, wireweed, sowthistle.
Sowthistle, melons, bladder ketmia, native rosella, rhynchosia, vines (cow, bell & potato), rattlepod, native jute, Josephine burr, young volunteer sunflowers, euphorbia weeds, poinsettia and volunteer or ratoon cotton.

Turnip weed, castor oil, blackberry nightshade, deadnettle, sowthistle, marshmallow, stinging nettle, noogoora burr, prickly lettuce, dock, wild radish and variegated thistle

Broad host range of common weeds including pigweed, sowthistle, vines (cow, bell and potato), crownbeard and volunteer or ratoon cotton



MANAGING RATOONS AND VOLUNTEERS

Planning to control volunteers is a key part of an integrated weed management strategy and should consider issues such as rotational crops, herbicide resistance risk and other weeds present in the field.

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

“Broadacre cultivation will control seedling volunteers as well as large volunteers in a fallow situation,” says D&D Team Weeds Management Specialist James Hill.

“Effective cultivation will only occur if the cultivation implement cultivates both the furrow and hill avoiding strips being left uncultivated.

“Cultivation will also manage other weeds besides seedling volunteer cotton which makes it an excellent non-chemical control to include within an integrated weed management program.”

The disadvantage of cultivation is that it only controls established seedlings, is slow and can cause moisture loss or soil damage if done at the wrong time.

“Seedling volunteers can be controlled reasonably well with less invasive physical removal such as Kelly chains,” adds Susan Maas, who as D&D Team Biosecurity Security

Specialist, is keen to ensure growers clean up to manage any risks.

“The chains break the seedling cotton stems and can be particularly useful close to planting.”

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

“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.

“It is important to read all labels to confirm the correct application timings and rates.

“Coverage can be compromised due to shading, stubble and lint so using the recommended water volumes for application is imperative for effective control.”

In addition to high water volume, nozzle selection, temperature, humidity, wind conditions, boom height, speed, and pressure should be reviewed to optimise efficacy.

Control of volunteers growing outside fields (along channels, roads and fences) is even more challenging as broader herbicide control is not always possible. Manual chipping and spot spraying is sometimes the only effective option, particularly where volunteers are well established.

Susan, Sally and James all agree that while this is an intensive strategy, it is a good investment when taking into account the potential costs and losses caused by pests such as SLW, aphids and now mealybugs as well as cotton bunched top.

“OF ALL WEEDS ROGUE COTTON IS THE BIGGEST PROBLEM”

BIG CONCERNS OVER BUNCHY TOP



“We are extremely concerned about Cotton Bunched Top (CBT),” says Susan Maas (pictured). “We have seen CBT go from isolated incidences (2009-10) to wide spread this season with some fields in both NSW and QLD having more than 70 percent of plants infected late in the season. This has a devastating impact on yield.

“This virus can only survive in living plants so we have an opportunity over winter to break the disease cycle by controlling hosts in particular volunteer and ratoon cotton. If we have a wet spring we have the potential to see CBT worse than in 1998/99 where CBT reduced yields by 25 percent on 21 percent of the growing area, equating to a 5.2 percent loss across the whole industry at a cost of \$140/ha.”

SEED: TO TREAT OR NOT?

COUPLED WITH WINTER WEED MANAGEMENT, RETHINKING THE NEED FOR AN INSECTICIDE SEED TREATMENT CAN GIVE BETTER OPTIONS FOR IN-CROP INSECT MANAGEMENT AND PREVENT INCIDENTAL SELECTION OF RESISTANCE IN BELOW-THRESHOLD POPULATIONS.

Choice of seed treatment is the first pest management decision for growers coming into a new season.

All insecticidal seed treatments on seed sourced from CSD 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.

Aphids may have kept a low profile in recent seasons but during this time resistance to the whole neonicotinoid group has become widespread, with spray failures occurring in 2010/11. 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.

Well known foliar-applied insecticides used in cotton belonging to the neonicotinoid group include Shield (clothianidin), Intruder (acetamiprid) and Confidor (imidacloprid).

These insecticides can no longer be relied upon when aphid control is needed.

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. Dimethoate is an economical alterna-



tive. 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. “There are only tough decisions to be made with early insecticide selections for aphids and mirids. “This reinforces the need to try to prevent the insect problems in the first place. Controlling winter weeds and cotton ratoons can effectively reduce the size of spring populations of cotton aphid. “Developing an aphid and mirid control plan with your consultant and seed reseller is also of utmost importance.”

More information: Cotton Insecticide Resistance Management Strategy and the *Cotton Pest Management Guide*, (published August 2011) contains all industry recommendations.

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WINTER CROPS PLAY HOST

Areas that have been quickly turned around into a winter crop should be considered high risk of harbouring ratoon and volunteers. “There is the potential for ratoons to be hidden over winter and will be a source of pests and disease for next season,” D&D Team Weeds Management Specialist James Hill said. “They are particularly insidious as they host all cotton pests. “It is also advisable growers and consultants know their weeds and familiarise themselves with which weeds host which pests.

“Scouting for weeds and correctly identifying them is a key to good management. Know what weeds you have and find out how to control them with correct sprays and spray rates. “Keep good records of sprays and avoid repetitive use of the same herbicides for long periods of time.” “Particular areas to look out for when scouting are where machinery has broken down over/post harvest and also areas out of crop for weeds and rogue cotton like along channels, roads and along fencelines.”

INCREASE PREDATOR NUMBERS AND REDUCE PESTS ON-FARM



INTEGRATED PEST MANAGEMENT STARTS WITH THE CORRECT IDENTIFICATION OF WHAT’S IN YOUR CROP, UNDERSTANDING THE ROLE OF BENEFICIALS AND HOW TO CONSERVE THEM.

One of the industry’s most popular publications is being updated and due for launch in August. *A Guide to Pests and Beneficials in Cotton Landscapes* will assist consultants and growers to correctly identify their pests and beneficials and will create awareness of the role that native vegetation can play in supporting Integrated Pest Management (IPM).

This guide replaces *The Cotton Pest and Beneficial Guide* (by Bruce Pyke and E H Brown), first printed in 1996, which has been a very handy reference for the cotton industry.

Guide editor Sandra Williams (CSIRO) says the new compact format is easy to use, providing key information for identifying pests or beneficials with the help of high quality images.

“This guide contains a considerable amount of new information about beneficials and pests which has significantly changed since the introduction of Bollgard II,” she said.

“It’s exciting and unique, as it is the

first to integrate outcomes of biodiversity research in a production-focused guide.”

Co-editor Stacy Vogel, Namoi CMA, said the guide “takes us to an exciting new era by introducing the role of native vegetation as habitats for beneficials on the farm”.

“It outlines some simple steps to improve natural areas on the farm to increase the numbers of natural predators and increase the effectiveness of your IPM,” Stacey said.

“The publication is not only an important tool for consultants and growers but supports researchers, extension staff, students and anyone new to the cotton industry.

“It is also a valuable resource for those completing the IPM and natural assets modules in *myBMP*.”

A more detailed web version will be on the Cotton Catchment Communities website, and will provide additional information about individual pests and beneficials.

<http://www.cottoncrc.org.au>

AUGUST RELEASE



WEB TOOL TARGETS SILVERLEAF WHITEFLY

GIVING COTTON CONSULTANTS MORE INFORMATION BASED ON RESEARCH TO MAKE THEIR JOB EASIER IS INTEGRAL TO A NEW WEB TOOL TO FIGHT INSECT PESTS, AS SANDRA WILLIAMS AND MELANIE JENSON REPORT.

CSIRO Plant Industry as part of the Cotton Catchment Communities CRC has recently developed a web tool to make silverleaf whitefly (SLW) management easier.

The SLW Matrix Threshold web tool allows users to enter regular sampling information to track the development of SLW populations over time. The tool then compares these populations with the control thresholds which are based on the pest population size, day degrees and crop stage.

Web developer Loretta Clancy and development specialist Sandra Williams, both of CSIRO, are excited to deliver this additional web tool to the industry, which will complement the other popular CottASSIST tools and give cotton growers and consultants the necessary information based on research to help their decisions.

"Once you have set-up farms and crops, the only required information is SLW sample data," Loretta said.

"The recommendation page presents the industry's threshold matrix with your whitefly population data



Silverleaf whitefly honeydew causes contamination which incurs large discounts and negatively affects Australia's reputation for producing high quality cotton.

LEWIS WILSON

BELOW:
What can make SLW management complicated is that they can rapidly develop resistance to insecticides, have a very large host range and fast reproduction rate.

overlayed. There is also a full explanation of the threshold that applies to your current SLW population and crop stage."

Large SLW populations can cause significant lint contamination with their honeydew which can result in large discounts and negatively affect Australia's reputation for producing high quality cotton. Lint yields can also potentially be reduced.

What can make SLW management complicated is that they can rapidly develop resistance to insecticides, have a very large host range and quick reproduction rate. Therefore to prevent resistance developing to the small number of registered products, it is fundamental to follow strict industry thresholds developed from research.

The development of this SLW matrix tool has been the combined effort of Emerald-based QLD DEEDI SLW researcher Richard Sequeira and Industry Development and Delivery Biosecurity Specialist Susan Mass, who were fundamental in getting this new tool up and running. They also ensured that its performance was accurate and easy to use.

"This is a fantastic development and a huge step forward because it reduces a multi-dimensional whitefly



spray decision and takes the process down to a simple and practical exercise that any crop manager will be able to use with confidence and ease," Richard said.

Susan Maas added that while the industry's SLW Threshold Matrix is in the *Cotton Pest Management Guide*, the web tool is easier to use as it automatically calculates the day degrees needed to use the matrix.

The SLW threshold matrix tool can be accessed through www.cottassist.crc.org.au

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see our website

email us

COTTON'S BIG NIGHT OUT

THE FINALISTS OF THE 2011 AUSTRALIAN COTTON INDUSTRY AWARDS WERE ANNOUNCED AT THE COTTON TRADE SHOW IN MOREE IN MAY.

The winners will be announced at the Cotton Industry Awards Dinner, held in conjunction with the Cotton Industry Forum on August 10 at the Crossing Theatre, Narrabri.

Monsanto Grower of the Year and AgriRisk Innovative Grower Award

DONALD AND DOUGLAS CROTHERS

Booligar is an irrigated cotton and dryland farming and grazing enterprise at Dirranbandi in the Lower Balonne region.

VON WARNER AND ED WILLIS

Bullamon Plains Pastoral Co operated by Ed and Bill Willis and Von is an irrigated and dryland farming and grazing enterprise at Thallon in Queensland.

HAMISH JOHNSTONE

Manages Primeag's irrigation, dryland and grazing properties Macintyre Downs, Warrindi and Riverview at Goondiwindi producing cotton, seed sorghum and winter cereals.

GORDON AND DAVID BROWNHILL

Merrilong Pastoral Co is an irrigated and dryland farming and grazing business at Spring Ridge NSW with a no-till controlled traffic system since 1995 growing winter and summer grain crops and began growing irrigated and dryland cotton this current season.

CRAIG AND SHARRON SAUNDERS

Irrigated cotton, dryland wheat and grazing enterprise on three properties at St George. Craig developed an irrigation system of pipes through banks with adjustable flow rates, resulting in a 20 percent water saving and significant yield increases.

STUART AND MAXINE ARMITAGE

Irrigation cropping enterprise at Wamara, Cecil Plains on the Darling Downs. Some 200-250ha of irrigated cotton are grown annually on the 600 ha property. Crops are in long fallow rotations with opportunity crops (sorghum) produced in a no till system with stubble retention.

Cotton Seed Distributors Researcher of the Year Award

KRISTEN KNIGHT, MONSANTO AUSTRALIA ENTOMOLOGIST, TOOWOOMBA, QLD

Kristen leads the Monsanto Australia insect resistance management program and manages the company's research efforts into allele frequency, field survival on Bollgard II cotton, alternative refuges and the entomological assessment of new traits.

DR SHARON DOWNES, SENIOR RESEARCH SCIENTIST, CSIRO, NARRABRI NSW

Sharon has made an outstanding contribution over a relatively short time to the monitoring of resistance to the cry proteins in Bollgard II. She has made important scientific contributions, for example identifying the value of and implementing the F2 and F1 tests.

DR WARWICK STILLER, CSIRO PLANT INDUSTRY, NARRABRI NSW

Warwick is a cotton breeder developing new cotton varieties adapted to Australian management and conditions. As an important member of the CSIRO team, Warwick delivered new varieties for all regions with higher yield, better disease resistance and fibre properties.

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

FLEUR ANDERSON, CAHOOTS COMMUNICATIONS, THEODORE QLD

Fleur's involvement in the community and industry demonstrates her natural leadership abilities. She has enthusiasm and passion for the industry, as president of her local grower association and leading by example in a tough period for growers in the Dawson Valley.

2010 Cotton Industry Researcher of the Year Nilantha Hulugalle.



NICK GILLINGHAM, NG AGRONOMIC CONSULTANCY, MOREE NSW

Nick was appointed farm agronomist in 2005 and is now cropping manager at Keytah, in the Gwydir Valley. Nick is part of the next cotton generation, taking on more responsibility each year and getting involved in industry activities.

DR ROSE BRODRICK, CSIRO PLANT INDUSTRY, NARRABRI NSW

Rose has been involved with the industry for over 10 years, as a PHD student and now as a scientist with CSIRO Plant Industry. Her research into physiology and management helped change the way cotton is grown with row configurations to improve water use efficiency.

Tickets are available from the end of June from Cotton Australia. <http://www.cottonaustralia.com.au>



2011 PRODUCTION MANUAL RELEASED

The newest publication of the Cotton Industry's Development and Delivery Team is the *Australian Cotton Production Manual 2011*.

The release of the manual at the Australian Cotton Trade Show in May comes on the back of the successful 2010 edition, which received excellent reviews from growers (experienced and inexperienced) and consultants alike. It was so popular, distributors quickly ran out of hard copies and the on-line

version was downloaded and accessed extensively.

The 2011 guide has been released to incorporate the (also released last year), irrigation and spray application information, pesticide use reduction as well as updated research and development outcomes.

The guide is produced by the industry's team of D&D specialists headed by Ken Flower, General Manager Best Practice and Research Implementation in as-

sociation with researchers, CSD and publishing partners Greenmount Press.

Copies of the Manual are available from the Cotton CRC by phoning Dave Larsen on 02 6799 2471 and on-line at

http://www.cottoncrc.org.au/content/Industry/Publications/Australian_Cotton_Production_Manual.aspx





BRIDGING THE GAP

LEFT: RIRDC National Rural Women's Award Runner-up Barb Grey making her acceptance speech in the Great Hall at Parliament House heaped praise on the cotton industry for its support of women.

MUNGINDI COTTON GROWER AND INDUSTRY ADVOCATE BARB GREY IS THE 2011 RIRDC NATIONAL RURAL WOMEN'S AWARD RUNNER-UP. SPOTLIGHT SPOKE TO BARB ABOUT HOW THE AWARD WILL REALISE HER VISION FOR A BETTER RURAL AUSTRALIA WHILE PROMOTING THE INDUSTRY SHE IS PROUD OF.

The award is a Rural Industries Research and Development Corporation (RIRDC) initiative and having already been named Queensland RIRDC Rural Women's Award Winner, Barb went on to participate in National title selection. The winners were announced at a ceremony in the Great Hall, Parliament House on May 24.

While thrilled to be awarded the title, Barb was quick to stress "It's not all about me! It is really about my message, about effecting change and influence".

"The Award does not mean that I am 'the best' or that I have all the answers; it's about knowing the questions to ask, and seizing this wonderful opportunity to effect change.

"Since winning these awards, the doors for my projects are opening."

In October Barb will be taking a group of rural/regional women to Canberra for a three-day educational workshop learning about the mechanics of government.

"I will use the RIRDC Awards to implement a pilot education program to empower aspiring rural and regional women leaders by giving them a better understanding of the political process and government decision-making," she said.

"This would collectively and individually build a stronger, more effective voice for rural industries and regional communities.

"I am committed to helping build or maintain strong, healthy and productive rural industries and regional communities and am deeply concerned about the growing disconnect between rural people and government and decision makers.

"The Award will also allow me to build my skills in project facilitation, to give me the competencies to deliver on this pilot program which if successful I believe could be replicated and become a regular training initiative for rural and regional women."

The second message Barb has is one of support for the industry she says has supported her to this point.

"It is very easy to represent an industry that has been so supportive of me," she said.

"I really do love being in the cotton industry, it's a forward thinking go-ahead industry.

"If women want to participate, our industry is truly supportive. It's about stepping out and stepping up, and our cotton industry allows and encourages this.

"From discussions with women from other agricultural sectors who aspire to be in positions of influence, I can vouch that this is not always the case."

Barb is no stranger to moving outside her boundaries and challenging herself. Personal development is continuous.

"My advice would be to pick an area you are interested in and to make a start; the opportunities then present themselves. There are many people who are willing to extend a helping hand," is her advice.

In 2007, Barb and husband Ralph were awarded the industry's AgriRisk 'Innovative Grower of the Year Award' for commitment to human resource management in agriculture.

"This was a defining moment, the start of my greater off-farm involvement

in the industry," Barb says.

"From this, I was the recipient of a cotton scholarship to participate in the Australian Rural Leadership Program (sponsored by CRDC, Cotton Australia, and Auscott Ltd) and that program absolutely launched me into the next stage.

"This program was not just a nudge, it was a push! I'm eternally grateful to the industry for their considerable investment."

Barb is currently the Chair of the Women's Industry Network – Cotton (WINCOTT), and cites her involvement with this committed and energetic team of women as an important step in developing her skills and confidence, along her leadership journey.

"I would not have arrived at this exciting stage in my professional and personal life had it not been for the generosity of spirit of the people with whom I work," she said.

"I'd like to thank the cotton industry, and RIRDC, for their investment in rural and regional women."

A cotton industry scholarship is again on offer for the next ARLP course. Applications close July 31.

<http://www.rural-leaders.com.au>

RIRDC Rural Womens' Award

<http://www.ruralwomensaward.gov.au>

BELOW: Receiving the award from Dr Mike Kelly, Parliamentary Secretary for Agriculture, Fisheries and Forestry.



FIGHTING ON AFTER FLOOD



Researcher Steve Yeates, Neek Morawitz “Argoon” Emerald and researcher Paul Grundy discuss the recovery of Neek’s crops after the severe floods earlier this year.

CENTRAL QUEENSLAND GROWERS CONCLUDE R&D ASSISTANCE IN FLOOD MANAGEMENT HAS BEEN INVALUABLE. CHRISSEY BROWN FOLLOWS THE STORY.

BELOW: Paul Grundy shares his insight with growers in the Emerald region at one of his many visits to the area to offer advice on managing flooded crops.

Feedback from growers and consultants in Central Queensland (CQ) indicate visits from cotton researchers Paul Grundy (DEEDI) and Stephen Yeates (CSIRO) during the flood recovery period were immensely beneficial and helped with planning and management of flood affected crops for the remainder of the season.

Susan Maas, QLD DEEDI and Industry D&D Team Specialist based at Emerald co-ordinated a large part of

the post-flood effort and says unprecedented wet conditions and flooding across Queensland in the 2010/11 growing season had growers and consultants looking for assistance in making decisions about how to manage flood affected crops in an effort to recover some yield.

Susan said Paul Grundy and Stephen Yeates travelled from the Burdekin region to share their knowledge about recovering lost yield potential through management strategies gained in their years of research into growing cotton in tropical climates.

Initially the researchers, together with Greg Kauter from Cotton Australia, visited Neek Morawitz’s property “Argoon” immediately following the flood in early December, where they focused on crop physiology and management. In particular, the group discussed the worth in continuing to grow the crop and considered the option of ‘trimming’

crops to manage plant growth.

“These guys have been around for a while and having on ground support from that depth of experience and with experience in an environment similar to ours was very valuable,” Neek said.

“Their visit at the field walks really gave us confidence that the crop would go on to produce something.”

With continuing poor weather and another more significant flood, the researchers returned twice in January to further discuss strategies for managing these crops including trimming, nutrition, Pix management and the likely impacts on yield potential.

SEEING THE SCIENCE

The second field walk was held soon after the second flood in early January at Andrew and Julie Geddes’ “Laikipia”.

Cameron Geddes attended the field walk and said the group was talked through ‘the science’, such as productive time remaining and impact of declining day degrees.

“Without the technical support we probably would have made some wrong decisions with regards to post-flood crop management,” Cameron said.

“This was something we had never





POST FLOOD DATA GOING TO GOOD USE

A PROJECT TO ASSESS THE RESPONSE OF FLOOD AFFECTED COTTON CROPS TO VARIOUS MANAGEMENT TECHNIQUES IS CURRENTLY BEING CARRIED OUT IN CENTRAL QUEENSLAND.

The project has evolved from flood response field walks carried out in the region during December 2010 and January 2011 after unprecedented wet conditions caused widespread flooding and inundation of many crops. The project is being carried out by local consultant Jamie Iker from Graham Spackman & Associates in collaboration with researchers Paul Grundy and Stephen Yeates.

The CRDC-funded project involves monitoring the treated crops throughout the remainder of the season to determine the impact of trimming the crop at different plant heights in comparison to leaving a flood affected crop untrimmed or replanting the field with late plant conventional cotton.

Jamie says that selection of treatments to monitor for the project resulted from discussions between himself, Stephen, Paul and growers involved in the project.

"We all contributed but it was influenced largely by constraints and interest from the growers participating in the monitoring program," he said.

"Also, the management options were

based on research Paul and Stephen had done in the Burdekin region."

Monitoring is being carried out on five crops. This has included fortnightly photographs and observations, and fruit mapping at cut out. Extensive box mapping will occur prior to picking.

One obvious difference that has occurred between the trimmed crops and the late plant conventional crop is that the conventional retained squares a lot better through some recent overcast weather than the flood affected crops which dropped a higher percentage of fruit in the mild conditions.

Picking of the treatments will be spread out from around late May through until end of July.

A full report of the findings of the project will be published in *Spotlight* when the crop has been picked and data analysed.

It is hoped that results of this project will help the industry by increasing knowledge of how flood affected cotton responds to different management practices for flood recovery in the future.

(Continued over page)

faced before and we just didn't know how to correctly analyse the situation.

"We really learnt a lot, not just about post-flood management but the basics of crop physiology."

A later field walk and bus tour was in January at "Goonoo", owned by the AA Company where both dryland and irrigated cotton were being grown for the first time.

Susan Maas said the visit coincided with average last effective flower, allowing Stephen, Paul and Greg to assess and discuss how the crops had compensated, how management might need to change for the late part of the season, and what the risk of frost damage was for growers chasing more crop late in the season.

"Discussions at the three field walks not only assisted with decision making for the remainder of the season, but also highlighted the opportunity for the industry to learn from the outcomes of this season and gain more information about the impact of various management practices on crop growth following flooding and inundation," Susan said.

A final field walk with the researchers was held in February, again at "Arگون" to look at the progress of trimmed and untrimmed crops, as well as very late planted conventional cotton.

"We have worked with them to trial trimming at different heights. It is too early to work out the best result yet," Neek Morowitz says.

"However, it was a great opportunity to get these researchers down to Emerald and hopefully we will be able to collaborate with them further here in the future."

ONGOING RESEARCH

The treatments observed at "Arگون" form part of a project being funded by CRDC to monitor the response of cotton to different treatments post flooding.

Jamie Iker, a consultant with Graham Spackman & Associates, was involved in organising the flood recovery field meetings in CQ and is collaborating with researchers Paul and Stephen on the flood management monitoring project.

"What they (Stephen and Paul) have seen and how they think about the crop is based on different experiences to what we normally experience here," Jamie said.

"They have pushed the boundaries up north because they have had to.

"Although there are no definite answers, they have been giving us some really good insight into what we expect to see and achieve out of each crop.

"It's been great to have them come down, their input has been invaluable."



PROFILE: JAMIE IKER



Jamie Iker is not new to Central Queensland, having grown up on a grain farm and feedlot operation at Comet, near Emerald. However, his interest in cotton production came later.

"I became involved basically out of demand for cotton agronomy services in the business," he said.

Working for agricultural consulting firm Graham Spackman & Associates, he says "Now, I love it and would not go back. There is so much to do, and it is a challenge all the time."

Having completed a Bachelor of Applied Science at Gatton Agricultural College where he majored in Agronomy, Jamie is now undertaking a Masters Degree in Science in Agriculture through the

University of New England (UNE). Trials that were to form part of these studies were washed out due to the floods so Jamie agreed to collaborate on the CRDC-funded project to monitor cotton response to different treatments post flooding in CQ.

"No one has any definite answers (about how flood affected crops will respond to various management treatments) but having Stephen Yeates (CSIRO) and Paul Grundy (DEEDI) coming down from the Burdekin to share their experiences from research in that region is helping give some insight. Their contribution has been invaluable."

Jamie is monitoring the crops and will be working with Stephen and Paul to assess the treatments post harvest.

TREATMENT 1:



LEAF BUT NO FRUIT – LEFT ALONE

This crop was totally inundated twice, at 16 nodes with no fruit, however maintained a large percentage of original leaf material following the floods. Unable to access the crop, it was left to continue growing with 80kg urea flown on initially then a further 80kg run through irrigation later in the season. Pix was applied three times over a six weeks to keep the vegetative growth under control and keep the plants producing fruit.

“New growth appeared quickly after the flood waters receded from this crop, with new squares soon developing at the tip of the main stem and laterals. The crop appeared to recovery relatively well and will be one of the first treatments picked,” explains Jamie.

TREATMENT 2:

NO FRUIT, NO LEAF – LEFT ALONE

This crop was inundated by flood water, had zero fruit retention, and no leaves after the floods. “Despite looking very poor initially, the crop produced regrowth from the base of the stem near the cotyledon nodes and substantial growth occurred late, around February 9,” Jamie said. “Six weeks after the flood, laterals were being produced normally with pin squares at the tip of the laterals.”



TREATMENT 3:



SOME FRUIT & LEAF – LIGHT TRIMMING

Overcast weather resulted in this crop having low fruit retention prior to the floods (as low as 45 percent). After the floods, the plants were around 17 nodes and although some fruit had been dropped there were still semi-mature bolls low in the canopy and some new squares and fruit on top.

As soon as the field was passable, the crop had four to six nodes trimmed to even out the field for management purposes and to promote recovery.

There was a lot of optimism locally that a light trimming would encourage significant fruit growth on the laterals, enhancing compensation. In the main this did not seem to occur. Jamie says that at the end of April, recovery from flooding was extremely variable across the field.

“Because of the flood itself some areas were not able to irrigate efficiently and have cut-out early. Fully irrigated areas of the field had more potential for compensation however due to the decline in heat units and radiation, this may not equate to yield,” he said.

TREATMENT 4:**NO FRUIT, NO LEAF
– SEVERE TRIMMING**

In this field, the floods washed out a large section of the crop. The head ditch and one side of the field was all that remained of the original Bollgard II crop. As the rest of the field was not salvageable and the grower intended to replant with conventional cotton, the remaining Bollgard II plants were trimmed quite aggressively from 17-18 nodes down to five to six nodes on January 26 in an effort to “even up the crop for management with the conventional”. “As with the other trimmed crops, squares appeared about five days later on the remaining lateral branches and new lateral branches began to develop from nodes along the slashed main stem. This treatment had 80kg of urea applied on February 3, which was incorporated by cultivation and followed by irrigation,” Jamie said.

“Compared with the lighter trimming, this particular crop has had fairly well structured regrowth. If you pulled a lateral off the plant, it looked like a normal cotton plant. “By the end of April, after three Pix applications, it has plenty of squares and is still flowering. At this stage it looks like it has reasonable potential. But, it is extremely late.” Jamie explains that although this treatment is looking reasonable, it is subject to the same high risk that other trimmed crops are exposed to with a number of squares being all at the same stage and at a high risk of being shed in overcast weather.

**TREATMENT 5:****COMPLETE FIELD
REPLANT TO LATE
CONVENTIONAL**

“The late planted conventional is looking okay,” Jamie says.

“We have hit it pretty hard with Pix. We used a high planting rate (14 seeds/m² with 10.5 plants/m² established) in an effort to increase competition and force the crop to mature quicker.

“Unfortunately, heavy heliothis pressure throughout the growing period has caused considerable tip damage and frequent insecticide applications have been necessary.

“Plants tipped out from insect damage were relatively slower to fruit and consequently have a lower yield potential than undamaged plants.

“In all other ways, the crop is growing as you would normally expect for a late plant conventional crop.” After three applications of Pix during the season, the crop started cutting out towards end of April.

SCIENCE BEHIND TRIMMING

TRIMMING CROPS WAS DISCUSSED AT LENGTH AFTER THE FLOODS IN DECEMBER AND JANUARY. PAUL GRUNDY (DEEDI) AND STEPHEN YEATES (CSIRO) EXPLAIN WHAT THEIR RESEARCH HAS REVEALED ABOUT THIS MANAGEMENT METHOD.

In the Burdekin we have a fairly well defined climatic challenge of a high probability of planted crops experiencing periodic wet overcast conditions for the first 50-60 days after planting. With crops starting flowering in this period this can present challenges for boll retention and ensuring timely nitrogen application. To help mitigate this risk we have been investigating the mechanical trimming of crops to delay flowering to avoid the worst of this weather.

We have found that the removal of the terminal shoot at any stage from seven nodes till first flower allows the lateral branches to become more dominant in growth habit, creating an 'open vase'-like canopy, improving light interception and reducing square shedding and delaying the advent of flowering by up to three weeks.

Importantly in the Burdekin, this delay allows more time to conduct pre-flowering nitrogen side-dressing and decreases probability of flowers being damaged by February rainfall.

Despite the two to three week delay in flowering, crop maturity and yield remain relatively unchanged as time is made up by tandem flowering on multiple plant branches resulting in a more rapid compressed flowering period after first flower.

The situation for the Central Highlands was quite different to the Burdekin with trimming being used on well advanced crops that had endured varying degrees of flood damage. In this instance trimming was tried for two reasons.



ABOVE:
The aim is to just trim off the tops, not to cut the crop harshly.

BELOW:
Only the top three to five nodes need to be removed during trimming.

To successfully trim a crop it is recommended that a cutter bar or very sharp, height controllable flail mower be used. The aim should be to only remove the top few nodes in a controlled manner with as clean a cut as possible. Swinging blade rotary style slashers tend to "smash" the main stem and can significantly damage a crop. When cutting it is important not to damage the terminals of the vegetative branches. If these branches are damaged crop maturity can be delayed by several weeks.



The first was that for crops that retained some foliage but had limited and variable fruit set, trimming the crop was tested as a method to even out top to bottom field variability and to encourage crop compensation on lower lateral branches and avoid the production of another 10-12 nodes of growth on top of already tall plants.

In this instance the response has been somewhat disappointing with crop response being best described as highly variable with big differences from plant to plant due to subtle differences in prior foliage condition and boll numbers.

The second reason was for severely damaged cotton whereby after flooding the majority of the crop was a "blackened stick" that was re-shooting at every node from top to bottom. In this instance aggressive trimming was tried to force the plant to put its remaining resources into growing three to four decent laterals rather than 15-20 simultaneous small branches.

Trimming in this case gave a desirable result, in that a well balanced plant with reasonable boll numbers and healthy foliage was produced albeit possibly being too late due to the treatments being undertaken in January.

In this dire set of circumstances the complete regrowth of these crops post-trimming may be comparable or

advantageous compared to replanting with conventional cotton or just letting the severely damaged plants regrow.

What has been clear across all treatments is that for growers who find themselves facing flood affected fields in the future the best approach to decision making will be one that takes into account the severity of crop damage and the realistic season length remaining for crop compensation.

The capacity to conduct basic operations such as irrigation and fertilising have also proven to be important determinants for likely success similar to deciding whether or not to trim, replant or grow a remaining crop out.

For some growers who suffered extensive damage to infrastructure, their remaining season length was cut short further due to an inability to irrigate for more than a month after flooding resulting in costly delays in optimising crop compensation.

We hope that after this season we will be able to put together a flood recovery decision making guideline that considers many of these variables for growers who face similar circumstances in the future.

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GROWERS DRIVING LOCAL INDUSTRY R&D

THE BUSINESS OF R&D IS ONE REQUIRING CLOSE CONTACT WITH ALL PARTIES TO ENSURE INFORMATION IS AVAILABLE WHEN AND WHERE IT'S NEEDED. MELANIE JENSON REPORTS.

This year has delivered unprecedented devastation to families, businesses and communities caused by major floods across eastern Australia. For the Australian cotton industry the impact has been a mixed, with individuals and regions badly affected but with significant improvement in water availability.

Cotton Australia, state and federal governments have been working to provide as much support for recovery as possible. In concert with this, cotton industry R&D has been working with growers and consultants to help with the challenge of maximising returns from damaged crops.

"We respond to R&D through close engagement with partners and government," CRDC Executive Director Bruce Finney said.

"The Central Queensland experience has been one that demonstrated very well how R&D can work in the field."

CRDC recently held a board meeting in the Emerald region so it could engage with growers to understand first hand if cotton industry R&D was helping with crop recovery as intended and discuss future R&D needs to best address the risks they face.

CRDC Chair Mike Logan travelled with the Board to Emerald and said the most promising thing he saw in the north was attitude.

"The group is young, creative and is looking to the future," Mike said.

"It is groups like this who have driven our industry and its research effort for years. The interesting thing about the Queensland floods has been the ideas and solutions that have been developed locally and tested on the ground in conjunction with the Cotton Industry Development and Delivery Team (D&D Team).

"The D&D team work face-to-face with the growers and consultants who have been thinking through solu-



ABOVE: The CRDC Board and management met with local growers at Emerald in early June where they heard first hand how effective the industry's flood response was for them personally.

tions. CRDC's role has been to support the team with R&D knowledge and resources that can assist growers.

"This is a good model for issues based research – let the locals who are facing the issues have the resources and capacity to drive and test their own solutions. Then we can all share in the outcomes."

A project to assess different methods of managing flood-affected crops to reduce crop loss and ascertain the best post-flood management techniques was commissioned by CRDC immediately in response to the flooding. This involves local consultant Jamie Iker working with researchers Paul Grundy (Qld Department of Employment Economic Development and Industry), Stephen Yeates of CSIRO and D&D Team Specialists.

Bruce Finney said in commissioning this project, reducing crop losses was the first and most important goal.

"Paul and Steve's previous research into management of cotton in the Burdekin region of northern Qld was invaluable during this time, as many of the scenarios the growers faced had been investigated in the high rainfall Burdekin," he said.

"With these small on-farm research projects comes the opportunity to learn how to best manage flood damaged cotton crops but the longer term goal is to assess the value for a regional R&D program in Central Queensland.

"Whether you're a grower in Emerald or Warren, industry R&D has been and remains critical to driving industry productivity growth, preparedness for change and risk management.

"There is no more powerful model for applied R&D than researchers work-

ing with growers and consultants. This is why CRDC has commenced an initiative to enable regional Cotton Grower Associations to develop projects that meet specific local R&D needs."

Minister for Agriculture, Fisheries and Forestry, Senator Joseph Ludwig has welcomed the collaborative effort of the cotton industry in responding to the northern floods.

"The collaborative response of the Australian cotton industry to the recent devastating floods in northern New South Wales and southern Queensland was positive," he said.

"It shows the value of industry research, development and extension, particularly in times of crisis."

In tabling the Federal Government's response to the Productivity Commission's report on rural R&D in early June, Minister Ludwig confirmed the government's support for R&D.

"Research and Development plays a vital role in supporting the sustainability, competitiveness and productivity growth of Australia's rural industries, particularly in the face of natural disaster," the Minister said.

"The Australian Government continues to play a key role in addressing market failures and supporting productivity growth through co-funding R&D. In 2009-10, the Australian Government contributed more than \$220 million in matching funding to the rural research and development corporations in 2009-10.

"The government is committed to maintaining the current level of funding despite recent recommendations of the Productivity Commission to reduce government contributions."



Soil in severely flooded and waterlogged fields may need special attention, as demonstrated by this field in the Emerald region.

CHALLENGES FOR POST FLOOD FIELD MANAGEMENT

COTTON INDUSTRY D&D TEAM CROP NUTRITION SPECIALIST DUNCAN WEIR EXPLAINS HOW SOIL IS AFFECTED BY LONG TERM WATER LOGGING.

Many cotton production areas, particularly in the northern regions have suffered unprecedented flooding and waterlogging events this season.

Along with the extensive damage to infrastructure and crop losses, there have been significant less obvious impacts on soil structure and fertility.

PHYSICAL IMPACT ON SOIL

Large volumes of water moving across farming land can cause gulying, scouring, sheet erosion, silting and soil deposition. The damage can be remediated through land works and re-levelling. However, many farmers have experienced compaction, dispersion and crusting of their soil following the flooding.

These impacts can be explained by the very low salinity of the flood water that reduces the electrolyte concentration in the soil.

Low soil electrolyte concentration activates sodium and magnesium, which results in dispersion of the clay. When this happens, the weight of flood water on a saturated soil in a dispersive state and the deposition of silt sized particles filling soil surface pores results in compacted soil.

Short term remediation of these soils can be difficult.

Light cultivation and growing a crop (eg wheat or vetch)

to add organic matter may be beneficial in breaking up the surface compaction. Given time, the leached salts will move upward in the evaporative stream to remedy the problem.

SOIL FERTILITY IMPACT

The flooding, and more importantly long periods of waterlogging have had major impacts on soil health and fertility.

Some fields may have been waterlogged, or at least soil saturated, for as long as eight weeks.

“Soil tests conducted following the flooding has shown that there has been extensive depletion of soil nutrients throughout the entire soil profile,” Duncan said.

“Nitrogen (N) levels are of considerable concern, with soil tests indicating that the nitrogen has been lost from the system, either leached to the subsoil or denitrified and lost to the atmosphere.

“Soil tests show that very little N remains in the subsoil and much of the N applied has been lost from the soil.

“The implications of this are very important for future cropping programs.



“Unlike previous seasons where growers could rely on historical information, cropping history and experience to develop a fertiliser program, it will be critical for growers to undertake soil testing and crop monitoring to ensure the nutritional needs of following crops are met.”

Thanks to Chris Dowling, Mike Bell, Chris Guppy, Ian Rochester, and David Lester for their input into this article.

Duncan Weir
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TAKE TIME TO KNOW YOUR SOIL

ANALYSIS LEADS TO HEALTHIER SOIL AND PROFITS.

Crop nutrition and soil management are as important in optimising returns and managing long-term sustainability as pest, disease or water management.

The best way to ascertain the status of soil health and make correct decisions is through soil and leaf testing.

“Growers would not apply an insecticide to a crop before it has been checked and the same reasoning should apply to fertilising a crop,” says Duncan Weir, who is the Cotton Industry Development and Delivery Team’s Soil and Crop Nutrition Specialist.

“Soil and leaf testing and analyses provide growers with quantitative information from which informed decisions can be made on crop nutrition, fertiliser programs and other cultural practices.

“Soil testing and analysis will allow growers to identify possible subsoil constraints that may impact on production, such as sodicity or salinity problems.

“Over a period of time it allows growers to build a picture of soil fertility trends and they can adjust management practices to prevent unexpected problems developing in the future.”

Leaf analysis can provide growers with important information on the nutritional status of the growing crop. In some cases it will allow early identification of emerging deficiencies before the plant shows physical symptoms, giving maximum opportunity for reme-

WHERE TO GET TESTED

Growers must be careful in the selection of which laboratory they use to conduct soil and leaf analyses.

Any laboratory used should be registered by the National Association of Testing Authorities (NATA) and use Australian standard methods, be involved in Proficiency Programs and have performance and results available, have external audited Quality Assurance, have a quality result reporting structure, provide guidelines for sampling and sample handling.



WHEN TO SAMPLE

“Soil testing is a very valuable tool used in developing crop nutrition programs and fertiliser plans for my clients,” says Darling Downs consultant Matthew Holding. “It is however critical to follow strict sampling and testing procedures in order to achieve accurate results and be confident in making recommendations.”

IN BRIEF:

- Soil sampling is best done May to August or at least a couple of weeks prior to fertiliser application.
- Very important to follow recommended guidelines for sampling and handling.
- It is recommended that soil sampling be done at the same time each year and preferably in the same location within the field. This allows a uniform history to be built up over time.

dial action in the current crop season.

“Even when used retrospectively, to identify the cause of poor growth in all or part of a paddock, tissue testing is useful as the information will add to the knowledge bank and improved fertiliser strategies for that paddock/soil type in the future,” Duncan said.

“Growers should know the nutritional status of their soils before they apply fertilisers as this represents a major production cost and getting it right can significantly improve returns.”

Knowing the nutritional status of the soil and developing a fertiliser program to meet the expected crop demand can reduce the risk of over or under fertilising the crop.

Both situations can result in significant yield losses, crop management issues and financial losses.

Over-fertilising can have major impacts on plant growth and yield.

For example, over-use of nitrogen promotes excessive vegetative growth, lower boll set, desiccation problems, trash issues at harvest and poorer quality lint. Over-fertilising reduces fertiliser efficiency and increases the cost of production.

Under-fertilising, or using the wrong fertiliser product to address the main nutrient limitations in a paddock doesn’t allow the crop to meet its full yield potential.

Using the wrong fertiliser product will also result in poor fertiliser use efficiency and unnecessary production costs.

For more information on where to have soil and leaf tested, contact Duncan on 07 4688 1602. <mailto:duncan.weir@deedi.qld.gov.au>





Competition for water is a huge driver for how the future of agriculture will look and was a strong message at a primary industries' climate change conference attended by CRDC Program Manager Bruce Pyke (below).

STAY ON TOP OF CLIMATE CHANGE

AT A CLIMATE CHANGE CONFERENCE THIS YEAR CRDC'S BRUCE PYKE HEARD HOW AGRICULTURE NEEDS TO IMPROVE PERFORMANCE IRRESPECTIVE OF CLIMATE CHANGE. TRISTAN VISCARRA ROSSEL REPORTS.

In February 2011, the first national conference organised by the National Climate Change Research Strategy for Primary Industries (CCRSPI) was held over three days in Melbourne.

CRDC's delegates, CRDC General Manager R&D Investment, Bruce Pyke and CRDC Director Lisa Wilson were among 300 delegates from around Australia.

Bruce Pyke said the conference covered many key areas of R&D as well as policy and integration issues related to climate change affecting primary industries. There were 80 presentations and a number of topical plenary presentations and discussions from which to choose.

Bruce said a particular highlight was the inclusion of a farm case study presented by a farmer at the end of each session.

"It was an effective way to demonstrate how farmers are dealing with the uncertainties of climate change and the policy responses to it," Bruce said.

The conference provided an opportunity for many researchers to present their most recent results or the progress made on their particular project to a group of peers.

Of the many interesting things he heard, Bruce says a presentation by John Langford, Chair of the Murray-Darling Freshwater Research Centre, highlighted in a new way what was unusual about the drought in the Murray-Darling Basin over the last decade.

"Dr Langford's presentation included a chart of Murray-Darling Basin measurements showing the number of months per year classified as 'wet months' - that is rainfall above the 90th percentile," Bruce said.

"From the mid-1990s until 2010, there were no wet months recorded in the Murray-Darling Basin. That's 15 consecutive years; a period unlike any previous drought in recorded history."

Bruce also said that the presentation 'Farming and food systems for a carbon, water, energy and nutrient constrained

world' by Professor Andrew Campbell from the Research Institute for Environment and Livelihoods "pulled no punches".

"Basically, rural landscapes are more contested and squeezed between the major drivers of climate, water, energy and food. Faced with no options other than moving forward, Campbell declared that we needed a third agricultural revolution," Bruce said.

"His ideas included development of 'closed loop' farming systems that did not leak water, energy, nutrients, carbon, biodiversity or young people, as well as smart metering, sensing, telemetry, robotics and guidance, a better understanding of soil carbon and microbial activity, reducing waste in all parts of the food (or fibre) chain, and producing renewable energy within farming systems.

"Professor Campbell spoke at length about transitioning to carbon-neutral, energy-positive, water-smart rural landscapes.

"His vision was to integrate forestry with farming, rather than replacing agricultural land with large monoculture plantations, to create 'carbon-plus' agricultural food and fibre products.

"This would necessitate significant offsets being built into farming systems, creating benefits for habitat, micro-climate, aesthetics, water quality, shelter, bioenergy and carbon.

"The take-home messages from his talk were that Australian land use, farming and food systems need to improve performance, irrespective of climate change, and that this is creating exciting new opportunities for the research community and agricultural industries across Australia."

The discussions confirmed that



the CRDC needs to continue along its pathway of investing in research on energy use, as well as developing other practical ways for growers to improve their resource use efficiencies to reduce their carbon footprint while continuing to improve production.

"Our preliminary research suggests that greenhouse gas emissions from Australian cotton crops are equally divided between energy use and soil emissions," Bruce said.

"The CRDC is continuing to invest in ways to better integrate improvements in cotton's water use, nitrogen and energy use efficiencies in the next few years."

Initial feedback from delegates and organisers supports a second CCRSPI conference in 2013.

PowerPoint files and audio are available at www.theccrspiconference.com.au.



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REALISING LOWER ENERGY USE

RESEARCH IS INCREASING OUR UNDERSTANDING OF THE RANGE, COSTS AND CONTRIBUTIONS OF ENERGY USE TO COTTON PRODUCTION AND GREENHOUSE GAS EMISSIONS.

TRISTAN VISCARRA ROSSEL REPORTS.

Direct energy inputs such as diesel and electricity are major costs in highly mechanised production systems, such as cotton growing. They also account for a significant proportion of the total greenhouse gas emissions from cropping systems.

National Centre for Engineering in Agriculture (NCEA) Deputy Director Craig Baillie is undertaking research into energy use, and says on the average irrigated cotton farm the main energy uses were pumping irrigation water, heavy tillage and harvesting.

However, he said, there were significant opportunities for irrigators to reduce energy use and costs.

"If I was an irrigator, I'd be looking at how I could improve energy use through irrigation management and pumping systems," Craig said.

"Energy use from irrigation in previous work has been observed to be as high as 60 to 70 percent of total energy use. It's generally the highest energy use."

New assessment method

The NCEA is developing a methodology to evaluate on-farm energy use. It involves three levels of assessment:

Level 1 (preliminary audit) – a collation of total on-farm energy use, using total fuel and total electricity consumed.

Level 2 (standard audit) – a breakdown or itemised account of energy use across the farm.

Level 3 (detailed assessment audit) – a detailed analysis, concentrating on specific aspects or a single process (eg irrigation pumping).

A farmer may progress from Levels 1 to 3, or undertake any level of assessment to gain insight for subsequent management decisions.



Recent developments

The NCEA's methodology is supported by EnergyCalc (www.kmsi.ncea.biz), a web-based tool that assesses direct on-farm energy use, costs and greenhouse gas emissions associated with the consumption of diesel, petrol, LPG and electricity.

The NCEA has made some changes to the EnergyCalc software, such as automatic report generation (in PDF format) to include summaries of machinery inputs and on farm energy use in the farming system and performance indicators for benchmarking on-farm energy use.

Other developments include an exporting feature allowing the user to manipulate data in an Excel spreadsheet. A 'lighter, introductory' version of the tool is also being considered, along with how existing farm management tools (eg PAM) can provide information for energy assessments.

By undertaking the multi-level assessment and using the supporting tools (ie EnergyCalc), Craig said farmers would discover plenty of areas to start saving energy and money.

"Potential strategies for energy and costs savings could include fuel switching, tariff negotiation and managing energy demands (efficiency)," he said.

"These opportunities become more evident once you start monitoring energy inputs.

"Given the significance of irrigation in the on-farm energy equation, you could employ practical measures such as checking pump performance and improving water use efficiency. Another

practical measure is modifying how tractors operate to achieve savings."

In highly mechanised, irrigated farming systems, Craig said reducing energy use appeared to be as important as improving nitrogen efficiency when it came to greenhouse gas emissions.

In irrigated agriculture, direct energy use may contribute as much greenhouse gas emissions as generated by nitrogen fertilisers.

Growers assisting research

A number of cotton growers are assisting the NCEA, including Phil Firth from Wee Waa. He said that talking about energy use as part of the project was good discipline.

"It's making me think more about energy use on the farm, and we will do what we can to reduce it," Phil said.

"I also hope to benchmark our farm's energy use against others on a per bale basis."

Phil's main uses of energy are diesel for tractors to complete groundwork and electricity to pump irrigation water from many bores across his property.

Another participant is John Hamparsum from Breeza in NSW. His biggest energy input is electricity, predominantly used to pump irrigation water from bores and surface water storages.

"We have been focusing on energy use for some years now, but participating in the project has highlighted where the big costs are located, and how things could be done more efficiently," John said.

"Sometimes the pain of change is too great, but we hope to work out ways to improve energy efficiencies and put them into action."

Cotton grower Phil Firth discusses ways to reduce energy use on farm with NCEA Deputy Director Craig Baillie, who is researching ways to help all growers achieve this.

"IT'S MAKING ME THINK MORE ABOUT ENERGY USE ON THE FARM, AND WE WILL DO WHAT WE CAN TO REDUCE IT..."



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SCHEDULING IRRIGATION FROM SPACE

TRISTAN VISCARRA ROSSEL LOOKS INTO HOW AN ONGOING PROJECT FUNDED BY CRDC AND INDUSTRY & INVESTMENT NSW COULD CHANGE THE WAY AUSTRALIAN COTTON GROWERS SCHEDULE IRRIGATION.

Griffith-based researcher with CSIRO Land & Water, Dr John Hornbuckle, has been trialling a system that monitors irrigated crops using satellite imagery and on-ground measurements of evapotranspiration.

John has been delivering the service to horticultural growers in southern Australia for the past two years, and last cotton season, he trialled the service with 10 consultants in the Gwydir Valley in Northern NSW. He explained how the system works.

“There are two sources of information that we routinely collect; on-ground weather information and satellite information that’s updated every seven to 14 days,” he said.

“With the satellite, we are measuring individual images down to a 30 by 30-metre basis of our clients’ individual crops.

“Every day, we measure the variables that drive water use for the crop at that particular stage, work out how much water the crop has used and send that information back to irrigators.”

For growers, the biggest benefit of this system is hoped to be its low cost.

While the price has yet to be determined — John said they hoped to commercialise the service within the next two seasons — the satellite data is available free of charge.

Another benefit is that the system detects spatial variability across the farm, which ties in well with existing technology like soil moisture probes.

“If you only have 10 (soil moisture) probes but you’ve got 50 paddocks, this approach could be used to fill the gaps in those paddocks that are not being measured by the probes,” John said.

“Potentially, the service could also be used for benchmarking water use and yields on cotton crops.”

John said that as each satellite image was approximately about 200 x 200 km, it covered a large area. By collecting end-of-season yield data the service could calculate production functions for benchmarking different paddocks.

The science that drives the system derives a crop coefficient for each paddock using the satellite image and constraints for management, soil, water and salinity. This crop coefficient is multiplied by evapotranspiration measurements to estimate crop water use in that paddock.

The evapotranspiration data is obtained from on-ground weather

stations installed in the Gwydir area (<http://weather.irrigateway.net>) or from the Bureau of Meteorology’s Water and the Land (WATL) website, formerly called SILO.

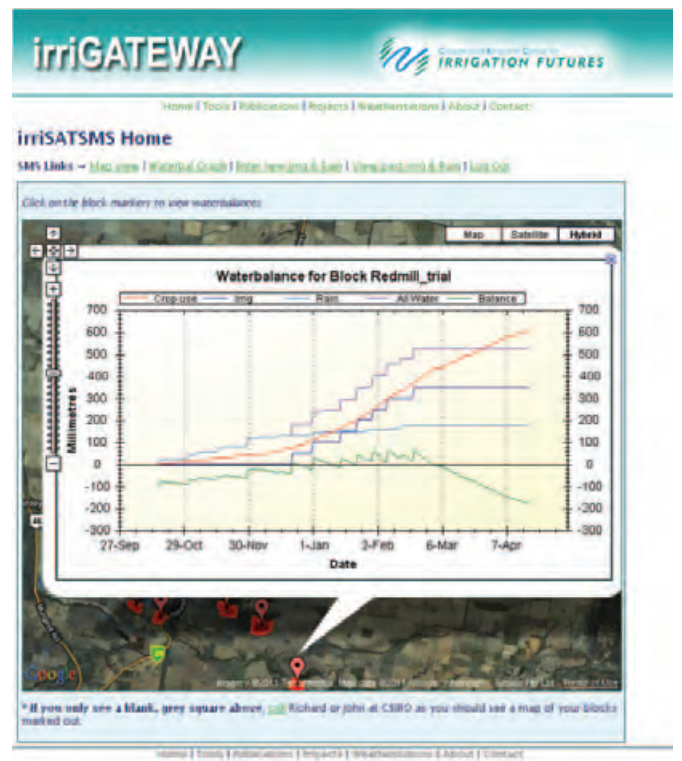
Dr Hornbuckle illustrated how the remote system accounted for crop management constraints when calculating crop water use.

“For instance, the system will incorporate whether you’ve got skip row or fully irrigated cotton because the satellite detects that in individual paddocks, the plant response is different; we can pick up the differences in water needs based on those management constraints.”

For horticultural growers that have only one or two blocks to irrigate, the service offers an SMS alert. This has not been possible for cotton irrigation consultants who frequently manage up to 50 blocks at a time, and require much more information that can be delivered via SMS.

Instead, they can access all the information they need — crop coefficient maps, weather station information, etc — directly from the IriGATEWAY website (<http://www.irrigateway.net>).

At this stage the project is a feasibility study in cotton but independent benefit-cost ratios completed for the Grape & Wine Research Development Corporation for the wine grape industry were very good. John said this indicated that similar benefits could be achieved in other crops and other irrigation areas.



ABOVE RIGHT: Paddock specific crop water use and scheduling information is updated daily and delivered via a website interface.

RIGHT: Griffith-based CSIRO researcher, Dr John Hornbuckle, has been trialling a remote irrigation service in Gwydir region cotton crops.



“WITH THE SATELLITE WE ARE MEASURING INDIVIDUAL IMAGES DOWN TO A 30 BY 30-METRE BASIS OF OUR CLIENTS’ INDIVIDUAL CROPS.”



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<http://www.irrigateway.net>
<http://weather.irrigateway.net>



John Hamparsum's family has been testing the groundwater continuously for 46 years on their property on the Breeza Plains of NSW.

TESTING THE WATER

AT GROUNDWATER WORKSHOPS IN THE NAMOI VALLEY RECENTLY THE MAJOR RECOMMENDATION WAS TO HAVE GROUNDWATER TESTED AT THE LEAST ONCE A YEAR, IDEALLY AT THE VERY START OF THE IRRIGATION SEASON.

An annual groundwater test should be a full irrigation analysis through an accredited laboratory. Added to this, regular in-season testing conducted by growers themselves helps identify trends in resource condition throughout the season.

By keeping records year to year, any changes in the groundwater resource will be easier to identify and farm management of the groundwater resource and water quality will help achieve maximum crop yields.

Upper Namoi cotton grower John Hamparsum is setting the benchmark for sustainable management of his farm's groundwater resources through regular monitoring of bore water levels and water quality.

John is the second generation to farm at "Drayton" on the Breeza Plains. His father Ian began farming there in 1961 and it was four years later the farm's first production bore was commissioned.

What is outstanding is that the Hamparsums have continually monitored their farm bores since the first bore was drilled, giving them 46 years of water records.

Today, 11 bores have their standing water level measured at least both pre and post-season. Three bores have a full irrigation suite of water quality tests done annually through a NATA (National Association of Testing Authorities) accredited laboratory. John can also do on-farm water quality

testing and monitors the surface water used on farm using inexpensive hand-held EC meters.

"When asked what parameters had been tested back in 1965 John produces a folder with handwritten laboratory reports from that year right through to current printed reports for testing this season," said CRC Catchment Officer Pete Verwey, who works with growers in the Namoi to assist them with resources to successfully implement natural resource management activities.

"All results have been entered into spreadsheets for backup and to also graphically show changes over time. Other related records kept are climate and rainfall data, and bore construction details."

Pete said from the graphs it is clear to see trends such as extra drawdown during drought periods as well as periods of recharge during wetter years. Another trend is a small but noticeable increase in EC from an untouched system to an extracted system.

John said he sees regular testing and well kept records as a powerful tool for sustainability on the farm.


The groundwater resource changes over time and with land use change and increased pressure from more bores being drilled for other types of industry. Mining in the area is one of

the newest and groundwater is being carefully monitored for any changes.

"Some years you just get busy and feel you don't have time to do the testing, but you just have to make sure that as you start the bores up to make the time and always do the tests," he said.

"All irrigators are interested in the water they are using, and with regular monitoring and record keeping the data they collect will be there for future generations to help them sustainably manage their farm," he said.

For more information on presentations from the groundwater workshops go to the Cotton CRC website, www.cottoncrc.org.au and follow the links on the "Catchments" home page.

Other water quality tools available for growers are available through NSW Office of Water's on-line, real-time groundwater database, CottASSIST water quality tool and *myBMP*. 



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BRIGHT FUTURE IN SCHOLARSHIP WINNERS

CRDC is pleased to announce the 2011 winners of the UNE Cotton Production Course scholarships, they are Trevor Gray, St George, Thomas Sandow, St George, Kieran O’Keeffe Coleambally and Nick Goodhew, Toowoomba.

All applicants share a passion for the industry and cite improving their knowledge and capacity to advance their own skills along with the industry as reasons for applying for the scholarship. Cotton growers, consultants, trainees, agronomists, cotton processors, researchers and existing students were all encouraged to apply for the scholarship to a course designed and written by experts in the cotton industry.

NICK GOODHEW

Nick applied for the CRDC/UNE scholarship after reading about it in an issue of *The Australian Cotton grower* magazine.

“It got me thinking about the Cotton Production Course,” Nick says, “It will complement and formalise my knowledge and 13 years of experience to date in various cotton roles.”

Nick has considerable experience across many sectors of the industry and his chosen sector of employment for more than 10 years.

“I really enjoy working in the cotton industry, it is a very rewarding environment, satisfying me personally, professionally and socially,” he said.

With his strength in economics, Nick believes the cost pressure points in the industry often go unnoticed by those who do not directly pay for them.

“While I have substantial experience (both on farm and post farm gate) in the industry, I’d really like to gain a thorough understanding of exactly how the cotton plant grows,” he says.

“Growing crops fascinates me, and through studying the cotton course in tandem with my studies towards accreditation with the Institute of Chartered Accounts, I would be skilled with sound qualifications to aid in the benchmarking of existing production efficiencies within the various farming systems.

“Additionally, environmental auditing could be comparatively analysed, along with energy use from seed to fibre and compared to other resource-based industries such as coal mining and coal seam gas production.

“By applying for this scholarship I am putting up my hand to help meet the industry’s challenges. I have some experience, but there are gaps in my knowledge, which I am confident can be filled by studying the Cotton Production Course.”



KIERAN O'KEEFFE

As Kieran O'Keeffe says, it is important for his ongoing career in agronomy to keep up to date with the latest technical information and changing crop production in his region.

Since July 2002, Kieran has been the Industry and Investment NSW District Agronomist at Coleambally in South-West NSW, a region where cotton is becoming established as a cropping option.

"The course will provide a good technical base for me to assist the emerging cotton industry in the Murrumbidgee and Coleambally Irrigation areas," Kieran said.

"I see cotton as an important crop option in our southern irrigation farming system. I currently have a good extension network and regularly hold grower discussion groups focusing on rice, soybeans and maize, however this season has seen a strong swing into cotton with the Riverina, going from 3000 to 23,000 hectares.

"I have worked with industry people to hold cotton walks

through the current season with up to 50 growers attending the sessions and I do see there will be continued interest with southern growers entering the cotton industry.

"In my role I have the ability to transfer information direct to growers and agronomists with regular grower meetings, newsletters and e-mail contact. This will directly benefit the irrigation communities of the Riverina. "These communities are currently dealing with a lot of change and adjustment. Improved access to technical information will be important to help changes in southern irrigation farming systems."

Kieran's study will also mark the start of his Masters degree, and said he has found the cotton industry to be well organised in research adoption and he had heard good feedback about this course.

"The greatest benefit to me personally will be the range of contacts I will make through the course," he concluded.



TOM SANDOW



Tom Sandow says completing the Cotton Production Course has always been on his 'to do list' since becoming involved in the industry straight after leaving school.

His current employer, consultant Jamie Street, strongly encouraged him to apply for the scholarship. Tom's family has a property in the Wyaga district east of Goondiwindi and farming has always been of interest to him, in particular agronomy.

Now, as an industry trainee consultant, working with Jamie in St George and surrounding districts, Tom's role entails all things to do with the business of consulting and feels the course will help in his current and or future employment and would be a valuable tool in reinforcing what is learned in the field.

"I think that the Cotton Production Course would greatly complement the current practical experience I am gaining with a sound theoretical base," he said.

"It will also assist in gaining an understanding about the theoretical components of

cotton growing.

"Through the completion of this course I hope to gain a greater understanding of the plant itself and therefore work towards a goal of achieving the best outcome for the growers as possible.

"I also hope that I will form personal and professional relationships with like-minded people within the industry.

"Leading up to this season the cotton industry has had a number of very lean seasons primarily due to drought. This has created capacity gaps within the industry and these gaps include a lack of young agronomists/consultants coming through in the cotton industry.

"Therefore I believe that someone like myself would be of benefit the cotton industry as a whole by furthering my education and career within the cotton industry, in particular in the area of agronomy.

"With the support of the CRDC I believe I can be of benefit to and an asset of the cotton industry for many years to come."

TREVOR GRAY

Although having worked in the industry for just two years, Trevor Gray "plans to finish my working life in this industry" and sees the Cotton Production Course as a way of achieving his goal of managing or owning a cotton farm.

"My focus to date has been finding a vocation that fits well with my family's community ideals, and it would appear that I have found a vocation and a location that suits our family," he says.

"I'm currently employed in the practical application of cotton farming and by completing this course I will have the knowledge and understanding of cotton production and the reasons why decisions are made. This will enable me to be more confident in the work I do and it

will also make me more employable.

"It is also a personal goal to either manage or own my own cotton farm and this course will put me in a better position to be able to achieve this."

Trevor says he has enjoyed being involved in trial work on farm and has attended any field days on offer since starting his employment, which he says has "given the opportunity to contribute back at a local level".

"I believe that the level of cotton production education for employees is critical to the day to day operations on the farm," Trevor said.

"After completing the course I can better contribute to the industry R&D that is currently done on the farm."



2nd Sustaining Rural Communities CONFERENCE 2011



[1] Presenter Paul Cruickshank, DECCW Renewable Energy, Graeme Harris, Farrer Agricultural High School, speaker and Federal MP for New England Tony Windsor and Saan Ecker, ABARES Social Sciences Manager.

[2] Associate Professor Stephen Winn, whose recent work includes using technology to proved access and engagement for people in regional, rural and remote areas with Elaine Eather, Boggabri and Sally Knight, Narrabri.

[3] Archeologist Wendy Beck and presenter Frances Andreoni, Namoi CMA.

[4] Peter Kennedy and presenter Dr Joanne Everingham, Post Doctoral Research Fellow at the Centre for Social Responsibility in Mining and the University of Queensland.

[5] The panelists - Eastern Star Gas General Manager Robert Petersen, Cotton Australia Chair Andrew Watson, North West Advisory Group's Russell Stewart, Fiona Simpson, Executive Councillor NSW Farmers' Association, Narrabri Mayor and local businesswoman Robyn Faber, NSW Coal Sub-committee of



[1]

the Mining and Construction Industry Training Body Chair Gerry McDonald and CEO NSW Minerals Council Dr Nikki Williams. The panel was asked a series of questions by facilitator Helen Dalley.



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SHARING KNOWLEDGE AND INSPIRATION

THE COTTON RESEARCH AND DEVELOPMENT CORPORATION AND THE COTTON CRC HAVE SHOWN THEIR COMMITMENT TO THE FUTURE OF RURAL COMMUNITIES THROUGH CONVENING THE SECOND SUSTAINING RURAL COMMUNITIES CONFERENCE IN NARRABRI ON APRIL 5 AND 6. THIS YEAR'S THEME WAS "TRANSFORMING REGIONAL AUSTRALIA".

CRDC co-convenor Rohan Boehm said the cotton industry believes that strong and resilient communities are needed to support strong industry and vice versa. As such, the two are inextricably linked, he said.

"It was clear throughout the conference as demonstrated by the speakers and comments from participants that people are the most important asset of any community," he said.

"Secondly, it was clear that people are at their best when working together, through different organisations to achieve common goals. The cotton industry believes in strong and resilient communities are a key force for sustainable industry.

"The conference provided a platform for idea sharing, collaboration, networking and inspiration for people to take the practical ideas and concepts back to their communities and put them into action with the aim of reinvigorating or maintaining vibrancy, services and the future of their towns and communities."

The conference brought together 270 participants. Speakers and representatives came from most rural industries from all over Australia.

"What was clearly shown is the advances communities can make by encouraging diverse groups working jointly – at the Conference, mining, broadacre agriculture, education, local government and small business demonstrated the benefits of diversity



Parkes Elvis Festival Manager Maria Chetcuti was interviewed by Helen Dalley and told conference participants how the people of the regional town of Parkes have rejuvenated the town's tourism with the Elvis Festival - which has grown to attract more than 10,000 people to the annual event.

in solving local and regional issues," Rohan said.

Discussions took place as to how different industries, for example mining and agriculture could work together for the betterment of generally smaller, regional communities.

Key speakers included Independent Federal Minister for New England Tony Windsor, Chair of the Murray Darling Basin Authority Craig Knowles, sociologist Dr Anthony Hogan and a long list of experts in the fields of sustainable energy, education and research.

The two-day event also included small group workshops with speakers covering topics such as diversification on-farm, health, education and technology. It concluded with two forums hosted by Sky News Business Channel journalist Helen Dally.

The first panel of speakers involved a diverse group from the NSW Minerals Council, NSW Farmers' Association, Cotton Australia, local business people and mining companies, who spoke about how these industries can work together for the betterment of the communities they are part of.

The second panel session was titled "Let's go Regional" and included interviews with facilitators of some successful regional events in Australia

which has reinvigorated the towns they inhabit, including the Parkes Elvis Festival and Boggabri Drivers' Camp Fire Weekend. These discussions outlined the keys to success, challenges and secrets to longevity.

Again this year grants were made available to individuals or organisations who had ideas or concepts to help their communities.

There are grants still available valued at \$2000 for community based projects which are aimed at the implementation of community projects which assist in increasing the sustainability of our rural communities.

One or more grants of \$5000 are available for community based projects which are aimed at better understanding how new or existing technologies can shape and benefit regional communities.

For more information about the grants contact Paula Jones at the Cotton CRC on 02 6799 2477.

For those who could not make it to the event, but are interested in finding ways to sustain their communities, all presentations are available for download from the Cotton CRC website at www.cottoncrc.org.au



2nd Sustaining Rural Communities CONFERENCE 2011



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[6] Adrian Davis and Brendan Fox of Farmplus.

[7] Program Management Director Meg Michelle and UNE Researcher Philip Thomas.

[8] Anna Hanson, Western

CMA Bourke, Border Rivers-Gwydir CMA's Beth Ozolz of Moree and Alyson Forster, Border Rivers-Gwydir CMA, Inverell.

[9] Rural Financial Counsellor Julie Roy and Warialda grazier Jillian Wood.



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[10] Organisers Rohan Boehm, CRDC Communications Manager, Cotton CRC Program Director Paula Jones and Grains Research and Development Corporation's Tom McCue.

[11] Penny Smith is a resident and Community Development Officer of Loxton-Waikerie shire and has overseen many initiatives to keep the region vibrant and attract visitors. She shared her experiences with conference goers

through an interview with Helen Dalley, presenter and facilitator with FOX Television.

[12] Olive Hood, University of Qld and Rosie Hannah, Department of Environment and Resource Management.

[13] Dave Anthony, CRC Program Director Paula Jones, Murray Darling Basin Authority Chair Craig Knowles and Cotton CRC Chief Executive Phil Armytage.



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[14] Robbie Sefton, Sefton and Associates, caught up with speaker Duncan Fraser, Vice-President NSW Farmers' Federation and Gabriell Cusak, CEO Regional Development Australia – Orana region.

[15] Trudy Staines, Cotton CRC and Narrabri Shire's John Clements.

[16] Bruce McCollum came from Goondiwindi to find ways and ideas to take back to his community.

[17] Carolyn Stone was one of last year's grant recipients and has gone on to form the South Burnett Community Foundation to help revitalize her community near Kingaroy, Qld.

[18] Kelly Foran is another champion of rural communities, having started a service called 'Friendly Faces Helping Hands' which links communities and

people to major health care facilities in cities.

[19] One of the most talked about sessions of the conference was Ian Plowman's "Meetings without Discussion" where conference participants learned how to get the best from themselves and a group in general.

[20a&b] 'Paws Up' is an initiative using working dogs to help young people in rural communities to reconnect with education and training – the team gave a demonstration on how to overcome hurdles – literally.

[21] Participants were people keen to help invigorate and sustain their local communities and came from near and far to hear and network with the enlightening speakers and other conference delegates.

AFTER ALMOST TWO DECADES IN THE AUSTRALIAN COTTON INDUSTRY, SPOTLIGHT'S **CHRISSEY BROWN** CAUGHT UP WITH GUY ROTH RECENTLY TO ASK ABOUT HIS EXPERIENCES AND CURRENT INVOLVEMENT.

Like many young agriculture students, Guy Roth's career in the cotton industry began in the mid 1980s as a cotton chipper, It was at Wee Waa in north-western NSW during university holidays.

"I must not have been very good at it as the following summer I was shifted to irrigating and tractor driving," Guy said.

"After leaving university I took on a farm hand job at "Telleraga" station near Moree with the aim of making a fortune so I could go backpacking around the world – which I did."

On returning from overseas, Guy spent the next two summers at "Togo Station", Narrabri doing a research Masters thesis on irrigation scheduling of cotton.

However, he said that drought in the early 1990s meant there was no work around at the end of his studies.

This led Guy to role in Sydney working as a ministerial advisor in soils and water management policy, which turned out to be good experience for someone who would later go on to be a strong advocate for Australian irrigation farmers.

More recently, Guy spent just under 10 years running the Cotton Course at The University of New England for the Cotton Cooperative Research Centre (CRC) then moved to Narrabri as a Program Manager at CRDC and Program Leader for Cotton CRC where he was part of the management group that developed and implemented the Best Management Practices (BMP) Program.

Appointed as Chief Executive Officer of the Australian Cotton CRC in 2003, Guy led the development of the current Cotton Catchment Communities CRC, which he says "placed greater focus on the community (social sciences) and natural resource management" aspects of the cotton industry.

Since leaving the Cotton CRC in 2007, Guy started Roth Rural & Regional Pty Ltd where he specialises in research services related to irrigation, water, soil and natural resource management for Australian agriculture and communities and is Manager of the National Program for Sustainable Irrigation (NPSI).

WRAPPED IN COTTON

A LIFE DEDICATED TO A BETTER INDUSTRY

Q&A

What is the National Program for Sustainable Irrigation (NPSI), which you are currently managing, and what are the key issues that the program is trying to address?

The National Program for Sustainable Irrigation is a joint venture of 14 organisations (government and industry of which CRDC is managing agent) who invest in irrigation R&D all over Australia. It has been one of the longest running cross industry sector R&D programs. Key aims of the program are to: improve irrigation water use efficiency and productivity and the ability to respond to changing levels of resource over time; reduce environmental impacts, improve sustainability, and create more prosperous communities; and improve skills and knowledge of people working in irrigation and enhance R&D capacity and collaboration.

NPSI is a cross-sector project - how do you see that this cross sector R&D will benefit the cotton industry and vice versa?

It is a cross sector program including projects in cotton, grains, rice,

sugar, citrus, wine grapes, vegetables, and other horticultural crops. All these industries are in essence trying to do the same thing; grow more product of better quality with optimised inputs while minimising their environmental footprint. While there are many differences between the crops and where they are grown much of the knowledge is generic such as irrigation scheduling tools. All industry sectors have common R&D problems like reducing evaporation, deep drainage, nutrient management so it seems sensible to pool resources to pursue R&D solutions. Cotton can learn from other high technology industries about intensive irrigation, fertigation, soil management etc. Others can learn from cotton for example about developments in surface irrigation technologies. A further benefit is that it brings together research managers across industries, which helps exchange ideas on common issues and stimulates new ideas for irrigation.

What do you see as the cotton R&D outcomes that have had the most impact on the industry in the time you have been involved?

The increase in yields from 6.5 bales/ ha to 10 bales/ha; the reduc-

Guy Roth says the cotton industry has a "can do attitude" which is rewarding to be part of.



workforce needs will be an important challenge for the industry.

Regional communities are the focus of another project you are currently managing. What is involved in the project and what are the objectives?

I'm involved in a few projects looking at what make regional communities tick and how they can optimise their future. I have been part of the CRC team, led by Paula Jones, that put together the Sustaining Rural Communities Conferences, which have been about implementing new ideas and actions. It is about finding solutions not problems. One thing that has become apparent from the other projects is how poor socio-economic data is on rural communities and I'm working on some social metrics for the cotton industry.

Do you have any particular career highlights?

Firstly I would say mentoring about 300 to 400 cotton industry people and undergraduate students as they undertook the cotton course at UNE. Teaching is a very rewarding profession, certainly in terms of doing something that can have a lifelong influence.

Secondly, a suite of activities related to managing riparian land.

Thirdly, leading the re-bid of the Cotton CRC in 2004 and pulling together the \$130 million proposal with a team of great people and is now the Cotton Catchment Communities CRC. As the name of the new CRC implies there was a significant broadening of our R&D activities and partnerships.

As a lecturer in cotton production at UNE you played a role in the professional development of many young people in the cotton industry, what would you say to young Australians involved in, or contemplating a future in, the Australian cotton industry?

I would say to any young person that a stint in the cotton industry will expose you to the "sharp end of agriculture" and even if you do not want a lifelong career in cotton, you will learn things and meet people in an industry with a strong culture of collaboration, sharing and innovation. You will be given more responsibility at an early stage of your career as well as opportunities to contribute at an industry level.

The cotton industry has a "can do attitude" which is rewarding to be part of. There is also a sense of spirit de corps in the industry. There are many different sectors of the industry that you will be exposed to and hence you will meet a wide range of people and make valuable contacts.



tion in pesticide use and Integrated Pest Management; and transgenic trait adoption for insects and weed management.

Some things sound pretty basic now, but my first R&D experiment was related to soil compaction and wheel track compaction. Soil management in general has come a long way since the 1990s.

The development and implementation of BMP had a significant impact on farm practices between 1999 and 2007. There has been a shift in thinking from bales per hectare to bales per megalitre and the industry is really focusing on making the most from the water available and there have been some large changes in attitudes and action on the ground relating to riparian land management.

In the future, what do you think will be the greatest challenges facing the cotton industry and what are some of the key things you believe the

industry is, or should be, doing to face these challenges?

If the insect pests developed resistance to the transgenic traits that will cripple the Australian cotton industry, so managing that is critical.

Water is clearly the issue of today. The industry will need to produce more with limited water. It also needs to better demonstrate how it is doing this. Therefore, the industry needs more robust data on a spread of farms/seasons related to various water metrics. The issues of water sharing needs resolving, The Murray Darling Basin Plan and associated water sharing plans, mining and coal seam gas, they all require a better policy framework.

Cotton's role in regional communities is changing. Where it may have once been "king" this is often no longer the case. Technology advances means it also no longer a large employer of unskilled people in remote locations. Regional communities and related

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WHERE TO WITH MARKETING OUR PREMIUM COTTON?

AT THE REQUEST OF COTTON AUSTRALIA THE CRDC HAS INITIATED AN EXTERNAL REVIEW OF THE STRATEGY FOR MARKETING PREMIUM AUSTRALIAN COTTON THAT HAS EVOLVED FROM R&D CONDUCTED THROUGH THE PREMIUM COTTON INITIATIVE (PCI).

The goal of PCI has been to explore the market opportunities for new Australian cotton varieties with superior quality characteristics produced under the industry's BMP program. Activities conducted over the last three years by the Australian Cotton Shippers Association, Cotton Seed Distributors, Cotton Australia, CSIRO and CRDC in partnership with a number of growers have highlighted the potential for creating and sharing additional value.

The review is critically examining:

- The purpose of marketing premium cotton – what is the need or opportunity?
- The strengths, weaknesses, issues, risks and factors likely to drive success for industry.
- Lessons from contemporary Australian and international textile branding strategies.



Grower Brendan Warnock shows consultant Kerryn Caulfield the finer points of cotton growing at Maules Creek in the Namoi Valley.


- The proposed implementation plans CRDC has been extremely fortunate in organising Brenda McGahan and Kerryn Caulfield to undertake the review.

Brenda is an experienced CEO, most recently of Australian Wool Innovation – the wool industry's R&D and marketing corporation. Brenda is an acknowledged leader in consumer marketing with a great depth of experience in building businesses by leveraging the strategic value in intellectual property and brand portfolios. She has led teams in merchandise, HR and marketing in multiple retail formats in apparel, homewares, consumer products, consumer electronics, financial services and agri-business.

Kerryn Caulfield heads up her own management and marketing agency,

Apical International, which specialises in association management. Kerryn worked in the fashion and textile industry for many years, including as a trade counsellor for the Australian Chamber of Manufacturers and as international business manager for Bradmill Textiles.

In addition to her "hands on" industry experience, Kerryn has authored numerous papers on themes within the fibre, textile and apparel industries including studies from "Technical Textiles" and "Composites", "Surf & Action Sports Apparel Market" to "Sources of Textile Waste in Australia".

By early July, the review will be completed and we look forward to reporting on the outcomes in future issues of *Spotlight*. 

FIELD TO FABRIC COURSE BURSARIES ON OFFER

The next Cotton Field to Fabric training course will be held at CSIRO at Belmont, Geelong from August 23 – 25 and with a \$1500 CRDC bursary it has never been easier or more affordable to attend.

For several years CRDC has been supporting people in the cotton industry to attend this course. This year three bursaries are available and CRDC Program Manager Bruce Pyke has strongly encouraged growers to apply, while consultants and other industry participants are also welcome to apply.


The F2F course is designed to give participants an overview of the entire cotton pipeline from farm to predicting fabric performance and is intended for anyone involved in the cotton

industry, from grower to technologist.

This training course was the recipient of the Cotton Co-operative Research Centre Annual impact in Adoption Award for 2007. It continually receives high praise from past participants who highly recommend it to people involved in the cotton, textile or fashion industries.

For further information about applying for a bursary, contact Helen Dugdale 0417 064 507 or <mailto:helend@northnet.com.au>

For general information about the course contact convenor René van der Sluijs at CMSE - 03 5246 4000 or

<mailto:rene.vandersluijs@csiro.au> or register at <http://www.csiro.au/resources/Cotton-Field-To-Fabric-Rego-Form.html> 



Australian Government

Cotton Research and Development

BOARD MEMBERS

WANT A LEADING ROLE IN AUSTRALIA'S COTTON INDUSTRY?

The Cotton Research and Development Corporation is the statutory authority that provides strategic support to industry through targeted investment in research and development. It is funded by levies from the cotton industry and matching funds from the Australian Government. The corporation is constituted under the *Primary Industries and Energy Research and Development Act 1989*.

The government is seeking to appoint five to seven non-executive directors to the corporation from 1 September 2011. Appointment to these part-time positions will be for up to three years.

The Cotton Research and Development Corporation works to foster a profitable and internationally competitive cotton industry by investing in research and development on a cooperative, partnership basis with industry participants, other research and development organisations and the general community.

The Strategic R&D Plan 2008–2013 sets out the framework for the current investment strategy. The plan is available on the corporation's website.

Applications are invited and will be assessed by a selection committee. Appointment is based upon the skills and experience of an applicant in one or more of the following fields:

- cotton production, processing or marketing
- management or conservation of natural resources
- science, technology or technology transfer
- environmental and ecological matters
- economics or finance
- administration of research and development
- business management
- sociology
- public administration.

Written applications should address the relevant fields of expertise listed above and be accompanied by a brief curriculum vitae that includes the names of three referees, career and personal details. Applications should not exceed four (4) pages. Applications should be submitted by email to:

**Ms C Hawkins, Presiding Member,
Cotton Research and Development Corporation Board Selection Committee**
Email: applications@cinnabarint.biz

Applications close on **Wednesday 13 July 2011**.

For more information regarding the CRDC please visit www.crdc.com.au.

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