COTTON RESEARCH & DEVELOPMENT CORPORATION

Spotlight on Cotton R&D

SPRING 2011

WISE CHOICES

A NEW LOOK AT PESTS AND BENEFICIALS

Best Practice

CONTENTS SPRING 2011

COVER PHOTO YVETTE CUNNINGHAM

Namoi Catchment Management Authority Officer Stacey Vogel and CSIRO's Sandra Williams put the new publication – *Pests and Beneficials in Australian Cotton Landscapes* – to the test at ACRI.

IN THE SPOTLIGHT

Spring heralds the start of another cotton season filled with promise and welcome challenges for the industry in finding the essential resources of people, equipment and services to plant what is forecast to be Australia's largest ever cotton crop. Making the most of this opportunity is both an individual and collective industry responsibility.

In this edition of Spotlight we focus on how growers can give their crops the best possible chance of success from the outset of the season. We have asked the Cotton Industry Development and Delivery Team to compile a list of helpful early season pointers and to highlight throughout the many resources available for growers, not least the latest publications – 2011 Australian Cotton Production Manual, Pests and Beneficials in Australian Cotton Landscapes, Pest Management Guide 2011 – plus a plethora of information in websites of the Cotton CRC, state departments of agriculture, CSIRO, CSD, Cotton Australia and CRDC.

Equally growers well understand that success often comes from managing the risk of things going wrong. So we have addressed a number of early season risks.

Integrated pest management is a key ingredient for good crop management and in particular we look at aphid control, concerns for emerging issues of resistance and the potential spread of cotton bunchy top.

Firing up CottonMap for a new season is an action that has proved to be one of the industry's most effective weapons against spray drift damage. Once again we urge all growers to map their fields and lessen the risks. We also urge resellers to make these CottonMaps available to all farmers using phenoxy-based products.

We also highlight a new project being run by Ian Taylor to address glyphosate resistance in weeds and the value of integrated weed management as a way to avoid this important issue.

We report on the successful Southern Cotton Expo and the strong interest in production of cotton in southern NSW is set to expand with forecasts of more than 40,000 hectares to be planted in the Riverina region this season. This expansion highlights the healthy challenge for CRDC and other organisations in meeting the R&D needs of growers throughout the industry.

Positively the increasing grower interest in *my*BMP is being well met by the efforts of the Cotton Industry Development and Delivery Team. We hope that you will enjoy reading the report of Breeza grower Andrew Pursehouse and his views having attended a *my*BMP workshop.

As we head into a new season and its challenges it's timely to reflect that on the importance of people to our industry success. Our cotton industry award winners demonstrate the Industry Vision characteristics we envision of capable, tough, responsible, successful and respected.

Further our culture of innovation stems from leading scientists, growers and consultants working together. You can see this with every Spotlight story. Whether it's the launch of 100 percent Australian cotton Dri Glo towels, the interview with Dr Brian Hearn or the story of the CSIRO team vying for one of the scientific community's most coveted prizes, the Eureka Prize for Innovation. It would be a great shame if we ever took these industry attributes for granted.

On behalf of everyone at CRDC I wish you great season of success.

Australian Government
Cotton Research and Development Corporation

Spotlight is brought to you by Australia's cotton producers and the Australian Government through the publisher Cotton Research & Development Corporation (CRDC).
CRDC is a research and development partnership between the Australian cotton industry and the Australian Government.
Cotton Research and Development Corporation
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Our vision: A globally competitive and responsible cotton industry
Our mission: Invest and provide leadership in research, innovation, knowledge creation and transfer.
Our outcome: Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community.
Corporate background: CRDC was established in 1990 under the Primary Industries and Energy Research and Development Act 1989 (PIERD Act.) which outlines its accountability to the Australian Government and to the cotton industry through the Cotton Australia. CRDC is responsible to the Australian Government through the Minister for Agriculture, Fisheries and Forestry, Joe Ludwig.
CRDC is committed to fulfil its legislated charter to: Invest in and manage an extensive portfolio of research, development and extension projects to enhance the ecological, social and economic values associated with cotton production systems and to benefit cotton industry participants, regional communities and the Australian community.
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GROWN IN AUSTRALIA'S BACKYARD

THE RECENTLY RELEASED DRI GLO AUSTRALIAN COTTON COLLECTION IS UNIQUE IN THAT PRODUCTS COME WITH MORE THAN JUST WASHING INSTRUCTIONS – EACH TOWEL AND SHEET COMES WITH ITS OWN AUSTRALIAN STORY OF WHERE IT WAS GROWN – AND BY WHOM.

To date, the Australian cotton towels are manufactured using Premium, Australian Long Staple cotton (Sicala 350B) grown in the 2009 and 2010 seasons by Glenn Rogan at St George, Queensland and woven in Australia's only towel weaving mill owned by Australian Weaving Mills, in Devonport, Tasmania.

The cotton for the Dri Glo sheets is grown using Best Management Practices by Glen Smith at Talwood in South East Queensland.

The official launch of these 100 percent Premium and Australian cotton products is the culmination of work started in 2008 through the Premium Cotton Initiative (PCI), which involved Australian Weaving Mills, CRDC, Cotton Australia, Australian Cotton Shippers, CSIRO and a number of grower partners who committed to growing new Long Staple varieties to enable sufficient production to test the technical and commercial value of the yarn and fabrics they produced. Also included were a number of partner spinning mills in various markets, including India, China, Thailand and Vietnam.

The PCI was initiated to investigate brand differentiation and premium markets for Australian Long Staple (ALS) and Premium cotton brands.

The Premium cotton brand is used for ALS cotton grown on *my*BMP accredited farms.

"The release of these products is a great outcome – to finally see quality Australian branded cotton products being marketed in a major retail outlet," Pete Johnson (former PCI chair) says.

"The work with AWM has been a fantastic learning experience, finding ways to work within existing commercial supply chains to come up with the right results.
"The team at AWM have indicated an intention to expand their range of Australian cotton products – but this will depend on consumer uptake, and ultimately the performance of our product once it leaves the store."

CRDC's Value Chain Investment Program Manager Dallas Gibb says this is something that will be of great interest to the Australian industry as a whole.

"The marketing message developed by AWM demonstrates their commitment to the Industry and the value of the *my*BMP program," he said.

"AWM promotional material highlights the benefits of buying premium Australian cotton as grown under Australia's Best Management Practice Program (*my*BMP) that leads to less water and chemical use.

"The use of the slogan 'Better for the environment, for farmers and better for you' provides a strong message to consumers about the industry and its modern practices.

"The industry looks forward to a strong future in working with AWM."

AWM's Marketing Manager Bronwyn Morgan says the links forged with the Australian cotton industry through the PCI has been a 'perfect fit' for the company.

"The Australian grown aspect of these ranges is the ideal extension to our story of Australian made," Bronwyn said.

"It makes a stronger story for us – and judging by the launch in Melbourne which Glenn and his family attended, the story was well received. For our retail customers to meet the actual farmer created a real trust of origin, which has been our aim with this initiative.

"We have had a great response, retailers are loving the human aspect of the story we are telling."

Recently the Victorian Myer homeware staff attended the launch at AWM's Melbourne showroom. The Myer staff were so taken with meeting Glenn, the actual farmer who grew the cotton in the Dri Glo towels, they were asking for autographs and having their photos taken with him.

"They loved his passion for the BMP initiatives and growing Premium Australian cotton," Bronwyn said.

The towels and sheets, their story and quality has such broad appeal, Bronwyn says their retailers customers have been drawn to them. The high quality of the Premium cotton is another aspect AWM is also immensely pleased with.

Cotton grower Glenn Rogan with his children Edward, 5 and Annabelle 4, at the AWM launch of Dri Glo towels and sheets in Melbourne in late July.

"We knew in theory we had premium cotton grown with best practices, but it is not until we started manufacture we realised how good this cotton is to handle," Bronwyn said.

"It is not until it is woven you know the true quality of cotton. Good quality cotton is important to us not just from the end product perspective, but also from an efficiency angle.

"With fewer cotton breaks we can weave more productively. Maintaining our efficient operations is paramount to remain competitive with overseas manufacturers, which in turn allows us to continue bring Australian grown and Australian made products to Australians."

Dri Glo Australian Cotton Bed and Bath Collections' selected ranges are available in Myer, David Jones, Harris Scarfe, Pillow Talk, specialty stores and on line at www.driglo.com.au

see our website

Stay tuned to Spotlight for special offers for cotton growers and industry staff from Dri Glo and AWM.

Further information

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PESTS AND BENEFICIALS FIELD GUIDE BOOK AN IPM BOOST

A NEWLY RESEARCHED AND PUBLISHED FIELD GUIDE TO PESTS AND BENEFICIALS IN COTTON LANDSCAPES HAS BEEN PRODUCED FOR THE INDUSTRY BY THE AUSTRALIAN COTTON INDUSTRY DEVELOPMENT AND DELIVERY TEAM.

PAUL GRUNDY

Green lacewing larvae camouflage themselves with the bodies of dead prey which they place on their backs- in this case mealybugs, but they are general predators and feed on other insects such as aphids, thrips and mites to name a few.

Working in collaboration with industry's leading researchers, the field guide authors, Sandra Williams, Stacey Vogel and Lewis Wilson worked hard to have 'Pests and Beneficials in Australian Cotton Landscapes' set up as a key help for growers and their agronomists to fine tune IPM.

As the first update on the subject since 1996, the new field guide is regarded as being highly innovative on two fronts. Firstly in providing information on high risk exotic pests and their identification and secondly for its comprehensive coverage on beneficials and their environments.

The Cotton CRC's Jane Trindall was a key driver to ensure the Guide comprehensively covered beneficial of cotton landscapes, and the resulting publication sets new standards in this field. The value of native vegetation remnants and their value as habitats for predatory and parasitic insects and spiders, as well as birds and insectivorous bats, that will also attack cotton pests is well covered.

The guide, which has been about five months in development, has been a team effort led by Sandra Williams, CSIRO Plant Industry / Experimental Scientist. Its production has involved many staff from Cotton CRC participants, including CSIRO, NSW DPI, QDEEDI, UNE, CRDC, Namoi Catchment Authority, Crop Consultants Australia, Cotton Growers Services, Greenmount Press and Monsanto.

"This publication is exciting and unique, as it will be a first to integrate outcomes of biodiversity research in a production focused guide," commented Sandra. "Co-ordinating input from so many research and extension people has been a challenge but everyone has been very willing to contribute their time and knowledge".

"The idea for a new publication arose from feedback received by Team members which identified that much had changed over the 15 years since the first guide was published and that a new publication set up as a field guide would be invaluable to experienced and non-experienced people involved with cotton production.

"Many individuals kindly donated images on behalf of their agencies – with Keith Power providing the front cover image," Sandra added.

Dr Lewis Wilson, CSIRO entomologist said he hoped the new guide will be a key resource for growers and consultants, especially for those new to the industry. "A number of new pests and beneficial species have been added and there is now a more detailed section for mealy bugs, reflecting the recent outbreaks of the 'Solenopsis mealybug' in the Burdekin and Central Queensland areas," he said.

"Of particular significance is the inclusion of a section on 'Sustainable Cotton Landscapes' which outline six key principles that can be used to make a cotton farm, and the general landscape more conducive to the conservation and use of beneficial species that will help control key pests."

Co-editor Stacey Vogel, Catchment Officer – Namoi CMA, who, along with Jane Trindall, Cotton CRC Catchments Program Leader, led development of this section of the guide. Jane Trindall 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, derived from catchment research, to improve natural areas on the farm to increase the numbers of natural predators and increase the effectiveness of IPM," she said.

"In addition to helping pest managers it will also be an important resource for land holders and anyone involved in farm management seeking to understand the value that non-cropped areas can have for improved pest management."

GET YOUR GUIDE

An online version of the guide is available at the Cotton CRC and CRDC websites: go to www.cottoncrc.org.au or www.crdc.com.au and follow the links.

Printed editions of the 98-page field guide are available from the following agribusiness outlets.

Cotton Grower Services: contact your CGS agronomist or email info@cgs.com.au with your mailing delivery address.

MIA Rural Services: email Mario@miarural.com.au or phone Mario Paquallotto 02 6964 2999

McGregor Gourlay: contact your MGC agronomist or email hilla@mgas.com.au or phone Andrew Hill 02 6757 3838

Pursehouse Rural: contact your Pursehouse Rural agronomist or email anelson@prural.com.au

LEWIS WILSON

APHID CONTROL

LIMITED OPTIONS REQUIRE WISE CHOICES

HIGH LEVELS OF RESISTANCE TO A KEY CHEMICAL GROUP FOR APHID CONTROL MEANS THAT FOLLOWING THE IRMS AND USING BEST PRACTICE WILL BE CRITICAL FOR SUCCESSFUL APHID MANAGEMENT. INDUSTRY SPECIALISTS SALLY CEENEY AND SUSAN MAAS REPORT.

Insecticides registered for aphid control in cotton fall into one of only seven different insecticide groups. So while the trade names are plentiful there is but a handful of distinct modes of action upon which the wide range of products rely.

The cotton industry's Insecticide Resistance Management Strategy (IRMS) is designed to help cotton growers collectively get the best out of these modes of action and stop or delay the development of resistance for as long as possible. Unfortunately a key mode of action group is compromised by resistance.

Spotlight spoke with the cotton industry's expert in aphid resistance research, NSW DPI Senior Research Scientist, Dr Grant Herron, for an update on the resistance situation.

"This cotton season, every cotton farm needs to have a plan for how to make the most of the aphid control options. How control options are used now will significantly impact what options might be left for future seasons," Grant said.

"In the 2010/11 season, 96 percent of the aphid strains tested showed some neonicotinoid resistance. This resistance makes the neonicotinoids at best unreliable for cotton aphid control."

Neonicotinoid products used in cotton include; Cruiser, Amparo, Gaucho, Actara, Confidor, Intruder and Shield.

"Even when aphids are present a very low levels, resistance is still being selected," Grant warns.

"There has been very low neonicotinoid use directed at aphids in recent cotton seasons."

Resistance has been inadvertently selected in two ways.

"The first has been through the widespread use of insecticidal seed treatments, all of which contain a neonicotinoid. The second is through the use of foliar applied neonicotinoid products targeting mirids," he says.

Fundamental to IPM and resistance management in cotton is the preservation of beneficial insects when thresholds dictate that an early season spray is required. Particularly if mites, silverleaf whitefly or mealy bugs are

present, softer options need to be considered first. With neonicotinoids out, this cotton season it is about the three Ps – pirimicarb (multiple trade names), parraffinic spray oils (Canopy and Biopest), and pymetrozine (Fulfill).

In the past, the linked resistance to pirimicarb (a carbamate) and dimethoate (an organophosphate) has also been present in cotton aphid populations. However no resistance in cotton has been detected since 2007/08 to either chemistry.

Grant says maintaining pirimicarb efficacy against cotton aphid is key to sustainable chemical control and requires collective action from the industry.

"Pirimicarb can be used with confidence this season, but its history suggests that resistance can, and will, be quickly reselected if overused," he said.

"A complication is that pirimicarb selection also occurs through the use of dimethoate.

"Although the products are from different insecticide groups there is a significant cross resistance between primicarb and dimethoate so use of one selects resistance in the other.

"The bottom line is that all early season uses of dimethoate need to be avoided to minimise pirimicarb selection."

Senior Principal Research Scientist with CSIRO, Lewis Wilson, routinely screens insecticides for their impacts on key beneficial species.

"To make the best insecticide selection for the situation, it can be useful to know which beneficial insects are present in the crop and are actively assisting in pest control," Lewis said.

"While all three early season aphid control options are generally soft, pirimicarb will have more impact on wasps that parasitise whitefly and Helicoverpa, while paraffic spray oils will have more impact on ants, and pymetrozine will have more impact on predatory beetles such as red and blue beetles and lady beetles."

TANYA SMITH, CSIRO.

A range of predatory and parasitic insects will help control aphids. The most voracious aphid eaters are lady beetles, both the adult and larval stages, lacewing larvae, hoverflies and silverfly. Should these be disrupted by a spray for another pest, aphid populations may quickly increase and as a result, require chemical control.

RIGHT
The larva of a dark three-banded lady beetle, both with their next aphid meal and the carcasses of their last.

BELOW
is the larva of the transverse lady beetle.

Diafenthiuron (Pegusus) is windowed in the latter half of the season in the IRMS. While a soft option, its mode of action requires full canopy cover to get the best efficacy. Its later window for aphids and mites in the IRMS is also designed to overlap with its best fit in the season for silverleaf whitefly. It is recommended that a maximum of two, non-consecutive applications be used in a season.

The newest mode of action for controlling aphids in cotton is spirotetramat (Movento).

Currently the IRMS allows use at any time of the season. The product moves systemically both up and down in the plant, meaning it can be used in younger or more mature crops.

Lewis explains that it is soft on most beneficial species, but will reduce populations of lady beetles by 40 to 60 percent and lacewings by more than 60 percent.

The industry's TIMS Committee will look to window spirotetramat in future seasons, once there is commercial experience to assist in balancing the resistance risk with the practical fit for the product. For now, the industry recommends using spirotetramat only twice during the season, including for silverleaf whitefly, and to avoid consecutive applications.

Once bolls begin opening, the risk of yield loss declines and is replaced by the increasing risk of honeydew contaminating lint. The use of the highly disruptive organophoshate insecticides is windowed late season in the IRMS. Their fast action protects lint quality at this time with limited repercussions from their broad spectrum of activity.

However, access to dimethoate for late season aphid control is under review by the APVMA. It seems probable that a new label with less use patterns and more restrictive conditions will be in place by 2012/13 season. Most other organophoshate options have 28 day withholding periods, precluding there use at defoliation.

This season the cotton industry needs to respond to aphid threats strategically, considering the short term gains as well as options for future seasons.

The spectrum of insecticides available to the cotton grower appears certain to progressively narrow, with the imminent losses of aldicarb and endosulfan likely to be followed by dimethoate beyond the 2011-12 season.

The neonicotinoids are the first 'soft options' to be compromised by resistance. With only six modes of action left, the cotton industry can ill afford further chemistry losses to resistance.

Successful, sustainable aphid management requires an IPM approach.

IPM starts before planting with the removal of winter hosts and continues through the season with effective sampling, confirming aphid species, confident use of thresholds and careful selection of spray options in line with the IRMS.

More information

2011-12 Cotton Pest Management Guide.
Pests & Beneficials in Australian Cotton Landscapes – hardcopies available from retail agribusiness see article page 4.
http://www.cottoncrc.org.au to order a copy of the manual or to download a web app to view contents on-line.

see our website

CHERIE GAMBLEY

EARLY SEASON APHIDS? DON'T PANIC!

THE COTTON APHID HAS THE POTENTIAL TO REDUCE YIELD, CREATE STICKY COTTON AND IS THE VECTOR FOR COTTON BUNCHY TOP DISEASE (CBT). EARLY SEASON APHID THRESHOLDS ARE BASED ON THE POTENTIAL FOR APHIDS TO REDUCE YIELD. IMPORTANTLY, THESE THRESHOLDS DO NOT TAKE INTO ACCOUNT THE RISK OF YIELD LOSS DUE TO INFECTION OF PLANTS WITH CBT. RESEARCH HAS HELPED TO IDENTIFY WHEN COTTON APHIDS REQUIRE CONTROL.

Recent research shows that risks of CBT spreading through crops and affecting yield are low unless significant populations of ratoon cotton or alternative weed hosts are neighbouring or within the field. *Spotlight* spoke to senior researcher at CSIRO, Dr Lewis Wilson, who has been involved in unravelling the mysteries of CBT since the first outbreak in 1998/99.

"The best advice to growers and consultants is to check field edges based on prevailing winds and edges closest to where cotton ratoons or host weeds have been plentiful. Mark any aphid hot spot areas, confirm that they are in fact cotton aphids, and return to them to check their survival and spread," Lewis said.

There is no specific spray threshold for minimising the risk of losses caused by CBT. Research has shown that there are simply too many factors involved and that decisions need to be made on a case-by-case basis.

Despite the complexity, Lewis says there are some simple guidelines that should allow crop managers to effectively manage the risk from CBT and balance this against the risk of over-using aphid sprays to control aphids.

"Growers can neither afford CBT nor to accelerate selection for insecticide resistance in the aphids," he said.

Lewis's advice is not to panic.

"If you do get caught in the difficult predicament after planting, where you have CBT hosts and aphids present, don't start spraying aphicides without sampling the aphid populations and getting a good understanding of densities and spread," he warns.

Research into the way CBT spreads from one cotton plant to the next shows that the risk of CBT is higher when more aphids colonise plants.

If just one CBT-infected aphid colonises a plant, the transmission rate is five percent, meaning only one in 20 plants become infected. If more than three infected aphids colonise a plant, the transmission rate increases to about 40 percent. Generally in excess of 20 colonising aphids per plant is required to get high levels of transmission greater than 80 percent.

There is no method for field detection of aphids that are carrying CBT.

"Not all aphids colonising the cotton crop will carry CBT but unfortunately we don't know which are and which aren't," Lewis said.

"This means that aphid management must be approached carefully and balanced against selecting for insecticide resistance.

"Looking for CBT symptoms in the days after aphids colonise is not a good indicator of the disease risk.

"When fewer aphids colonise each plant, they take longer to show symptoms of the disease. The first signs of leaf mottling can take up to eight weeks to develop.

"Infections from high numbers of aphids will still take two to three weeks for the earliest symptoms to show and it is difficult to detect symptoms in these early stages."

Lewis advises that the better indicators of CBT risk are; the source of the aphid population, the size of the initial influx of aphids into the field and the rate at which they spread though the crop.

"If the aphid colony establishes well and begins to increase quickly, or if the crop receives a large influx of aphids from cotton volunteers nearby, then control may be required to prevent spread of the disease," Lewis said.

"If few plants are colonised by aphids, or the influx of aphids is clearly from a winter cereal crop, that is an unlikely CBT host, then the risk to the crop from CBT is lower, but situation still warrants monitoring."

Lewis also notes that cotton aphid populations don't always establish well in cotton.

"If there is a lot of natural mortality of aphids, due to rainfall or beneficial insects, the aphid populations may not build. This will prevent spread of the disease and may negate the need to spray the aphids," he said.

"In high risk situations where the decision is made to spray, aphid control should be as selective as possible. Retaining beneficial insects will 'mop up' any spray survivors, minimise the establishment of late arrivers and help to prevent build up of other pests."

Research supports the notion that the most efficacious solution to CBT rarely comes in a drum, but is to reduce aphid abundance and the size of the disease reservoir on farm.

"Spraying aphids is the last line of defence. Farm hygiene and weed control during the months prior to planting can have a big effect in reducing risk from CBT disease, putting you in the best possible position for the coming season," Lewis said.

MURRAY SHARMAN, QDEEDI

WHICH WEEDS ARE CBT HOSTS?

Confirmed hosts of CBT:	ratoon and volunteer cotton and marshmallow weed (pictured).
Unlikely hosts of CBT:	summer grasses, perennial grasses, winter cereals (not hosts of cotton aphid).
Suspected hosts of CBT:	weeds closely related to cotton, such as malvestrum
Unknown:	other broadleaf weeds that host cotton aphids

KNOW WHICH APHID YOU'RE DEALING WITH

MELINA MILES, QDEEDI.

Pictured are corn aphids. Cotton is a very poor host for the range of aphid species commonly found in cereals. Cotton aphid, *Aphis gossypii*, is the most common aphid species to colonise cotton and also is the vector to cotton bunchy-top (CBT). Green peach aphid and cowpea aphid may also establish in the crop early in the season, but numbers tend to naturally decline as the weather hots up, and importantly they are not CBT vectors.

If winged aphids are seen on cotton, verify which aphid species is present. Many winged forms of non-pest aphid species will settle on cotton and test feed, then move on when they find it unsuitable. A simple strategy to establish if the aphids are a cotton pest is to mark the area and return to it several days later it to see if a colony establishes and is reproducing (non-winged forms are present). Non-winged forms are much easier to identify, see the new Pests & Beneficials field guide. Once colonies are observed, regular, structured sampling should commence to track the rate of population development.

The *Aphid Yield Loss Estimator,* on the Cottassist website, will help you track the aphid population over time and alert you to situations in which economic yield loss could occur. Visit; http://cottassist.cottoncrc.org.au/

Further Information

Information on aphid control options, their selectivity, management of insecticide resistance in aphid populations, and the latent periods involved in the spread of CBT, can be found in the 2011-12 Cotton Pest Management Guide, available on the Cotton CRC website.

EARLY SEASON CHECKLIST

IN GENERAL

- ☐ Timing is everything especially in the southern areas.
- ☐ Good ground preparation is vital for seed establishment. This relates to the first point as if possible prepare the field early so as to avoid pulling up hills, fertilising etc when condition are not ideal. This will help avoid the presence of large clods and provide time for the hills or beds to settle.
- ☐ Discuss and plan nutrition and Integrated Pest Management (IPM) strategies with your agronomist pre-season.
- ☐ Ensure all weeds and volunteers have been controlled in fields and along channels, roads etc. Develop a plan or strategy to control weeds considering herbicide resistance.
- ☐ Allow plenty of time for forecasting crop inputs. Discuss with your supplier your season's requirements to avoid product shortages at vital times.
- ☐ Ensure your fields are mapped on CottonMap to assist with drift awareness.
- ☐ Have a marketing strategy in place and ensure you are receiving the latest marketing information.
- ☐ Register on *my*BMP to take advantage of the large amount of information and industry links.
- ☐ If you do not have your own harvesting equipment ensure you start sourcing a contractor and ensure that there is ginning capacity in your area.

Preserving beneficial insects

As the 2011/2012 season approaches remember your pests' natural enemies – beneficials – as they suppress populations of a wide range of pest insects, reducing the potential for pest species to reach outbreak levels in field crops. Conserving and enhancing populations of beneficials is an important component of any integrated pest management (IPM) strategy. Perennial native vegetation is an important alternate habitat for beneficials. The stability of perennial vegetation provides resources otherwise not found in cropping fields, especially when in fallow. While pest species can be found in native vegetation, most do not use native hosts, so native vegetation has a low risk of increasing pest numbers. Beneficials are highly mobile and must be able to move between suitable habitats through the landscape to be effective.

Water Quality

- ☐ All irrigated cotton growers should monitor their water quality once a year at a minimum. The start of the season is an ideal time to do this as groundwater aquifers have returned to a resting state and if testing is done at the same time each year a consistent water quality picture can be established.
- ☐ Water quality testing should be done for surface and ground water sources. Recommended tests are EC (salinity), pH, SAR (sodium absorption ratio) and standing water level for groundwater bores.

Seedling disease considerations

Reducing your risk of plant stand losses from early season diseases is all in the planning.

- ☐ Cool, wet early season conditions are conducive to infection and disease development. The best solition is to avoid unfavourable conditions by planting as late as possible within the planting window, and ideally once soil temperature are at 16 degrees and rising.
- ☐ Planting higher V-ranked and F-ranked varieties where disease is present will produce higher yields and will slow the build-up of the pathogen in the soil, in contrast to lower ranked varieties.
- ☐ Good bed preparation is critical. Plant into well prepared, firm, high beds to optimise stand establishment and seedling vigour. Carefully position fertiliser and herbicides to prevent damage to the roots.

THE FOLLOWING PRINCIPLES CAN BE USED TO GUIDE NATIVE VEGETATION MANAGEMENT TO MAXIMISE ITS VALUE FOR NATURAL PEST CONTROL:

Principle 1:	Think beyond the crop
Principle 2:	Encourage beneficials with diverse, messy vegetation
Principle 3:	Do not disturb, conserve your beneficials
Principle 4:	Consider birds and bats as beneficials
Principle 5:	Control weeds on the farm
Principle 6:	Consider water availability

For more information refer to the Pest and Beneficial in Australian Cotton Landscapes Book.

DALLAS KING

Good ground preparation is vital for early crop establishment.

- ☐ Good planter set up will help to ensure the planting depth is optimal across the field. If planting into moisture, avoid planting when the beds are too wet, as you end up with shiny, smeared slot which can be difficult for young roots to penetrate.

Water Use Efficiency

- ☐ Take stock of your current water supply.
- ☐ Check what you have in fallows and don't over-estimate what you have in your storages.
- ☐ Minimise losses from pre-irrigation by careful field choice.
- ☐ Don't plant too big an area to handle.
- ☐ Estimate crop water requirements using the DEEDI CropWater Use on-line tool (cropwateruse.dpi.qld.gov.au).
- ☐ Check your supply infrastructure – check supply channels, head-ditches and pumps are in good order to deliver water when needed
- ☐ Plan to irrigate quickly and efficiently.
- ☐ Don't run excessive tailwater and risk waterlogging by irrigating at too slow a flow rate and too long to cut-off.
- ☐ Get your seedbed in good condition and nutrition strategy right– poor establishment and poor nutrition lead to poor yields and low water use efficiency.
- ☐ If your planting where cotton hasn't been grown before, or for several years, engage a crop consultant to aid irrigation scheduling decisions.

WHAT WILT IS THAT?

Plant pathologist Linda Smith (QDEEDI), Stephen Allen (CSD) and Linda Scheikowski (QDEEDI) take a closer look at suspicious plant during the annual disease surveys.

LAST SEASON THERE WERE FOUR NEW CASES OF FUSARIUM WILT IDENTIFIED, INCLUDING ONE FROM EACH OF CENTRAL HIGHLANDS AND SOUTHERN NSW. GIVEN THE WIDE SPREAD FLOODING IN SOME GROWING AREAS THE THREAT OF FURTHER DISEASE SPREAD IS LIKELY.

Both Verticillium and Fusarium wilt can be hard to identify. The good news for the industry is the development of a new molecular test to identify the Fusarium wilt pathogen, so it is important that growers send samples of suspicious wilted plants in to confirm areas that have Fusarium.

"In collaboration with Juliane Henderson (UQ) we are developing an additional new molecular diagnostic that will enable faster identification of the three strains of the Fusarium wilt pathogen," DEEDI Plant Pathologist Linda Smith said.

"If you have wilting cotton plants or stem discolouration, it is really important to get the disease identified. Even if you are confident about what disease you have, it is useful to confirm which strain, to ensure we don't have new strains (either introduced from overseas or developed locally)."

Cotton Industry D&D Biosecurity Specialist Susan Maas said it was a good time to reiterate the need for good farm hygiene when moving machinery, vehicles and humans from farm to farm.

"It is very disappointing for the growers in the previously Fusarium free areas of Central Highlands and Southern NSW to have Fusarium confirmed in their area. We strongly encourage growers to remain vigilant with their farm Come Clean Go Clean procedures to reduce this spread," Susan said.

"A strong Come Clean Go Clean program will protect your biggest asset, your farm, from pests, diseases and weed seeds that may have herbicide resistance."

"Despite new more resistant varieties, if the environmental conditions are conducive to disease, such as cool, wet early season conditions, Fusarium can still have a significant impact on seedling mortality," Linda says.

"The best way to way to avoid such favourable conditions is to plant as late as possible within the planting window."

WHAT TO DO

In advance:

When sending samples, contact Linda Smith at mailto: linda.smith@deedi.qld.gov.au or 07 32554356 in advance.

What to send:

- When collecting seedlings – dig them up rather than pull them out; include some soil.
- For stems with vascular discolouration, sections 10-15cm are adequate.

Information to include:

Date sample was collected, property name and location, symptoms, variety, disease incidence (one plant, scattered single plants, patch etc), cropping history, has Fusarium been diagnosed previously, contact details.

How to send it:

- Wrapped in paper/newspaper, not plastic. It is okay to send paper wrapped sample in a plastic Post Bag.
- It is better to despatch samples early in the week rather than just before the weekend.

Where to send it:

Linda Smith
DEEDI
Ecosciences Precinct
Basement 3 Loading Dock, Off Joe Baker Street
Dutton Park Qld 4102

The Cotton Catchment Communities CRC website on Integrated Disease Management for Australian Cotton has a form with information to include with your sample and can be found at http://www.cottoncrc.org.au/files/3f0aa0a1-c414-4060-8ac3-995a01634553/IDMGL02x.pdf.

A GOOD START FOR A GOOD FINISH

EVERY BAG OF COTTON SEED HAS THE SAME YIELD POTENTIAL BUT IT IS GOOD MANAGEMENT THAT MAKES THE DIFFERENCE AT THE END OF THE SEASON. CSD EXTENSION AND DEVELOPMENT AGRONOMIST JIM QUINN EXPLAINS.

Part of the monitoring process for growers and consultants is being aware of possible disease and pest threats and knowing how to recognise them in seedlings.

Cotton plants are at their most vulnerable when at the seedling stage which is why planting plays an important role in achieving high yields, and to give a seedling the best chance to become a high yielding plant, the key is monitoring – during and post planting. Uniformity of establishment is the key.

Planting is still one of the hardest jobs to do correctly because there are so many factors at play and precision is necessary to get close to ideal plant stands.

Growers who manage good healthy, uniform stands pay attention to detail during the planting process, ensuring temperature, moisture, planting depth and other factors are closely monitored.

Most importantly, to improve the chances of healthy, vigorous seedlings there are two main factors that are crucial – plant into rising soil temperature and into moisture.

A healthy, fast emerging seedling in around five days has a greater barrier to disease and pests.

Part of the monitoring process is being aware of possible disease and pest threats and knowing how to recognise them in their seedlings. In 2011-12, be aware that wireworm could emerge as an early-season owing to more cotton planted into stubble.

Growers and consultants should closely monitor young crops and report anything they think looks suspicious, and while number of plants per metre is often a guide to successful planting, uniformity is more important.

In terms of yield, there is no difference between four and 12 plants per metre, but, uniformity is the key. In practice although, four evenly spaced plants per metre is relatively hard to achieve.

Most growers aim for eight to 10 mostly as a risk management strategy, to make up for losses that may occur due to seedling disease, frost or insect damage.

Replanting

Replanting decisions should be made early and with good advice.

A decision to replant should be made based on stand losses and not the size of seedlings. Establishing the cause of the stand loss is also important in ensuring that further plants will succumb to the same problem.

The decision of whether to replant or not depends on the grower's target population, but also the 'gappyness' of the stand.

In cases of gappy stands, in areas from Narrabri north and west, growers could replant up until November 1 without detrimental yield potential decline, but this is not possible in regions further south.

For relative yield potential at a range of plant stand uniformities, go to Page 42 of the *2011 Australian Cotton Production Manual*.

The replant calculator on the CSD website also gives growers good guidelines for replanting and booklets such as the CSD replanting guide are available.

Website references.

http://www.csd.net.au or the Cotton CRC website http://www.cottoncrc.org.au/content/Industry/Seasonal_Planner/Planting_to_Flowering_/Plant_Stand.aspx

see our website

TOOLS TO ASSIST DECISIONS

COTTASSIST IS A USEFUL ONLINE TOOL FOR GROWERS AND CONSULTANTS TO IDENTIFY NUTRITIONAL REQUIREMENTS, ASSESS GROWTH AGAINST EXPECTED STANDARDS AND EVALUATE THE NEED FOR PEST CONTROL. COTTASSIST DEVELOPER LORETTA CLANCY REPORTS.

Crop managers can freely access the CottASSIST web-based tools developed from industry's best science and produced by CSIRO Plant Industry in a convenient online package. The purpose of CottASSIST is to provide cotton farmers and their consultants with science-backed support tools for timely decisions based on their own crop, soils and climatic information.

The first step to using the CottASSIST tools is to register for a (free) account, which enables the user to access all the CottASSIST tools and their features and provides the ability to save and retrieve their own data.

CottASSIST has been in development since 2004 with the CSIRO team based at ACRI near Narrabri. The following tools are now available in the program.

Crop Development Tool (CDT)

Cotton development can be predicted using daily temperature data (day degrees). The CDT uses this to enable crop managers to check the vegetative and reproductive growth of crops compared to expected rates of growth and development under those conditions. This information can be used to further explore why the crop may or may not be on track and then manage accordingly.

Day Degree Report

Keeping track of day degree accumulation is widely used to identify the progress towards a cotton development stage (eg first square (a flower bud), first flower). The Day Degree Report predicts crop progress through the season using local weather data and sowing time and compares progress with other years using historical climate data.

Last Effective Flower Tool (LEFT)

LEFT predicts the date after which a flower is no longer likely to have sufficient time to complete development into an open boll. Predicting this date can be used to manage a cotton crop to ensure harvest timeliness to avoid wet and cool weather, which is important for picking good quality cotton.

Helicoverpa Diapause Induction and Emergence Tool (DIET)

Using local day length and temperature data, the DIET can predict the percentage of Helicoverpa armigera pupae going into diapause and when these are likely to emerge as moths. This information can be used to refine decisions for effective pupae busting. This tool was developed in collaboration with the Queensland Department of Employment, Economic Development and Innovation (DEEDI).

Aphid and Mite Yield Loss Estimators

Manual calculations of yield loss from pest infestations are complicated and time consuming. This tool allows the user to enter current aphid or mite samples to estimate a rate of pest increase and the potential effect on yield. This allows crop managers to 'look ahead' to decide if these pests require control or if natural enemy populations are providing sufficient control.

NutriLOGIC

Optimising yield, reducing fertiliser costs and minimising green house gas emissions are important considerations for cotton production. NutriLOGIC uses information collected from soil, petiole, and leaf tests to interpret levels of major nutrients needed for production to generate optimal fertiliser recommendations.

This tool can help interpret the in-crop N status from petiole tests and the status of other nutrients from leaf tests.

Seasonal Climate Analysis

Climate variability challenges all aspects of farming in Australia and cotton production is no exception. This tool can help analyse seasonal variability or regional influences on crop performance by comparing rainfall, day degrees, number of cold and hot days with long-term averages and probabilities.

Silverleaf Whitefly Threshold tool

This 'newest' CottASSIST 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. This tool was developed in collaboration with Emerald based SLW researcher Richard Sequeria and extension officer Susan Mass (both with QDEEDI).

Water Quality Calculator

A potential impact on cotton yield is poor quality water. This tool helps calculate the water quality resulting from mixing water from different sources and highlights the potential impact that this water quality may have on cotton yield.

For further information; contact Loretta Clancy or Sandra Williams
mailto: Loretta.Clancy@csiro.au or
mailto: Sandra.williams@csiro.au
Use the tools any time, simply go online to CottASSIST and register for a free account
www.cottassist.cottoncrc.org.au

email us

see our website

KNOW WHERE YOU ARE HEADING

SPOTLIGHT CAUGHT UP WITH COTTASSIST USER AND CONSULTANT FRED GHIRADELLO OF GOONDIWINDI FARM TECH TO GET A USER'S PERSPECTIVE OF HOW THE SYSTEM WORKS FOR THEM.

CottASSIST is very effective in helping to evaluate field-by-field or cotton variety-by-variety comparisons both within a season and between seasons. I find it most useful in monitoring the crop progress and I use it during the season to explain the growth/crop performance pattern to cotton clients and their key staff.

By actively using CottASSIST for the current crop of the season and combining that data with:

- C Probe technology;
- daily weather forecasts of Temperature and Rainfall (seven days out); and
- where necessary, current crop nutrient data; against crop biomass and the current fruit load, retention figures and insect pressure etc.

We can:

- fine tune our crop irrigation needs;
- prepare and monitor the crop requirements for growth regulators such as Pix;
- make proactive decisions as regards nutrient supply ie water-run N; and
- modify our crop insect thresholds, if necessary.

In short, having used CottASSIST, to previously monitor crop production records in a particular field or management unit, and knowing that previous crop's yield for the field and to some extent quality issues, we can view the current crop's position at any stage in the season. We can then conclude if we are ahead, on par or behind the previous crop, and therefore the target yield for that given level of 'day degrees' that apply for the same number of day degrees or calendar days as in previous seasons for that field or management unit.

CottASSIST is a fine tuned GPS roadmap, which records the crop progress and gives you confidence in your agronomy/farm management that you know where you are heading as long as the weather goes with you. Without CottASSIST, I would still derive the same information – but it would take longer and more manual calculations – just like I used to do before CottASSIST.

As far as the tool saving me time, the answer is yes and no. Yes, it saves time from the old method of comparison and charting individual field or variety results.

But "No", because you want to understand more about the crop being managed and thereby use the data as a predictive tool for future crop management, so you end up confidently trying to predict the outcome of the management objectives more than before the development of CottASSIST. So, you spend more time balancing crop management "fine tuning" thoughts, for example, mirid thresholds versus mirid fruit loss, if you reason that the crop is growing well and is likely to continue to grow on strongly for the next seven days forecast, etc.

MORE TOOLS

Many cotton farmers and consultants regularly use the Cotton CRC website for its comprehensive guide to early season disorders of cotton.

Known as The on-line Australian Cotton Symptoms Guide, this website resource has been built up over many years and is presented as a compendium of photos with information resources.
David Larsen, Technology Resource Centre Coordinator at the Cotton CRC says viewers need to be aware that many symptoms are similar, and by searching the 'look-alike' links to research for evidence of compound problems that may occur can result in a reliable initial diagnosis. The Cotton CRC website also has a Key to Diseases and Disorders of Seedling Cotton, and this section includes useful illustrative images to help identify the symptoms and disorders.

Fertlisier burn

Root tips are 'pinched off' and sometimes blackened. All roots of affected plants are affected at the same level. If a particular row, or rows, are infected in each set across the field then a problem with the fertiliser rig is implied. Fertiliser burn occurs when either solid or liquid fertiliser is placed too close to, or directly under, the planting line. Very dry soil conditions between fertilizer application and planting may exacerbate the problem. Symptoms occur at a consistent depths on the roots and severity is increased by dry conditions between fertiliser application and planting

Herbicides

Herbicides applied at planting can be washed into the root zone by rain, especially with dry loose seed beds, planting slots that open with drying, or depressions along the top of the bed.
The CRC on-line guide shows some of the more typical damage symptoms seen in Australian cotton from exposure to a range of herbicides. Images were obtained from experiments where known rates of herbicide were applied to irrigated cotton at specific growth stages (follow the >MORE links for trial results and more images). The symptoms of herbicide damage displayed by cotton plants are affected by the type of herbicide, the herbicide rate, the crop growth stage, and environmental factors such as soil moisture, temperature and humidity. Under different conditions, crops may not display the symptoms of damage indicated in these photos.
To assist identification or to submit images, contact David Larsen, Technology Resource Centre Coordinator Cotton CRC http://www.cottoncrc.org.au/content/

MAPPING AND VIGILANCE CURBS DRIFT DAMAGE

WITH THE INCREASING THREAT OF HERBICIDE SPRAY DRIFT TO THE COTTON CROP AS THE NEW SEASON BEGINS, THERE IS GOOD NEWS FOR GROWERS WITH THE RE-LAUNCH OF THE ON-LINE INTERACTIVE COTTONMAP WHICH WAS SUCH A SUCCESS LAST SEASON.
MARY ANN DAY REPORTS.

Moree grower and Gwydir CGA chair Tony Bailey has used CottonMap for the past two seasons and says it has generated good communication between all farmers.

Now in its third year, the Cotton Field Awareness Map (www.cottonmap.com.au) has become well-proven in its capacity to curb herbicide drift damage. Available online from September 1 to April 30, CottonMap is free of charge and is industry's best-bet initiative to minimise off-target damage from downwind pesticide application, particularly during fallow spraying.

CottonMap is a joint initiative between CRDC, Grains Research and Development Corporation (GRDC), Nufarm Australia Limited and Cotton Australia.

Cotton Australia's Greg Kauter said some 580,000 hectares were voluntarily mapped on-line last year.

"CottonMap was first implemented on-line in season 2009/10. The results were encouraging with an estimated 97 percent of cotton fields voluntarily mapped in a short space of time. This coming season our new-look map has a wider screen presence, a simplified log-in process, as well as recognition of previous season's fields," Greg said.

"The 2010/11 cotton season had a potential concern given the three-fold increase in the cotton area planted. But we are pleased to say that there was not a single reported damaging drift incident – a great result."

Herbicide spray drift is a constant issue for cotton growers.

"In past cotton seasons, cotton crops in New South Wales and Queensland have suffered damage as a result of the off target drift from herbicides, particularly from Group I (phenoxy and pyridines) and Group B herbicides," Greg says.

"It is of grave concern to the industry that in some seasons up to 10 percent of the Australian crop has been affected by drift. Data collated by Cotton Australia during the previous

season indicated that the cost of damage to the crop was just under $10 million."

Using Google Maps technology, growers or their agronomists can login to the site and add their cotton fields, which then appear in yellow. CottonMap enables farmers, their agronomists and distributors to access the website, print a map and discuss application practices when applying pesticides around sensitive crops. Anyone is able to view the site and print off a localised map, complete with a spray application checklist, without the need to login or register.

While Greg Kauter is upbeat about the success of CottonMap, he said the next step was to ensure that the wider farming community in cotton growing regions are aware of and use CottonMap when planning to spray over summer.

"Ongoing vigilance and awareness is required," he stressed.

"We thank rural agricultural suppliers for being so involved and helping log cotton fields onto the website. If we can all do our bit, this will be a great result not just for the cotton sector, but for the wider agricultural community."

"CottonMap is a great example of how a collaborative effort between grower groups, agribusiness and research organisations has the potential to make a real difference," said Nufarm's Business Manager Gerard Bardell.

"At Nufarm, we are investing in a number of initiatives to help growers minimise drift and maintain efficacy. It's all part of our Spraywise program which has been developed for industry stewardship, leadership and protection.

Peter Birch of B&W Rural Moree has played an important part in the success of CottonMap in the Gywdir Valley and Border River regions.

"An increasing trend towards night spraying can potentially cause issues if conditions are unfavourable. Spraying during a low-level temperature inversion is not an option and these inversions will happen most nights and can be strongest around sunrise.

"Spray quality, boom height and wind speed and direction are critical to minimise the chance of off-target damage occurring."

Tom McCue from GRDC said CottonMap was a proactive solution to the spray drift problem. He is urging both grain and cotton growers to use the service.

"This initiative is reducing crop damage due to spray drift and increasing awareness of best management practices in chemical application," he said.

"Spray drift is a serious issue and affects everyone living, working and running broad scale farming businesses. If spray drift continues, the implications could be permanent and felt industry-wide."

Peter Birch a cotton consultant with B&W Rural based at Moree, has played an important part in encouraging use of CottonMap and says it remains very well received by cotton and broadacre growers.

"Uptake was successful and I recommend to all my growers to look at CottonMap when planning their spray jobs".

"UPTAKE WAS SUCCESSFUL AND I RECOMMEND TO ALL MY GROWERS TO LOOK AT COTTONMAP WHEN PLANNING THEIR SPRAY JOBS".

Log on to CottonMap at
http://www.cottonmap.com.au
http://www.spraywisedecisions.com.au

see our website

To download the GRDC Sprayright fact sheet, go to http://www.grdc.com.au/GRDC-FS-ManagingSprayDrift

see our website

GROWERS IMPRESSED

Growers have also been impressed with the collaborative initiative and are aware of the importance of CottonMap to the region, as well as their own farms.

Moree grower and Gwydir CGA chair Tony Bailey has used CottonMap for the past two seasons. It has been effective because other farmers – non cotton – see the maps at field days, resellers' offices and in newspapers.

"I think CottonMap has generated good communication between all farmers and if a combined map was produce for all summer crop growers it would be even more effective," Tony says.

Tony Bailey has further suggested a summer crop colour code to complete a wider map.

"For example, cotton colour would be yellow, sorghum, red, and you could use other colours for sunflowers, soybeans and so on.

"As well as being really useful, the mapping has also been helpful in getting the hectares correct, especially in dryland fields."

Phil Firth, a grower from Wee Waa says "I think CottonMap has been a great tool for reducing spray drift damage to cotton crops. Neighbours, and those a bit further away, have been able to see quickly and easily where cotton is grown and it has alerted farmers to the extent of cotton as part of the farming landscape in their area.

"It has also made farmers aware of just how much cotton is being grown and the great risk of damaging a neighbour's crop."

Phil believes that in conjunction with the publicity campaign that Cotton Australia has been running, CottonMap has proved to be a key part of the strategy to reduce spray drift damage to cotton crops.

"Growers who aren't on it have only themselves to blame if nearby farmers aren't aware that they are growing cotton," he said.

Growers can also make use of a fact sheet from GRDC – *Managing Spray Drift – Sprayright to Avoid Drift*, which outlines best management practices to minimise off-target movement.

Among advice listed, growers should:

- Spray under desirable weather conditions including appropriate temperatures and no inversions;
- Select the correct droplet size;
- Spray when there is a consistent crosswind;
- Do not spray with the wind direction toward sensitive areas;
- Do not spray when there is excessive wind speed;
- Do not operate with a boom height too high;
- Avoid spraying with volatile products.

R&D RAMPS UP FOR CARBON INNOVATION

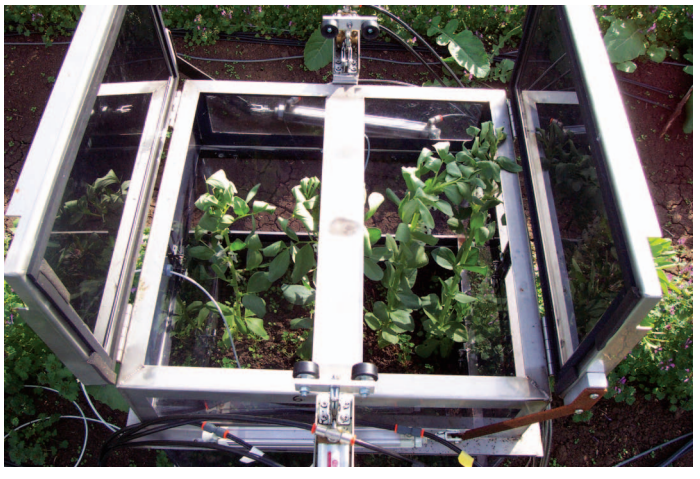
NOW CARBON IS SET TO HAVE A VALUE THE AUSTRALIAN COTTON INDUSTRY HAS MANY NEW QUESTIONS TO ANSWER, AFFECTING THE BOTTOM LINE FOR PRODUCERS. TRISTAN VISCARRA ROSSEL REPORTS.

To help cotton growers prepare for changes in an Australian economy where carbon is valued, CRDC and the Cotton CRC are supporting research to increase industry knowledge of carbon emissions and opportunities for abatement on cotton farms. Key areas of focus are nitrogen fertiliser use, fuel and energy use, irrigation, tillage, crop rotations and native vegetation management.

Industry's peak body, Cotton Australia has also weighed in with its support of the scientific research efforts and has indicated its desire to support industry to reduce its carbon footprint by co-investing with CRDC to study the impact of a carbon price on cotton farming businesses. Cotton Australia has summarised how cotton farmers can respond to a price on carbon and how the Australian Government's Clean Energy Package might be applied. Cotton Australia has published a 'background briefing' paper on the Carbon Farming Initiative and the clean energy future package opportunities for agriculture and cotton.

Philip Armytage from the Cotton CRC said the potential increase in costs would be the primary driver of change in cotton farming technology, via a potential carbon tax, an emissions trading scheme and eventually the proposed Carbon Farming Initiative.

RIGHT: Dr Ian Rochester with a soil core at his trial site at ACRI.



BELOW: Enclosed chambers made from a transparent material to allow light in so plants can still grow while gas emissions are measured in various crop rotations.

"Potentially, a new carbon economy could present some opportunities for growers to be accredited for carbon sequestered with some potential monetary return to growers," he said.

Soil carbon stocks – what R&D says

Dr Nilantha Hulugalle, Senior Research Scientist with NSW Department of Primary Industries in Narrabri, has been monitoring the effect of different cotton–cereal and cotton–legume rotations on soil carbon and other soil properties since 1993. Between the rotations, he said there was little difference in carbon stocks in the 0–60 cm topsoil layer at several sites in NSW (Narrabri, Warren, Merah North, Wee Waa, Hillston).

"Interestingly, although we haven't seen any differences in carbon between the rotation systems in many sites – because of the permanent beds in which we are retaining standing stubble – they have been declining at the same rate," he said.

At the sites where soil carbon stocks have remained stable, Nilantha pointed to structural stability (mainly due to clay mineralogy) and conservative management practices (ie retention of standing stubble, minimal tillage, optimal water management and nitrogen management) as contributing factors.

Soil organic carbon stocks were generally 50–70t/ha in the 0–60cm

layer. Nilantha said that although vetch produced large amounts of stubble, it did not increase carbon stocks because increasing soil nitrogen also increased microbial activity and organic matter decomposition rates.

"In the vetch system, the beds have a lot of stubble with a very low carbon-to-nitrogen ratio. This means that whatever nitrogen vetch puts back into the system gets broken down very quickly. The nitrogen acts as a nutrient for the associated microbes, who use the soil organic matter as a source of energy and carbon."

Across all the experiments, soil organic carbon stock was positively related to dry matter inputs, average maximum temperature, soil aeration and water availability, but negatively related to excessive nitrogen fertiliser inputs. Nilantha said that the ultimate level of soil carbon was a function of all these factors.

In other experiments, Ian Rochester from CSIRO Plant Industry at ACRI has observed increases in organic carbon in topsoil where stubble from cotton, vetch, faba beans and wheat were incorporated into the soil rather than leaving it on the surface.

The differences in these findings highlight the need for ongoing research to define clearly the practices and situations that will reduce carbon emissions and increase carbon sequestration.

Since 1993 NSW DPI scientist Nilantha Hulugalle has monitored the effects of different cotton -cereal and cotton-legume rotations (particularly vetch) on soil carbon and other soil properties.

Greenhouse gas emissions from fields

In a CRDC funded research project that has recently begun collecting data, CSIRO's Ian Rochester said researchers were measuring greenhouse gas emissions from fields.

"The project uses 12 recently-acquired enclosed chambers made from a transparent material to allow light in so plants can still grow while gas emissions are measured in various crop rotations," he said.

"Sampling gas from each chamber indicates how much carbon dioxide, methane and nitrous oxide—the most potent greenhouse gases—are coming out of the soil."

Rotation crops being investigated include faba beans, a winter-grain legume; vetch, a pasture legume that fixes a lot of nitrogen in the soil; and wheat that will be harvested just before the end of 2011, with nitrogen fertiliser inputs to ensure high yields. The project runs for another two years, and will provide the industry with a complete account of greenhouse gas emissions from the cotton and rotation crops, including fallows.

In September 2011, the researchers will begin fertilising the cotton country and measuring emissions from the fertiliser. The cotton will be sown in October, and monitored throughout the season. Subsequent rotation crops will also be monitored to gain a more complete understanding of the carbon cycle under actual conditions.

"We will be looking at four rates of nitrogen fertiliser applied to cotton this summer, from zero up to 320kgN/ha, in reasonably fertile soil. And we anticipate that each flood irrigation will stimulate some gas emissions," Ian said.

"Our current research indicates that growers often use more nitrogen fertiliser than their crops need, as most growers are more focused on high yields, rather than greenhouse gas emissions. We will have some clear results by mid-2012."

On-farm energy use and GHGs

Craig Baillie, Deputy Director of the University of Southern Queensland's National Centre for Engineering in Agriculture, has been busy entering cotton farm data into the web-based software tool, EnergyCalc, to assess on-farm energy use.

"One of the issues is how to represent what happens within a farm and between farms in a common format, as operations tend to be quite different from one farm to the next," Craig said.

"To work through this, I am collecting more details from growers, especially around irrigation and harvesting operations."

As a general observation, Craig said that he was impressed by the level of data captured by growers on energy use and their general awareness of energy use around particular farming operations and practices.

He said on the average, irrigated cotton farm the main energy uses were pumping irrigation water, heavy tillage operations and harvesting, adding that in previous work, energy consumed in irrigation operations had been as high as 60 to 70 percent of total energy use.

A recent project funded by the National Water Commission found that the irrigation technologies that used water more efficiently such as pressurised drip and sprinkler systems generally consumed more energy and emitted more greenhouse gases than surface gravity-based irrigation systems.

For further information:
Dr Ian Rochester CSIRO Plant Industry, Narrabri
02 6799 1520
mailto: ian.rochester@csiro.au

Dr Nilantha Hulugalle NSW Department of Primary Industries
02 6799 1533
mailto: nilantha.hulugalle@industry.nsw.gov.au

Adam Kay, Cotton Australia
02 9669 5222
mailto: adamk@cotton.org.au

MOVING SOUTH

RIVERINA'S FIRST COTTON EXPO MARKS A NEW ERA FOR COTTON PRODUCTION IN THE SOUTHERN DISTRICTS.

The Southern NSW Cotton Expo was held in late July attracting 220 attendees from regions of NSW who are warming to the idea of cotton as an alternative crop.

The expo was co-ordinated by Cotton Industry Development and Delivery Specialist James Hill, Lachlan & Murrumbidgee Cotton Growers Association and NSW Primary Industry's Coleambally District Agronomist Kieran O'Keeffe.

Kieran said the event attracted farmers with a range of levels of cotton experience from mainly Griffith, Coleambally, Hillston and some from the Murray Valley and that feedback since the event has been very positive.

"Westend Winery was an excellent venue in that it allowed the event to really work as we could offer machinery displays, catering facilities, trade tent and talks inside a function room. Visitors had the opportunity of a winery tour at the end of the day," Kieran said.

"The support of the major industry sponsors and trade stalls made the day possible and an event like this allows us to get a large amount of information out at one time and also allows for follow up once this contact is made.

"The day was designed to be flexible with researcher talks, trade displays and machinery exhibits, with attendees able to freely move between them.

"It was a good networking event with industry people making contact with growers and I've had positive feedback from the trade stalls.

"Comments from others were that the 'Grower Panel' at the end of the day was a good idea. There were plenty of questions and it showed that there are challenges in growing cotton with the shorter season in the south.

"A personal highlight for me was having a round bale picker from the Stott family, which was incorporated into the Come Clean Go Clean talk."

Kieran believes an event like this does educate more people about the cotton industry – especially in an emerging cotton area, where growers are looking at diversifying their summer crop options.

That a cotton expo has been held in Griffith is testament to the growing market in this region.

According to New Grower Specialist James Hill, Southern NSW is definitely an expanding market, with 23,000 hectares of cotton sown in 2010 along the Lachlan and Murrumbidgee and indications this will grow to more than 40,000 hectares this coming season.

"There has been an increase interest in cotton as growers are looking for alternative crops and the fact that cotton can be sold on the futures market three years in advance is attractive to growers," James said.

"Therefore the aim of the day was to provide current and new growers with up to date information pertaining to all facets of growing the crop.

"Presentations were prepared by the Cotton Industry Development and Delivery Team and provided an opportunity for growers to hear information directly from researchers on topics including nutrition, IPM, weeds and disease.

"This expo is a great opportunity to educate growers on how to maintain crops in the cooler areas, and have a chance to talk to experts in the field," he said.

As cotton makes its way into these communities, the community groups were also enlisted to be part of the day.

"Catering was done by local groups including excellent coffee by a local barista, homemade morning and afternoon teas from local school students and lunch from the Griffith junior rugby club," Kieran said

"This worked well, as it gave the day a local feel."

ABOVE:
Ian Robertson and Tony Glennon of A&G Machinery with Peter Treverrow, Yenda Products were in support of the Southern Cotton Expo in July.

LEFT:
Organisers NSW DPI's Kieran O'Keeffe and Cotton Industry Development and Delivery Team's James Hill.

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GLYPHOSATE RESISTANCE SOLUTIONS 'TAYLORED' IN THE NORTH

GLYPHOSATE RESISTANCE IS NOW A REALITY FOR GROWERS AND CONSULTANTS ACROSS COTTON REGIONS. **TRISTAN VISCARRA ROSSEL REPORTS.**

Cotton and grains RDCs have kick-started a new joint project that will tackle head-on the issue of glyphosate-resistant weeds accross the north.

The project gives the issue top billing as the incidence of weed herbicide resistance gathers pace.

Beginning July, cotton and grains agreed to adopt a unique approach by employing an independent consultant, Dr Ian Taylor of Taylored Agricultural Systems to coordinate the project. Ian Taylor is widely known in the cotton industry in his previous roles with the Cotton CRC and CRDC.

"Our focus is improving the adoption of IWM (integrated weed management) tactics and practices – especially around glyphosate-resistant species in cotton and grains farming systems of northern NSW and south-east and central Queensland," Ian said.

The project will link into existing extension networks such as the Cotton Industry Development and Delivery (D&D) Team and to GRDC's regional farming systems groups to ensure messages are delivered to growers and advisors, and that messages are specific to grower needs in each location.

The cotton and grains industries have two main goals for the project: to delay incursion of glyphosate-resistant weeds on farms currently free of them, and to help growers with glyphosate-resistant weeds to manage them as effectively and economically as possible.

Australia is not alone in its battle against glyphosate-resistant weeds, and we have the advantage of being able to see how other countries are addressing the problem.

"From a global standpoint, it's quite a large problem. The US has 4.9 million hectares, while Brazil and Argentina have 2.8 to 3.2 million hectares of land affected by glyphosate-resistant weeds." Ian said.

Ian Taylor explained that glyphosate-resistant weeds in the US, Brazil and Argentina evolved through intense selection pressure from back-to-back cropping of glyphosate-resistant crops (eg RoundUp Ready soybeans, corn and cotton). In Australia, glyphosate-resistant weeds had evolved mostly due to over reliance on glyphosate as a chemical fallow. He said that the push towards minimum and no till cropping systems, along with restrictive herbicide plant-back periods, has made glyphosate the "herbicide of choice" for weed control.

In Australia, RoundUp Ready Flex cotton is planted on a relatively small number of hectares, and Ian said that to date, there was no evidence of glyphosate-resistant weeds in the irrigated cotton system.

"But as we expand our dryland cotton system, planting RoundUp Ready Flex cotton where there has been over reliance on glyphosate on some of these dryland hectares, it's starting to act as a bioassay for populations of weeds that have become resistant due to other farming practices," Ian says.

"Potentially, we have a reasonable-sized problem on our hands."

Ian said Australia already had 136 confirmed populations of glyphosate-resistant annual ryegrass, as well as populations of glyphosate-resistant barnyard grass (18), liverseed grass (3), windmill grass (2) and fleabane (8) in NSW and Queensland.

"There is a lot of excellent research going on—it has been going on for a number of years—and this project will help bring these research findings together and provide some clear guidance to our growers," Ian says.

MAIN IMAGE:
New project Manager Dr Ian Taylor (right) discussing annual ryegrass management techniques with leading spray technology expert and trainer Bill Gordon.

INSET:
Fleabane is one of the target species for the new cotton and grains project managed by Dr Ian Taylor.

"THE US HAS 4.9 MILLION HECTARES, WHILE BRAZIL AND ARGENTINA HAVE 2.8 TO 3.2 MILLION HECTARES OF LAND AFFECTED BY GLYPHOSATE-RESISTANT WEEDS."

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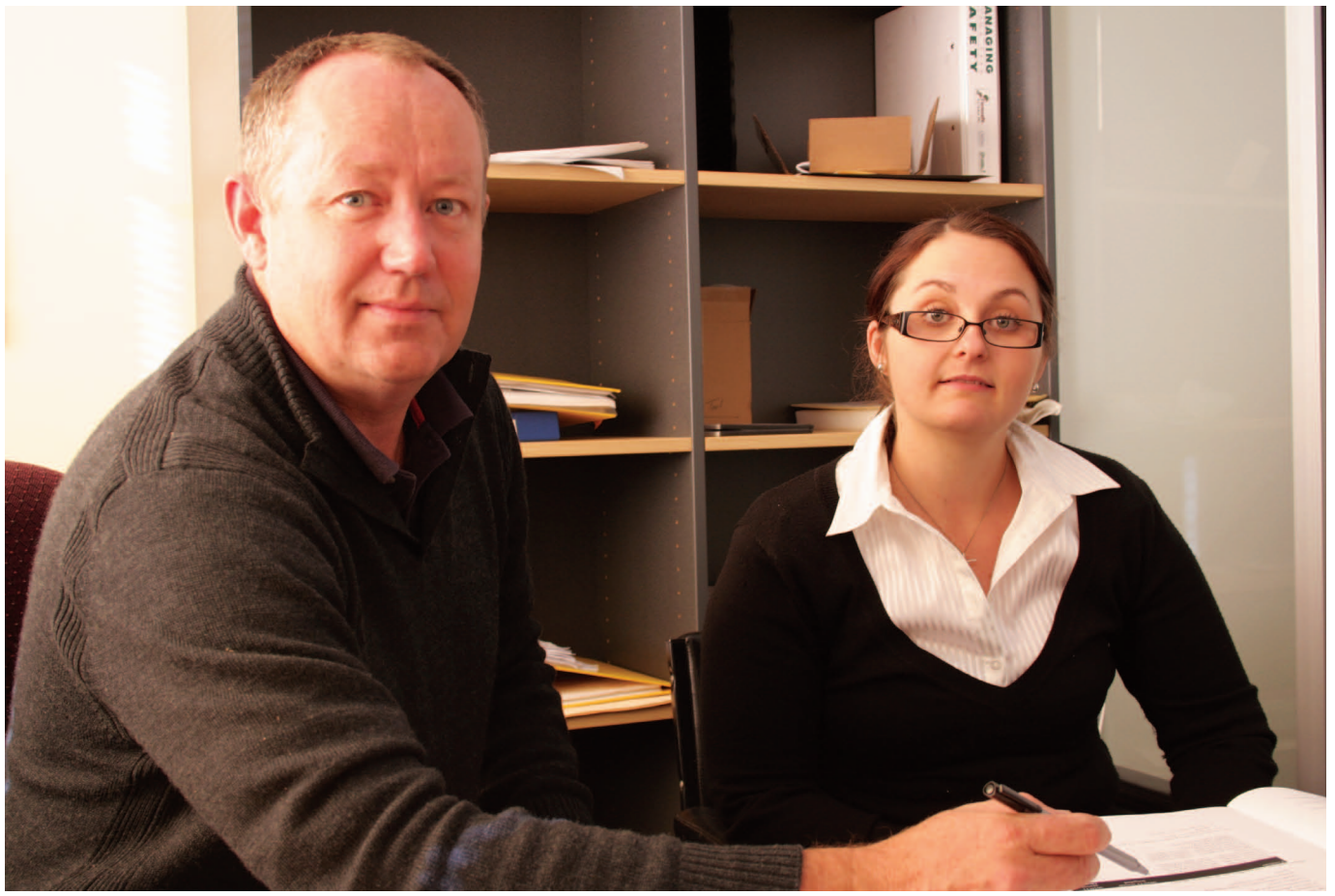


*my*BMP Business Manger Jim Wark and Rebecca Rogan who has taken on the role as *my*BMP customer service officer based in Toowoomba.

NEW FACE FOR *my*BMP

REBECCA ROGAN IS NO STRANGER TO THE COTTON INDUSTRY, HAVING GROWN UP ON THE COTTON PROPERTIES "BENELONG" AND "HARLEQUIN" AT ST GEORGE IN QUEENSLAND.

Bec recently joined the myBMP team as the customer service officer and as such is the first port of call for anyone keen to use the system or begin the accreditation process.

Based in Toowoomba, so far Bec has been kept busy with assisting with running Certified Advisors Training sessions and attending workshops with Cotton Industry Development and Delivery (D&D) Team Specialists.

Bec has always taken an interest in farming and in particular sustainability, which saw here initially study environmental engineering before moving into agronomy in 2007.

"I changed degrees because I felt it gave me a better 'hands on' opportunity to help growers manage farms sustainably. Now working with myBMP I have a real opportunity to do this," she says.

"I feel myBMP gives uniformity to the industry – providing guidelines to make farms sustainable and getting the balance right between economic and environmental outcomes.

"When I was assisting my Dad (Glenn) to become BMP accredited early last year, I would have loved to have had a resource like myBMP, all the info is there in one spot and with links to technical staff."

Before taking on this appointment Bec was working in horticulture, but admits it is great to be working in the cotton industry.

"Compared to a lot of other agricultural industries it has an open, sharing culture toward information and R&D," she said.

"This is something you may not realise or appreciated until you have come from another agricultural sector."

Call 1800COTTON (1800 268866) to speak to Rebecca and find out how simple it is to access the *my*BMP site, whether the aim is to make use of the knowledge centre and/or gain accreditation.

NEW POSITIONS VACANT: BECOME A MYBMP AUDITOR

The cotton industry is seeking individuals with a mixture of applied and in-field experience within the cotton industry to become *my*BMP auditors.

To be eligible, auditors must possess either:

- In-field experience of at least five years; or
- In-field experience of three years plus a relevant degree or diploma

A degree or diploma in the following fields is considered relevant:

- Environmental Science / Management
- Natural Resource Science / Management
- Rural Land Management
- Agricultural Science
- Agribusiness

To be eligible to become an industry *my*BMP auditor, the applicant is to have experience in the cotton industry in a capacity where judgement, problem solving and communication skills were required. This may be demonstrated either as agronomic, environmental, crop management, research, extension or other appropriate experience. Whilst the industry provides ongoing technical training for *my*BMP auditors against the content of the *my*BMP Program, it is expected applicants do possess a level of technical capacity in the fields of cotton production and agronomy and crop management, and rural land management / environmental management / natural resource management.

For further information, contact Ken Flower 02 6792 6042
mailto:kenneth.flower@csiro.au

WORKSHOPS MAKE IT EASY

Cindy and Andrew Pursehouse of "Breeza Station".

BREEZA STATION'S ANDREW PURSEHOUSE ATTENDED A MYBMP WORKSHOP RECENTLY AND SAYS HE WOULD RECOMMEND ALL GROWERS AND MANAGERS ALSO MAKE THE MOST OF THE OPPORTUNITY.

Run by Cotton CRC Catchment Officer Peter Verwey, *my*BMP workshops were held at Breeza, Wee Waa, Boggabri, Walgett and Spring Ridge. The three-hour sessions were aimed at giving an introduction to the functions, tools, information and use of the web-based system.

Andrew and Cindy Pursehouse had registered for *my*BMP at the Cotton Conference last year, but had not progressed with the system since that first registration.

"The workshop I attended was good because it allowed me to explore all the abilities of *my*BMP compared to the previous BMP," Andrew said.

"The registration process overawed me at the Cotton Conference, but there was more time to explore (at the workshops), I was able to go through all the features of the program and get a snapshot of what it can do.

"I would encourage everyone to come to these workshops. You have to really explore *my*BMP yourself, and put a toe in the water. I haven't found any faults and the system is really well put together.

"The new *my*BMP system is a breath of fresh air compared to the old BMP system – you can't really compare it to the old system."

Andrew said there seemed to be endless possibilities with the new *my*BMP.

"You can work towards levels 1 and 2, or higher to 3 and 4, or just pick the pieces that are immediately applicable to you, for example – workplace agreements," he said.

"Since the workshop we have been working our way through the Human Resources module at Breeza Station.

"We have also been looking at our fuel handling situation and soon we will be installing ground filling inlets on all tanks."

Andrew's advice to other growers/managers/office staff is the workshops are a good place to kick off where you can ask questions and get answers.

"It is handy to bounce ideas off the presenter and other growers," he said.

"Human nature being what it is, sometimes you need a shove in the side to kick things off and get started. The workshops are nice and brief and quick at three hours and don't take up a full day.

"I would encourage all growers and managers to go to one of these *my*BMP training workshops."

More workshops will be run and all people involved with running the farm are encouraged to attend.

Call Peter (Namoi) or Gwydir Landcare Officer Sally Dickinson to discuss a training for your locality.

Namoi myBMP Enquiries:
Peter Verwey
02 6799 2476/0408 972 516
peter.verwey@cottoncrc.org.au

email us

Gwydir myBMP Enquiries
Sally Dickinson
0427 521 498
sally.dickinson@gvia.org.au

email us

"THE NEW *my*BMP SYSTEM IS A BREATH OF FRESH AIR COMPARED WITH THE OLD BMP SYSTEM."

BACK ROW FROM LEFT – Certified myBMP advisors Andrew Stewart, Peter White, Susie McCutcheon, Rob Dugdale, Jim Wark (*my*BMP Business Manager), Michael Smith, Matt Westgarth.
FRONT ROW – Dale Clark, Nat Groves, Laura Macpherson and myBMP's Bec Rogan.

ADVISORS CERTIFIED FOR BEST MANAGEMENT

MANAGEMENT OF COTTON FARMS HAS ENTERED A NEW ERA WITH AGRIBUSINESS BEING TRAINED TO HELP GROWERS UTILISE THIS IMPORTANT FARMING TOOL.

The *my*BMP Certified Advisor Program started in June with nine Cotton Growers Services' staff from Narrabri, Wee Waa, Hillston, Warren and Goondiwindi attending the inaugural training. Further training in July saw the total rise to 16 Certified *my*BMP Advisers to help growers make the most of what myBMP has to offer.

myBMP is a web-based management system that is a complete rejuvenation and extension of the original BMP system by providing provides growers with the tools required to improve production performance, better manage business risk and maximise potential market advantages. It also enables the industry to demonstrate responsible and sustainable natural resources management to the broader community.

Cotton Industry myBMP Specialist Jim Wark said one of the challenges in introducing such a significant change to the delivery of best management was making sure that there were sufficient resources to help users getting started or transitioning to the new system – as smoothly and efficiently as possible.

"To help facilitate this transition, myBMP created the Certified Advisors program to train agribusiness staff to confidently work with any of their clients who would like to participate in myBMP," Jim said.

"Once accredited, the certified advisors will be able to work with growers determine the most appropriate myBMP level to suit individual farming operations all the way through to helping prepare for an audit, if the growers want the business to be certified.

"The aim of the Certified Advisor Training Program is to train sufficient agribusiness staff to ensure that all key cotton producing areas have access to myBMP certified advisors who will be available to help."

All certified agribusiness advisors' contact details are readily available by visiting the myBMP website and clicking on the 'Contact Us' link or alternatively getting direct access on the following link. https://www.mybmp.com.au/Resources/CertifiedAdvisors.aspx

myBMP is the result of industry wide consultation with growers, researchers and industry bodies, taking into consideration the requirements of the cotton industry both now and into the future.

More Certified Advisor Training days are planned, for more information please visit the myBMP website on www.mybmp.com.au or contact the myBMP Office on 1800COTTON (1800268866) or e-mail admin@mybmp.com.au mailto: jwark@csd.net.au

see our website

email us

REGISTER FOR NEW SEASON

As the a new season kicks off, *my*BMP is ready for growers to register and gain access to all of the information and resources. Register early in the season to make the most of the resources offered through the system – whether planning for accreditation or not *my*BMP helps identify opportunities to improve farm performance .

There is no cost to register and access the extensive resources and information available on the website. The easy to use web based format is designed by grower for growers. Progress through the program at your own pace and at a level that suits your specific farming operations.

Please note that existing BMP growers need to be update to the new *my*BMP program by October 2011 to retain existing certification.

Contact Bec Rogan at 1800 COTTON (1800 268866) for more information.

GROWERS WILL BENEFIT

COTTON ADVISORS ARE LINING UP TO GAIN FULL INSIGHT INTO *my*BMP AND HOW IT CAN SERVE THEIR GROWERS. MELANIE JENSON CAUGHT UP WITH PARTICIPANT PETER WHITE AT CGS TO FIND OUT HIS THOUGHTS ON THE ADVISOR TRAINING PROGRAM, AND WHAT IT MEANS TO BE A *my*BMP-CERTIFIED ADVISOR.

What value do you see in having staff trained through the program?

"This training helps CGS to support a key industry initiative to our mutual benefit. The business of CGS depends on a sustainable industry. After all, this is the industry which supports us! If our people can interact with our customer in a more effective way by adding additional value to the conversation, which is outside of our traditional expertise, it gives us a competitive advantage."

Did you find any greater value in myBMP through doing the course than you may have otherwise expected?

"Having been involved on the periphery of the old BMP for many years we had not been inclined to really understand the program or the tools within it. Without exception, all of us who did the (recent) training were surprised at the depth of information and its usefulness. All growers will benefit from getting involved, some will get involved to a lesser degree depending on their type of enterprise, others will embrace the program entirely but all will get far more out of it than the low cost of getting involved."

How do you see myBMP helping growers in terms of improving farming systems for better profitability and sustainability?

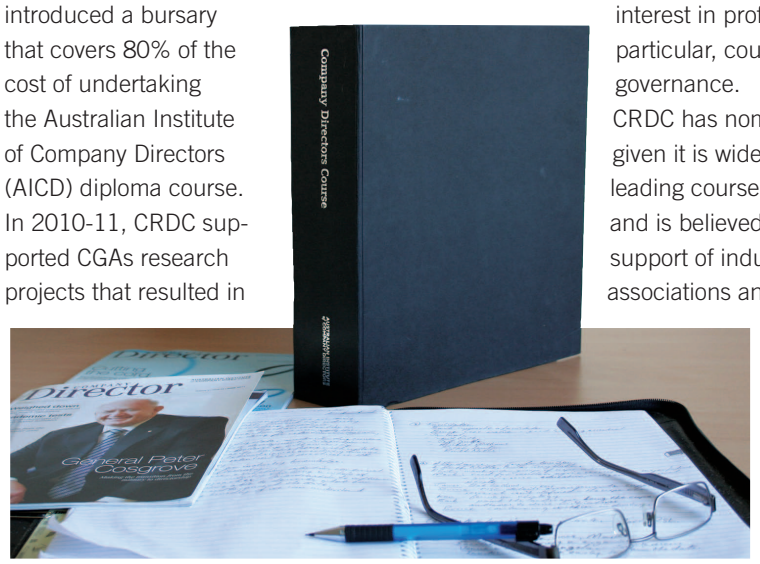
"For many this will simply be a risk management tool, others will use it to manage business processes which a consultant may have previously been used. As their farm management practices improve through better safety procedures, improved staff management and better record management growers will start to identify trends which guide them to opportunities to improve profitability and sustainability. The farms will look better, be more efficient and be easier to manage as risks are identified. In many cases the partner will manage the BMP processes becoming more involved in the farming operations adding even more value."

How could it do this?

"The website is easy to navigate around and the answers to problems are easy to find. As it is tailored to the cotton industry it is relevant, and because it has been designed with input from cotton growers it is practical. The best experiences from the old program have been incorporated into the new one, it has grown with the changing environment to help manage the current issues."

CRDC SUPPORTS COMPANY DIRECTOR TRAINING COURSE

In response to feedback from cotton grower associations (CGA) involved in the cotton industry's first grower driven R&D projects, CRDC has introduced a bursary that covers 80% of the cost of undertaking the Australian Institute of Company Directors (AICD) diploma course. In 2010-11, CRDC supported CGAs research projects that resulted in many development projects designed to improve industry capacity. Engagement by CRDC in these CGA-led R&D projects has identified a strong interest in professional development, in particular, courses that focus on corporate governance.



CRDC has nominated the AICD course given it is widely regarded as Australia's leading course for corporate governance and is believed by CRDC as ideal training support of industry's numerous committees, associations and businesses.

Applications are now invited from cotton growers, consultants or professionals engaged in the industry and who can apply their knowledge for the benefit of industry beginning in 2011-12.

Facilitated by experienced directors, the AICD Company Directors Course is a comprehensive and credible learning program for directors. Participants learn what it takes to contribute to organisational governance and to gain a thorough knowledge of the role and duties of being a board member. Flexible delivery is a feature of how AICD runs the course. Participants can choose to undertake their studies in facilitated sessions, correspondence or a residential program run every month in all capital cities.

For further information, visit the AICD website. http://www.companydirectors.com.au
To obtain a CRDC bursary application, please contact Helen Dugdale 0417 064 507
mailto: helend@northnet.com.au

see our website

email us

2011's BEST AND BRIGHTEST AWARDED

THE INDUSTRY'S BEST AND BRIGHTEST WERE CENTRE STAGE AT THE 2011 AUSTRALIAN COTTON INDUSTRY AWARDS AT NARRABRI IN AUGUST – WITH SOME WELL KNOWN AND NEW FACES AMONG THE FINALISTS AND WINNERS.

One face known to most is Mungindi cotton grower Joanne Grainger, immediate past chair of Cotton Australia and passionate industry advocate. At the awards evening at Narrabri on August 10, Joanne was handed the Cotton Australia Service to Industry Award, recognising her three decades of service to the industry.

The team from Bullamon Plains Pastoral Company at Thallon near the NSW/QLD border are the 2011 Monsanto Growers of the Year, who last year grew their largest crop ever – of 11.4 bales per hectare over 1430 hectares. The farm is owned by the Willis family and irrigation is run by Von Warner. The 20,000 hectare farm is myBMP accredited and at the leading edge in all aspects of their management techniques.

Dr Warwick Stiller was named as the CSD Researcher of the Year. Joining CSIRO Plant Industry in 1995, Warwick is now a globally-recognised plant breeder. The young scientist has played a key role in delivering new varieties to the Australian cotton industry that deliver exceptional yield and quality which are the envy of our competitors.

Stuart and Maxine Armitage of Cecil Plains on Queensland's Darling Downs are the AgriRisk Innovative Growers of the Year. The Armitages were recognised for their work in putting their own problems aside and helping the local community following the devastating flooding earlier in the year, organising community events to address mental health and other side effects of the flooding. They have now turned their attention to the coal seam gas issue and researching how it will affect farmers in the region.

Young people are the future of the industry, and if the finalists for the Chris Lehmann Trust Young Achiever of the Year award are anything to go by, the industry is in good hands. However, it was Theodore CGA president Fleur Anderson who was named winner for her work after the floods bringing attention to the plight of cotton growers. Data gathered by Fleur helped gain additional government assistance for growers. Fleur has been a dedicated member of the industry for a long time, a remarkable effort for a 29-year-old.

Grower of the Year convenor Geoff McIntyre, award's night host Gordon Bray; Innovative Grower of the Year winners Stuart and Maxine Armitage; Cotton Australia Vice-Chair Lyndon Mulligan; Cotton Growers of the Year Ed Willis and Von Warner; AgriRisk Services managing Director and sponsor John Van Der Vegt; Young Achiever Fleur Anderson; Grower of the Year Bill Willis; Greg Constable accepting the Researcher of the Year award for Dr Warwick Stiller; CSD General Manager and award sponsor Steve Ainsworth; Service to Industry winner Joanne Grainger; Monsanto Australia Country Lead and Sponsor; Peter O'Keeffe; Sponsor Bayer CropScience's Warren Inwood; Young Achiever sponsor Deb Lehmann.

An accurate measure of seepage is still very useful for determining the cost effectiveness of possible solutions.

LARGE SCALE SEEPAGE PROJECT GIVES GROWERS OPTIONS

USQ's David Wigginton was engaged to oversee the research.

SEEPAGE AND EVAPORATION LOSSES HAVE BEEN MEASURED IN 135 STORAGES.

On-farm water storages are an integral component of most irrigated cotton farms in Australia. However recent whole farm water balance studies have indicated that around 30 to 40 percent of all water on farm can be lost in storages. This comprises the biggest proportion of on farm water loss out of any component of the irrigation system.

Good news for growers is that the results of a project to be released in coming months will include guidelines for best practice in storage measurement, evaporation mitigation and seepage remediation to help growers identify and manage seepage.

To determine the extent of storage losses the National Water Commission, through its Raising National Water Standards Program, funded the Cotton Catchment Communities CRC to undertake this project "Measurement to improve the water efficiency of on-farm storages in the cotton industry". University of Southern Queensland's David Wigginton was engaged to oversee the research.

The project has now determined evaporation and seepage losses from more than 135 storages using the Irrimate Seepage and Evaporation Meter.

The results show the importance of carefully planning any remediation work, given the fact that the earthworks required can be expensive so growers should engage appropriately skilled contractors to provide advice on the best solution.

"Of all the case studies we were able to find only about 40 percent of remediation works previously undertaken by growers were successful, 40 percent were partially or initially successful (with seepage subsequently increasing again) and the remaining works were unsuccessful," David said.

"While this indicates that seepage issues can be difficult to fix, we found there was also a wide range of practices employed by individual growers."

As the causes of seepage issues are often difficult to identify, some of these outlined in the growers' case studies have been effectively resolved whilE others remain a work in progress.

"It is hoped that the lessons that these growers have been able to provide might help others who are also looking to remedy their own seepage problems," David said.

"This will initially be through the case studies booklet launched at the Cotton Collective in August, which provides examples of works that growers have undertaken in the past to remedy storages with unacceptable seepage losses.

"Many thanks must go to the growers and consultants who have provided very insightful information for these case studies."

The case study booklet can be found on the Cotton CRC website at www.cottoncrc.org.au

see our website

WHAT TO DO FIRST?
MEASUREMENT AND IDENTIFICATION

The first step in seepage remediation is identifying the problem.

Measurement of seepage losses has traditionally been challenging as it is difficult to differentiate seepage losses from evaporation losses.

For storages with very high seepage, an estimate is often made visually, as water levels may drop very rapidly over a period of weeks. However, an accurate measure of seepage is still very useful for determining the cost effectiveness of possible solutions. The Irrimate Seepage and Evaporation Meter has been used with success by this project and is able to cost effectively separate seepage and evaporation losses within a storage.

For storages with low or moderate seepage, an accurate measure is still recommended to confirm the true seepage rate and to provide rigour to on-farm water budgets and calculations.

Once a seepage problem is identified, the next challenge is determining the nature of the seepage loss. Evidence from the project suggests that most seepage problems occur in discrete locations within a storage, rather than uniformly across the storage floor. Such problems are often due to the presence of small sections of sandy or gravelly soil.

In many of the case studies, a combination of EM surveys and physical inspections (test holes or excavation pits) were used to identify these regions. As one of the case study growers noted, EM surveys can be very useful for identifying particular problem areas, but they are not completely foolproof, and ground truthing the results is important to ensure that potential issues do not go unnoticed.

Another method of investigation, resistivity imaging, was used by one grower to look at cross sections of soil profile in significant detail.

REMEDIATION OPTIONS

Clay lining and compaction

The most predominant type of seepage solution employed by growers involved the application of additional clay material over suspect areas, sometimes with additional compaction. Compaction of existing materials was also used on some occasions.

The case studies indicate that the methods for undertaking these works can vary significantly. The depth of clay lining varied from 0.25m up to 2m. Some growers chose to overlay this compacted clay with additional material of around 0.5m thick to prevent the compacted area from drying out.

Compaction was provided by various means, using earthmoving machinery (bulldozers, scrapers or laser buckets) while others applied additional compaction with sheepsfoot rollers or square impact rollers.

The level of compaction provided by different equipment should be considered. In particular, tractors and bulldozers are designed to spread their load over a large area to avoid compaction and ensure traction. Equipment designed for compaction such as the sheepsfoot roller provides many times more compaction than a bulldozer even though the machine weight is lower.

Soil type a key consideration.

Many clay soils in cotton growing regions have a large shrink-swell capacity. Therefore

Sheepsfoot rollers are a popular piece of machinery for effective compaction.

if compacted clay is allowed to dry out, it will most likely crack open and the effectiveness of the compaction will be diminished. This is why some growers had chosen to overlay their compacted soil with additional material to try and prevent cracking.

Planting crops in empty storages will dry the soil more than evaporation alone and will almost surely reduce or completely remove the effectiveness of compaction. For this reason, planting crops in storages is strongly discouraged.

Bentonite

Bentonite is a type of clay which has a very large shrink-swell characteristic that results in a very low permeability when wet. Bentonite suppliers should be able to provide advice regarding the best application method for specific applications and soil types.

It is critical to ensure that bentonite is applied at the recommended rates and in the recommended manner as the results may not be satisfactory when the rate of application is too low. As with clay lining, a protective cover of at least 0.5m of soil is likely to improve performance and longevity.

Polyacrylamide

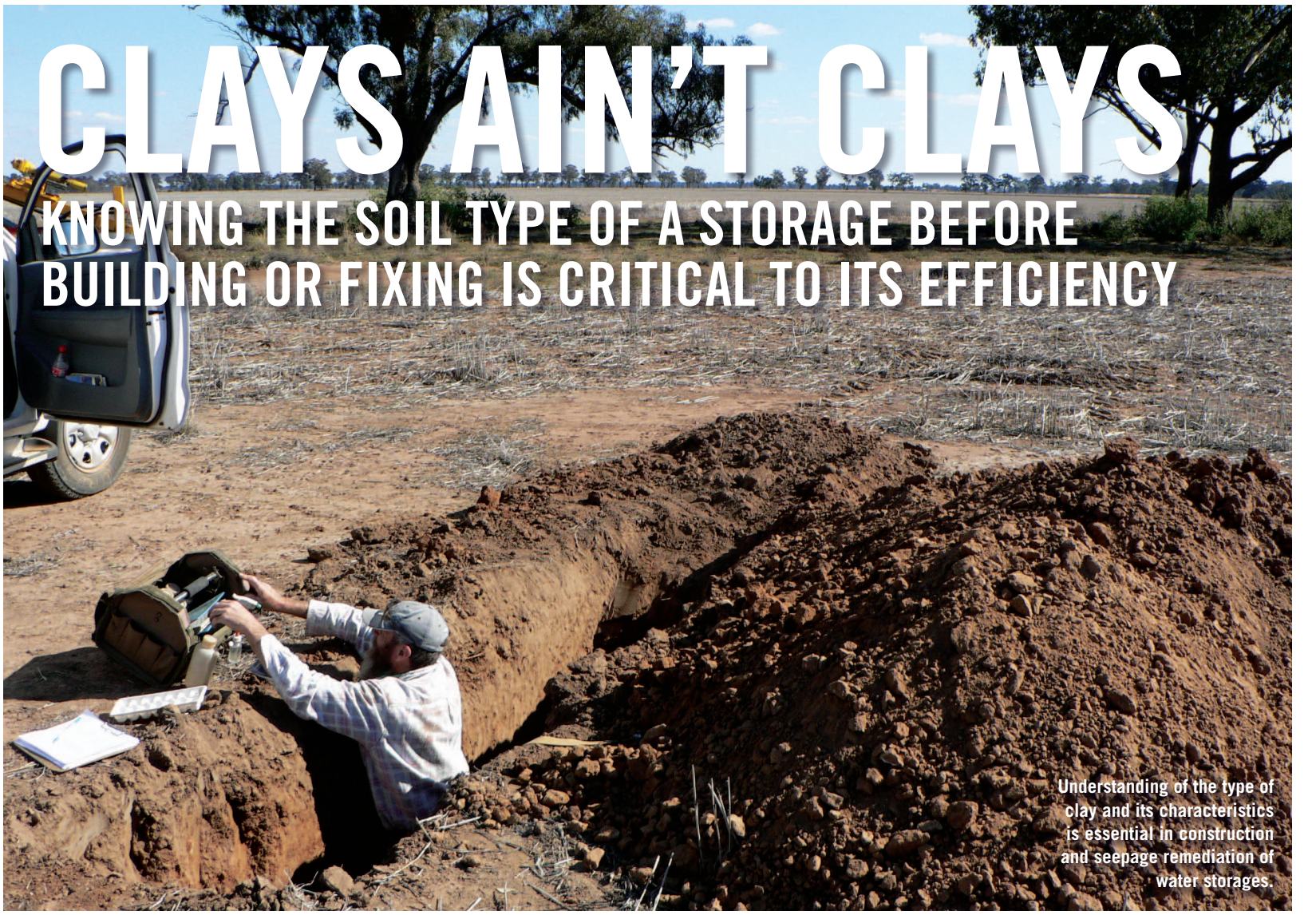
Polyacrylamides (PAM) are chemicals used in a variety of industries including the food and water industries. Specific PAM formulations, typically high molecular weight products, have been found to provide seepage reduction in some cases.

PAM can be applied to the soil surface, where it may or may not be incorporated in to the soil. It can also be broadcast over a body of water. Whilst evidence of PAM effectiveness exists, the only use of the product within these case studies does not seem to have reduced seepage loss.

The use of PAM may be of lower cost than some structural solutions, although the PAM is likely to need reapplication at regular intervals and the seepage reduction effectiveness may be variable.

CLAYS AIN'T CLAYS

KNOWING THE SOIL TYPE OF A STORAGE BEFORE BUILDING OR FIXING IS CRITICAL TO ITS EFFICIENCY



Understanding of the type of clay and its characteristics is essential in construction and seepage remediation of water storages.

Soil management consultant Pat Hulme was asked to investigate a leaking water storage near Yanco in the Murrumbidgee Catchment in southern NSW which illustrates the importance of adequate compaction and an understanding of the type of clay and its characteristics in construction and seepage remediation of water storages.

Built in 2002 to store water pumped from bores for annual summer row crops, it covered an area of 1.5ha. An engineer was engaged to design the storage and an EM31 survey was carried out followed by a small number of test holes to assess the soil material. The engineer determined that the site was suitable for construction of a water storage pond and designed the structure.

The storage was constructed using a scraper when the soil was moist. The walls were built using clay borrowed from the floor of the storage. No additional compaction was carried out to the floor or walls during this construction phase.

After filling the storage with water, the grower soon observed the water level dropping more rapidly than was expected.

Engaging an expert

Pat Hulme of Sustainable Soil Management in Warren was engaged to give remediation solutions.

He firstly used a home-made floating seepage meter and evaporation pan, constructed from an old drum and tied to star pickets to differentiate between seepage and evaporation losses in the storage. Seepage can be estimated by measuring the difference of change in water levels inside and outside the drum.

These daily measurements revealed that seepage was approximately 60mm/day. This equated to total loss of 1ML/day from the relatively small water storage. The grower estimated that the direct water and pumping cost was approximately $75/ML. This can be added to the opportunity cost of water lost from the grower's allocation for crop production.

"The hydrogeology of the area showed a prior stream below the storage and the entire floor was leaking into this aquifer," Pat says.

"It was determined that although the material at the site was a type of clay, it was relatively permeable in its natural state and not suitable for holding water without significant compaction."

The solution

The grower emptied the water storage and began pulling a PTO driven vibrating sheepsfoot roller over the entire site.

Initially the soil was too wet causing the feet on the roller to block up. However, as the site dried up the roller was pulled for two to three days with the vibrator turned off until the feet on the roller were no longer imprinting the soil.

At this point the vibrator was then turned on and the grower continued to roll the site for a further two to three days until again the roller was on top of the ground and the feet were not imprinting the soil.

"By significantly increasing compaction to the existing material eventually the soil pore spaces were diminished to such an extent that the floor was able to store water," Pat explains.

"Measurements taken after remediation showed losses of approximately 1mm/day.

"This case study illustrates the importance of adequate compaction and an understanding of the type of clay and its characteristics in construction and seepage remediation of water storages."

The compaction has been effective for three years largely because the pond floor has remained wet. It can remain effective provided the compacted layer remains intact.

MAJOR POINTS

1 Clay lining should be of a sufficient thickness, it should be compacted properly (preferably using specialised equipment such as a sheepsfoot roller) and it should be at the correct moisture content at the time of compaction (an engineer or soil specialist can advise on this for individual soil types). Soil will most likely need to be laid down and compacted in a series of layers to achieve the required depth.

2 The effectiveness of compaction will be reduced if the soil is allowed to dry and crack. Therefore a layer of covering material is recommended to be applied over the compacted layer, of sufficient depth to prevent the compaction from drying out completely.

YOUNG SCIENTIST SOUGHT

Applications are open for the 2012 award are now open, and CRDC is encouraging young scientists to apply for the next round.

The Science and Innovation Awards is an initiative of ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) within the Federal Department of Agriculture, Fisheries and Forestry.

The Award supports people aged 18 to 35 to undertake a project on an innovative or emerging scientific issue, including biophysical and social sciences that will contribute to the ongoing success and sustainability of Australia's agricultural, fisheries and forestry industries.

Most Rural Research and Development Corporations, of which CRDC is one, sponsors one scientist and all awardees from each industry pitch their project competitively.

There are a number of grant categories available including animal welfare, cotton, dairy, new and emerging rural industries, fisheries and aquaculture, horticulture, forestry, grains, pork, and viticulture and oenology. Each category includes a grant of up to $22,000, while one grantee will also be awarded an additional $33,000 as the winner of the Minister for Agriculture, Fisheries and Forestry's Award.

Applications open on September 12 and close November 18. Final winners will be announced at a presentation dinner in March at the annual ABARE conference in Canberra.

For James Hereward, winner of one of an ABARES and CRDC-sponsored science award, the best part of the whole experience has been the encouragement provided to young researchers in agriculture through the awards.

RIGHT:
Winning the CRDC co-sponsored ABARES Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry has given James Hereward a kick start to his glyphosate resistance research.

BELOW:
James being congratulated by the Minister for Agriculture Fisheries and Forestry Joe Ludwig at the March 2011 ceremony.

James Hereward strongly advises young scientists to apply for the ABARES Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry.

"All you need is an idea that can help the sustainable future of agriculture," James told *Spotlight*.

"You hear a lot in the media regarding food security these days, so it's great to experience such financial and personal investment in young scientists, and to feel a part of the solution to these future challenges."

The University of Queensland PhD student said winning the CRDC-sponsored award in March 2011 had been an amazing experience, and attending the ABARES conference and awards dinner has given him more insight into the current outlook of agricultural economics and research.

"Meeting the other award winners, funding agencies and ministers was also very rewarding and I learned a lot over the two days," he says.

In winning the 2011 CRDC Young Scientist of the Year allowed James to undertake "next-generation sequencing" for two important resistant weeds – fleabane and barnyard grass.

"The award provides much needed funds; and a massive kick-start to this line of research for me," he said.

"My research should provide most of the genes for these two species and also much of the non-coding genome. I plan to use these genomic tools as a basis to test the role of genetic diversity in allowing the evolution of resistance to glyphosate.

"These data may also provide insights into the molecular mechanism of resistance in these two species."

For more information and an application pack, e-mail scienceawards@abares.gov.au or phone 02 6272 2260

see our website

SCIENTIFIC RECIPES FOR A NEW INDUSTRY

SCIENTISTS LIKE BRIAN HEARN KICK-STARTED AUSTRALIA'S MODERN COTTON INDUSTRY BY FURTHER ELEVATING SCIENCE AS THE TRUSTED LANGUAGE OF COTTON FARMING IN AUSTRALIA. CHRISSY BROWN REPORTS.

The prosperity and sustainability of Australia's cotton industry would have been much the poorer had it not been for the unstinting efforts of a young colonial crop scientist who saw the real opportunity for high yielding production in Australia. As both witness and participant in cementing the link between crop sciences and farm practice in the early days of the modern cotton industry, Brian Hearn's vision of best practice cotton agronomy lives on today on every Australian cotton farm.

Born in Woolwich, England, now retired cotton researcher Brian Hearn has been involved with cotton in multiple countries and contributed immensely to the industry that has benefited from his passion with the science of cotton production.

Brian's career began as an agronomist in Nyasaland (now Malawi) in southeast Africa and later landed a job with the Empire Cotton Growing Corporation (ECGC) in Yemen to work solely on the crop as a breeder/agronomist.

"In Yemen, cotton was grown in a unique and instructive way – leaving an invaluable insight into the ecology of cotton's wild ancestors that also explained the behaviour of modern crops.

"I wanted to do more than obtain empirical recipes for growing cotton; I wanted to be able to design the recipes. I was frustrated however in that I could not explain how the treatments caused the variation in yield, and predict how yield was determined by the environment, then I discovered crop physiology!"

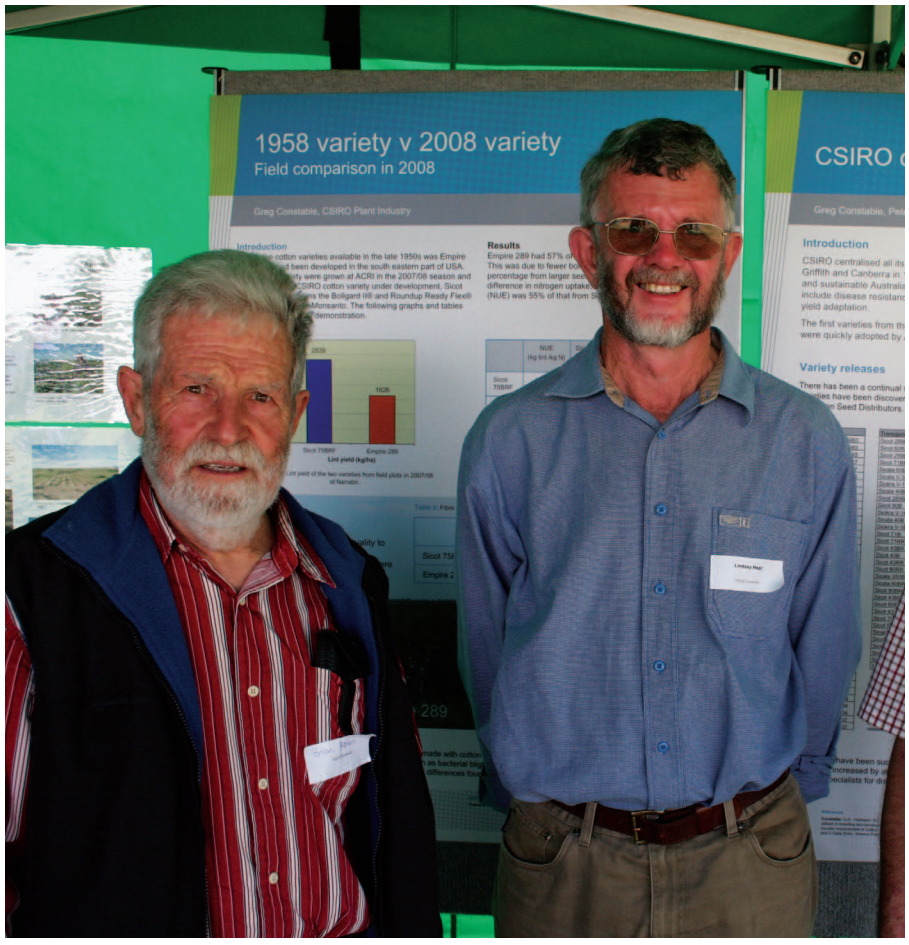
In 1966 Brian moved to ECGC's main headquarters in Uganda continuing to research cotton physiology and it was then he wrote what he thinks

Brian Hearn (right) and Norm Thompson were two of the industry's leading scientists who successfully linked science with practical farming.

was his most significant publication.

"It showed that the most significant event in the life of a cotton crop was not identified by phenology[1] (eg timing of flowering) but occurred when the number of fruit was sufficient to utilise all the nutrients available. The crop then 'cutout', further development stopped, no further bud or leaf production, no further fruit set, all young fruit shed. We were making progress; we could explain but we couldn't yet predict!"

During the same decade, large scale production of cotton began in Australia. In 1970 ill health and the need for a climate change motivated Brian to apply and accept a position as a cotton research agronomist in the Ord Irrigation Area in north-west Western Australia, and later an appointment in Narrabri where he joined Norm Thompson as part of the team working with the industry. "Narrabri introduced me to temperate production. Cotton is king in the irrigated valleys between the 22nd and 32nd parallels in eastern Australia."



Another long time employee at ACRI Lindsay Heal (right) and Brian caught up at the ACRI 50-year anniversary celebrations .

When you first began, what were you working on at the Ord and then when you moved to Narrabri?

On the Ord I was investigating nitrogen and irrigation management to find an agronomic solution to a quality problem. One of the advantages of the Ord for mechanised production was the long Dry and frost-free winter which potentially meant a long picking season so that fewer pickers were needed for a given acreage. Some paddocks stood fully mature for up to four months before they were picked. This was exacerbated by extending the season with more water and nitrogen to get a second cycle of fruit so that the first bolls to open waited even longer to be picked. However during this time ultra-violet light degraded the cellulose and reduced fibre strength.

"INNOVATION NEEDS GROWERS AND SCIENTISTS...."

I was working on ways to manage water and nitrogen to set the crop quickly, to avoid going into the second cycle, and to stagger the production of a grower's crop so it didn't all mature at once. However, I came to the Ord in time to witness the ecological coup in which King Cotton lost his throne when H. Armigera became resistant to DDT. Production was abandoned on the Ord, I always thought the research was abandoned prematurely; to me it was like cowardice in the face of enemy fire.

At Narrabri I continued to investigate nitrogen and irrigation management with a view to optimising their use. Also on the Ord and at Nararbri, I continued to work on a model of cotton, which I started before I came to Australia in order to answer the scientific question: how does cotton grow. I entered an agronomic culture in the CSIRO Division of Land Research that was buzzing with crop simulation. Simulation modelling was what I needed and what cotton needed.

The entomologists at Narrabri also had a model for pest management. The prototype had been developed by Peter Room, he moved on and others took it over. It became SIRATAC and successful trials started on growers' properties. But conflict developed among the entomologists, some favouring a soft 'green' approach, others more use of hard chemicals.

Jim Peacock, who was then head of that area in CSIRO asked me to take over and act as an umpire. This enabled me to incorporate parts of my cotton model in SIRATAC. The model integrated what I and others knew about how cotton grows and responds to climatic and agronomic inputs and was a simple simulation model, which captures the dynamics of cotton fruiting when water and nitrogen are not limiting.

Meanwhile, synthetic pyrethroids (SPs) had replaced DDT to control *Helicoverpa*. Scientists warned industry "if you use SPs like you used DDT, you'll get resistance very quickly". Most didn't take any notice, they wrote us off as a bunch of green ideologues. One of the main design features of SIRATAC was to minimise the risk of resistance, and so SIRATAC only recommended SPs as a last resort, and limited to one generation in the season, recommending instead softer options. These softer options were derided as 'lolly water' by many consultants.

And so very soon, because most were not using SIRATAC, surprise, surprise, along came resistance to SPs. The SIRATAC records also provided the hard evidence of resistance until topical lab testing could be done, and the Resistance Management Strategy devised to contain resistance embodied the SIRATAC principle of limiting SPs to one generation. The industry learnt the lesson, and has since adopted a very responsible attitude.

The model saw more than 10 years service in the SIRATAC pest management system however during this time it became apparent that at very high yields (which were starting to be seen) the model predictions were inconsistent with reality. The OZCOT and hydroLOGIC models were developed from the SIRATAC fruit model.

What was it like to be a part of an emerging industry?

Exciting!! ... and rewarding.
I have enjoyed my career as an agronomist because of a life long love affair

with cotton. The distinctive features of its physiology, derived from its indeterminate habit and xerophytic origins, captivated me, and continue to captivate me.
Its social and political impacts on history are equally fascinating. Why else endure the heat and burden of the day under the blazing sun collecting data; why else do the lights in the lab burn late when the administrators have long gone home; why else travel on a shoestring to attend a conference? There has got to be some passion there!

Having a role in the development of cotton as a sustainable crop, rather than the ecological tyrant it threatened to be, has been the most satisfying of my career, and I count it a privilege to have served an industry that changed Australia from being a net importer of cotton to being high in the global export league table, with yields almost tripled and expansion into every valley west of the Dividing Range between the 22nd and 32nd parallels.

What was the mindset of the early growers and researchers?

When I moved to Narrabri in 1974 a prominent leading grower said to me "We don't need help with agronomy and varieties, only pests". Like me, he thought Norm (Thomson) was wasting his time trying to beat Deltapine, and it took another 10 years for Norm to prove us wrong. And he clearly thought I couldn't improve his agronomy.

An agronomic problem soon turned up – compaction. I was experimenting with rotations, and expected the effects of the preceding crop on cotton could be explained in terms of nitrogen nutrition. But nitrogen did not explain everything, there was another factor at work. I suspected compaction.

I had John Loveday, a soil scientist look at the profile. At that point, the soils program was launched with a new recruit Des McGarry who proved able to extend the science.

What goes into breeding some of the best cotton varieties in the world?

Patience, perseverance and passion; playing the numbers game, and having the resources to make large numbers of crosses and selections, test thoroughly under a range of conditions, and cull ruthlessly.

What was the relationship like between researchers, cotton growers and the industry – science being the trusted language of best practice cotton production?

At its best, it's a dynamic healthy tension that leads to progress.
Contrary to what most people think, it is not the purpose of science to solve problems.

The purpose of science is to explain the way the world works. It's those two questions: farming is about 'how to grow cotton', while science asks 'how does cotton grow'. That said, some growers have a scientific approach; some researchers think like farmers.

Innovation needs growers and scientists. I don't mean that science is superior and occupies the moral high ground, far from it. Science cannot make value or moral judgements. This is of overwhelming importance, but is not understood.

Science says: this is the mechanism, this is way it works, if you do this, x will happen; if you do that y will happen; but science cannot say whether x is better than y. In the case of farming, the grower provides the criteria for saying which is better.

Growers innovate too. If we think only in terms of how to grow cotton, we will think in terms of recipes. When a new crop, like cotton, is introduced, we try and compare recipes used in other parts of the world, and then experiment with different quantities of ingredients.

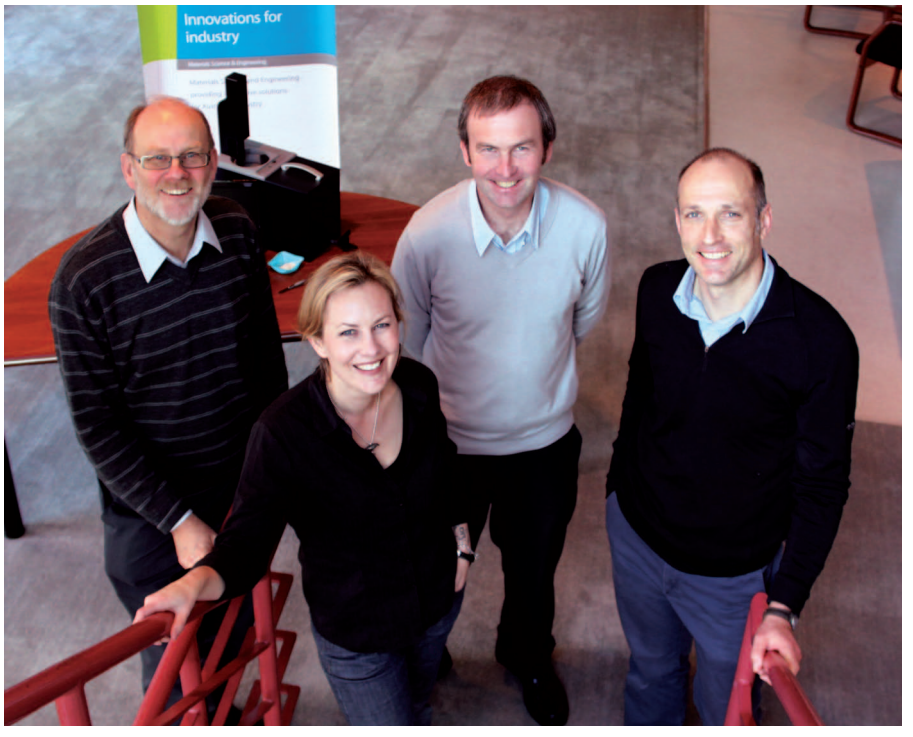
But that is not intellectually satisfying; a scientist wants to design recipes based on his understanding of how the crop grows. Too bad, says the industry, we don't pay scientists to be intellectually satisfied. But if industry doesn't then it does not get good scientists, who will think outside the square, and an important source of innovation is lost.

1 Phenology is the study of periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate.

Brian and CSIRO plant breeder Greg Constable at the 50-year anniversary of ACRI in 2009.

EUREKA MOMENT FOR COTTON INDUSTRY R&D

THE PRESTIGIOUS ANSTO EUREKA PRIZE FOR INNOVATIVE USE OF TECHNOLOGY HAS NAMED THE COTTON INDUSTRY'S COTTONSCOPE FIBRE TESTING INSTRUMENT AS A FINALIST FOR INNOVATIVE USE OF TECHNOLOGY IN 2011.



Drs Naylor, Gordon and Lucas with Nicole Phair-Sorensen – the inventors of Cottonscan and Siromat. Image courtesy CSIRO.

Cottonscope is the first instrument of its kind to measure both cotton fibre fineness and maturity and is the result of extensive proof-of-concept research conducted by the Post-Harvest Cotton Research Group at CSIRO's Division of Materials Science and Engineering (CMSE). CRDC and the Cotton CRC invested with CSIRO in the research and development of Cottonscope over many years.

The research led to the development of two separate prototype instruments and two full national phase patents: one for measuring cotton fibre fineness (Cottonscan), and one for measuring fibre maturity (SiroMat). The Post-Harvest Cotton Research Group combined the technologies to create the Cottonscope instrument.

Group Leader Dr Stuart Gordon said the Cottonscope team is very happy and honoured to be nominated for the ANSTO Eureka Prize for Innovative Use of Technology.

"Cottonscope is a new instrument. For the first time, the Australian cotton industry can have full confidence in measuring fibre fineness, maturity and the distribution of these properties in a cotton fibre specimen," he said.

"The ability to measure these parameters quickly and directly gives the cotton industry and their mill customers the opportunity to place a financial value on these properties, and in doing so should motivate the market to produce finer, more mature fibre."

It has been estimated that up to 25 percent of Australian cotton has been wrongly assessed and discounted due to the ambiguity associated with interpreting the Micronaire measurement, a direct commercial loss to the Australian cotton growing industry of up to $50 million annually as a result of lost premiums.

UP TO 25 PERCENT OF AUSTRALIAN COTTON HAS BEEN WRONGLY ASSESSED AND DISCOUNTED… A DIRECT COMMERCIAL LOSS TO THE AUSTRALIAN COTTON GROWING INDUSTRY OF UP TO $50 MILLION ANNUALLY.

Cottonscope has been described as a 'major breakthrough' in measuring cotton fibre linear density and maturity by Dallas Gibb, CRDC Value Chain Program Manager.

"The ideas are unique and the use of the instrument will benefit the Australian industry," he said.

"The most important overarching perspective is the value of the market opportunity brought by the instrument in defining (Australian) cotton quality."

"Cottonscope provides a tremendous opportunity for plant breeders and merchants to select and value cotton on the basis of its fineness and maturity, and for spinning mills to manage their raw material," added Dr Geoff Naylor, CSIRO Program Leader for textiles.

The importance of cotton fibre fineness and maturity has long been recognised by the international cotton trade, processing and research communities. Previous methods have been either extremely slow, making precise measurements impractical, or have measured fibre parameters not solely related to fineness or maturity.

For example, the Micronaire measurement was introduced to cotton classing in the 1940s to measure cotton fibre fineness (linear density).

However, it was soon understood that it actually measured a combination of fineness and maturity. The Micronaire instrument measures the pressure differential of air forced or pulled through a compressed plug of raw cotton fibres.

It is attractive commercially, being a relatively rapid and inexpensive test, but the interpretation of the result is fraught with difficulty. It is still in use today as the best alternative available to the industry.

Following successful demonstration of the prototype instruments in a range of international industry and research forums, BSC Electronics P/L, an Australian company, played a key role in combining the two separate technologies into one instrument. BSC now has an exclusive licence to manufacture and sell the Cottonscope instrument.

For further information, go to:
http://eureka.australianmuseum.net.au/

see our website

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