COTTON RESEARCH & DEVELOPMENT CORPORATION

Spotlight

AUTUMN 2011

on Cotton R&D

NUTURING NATURE

VALUE IN ECOSYSTEM SERVICES

BIG WET: RESEARCH RESPONSE

*my*BMP WOVEN IN TO DAILY PRACTICE

CONTENTS SUMMER 2010/11

COVER PHOTO ROHAN BOEHM

Rhiannon Smith is dwarfed by a giant river red gum in the Namoi Valley.

IN THE SPOTLIGHT

It has been a season of highs and lows for many as we look to picking season. What started as the most promising season on record had many surprises in store in terms of the weather, a double-edged sword that has filled our dams yet also devastated a lot of dryland and to a lesser extent irrigated crops. Our thoughts are with those who have endured flooding over these summer months.

While growers contended with flooding in most cotton growing areas, the industry put into place some measures to alleviate the effects and respond to the changed needs of growers to finish crops.

Leading researchers visited the hardest hit areas to answer growers' questions and assess damage, which has led to some important insights for the future of research and the relevancy of current research into waterlogging and wet seasons. We have included a summary of what these researchers had to say about crop management and recovery for these growers.

A major feature in this issue relates to 'ecosystem services'. The benefits people gain from the environment are referred to as ecosystem services and it is becoming increasingly apparent just how much cotton producers and the wider community stand to gain from improving ecosystem service provision on farm. Many growers have been improving environmental management on farm and in doing so have seen benefits for production.

"MANY GROWERS HAVE BEEN IMPROVING ENVIRONMENTAL MANAGEMENT ON FARM AND IN DOING SO HAVE SEEN BENEFITS FOR PRODUCTION."

We look at current research undertaken by PhD student Rhiannon Smith based on the flood plains of the Namoi Valley, where the value of vegetation for both insect management and carbon sequestration has been assessed. We also check in with Andrew Watson, who is a grower very aware of how the natural environment affects his bottom line at his farm near Boggabri, NSW. This will be the fourth consecutive season the Watsons have grown cotton without the use of sprayed insecticide, which has benefited ecosystems, beneficial predators and his bottom line.

March will also bring to a close the first full season under the new *my*BMP program. In the current climate, never before has best management practice been so relevant, with it becoming a criteria for certification of Australian Long Staple cotton as "Premium". The industry BMP farm manager award has also been outlined. This cotton industry initiative was used as an example at an international conference in Geneva as an example of an industry at the forefront of green skilling its workforce – a welcome accolade.

This is outlined in this month's edition along with *my*BMP manager Jim Wark who has been working with consultants and agribusiness to find ways to bring *my*BMP to growers.

As picking begins in many regions, useful knowledge has been provided by Drs Mike Bange and Rob Long on fibre quality and how management decisions can help keep the integrity of our product through defoliation and harvest.

On behalf of CRDC Board and management, we wish you a successful harvest.

Australian Government
Cotton Research and Development Corporation

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CRDC is a research and development partnership between the Australian cotton industry and the Australian Government.
Cotton Research and Development Corporation
ABN: 71 054 238 316 Our vision: A globally competitive and responsible cotton industry
Our mission: Invest and provide leadership in research, innovation, knowledge creation and transfer.
Our outcome: Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community.
Corporate background: CRDC was established in 1990 under the Primary Industries and Energy Research and Development Act 1989 (PIERD Act.) which outlines its accountability to the Australian Government and to the cotton industry through the Cotton Australia. CRDC is responsible to the Australian Government through the Minister for Agriculture, Fisheries and Forestry, Joe Ludwig.
CRDC is committed to fulfil its legislated charter to: Invest in and manage an extensive portfolio of research, development and extension projects to enhance the ecological, social and economic values associated with cotton production systems and to benefit cotton industry participants, regional communities and the Australian community.

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BIG WET RESEARCH IN ACTION

RESEARCHERS HAVE IDENTIFIED KNOWLEDGE STRENGTHS AND GAPS AS A RESULT OF EXTREME WEATHER CONDITIONS IN COTTON GROWING REGIONS.
MELANIE JENSON REPORTS.

The weather which has adversely affected cotton crops across many growing regions has "demonstrated the importance of conducting research and extension that creates an understanding of how the plant grows in response to climate, soil and management rather than developing simple recipes," according to one of the industry's leading researchers.

"We have a pretty smart industry in Australia and this approach creates a situation where the response to a new problem can be developed from this understanding and have a reasonable chance of success," says CSIRO's Steve Yeates who has dedicated years of research to water use and crop physiology and is currently stationed in the Burdekin Region – an area that has had a run of much wetter than average seasons since 2007.

Steve said while it was rewarding to be involved in work that was timely for the hard-hit (Central Highlands) Emerald growers, he would have preferred the circumstances to have been less dire for the growers.

"However it is critical we learn as much as we can from this season's crops to ensure a better response next time," he said.

"Some knowledge gaps were identified so the success of our efforts will not be known until picking.

"The work that consultant Jamie Iker and D&D Team Specialist Susan Maas are doing will provide valuable information."

Steve toured the Emerald district in mid January with fellow researcher, QDEEDI's Dr Paul Grundy and Cotton Australia's Greg Kauter as part of an effort to assess damage and devise management tactics that would allow a degree of crop recovery for the remainder of the season. Similar tours were held with other researchers on the Darling Downs and in Western and Southern NSW.

These visits came about after CRDC facilitated a meeting of the Australian Cotton Industry Council (ACIC) in early January to bring leaders together to determine what steps could be taken immediately and for the remainder of the season to help wherever possible. Industry leaders sought to immediately quantify the industry impact and shared information on the possible market risks for growers and merchants as well as the ideas growers had suggested to Cotton Australia for flood support.

Beyond addressing immediate impacts, it was clear that initiatives were required to have industry research and extension specialists assist growers to assess what remained of crops yield potential after flooding events or waterlogging. Some crops had been inundated for lengthy periods and a number of times.

CRDC has worked with the Cotton CRC and Cotton Australia to prepare and disseminate available R&D information on managing flood damaged crops to cotton growers and their consultants through the cotton industry's Development & Delivery team and CSD.

The information covered likely crop responses to flooding and waterlogging, crop management for late matur-

Dr Paul Grundy used information gathered from research into growing cotton in wet climates to help growers affected by flooding in the Emerald district. Image courtesy Greg Kauter.

ing crops, fertiliser, disease and irrigation management. CRDC assisted with extending this information through industry media and funding visits by cotton scientists to each of the flood impacted cotton regions to speak with growers and consultants directly.

Excellent body of research exists

Paul Grundy said after a couple of visits to Emerald with Steve Yeates, one of the clear messages they had been able to articulate to growers was the potential for and value of compensatory growth and crop recovery in the Central Queensland climate.

"Many inundated crops in Emerald were badly damaged and I think a lot of growers and consultants took heart from our discussions about our R and D experiences in the Burdekin, whereby lost yield potential even on advanced crops could be partly recovered with management strategies geared towards accelerated vegetative growth soon after the flooding event," Paul told *Spotlight*.

"Strategies involving slashing, nutrition, Pix and defining seasonal climate and time constraints going forward were all part of these discussions and drawn from the excellent body of research that exists within the industry and some recent Burdekin experience, of which Emerald has similarities.

"For Emerald at least I think our inputs were serendipitously well timed, highly valued and may prove to be worth quite a bit to the Central Queensland industry. Many growers and consultants were at somewhat of a loss as to the best way forward after quite severe flooding and these discussions allowed people to more clearly pick a path to some sort of recovery for their given situations.

"Time with these things is generally the enemy and for people to be able to get on with the job as soon as possible will have been of significant benefit.

"Reports from consultants with whom I have spoken, indicate that many of them are both pleased and surprised with the level of yield compensation that has been achieved even on some badly affected crops

ABOVE AND BELOW: Damage was in varying degrees, some caused by prolonged waterlogging or by complete inundation.

"Whilst there is not anything particularly unique about this, I think having the data and experience of recovering good yields from crops that are 15-17 nodes in the Burdekin with no bolls gave a lot of people some hope that many situations were in part recoverable but would require a different management approach and the acceptance that these crops would finish quite differently to normal.

"Time will tell how well these crops finish at the end of the day."

Dr Michael Bange also from CSIRO travelled from the Australian Cotton Research Centre at Narrabri to the Darling Downs and Goondiwindi regions along with Nilantha Hulugalle NSW I&II and Cotton Australia Chairman Andrew Watson to discuss issues for post flood and severely waterlogged cotton crop recovery. Meetings were held at Cecil Plains, Bongeen, Oakey Creek, Nandi, Macalister, Warra and Goondiwindi.

Mike said the level of damage to crops was varied.

"In many ways the reasons for the impacts of waterlogging and flooding impacts on cotton were evident," he said, "however there were many instances where the levels of impacts were different and sometimes this was difficult to understand.

"While there has been much research on waterlogging the level of impact on crops was far beyond that any research could adequately address."

Mike said many factors on The Downs had conspired to cause the level of impacts of the waterlogging and flooding that led to severe effects. These included a cool start to the season delaying crop growth, extremely cloudy weather, multiple and prolonged flooding events, bed formation, elevation and slope of fields that were flooded.

"Again, managing the impact following waterlogging/flooding inundation therefore varied due to the degree of impact," he said.

"In discussion with growers it was evident that many of the current principles of soils and cotton cropping applied. Many challenges relate to the length of season remaining to produce a crop and the risks of expending too many resources (monetary or otherwise) on a crop that may not return yield (if any of significant worth).

"While we had the knowledge and tools to assist with these discussions, some issues that could not be answered clearly were the impact of slashing to generate more fruit. However this did not come up much in the southern areas.

"As Steve Yeates and Paul Grundy outlined in their discussion with Central Queensland growers, this concept had not been tested following extreme stress conditions but some research has been initiated to explore the issue.

"A rapid and reliable means to sample for nutrients in the top 30 centimetres would have helped some decision-making on nutrition."

Mike said the response from industry was something to be proud of.

"Many growers and consultants had plans in place based on sound principles and knowledge. It was a credit to the industry," he concluded.

CRDC in consultation with Cotton Australia and the Central Highlands Cotton Growers' Association is fast-tracking a farming systems research project to monitor flood damaged crop responses as they regrow to a range of management treatments (slashing, fertiliser, water and pest management). Similar investigations have been initiated on The Downs and in Goondiwindi.

CRDC has also confirmed its support for a study of cotton farm business flood impacts in conjunction with the Cotton CRC and Cotton Australia. The Dawson CGA and Cotton Australia have identified a high priority need for financial analysis of the impact of two successive major floods on cotton farm businesses in their region. The objective of the study will be to provide growers with a platform on which to develop individual and possibly regional plans for recovery and provide

Northern grower Hamish Millar in a crop at Emerald during the field walks with Paul Grundy and Steve Yeates in January, where a trial is being run to investigate the effects of slashing at different heights post flooding.

information for exceptional circumstances assistance.

Southern region visit

Drs Michael Bange and CSIRO's Lewis Wilson also visited the Macquarie and Lachlan valleys, visiting properties at Narromine and Warren with the help of CSD and the Cotton CRC.

Lewis Wilson said in those situations growers and consultants were most interested in the capacity of plants to recover their fruit set.

"There was a sense that total protection could be justified to ensure that every fruit that could be set was set," Lewis said.

"However the plants will still produce more fruit than they can retain and such an approach, which often relies on more frequent insecticide applications of cheaper broad spectrum pesticides, will be very detrimental to beneficial populations and increase the risk of expensive-to-control secondary pests later. These include spider mites, aphids and silverleaf whitefly.

"So a sensible approach to pest management is needed – using good sampling, sticking to recommended thresholds, monitoring fruit retention and using more selective insecticide options where possible to help retain beneficial populations and reduce the risk from these pests.

"The risk of 'pushing' crops along with extra N and water was also discussed – the risk here is that it can create a situation where the crops will regrow rapidly after defoliation as there is still water and N to use.

"This regrowth can be very attractive to late season pests, such as aphids, whose honeydew could then be a contamination risk – and having to spray a potentially relatively low yielding defoliated crop with an expensive insecticide to manage pests is undesirable due to cost and withholding periods that can further delay harvest.

"In these cooler areas it is important to set some reasonable expectations about yield potential and last effective flower is a means to guide management."

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Greg Bath, DEEDI films Pat Daly of Daley Water Services who is inspecting a flood-inundated electric turbine pump to illustrate what growers need to do to repair pumps damaged by floods.

NEW VIDEO HELPS ASSESS FLOOD DAMAGE

In response to the flooding events on many broadacre irrigation farms and the subsequent damage to infrastructure, the QLD DEEDI "More Profit per Drop" team is putting together a series of short videos on dealing with flooded pumps and overhead irrigation systems.

This work is being undertaken through the Queensland Healthy Headwaters Water Use Efficiency Project funded by the Australian Government as part of the Sustainable Rural Water Use and Infrastructure Program under the Water for the Future Initiative.

"This is in response to requests from irrigators who would like to see information provided to them in video format rather than as written material which often piles up and may not be read," says Graham Harris, leader of the More Profit per Drop team, and the cotton industry Specialist for Irrigation D&D.

Graham said that in the first of the videos, Pat Daley of Daley Water Services demonstrates how to inspect pumps and flooded overhead irrigation systems. The first videos detail the inspection process for a flooded submersible electric pump.

These videos cover:

- the electric controls
- the electric motor
- the pump
- the borehole assembly

Other videos to be included shortly will look at a diesel pump and an electric belt drive pump, Graham said.

see our website

For more information and to view the videos, go to:
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KNOWLEDGE OF NATURE INCREASES

MANY COTTON GROWERS HAVE BEEN IMPROVING ENVIRONMENTAL MANAGEMENT ON-FARM IN RECENT YEARS AND IN DOING SO HAVE GAINED BENEFITS FOR PRODUCTION. CHRISSY BROWN FINDS OUT HOW.

The benefits people gain from the environment are referred to as 'ecosystem services' and it is becoming increasingly apparent just how much cotton producers and the wider community stand to gain from improving ecosystem service provision on farm.

The Cotton Catchment Communities CRC (Cotton CRC) is helping to identify the benefits of environmental management and provides information to help growers to gain the most value from them.

Cotton farms comprise a variety of different non-crop ecosystems including native vegetation areas, tree corridors, river frontage, natural wetlands and water storages.

One of the most important and widely recognised benefits from non-crop ecosystems on cotton farms is natural pest control as these areas provide habitat for beneficial organisms – generally termed 'beneficials'.

At the 2010 Australian Cotton Conference, insect ecologist Dr Nancy Schellhorn from CSIRO Ecosystem Sciences, Brisbane, reported that research has shown beneficial insects are using native vegetation habitats, moving into crops and attacking pests early in the cotton season. Nancy said that having a diversity of habitats is important for agricultural ecosystem services as this allows flexibility throughout the year and in changing environments.

Growers such as Andrew Watson from "Kilmarnock" near Boggabri in NSW (see feature story) are finding that with the availability of Bollgard II, beneficials are now playing an even greater role in Integrated Pest Management (IPM).

"As part of our IPM strategy we have looked at how far beneficals can travel, how far our tree corridors and native vegetation areas are from cotton and how this relates to spraying for insects. It is only in the last couple of years with us not spraying (insecticides) that we have been able to see the benefits from not spraying," Andrew says.

Cotton Catchment Communities CRC Catchment Program Leader Jane McFarlane says that there has been quite a lot of research into strategies to manage beneficial insects through native vegetation and "we want to extend those results and pass them on to growers, agronomists and CMAs".

This is one of the drivers behind a new project to update the *Guide to Pests and Beneficials in CottonLandscapes* which has started this year. A number of researchers and extension staff will be involved with updating the guide which is being funded by the CRDC, Cotton CRC and commercial partners. This project is being co-ordinated by CSIRO's Sandra Deutscher.

"It is due for launch later this year, and we expect the guide will not only be a key resource for correct identification of cotton pests and beneficial species by crop agronomists and consultants, but will also provide a better appreciation of the contribution of native vegetation to IPM," Sandra says.

"We hope it will ultimately contribute to improved awareness and management of native vegetation areas on cotton farms."

In addition to natural pest control, there are a number of other important ecosystem services providers to cotton production.

Stacey Vogel, Namoi CMA Catchment Officer and Catchment Sub-program Leader for the Cotton CRC says healthy soils are important to water, carbon and nutrient management, and determine how these are transformed and transported through the soil and in turn made available for cotton growth and yield.

"Fertile soils can sequester carbon and activities in cotton cropping systems that sequester carbon include minimum tillage and residue mulching and incorporation," Stacey says.

"Soils also determine infiltration, run-off, deep drainage and groundwater recharge."

Valuing ecosystem services can be a difficult task due to the high level of variability in ecosystems on cotton properties and the enormous number of interactions that occur between them. However, the Cotton CRC now has a number of R&D projects that are increasing knowledge in the value of ecosystem services to help growers understand the benefits in managing natural and revegetated areas in cotton production.

Jane McFarlane explains that the industry is shifting its focus of new ecology research and is looking at other ecosystem service provisions, in particular carbon sequestration.

For more information on ecosystem service provision in cotton production systems, contact Stacey Vogel.

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Cotton farms comprise a variety of different non-crop ecosystems including native vegetation areas, tree corridors, river frontage, natural wetlands and water storages.

UNDERSTANDING THE FULL VALUE OF ECOSYSTEM SERVICES

A NEW STUDY PROVES THE VALUE OF RIVER RED GUM COMMUNITIES AND NATURAL AREAS TO COTTON FARMS

Areas of native vegetation, in particular river red gum communities provide many benefits on cotton farms including carbon sequestration, erosion mitigation and biodiverstiy conservation.

Quantifying these ecosystem services in various native vegetation communities on the Lower Namoi Floodplain was studied by PhD student Rhiannon Smith of The University of New England.

Rhiannon says there are significant economic and environmental incentives for cotton producers to manage these and other non crop areas such as revegetated areas, natural wetlands and river frontage on farm.

Completing the research in June last year, Rhiannon said that non-crop ecosystems comprise a substantial proportion of many cotton farms and the likelihood that natural and revegetated areas will contribute significant income streams in the medium term through emerging markets in carbon and biodiversity is high.

"Ecosystem services generated on cotton farms are not only beneficial to production and the sustainability of each farm, but also benefit the wider community and may attract incentive payments for growers that can supply them (eg environmental stewardship payments from the Australian government) or become tradable assets (eg carbon sequestration)," Rhiannon said.

"Ecosystem services generated by native vegetation on cotton farms therefore have the potential to contribute directly to the farm's income."

Working in partnership with the Cotton CRC, CRDC and the Namoi CMA, Rhiannon's PhD research into ecosystem service provision across the lower Namoi floodplain involved research in native vegetation on 36 cotton properties between Boggabri and Walgett.

"Five different native vegetation communities, which are common on the Lower Namoi Floodplain, were studied: river red gum, coolibah, myall, black box and grassland," explains Rhiannon.

"A meeting was held initially with local cotton producers and other stakeholders to discuss the ecosystem services considered of greatest importance for the research project.

"As a result the project focused on quantifying carbon sequestration, erosion mitigation and biodiversity conservation (birds and plants) on cotton farms and adjacent public land. Other important ecosystem services considered at the meeting included natural pest control, salinity mitigation, and forage production."

Rhiannon's research was some of the first in the world to evaluate several ecosystem services across a large study area with a variety of vegetation types and climatic conditions. It was also the first project to look at vegetation condition from an ecosystem service provision perspective.

"In Australia we often look at vegetation condition in the context of biodiversity conservation. My thesis looked at what attributes of vegetation are important in providing other ecosystem services that cotton growers or other landholders may be interested in," she said.

Rhiannon explains that a patch of vegetation that may not be as valuable in terms of biodiversity conservation is likely to be providing other ecosystem services. Ecosystem service provision is also variable through time.

"For example, a patch of coolibah regrowth may not be considered valuable from a biodiversity conservation perspective but is valuable for carbon sequestration. The same patch of coolibah will increase in value for biodiversity conservation through time as the trees mature and hollows start to form."

Some of the key findings of the research were that river red gum vegetation, on average, sequestered the most carbon (216 t C ha–1), had the most stable soils as a result of high carbon content and ground cover and provided valuable habitat for biodiversity. River red gum vegetation was also more structurally complex, often with a well developed shrub layer which provided habitat to a unique bird community. Many of the bird species seen in river red gum sites were not seen anywhere else.

Woody vegetation, that is, large trees, sequestered the majority of the carbon, though soil carbon storage was also high where woody vegetation was contributing large amounts of litter to the soil.

It was also found that the most stable soils – those most able to resist erosion – were those with a high carbon to nitrogen ratio.

Rhiannon explains that a lot of the benefits from conserving a patch of native vegetation for ecosystem service provision are benefits that not only contribute to the farm's bottom line but are also beneficial to the wider community.

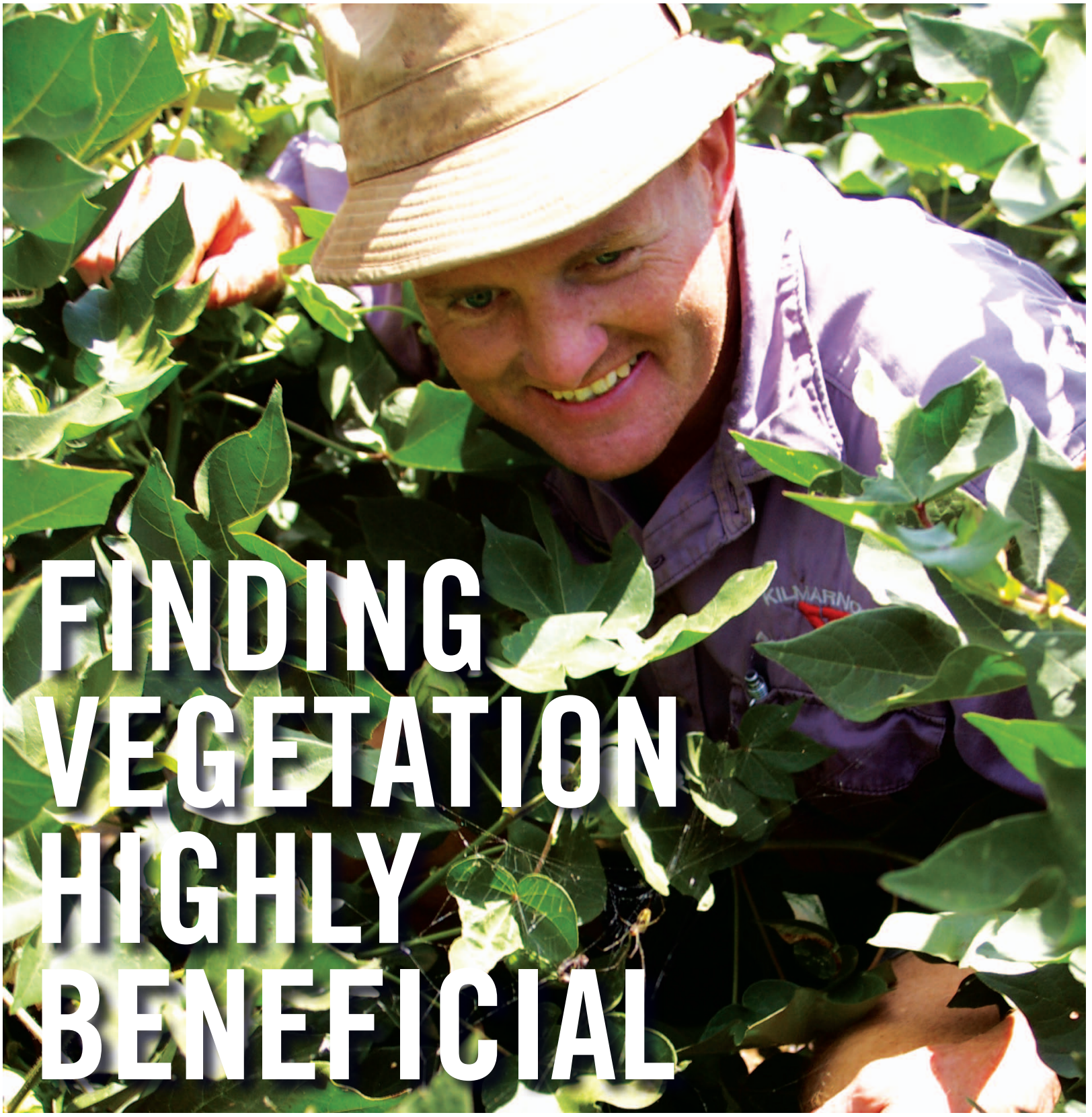
"Many ecosystem service benefits extend well beyond the farm gate, including erosion mitigation, water purification and climate regulation," she said.

"Cotton growers contribute substantially to regional biodiversity by maintaining native vegetation in regions where very little land is formally managed for conservation.

"By managing natural areas on farms for biodiversity and ecosystem service provision, growers are not only gaining benefits from ecosystem services but also demonstrating their commitment to active environmental stewardship and meeting their duty of care.

"The results of the thesis will assist property owners and managers understand some of the lesser recognised or contemplated values of natural and revegetated areas on-farm. It also provides targets for management to maximise vegetation condition for service provision in various ecosystems in agricultural landscapes."

The cotton industry has supported Rhiannon Smith's research, which was some of the first in the world to evaluate several ecosystem services across a large study area with a variety of vegetation types and climatic conditions.



FINDING VEGETATION HIGHLY BENEFICIAL

NATURAL PEST CONTROL – IT IS AN ECOSYSTEM SERVICE THAT THE INDUSTRY IS WELL AWARE OF HOWEVER A NAMOI VALLEY GROWER HAS BEEN EXPLORING THE POTENTIAL OF BENEFICIALS IN INTEGRATED PEST MANAGEMENT FOR FOUR YEARS AND HAS FOUND IT IS NO LONGER ECONOMICALLY WORTHWHILE TO SPRAY INSECTICIDES.
CHRISSY BROWN REPORTS

Investigating the cost of achieving marginal increases in yield, in an effort to maximise gross margin per hectare, Boggabri grower Andrew Watson stumbled across the immense value of preserving beneficials in cotton production.

Returning to run his family's farming enterprise Kilmarnock Farming Pty Ltd in the Upper Namoi region of NSW, Andrew began to look closely at the cost of trying to achieve high yields through high levels of input. He questioned if this was necessarily the best strategy for driving the long term profitability and sustainability of their operation, particularly with the availability of Bollgard II varieties which provided protection against the cotton pest moth Helicoverpa spp.

He was not alone in his thinking and began to work with other like minded growers, in particular Ben Stephens the former manager of Auscott Narrabri, to find if they could strategically manage their cotton IPM through fruit mapping.

Initially they were interested to determine if myrids were actually impacting yields. Using fruit counts and plant mapping they began to adjust their management of myrids and then other insects in response to plant condition.

For example Andrew says that "at this stage of the season (late January 2011), we have approximately 300

OPPOSITE PAGE AND FAR LEFT: Insects beneficial to the predation of cotton pests can be found throughout the Watson's crops – made possible because no sprayed insecticides are used.

LEFT: Andrew in another promising crop (in January this year), with the native vegetation that has become integral to his farming system in the background.

squares and 100 bolls, so if we lose some fruit it may not actually damage yield.

"We avoid spraying with pesticides as this significantly damages the population of beneficials.

"Furthermore if we spray, we are likely to end up 'flaring' mites! With whitefly and aphids, they are there, but not infesting to levels that cause damage."

Realising that beneficials could contribute significantly to his insect management, Andrew looked at research conducted on how far beneficials can travel to cotton from refuge areas such as tree corridors and native vegetation.

UNDERSTANDING BENEFICIALS

Andrew says that as his understanding of beneficials increased and the need for spraying decreased, he began to look at ways to manage and promote these non crop areas on the property.

Drawing on his knowledge of beneficials and whole farm management principles he had learned from a Grazing for Profit program, he studied the farm layout and the distance that tree corridors and vegetation areas were from cotton and how that related to spraying in cotton.

"It helps we are a relatively small farm so distances across our cotton area are not too great," he said.

His family had already spent many years working on the principles of whole-farm management and long term sustainability prior to Andrew returning to the farm.

They had initially established tree belts for spray drift management and as the enterprise is a mixed farm operation, ease of management was needed for the grazing, so laneways to move stock between grazing areas was essential.

Andrew explains that these laneways were the basis for extensions of tree lines and wildlife corridors, some of which link up to a central area of buildings and machinery on a small hill surrounded by trees and vegetation.

"We've been involved in research projects with the UNE and Greening Australia, which involved planting different areas to tree and vegetation belts," Andrew said.

"Riverine environment was important to my mother Robyn and she, in conjunction with the Boggabri Landcare group, removed willow trees from the 17 kilometres of river frontage we access and re-established native vegetation along the banks to stabilise them. She is now working on the river frontage of my brother's farm downstream."

Although these non crop areas were important to the farm Andrew says that it is impossible to determine exactly how these environmental improvements impacted on cotton production.

"It was really hard to quantify the value of beneficials, or to know the value of providing habitat to encourage beneficials," says Andrew.

"For example we put bat houses in some of the trees to encourage bats as we know bats will fly out and feed on insect pests, consuming up to 100 percent of their body weight in a night, but it is difficult to measure that benefit."

THE BENCHMARKING FACTOR

That is where benchmarking came in to the story. Andrew explains that he had been part of a benchmarking group for a number of years which has helped him to quantify his low input system that relies heavily on beneficials, in comparison to other growers using different production strategies.

"With benchmarking and getting more information about other farming systems, we have been able to get some estimate of the value of beneficials," he said.

"Data from the Namoi and Gwydir areas indicate that yield alone is not necessarily an indicator of gross margin per hectare."

The farm contracts local agronomist Rob Weinthal of RAW Agriculture to monitor the crop and assist in management decisions. They consider the condition of the cotton plants in each field and look at insect counts (including beneficials).

Andrew records all of this information in a spreadsheet, comparing current conditions to historical averages to try to predict what might happen in the crop and make informed decisions about spraying and insect management. The result has been that Kilmarnock cotton has not been sprayed with insecticide for three seasons in a row, this is shaping up to be the fourth.

Results from the last few seasons

showed that although the property's yields averaged 10.5 bales/ha, the economics highlighted they were making as much money as other high input, higher variable costs growers who were growing as much as 14 bales/ha.

CONSERVATIVE APPROACH

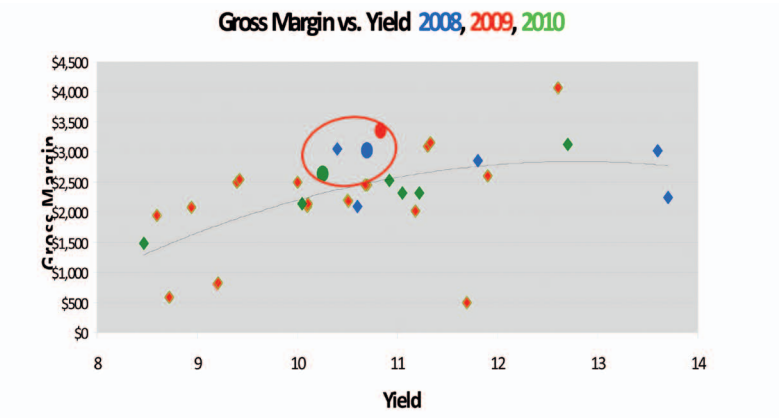
Contributing to the success of his system is a conservative approach to all levels of spending on the property.

"Keeping costs to the minimum required extends into fertiliser management and even machinery costs. We look closely at tailoring nitrogen input to yield and have gone to wider equipment," Andrew said.

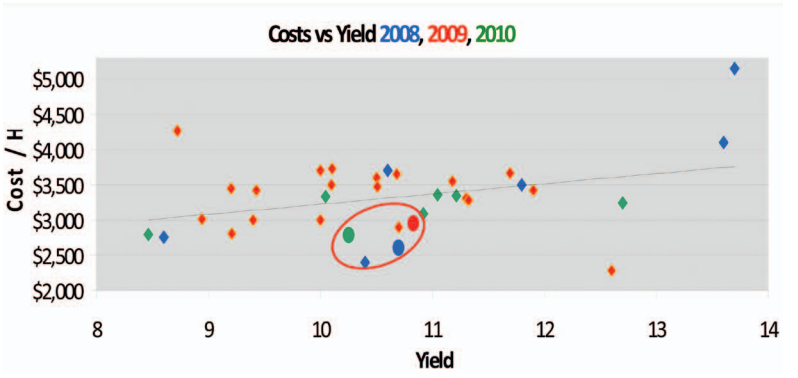
As part of Monsanto's Bollgard II licence requirements, pigeon pea is grown as a refuge crop and where beneficials appear to be playing some part in natural pest management. Although there are generally high levels of Helicoverpa spp in the pigeon pea which impact on yield, the Watson's still produce around 1t/ha which they sell and recover approximately half the cost of growing the refuge crop each year.

Andrew points out that the use of economic analysis and utilising the ecosystem service provision of beneficials in IPM, is not just used in their cotton production system. He says that they are also applying these principles to their broadacre farming.

Gross Margins vs Yield



Financial Comparative Analysis



Data Source: Agripath Comparative Analysis

THE JOURNEY CONTINUES

The story does not end there.

Driving around the property Andrew points out areas that he plans to redevelop sometime in the future. This includes tree corridors on the outside of grazing lanes (to prevent stock damaging the trees) that will join the farm's central area to the river vegetation, and a section of irrigation fields is to be rebuilt for lateral irrigation, allowing for connection of two separate stands of native timber once the need for channels is eliminated.

"This is a journey, and I hope I never stop looking for new and better ways to do what we do in all senses of the words, be they economic, environmental or related to quality of life," he says.

Andrew's suggestions to growers wanting to develop their environmental management to gain greater benefits from ecosystem services such as natural pest control are straightforward.

"Do your analysis, benchmark yourself against other people then start to look at what you are doing.

"Look at it carefully, if my variable costs are $900/ha less than someone else, they have to achieve approximately 2bales/ha (at $450/bale income) than me to make more money than I am.

"Then, trust your beneficials. It is hard to say 'we have spiders in our crop so we are not going to get yield loss'.

"However, when you are benchmarking yourself against other people and looking at what you are doing, then you can assess your IPM and overall production strategy against profitability."

GUIDE REFLECTS CHANGING MANAGEMENT TECHNIQUES

ONE OF THE COTTON INDUSTRY'S MOST HANDY RESOURCES, THE COTTON PEST AND BENEFICIAL GUIDE, FIRST PUBLISHED IN 1996, IS BEING OVERHAULED THIS YEAR IN A PROJECT FUNDED BY CRDC

Due for launch in July, the publication will incorporate photographs and descriptions of both insect pests and beneficial insects in the cotton landscape to assist with correct identification.

With the introduction of Bollgard II, cotton pest management has changed and more information is now available about beneficials and the significant role they play in Integrated Pest Management (IPM). The new guide will include the latest information about beneficial insects and will highlight the importance of native vegetation on cotton farms and the role these areas play in integrated pest management.

General Manager of Best Practice and Research Implementation Ken Flower says the Pest and Beneficial Guide has been a key part of accurate insect identification over the past 17 years.

"This edition will have the added advantage of the additional knowledge we have on the insect environment within our cotton farm landscapes," Ken said.

"The guide will be important for cotton consultants, insect checkers and cotton growers for accurate identification of insects to enable more natural pest management."

The guide will be printed in a compact, durable format to enable it to be easy carriage in the vehicle glovebox or farm machines.

"The publication is expected to be launched in August and agribusiness resellers are taking a key role in sponsoring the guide," Ken said.

"The on-line version will be available after publication on the CRDC, *my*BMP and Cotton CRC websites."

For support in *my*BMP Natural Assets module, ecosystem research, farm mapping, energy and input efficiencies services, contact the industry's NRM Team.

A TEAM APPROACH TO NATURAL RESOURCE MANAGEMENT

THIS NEW-LOOK CATCHMENT DEVELOPMENT AND DELIVERY TEAM HAS SPECIALISTS FOCUSED ON DEMONSTRATING WHERE NRM ADDS VALUE TO THE COTTON FARMERS' BOTTOM LINE

Jane Macfarlane

Jane Macfarlane is the Catchment Program Leader for the Cotton Catchment Communities CRC. As such Jane is responsible for overseeing and disseminating research into better understanding groundwater, surface water, water quality, ecosystem services and projects to provide guidelines for growers, CMAs, NRM bodies and other decision makers.

"Our aim is to improve our management of natural resources in cotton catchments," Jane says, with uptake of the *my*BMP Natural Assets module a key focus for the team to achieve these goals.

mailto:Jane.MacFarlane@csiro.au

Stacey Vogel

Stacey is employed by the Namoi CMA and Cotton Catchment Communities CRC as the Catchment Officer for the Lower Namoi Catchment, and is based at the Australian Cotton Research Institute at Narrabri. Her role is to provide cotton growers as well as other landholders and the general community within the Namoi Catchment with technical advice and support on a range of natural resource management issues.

mailto:stacey.vogel@csiro.au

Peter Verwey

Peter Verwey is the Cotton Catchment Officer in the Namoi Catchment. This position is a partnership of the Namoi CMA and Cotton CRC. Peter is working with Namoi Valley cotton growers to develop and deliver resources growers require to successfully implement NRM activities.

This includes working closely with the grower associations, developing property plans, assisting with monitoring groundwater quality, and providing technical advice in natural resource management and the industry best practices through face to face meetings and grower workshops.

Peter is the key contact for technical advice helping growers move through the Natural Assets module in *my*BMP.

mailto:peter.verwey@csiro.au

NEW FACE TO HELP CARE FOR YOUR LAND

Based in Moree, Sally Dickinson's appointment as a Landcare facilitator is a unique project between the cotton industry and natural resource management bodies.

This has involved the partnering of Gwydir Valley Irrigators Association, Border Rivers Gwydir Catchment Management Authority, Cotton Catchment Communities CRC and the New England North West Landcare Chairs Network.

Sally is based in the Gwydir Valley Irrigators Association office in Moree and has 15 years' experience working closely with rural communities in the areas of sustainable agriculture and natural resource management for both state and local government in Victoria and Queensland.

"I will be working closely with all of the project's stakeholders to assist landholders to participate in *my*BMP and Property Management Planning workshops, invasive species control programs and assist in the increase of awareness, skills and knowledge in the community of natural resource management and sustainable agriculture issues in the each region," Sally said.

"The project also provides the opportunity to provide some support for any farmers who wanted to get together as a group and discuss local issues.

"If interested in learning more about *my*BMP, Property Management Planning workshops or you have a general interest in sustainable agriculture and natural resource management please don't hesitate to give me a call."

New regional Landcare facilitators were also appointed in Walgett, Gunnedah and the North West Tablelands/Slopes area, with the broad aim of increasing the capacity and uptake of sustainable farm and land management practices including natural resource management by farmers and communities.

Sally Dickinson – 0427 521 498

mailto:sally.dickinson@gvia.org.au

Jane Macfarlane and Rod Williams (former Border Rivers-Gwydir CMA Manager), new Moree-based Landcare facilitator Sally Dickinson and Sonia Williams (Project Manager New England North West Landcare Network Chairs Inc) at the Gwydir Valley Irrigators' office in Moree.

Phone 02 9412 1040 to find your local Landcare facilitator.

SOUTHERN GROWERS GIVEN THE 'GOOD OIL'

NEW GROWERS HAVE BEEN INTRODUCED TO THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT AND CROP PHYSIOLOGY IN COTTON FARMING SYSTEMS WITH A VISIT FROM LEADING RESEARCHERS

Two field walks held in early December in southern growing regions at Darlington Point and Tabbita near Griffith NSW introduced the principles of Integrated Pest Management (IPM) and how to apply them to first time cotton growers and agronomists.

The meetings were organised by cotton industry Development and Delivery Team Specialists Sally Ceeney and James Hill. Sally is the D&D Pest Management Specialist and James the New Grower Specialist.

The field walks covered basic cotton physiology – how a cotton plant grows and responds to the environment and identification of key insect pests and beneficials. James Hill gave a demonstration of how to monitor pests and beneficial in-crop through visual checks, beat sheets and using sweep nets.

The Cotton Pest Management Guide was used to show key facets of IPM – thresholds, IRMS (Insect Resistance Management Strategy) and the 'impact on beneficials' table.

"We wanted to also inform growers of where to go for more information, which included *The Cotton Pest Management Guide*, various industry websites and through myBMP," Sally Ceeney said.

"The field walks were well received with between 10 and 15 growers attending at each location. Growers commented that the day made them think more carefully about their insecticide choices and the possible consequences involved.

"They particularly liked the practical sampling demonstration and were surprised at the number of different insects, especially the large number of spiders, that could be seen when using a beat sheet to sample crops."

A follow up of this field day was held in January with CSIRO's Dr Lewis Wilson and Mike Bange.

Lewis was asked to discuss IPM strategies for the mid to late part of the season, while Mike discussed crop physiology and how crop management affects fibre development.

Lewis explained the feeding habits of the different key pests and how this was related to their potential to reduce yield.

"Mites and aphids can directly affect plant photosynthesis – reducing the plant's capacity to retain and fill bolls and are indirect pests, while Helicoverpa attack the fruit directly," he told the gathering.

"Aphids and silverleaf whitefly are a problem because they excrete honeydew which contaminates the open bolls, putting at risk both returns and the reputation of the industry for producing clean lint."

He pointed out that two factors really assist in managing pests.

"Firstly there is a wide range of beneficial insects and spiders that will help control pests," he said.

"Careful attention to deciding if and what type of insecticides are used can help conserve these populations and reduce the need to spray pests.

"Secondly, cotton plants produce many more fruit than they can mature – hence they have strong capacity to compensate for damage. This capacity forms the basis for pest thresholds – for example the amount of damage that must be exceeded before loss occurs.

"Key tactics to effective management include good farm hygiene to avoid providing hosts for pests, effective sampling for pests and beneficials and fruit retention to understand what is happening in the crops, use of thresholds to decide if control is warranted, and use of selective control options, within the guidelines of the insecticide resistance management strategy to help conserve beneficials and minimise the risk of selecting for resistance in pests."

According to James Hill, one of the main points to come from Mike Bange's talk was that earliness is vital.

"He reinforced tactics that some agronomists were using such as cutting crops out in mid January," James said.

"Growers heard how going past this date was of little benefit as there is not enough season length to finish the late top fruit – or if this fruit does mature there are usually quality issues such as low micronaire and increased neps."

A defoliation field walk is planned for March, again targeting new growers and consultants to introduce them to the principles of determining crop maturity and defoliation timing.

James Hill
mailto:jh2solutions@bigpond.com

Sally Ceeney
mailto:msceeney@gmail.com

Lewis Wilson talking with mostly new growers and consultants at Tim and Roger Commins' farm at Whitton near Griffith.

WHAT IS IPM?

IPM is a whole farm, year-round approach.

Cotton IPM programs:

- Should provide effective control of the pest complex by using compatible control measures
- Should reduce reliance on synthetic insecticides
- Need to be economically viable
- Need to be simple and flexible
- Need to be integrated in the farming system
- Should have minimal harmful impact on the environment, the producer and the consumer

SOUTHERN GROWERS ARE READYING THEMSELVES TO TACKLE THE SPREAD OF SILVERLEAF WHITEFLY. INDUSTRY SPECIALIST ON PESTS AND BENEFICIALS IS SALLY CEENEY AND SHE PLAYED A PIVOTAL ROLE TO DEVELOP AND DELIVER A SERIES OF WORKSHOPS

WHITEFLY WING IT SOUTH

IMAGE COURTESY RICHARD SEQUEIRA

IMAGE COURTESY LEWIS WILSON

MAIN PIC: Silverleaf whitefly honeydew.

INSET: Adult silverleaf whitefly.

Key cotton growing districts of Goondiwindi, Moree, Narrabri, Gunnedah and Trangie hosted early-season IPM meetings focussed on silverleaf whitefly (SLW) management throughout December and early January.

The industry's Development and Delivery Pest Management Specialist Sally Ceeney said SLW were previously considered a 'northern pest' – but consultants in these regions reported being unprepared for the quick build-up of SLW in the more southern valleys in recent seasons.

Sally's role in the industry's D&D Team is a joint investment of CRDC, Cotton CRC and Cotton Australia, and as such is responsible for developing and delivering best practice solutions in pests and beneficials in cotton.

"The 2010/11 season had the potential to see high numbers of SLW due to a mild, wet winter and spring in 2010. This provided an ideal environment for these populations to over-winter on abundant weeds and alternate crop hosts," she said.

With the support of Sumitomo Chemical, Sally organised the series of meetings in an area-wide approach aimed at assembling growers, managers and consultants with researchers and industry experts to discuss how to best manage the threat of SLW this season.

CSIRO entomologist Dr Lewis Wilson and Sumitomo Chemical's Phil Glover both say consultants and growers in the regions were generally well prepared to manage the threat of SLW outbreaks and had factored in monitoring the pest and potentially having to control SLW in their farming plan for the season.

Phil Glover said the meetings generated good discussion and everyone was prepared to talk about management options and shared experiences in an open manner. The open format of the meetings and allowing participants to nominate the topics of discussion meant that each of the meetings were quite valley specific, he said.

Lewis Wilson said that despite the different topics of discussion it was clear the overall message was 'getting out there'.

This message is that implementing an effective IPM strategy and conserving beneficials, particularly when targeting sucking pests such as mirids early season, was the key to avoiding potential costly SLW outbreaks later in the season.

"SLW pressure has been low across all cotton growing regions so far," says Sally Ceeney.

"The mild temperatures and rainfall experienced across eastern Australia this summer has been a major factor in keeping populations of SLW under control, however the role of a good IPM strategy particularly conserving beneficials has also played an important part in keeping these outbreaks to a minimum."

Sally Ceeney
mailto:ms.ceeney@gmail.com

*my*BMP has a comprehensive resource on Pest and Beneficial management at https://www.*my*bmp.com.au/Resources/resources_ipm.aspx

Listen to Lewis Wilson discussing management of SLW in his recent INSIDECOTTON broadcast. Listen to his discussion as an MP3 recording. Go to http://www.crdc.com.au/index.cfm?pageID=181

See the online version of *The Cotton Pest Management Guide* http://www.crdc.com.au/emags/PMG10_11/

INDUSTRY ON BOARD TO MOVE GROWERS FORWARD

THE ROLL OUT OF *my*BMP HAS MOVED TO A NEW LEVEL, WITH TRAINING DAYS FOR AGRONOMISTS AND CONSULTANTS

> "We had been thinking of setting up the farms for some time but kept putting it off, but we were given terrific support and the advice that we needed to get into the program."
> "Although the process seemed daunting at first, once we got into it the easier it became. We were helped to get set up and given some on-line training which was adequate to get us started. Any queries we had she was able to quickly sort out over the phone and on-line.
> At first we did wonder why we should be changing from the paper-based system to the on-line system but quickly saw the benefits of a central place for data storage and for quickly accessing information that has been referenced and linked and is easily understood."
>
> **– Martin Mead, Auscott Namoi Valley Farm Manager**

An industry training program for agribusiness is available to gain a more detailed understanding of how to get the best from *my*BMP, and to help prepare a farm for a certification audit.

General Manager of Best Practice & Research Implementation, Ken Flower said the Commercial Support Training program is another important step in the introduction of *my*BMP.

"It will be one of the key tools used in driving continual improvement to the program and supporting the delivery and implementation of advancements from the industry's world-leading research community," he said.

"For the industry to gain value from the *my*BMP message it is important that there is a high level of industry confidence and that *my*BMP certified farms continue to comply with all of the Level 1 & 2 practices covered in the audit."

The development of the *my*BMP Commercial Support Training Program will involve an initial trial phase to clearly identify and test the key areas required to help growers prepare for a *my*BMP certification audit.

Many growers are showing their keenness to try this exciting industry initiative with more than 60 growers already actively using the system.

- *my*BMP is extremely user friendly and is designed to be self-explanatory. To help users quickly become confident in using the extensive tools and resources, *my*BMP has a number of help options available including:
- The *my*BMP help desk (1800COTTON) for "over the phone" training and systems support.
- On-line video tutorials demonstrating how to use the key functions of the *my*BMP website.
- Cotton Industry Development & Delivery Team Specialists to support *my*BMP at a local level.
- An in-built Technical Help section, offering access to industry researchers.

Jim Wark, *my*BMP Business Manager, said the goal of this training program is to communicate the principles of *my*BMP while offering an industry training program that can help interested industry participants understand the requirements of *my*BMP including the audit and certification process allowing them to confidently consult to growers as experts.

"The primary focus of this training package is distribution agronomists and industry consultants, however, anyone who is interested is more than welcome to attend," Jim said.

"Becoming a *my*BMP certified farm can require a significant commitment to ensure farms comply with the required Level 1 & 2 practices."

The training program is aimed at anyone who is interested in preparing for, or would like to act as a consultant/expert to help others prepare for a certification audit by gaining a thorough understanding of key *my*BMP functions, including:

- *my*BMP website navigation
- Resources & Tools
- Details of the 11 modules
- *my*BMP Certification audit processes.

"A key point from this initiative is that while we are promoting the idea of consultants helping prepare for a certification audit, it will be the responsibility of the grower to attend and participate in the audit, as the primary function of certification is to confirm that the key on-farm decision makers understand and continue to comply with the principles of Best Management Practices," Jim says.

The *my*BMP Commercial Support Training program underwent testing during February. Further meetings will now be held in key cotton producing areas as required.

If you would like to attend these meetings or like more information on the *my*BMP Commercial Support Training Program, please call Jim Wark 0427 050 832 or mailto: jwark@csd.net.au

Website: www.*my*bmp.com.au

email us

see our website

Auscott Narrabri Farm Manager Martin Mead and Agronomist Bill Back have embraced the new *my*BMP system.

TRAINING MADE EASY

GROWERS CAN LEARN TO USE THE *my*BMP SYSTEM WITH TRAINING OVER THE TELEPHONE – IT'S QUICK AND IT'S EASY

*my*BMP Business Manager Jim Wark is assisting growers to use the *my*BMP website and says most are surprised at the simplicity of it.

Generally it takes about an hour, and is a very easy step by step process.

Growers with varying levels of computer literacy have been trained and we are yet to encounter a grower who has had difficulty in using *my*BMP.

The system has been designed to ensure that the process is logical and systematic which means that most growers find it particularly simple to use, in fact I very rarely have growers call the help line for assistance once they have completed the training.

The *my*BMP training process involves a quick overview of *my*BMP and the major changes to the system (for example the new practice ranking system and improvements that have been made to the auditing process). Growers are then shown how to create an assessment, how to work on that assessment and the key features of *my*BMP, such as online technical assistance and tools and resources.

The training system has been designed to get growers up and running with a minimal impact on their time and of course at no cost, Jim said.

As the training is a one-on-one session, it can be tailored to meet the interests and skills of the grower. Using the telephone means that growers are not required to travel or to take large chunks out of their day.

The success of the training to date lies in the fact that growers are trained using their own business, farms and information.

This means that not only is the training relevant to their operation, while they are completing the session, they are also actually working on their own *my*BMP assessment.

The *my*BMP website training can be accessed by phoning 1800COTTON (1800 268 866) and making a time to be shown you how the site works.

> "Perhaps the biggest benefit is the time it will save in future years; the ability to cross reference from audit to audit rather than double up on paperwork is great." With the majority of our farm records stored on a server it was quick and easy to upload the appropriate documents. Automatic action plans list what parts of the assessment need finishing, making it easy to come back to the program and start up where you left off."
>
> **– Bill Back, Agronomist, Auscott Ltd Narrabri**

GETTING OF KNOWLEDGE

*my*BMP offers access to information to all growers and their consultants to help improve cotton growing success, whether a registered *my*BMP participants or not.

How do you access it?

Through the website it is possible to find information about best management practices based on the latest cotton research. The system is very user-friendly according to Sandra Deutscher, whose job it is to help keep this information up to date and oversee the information delivery process. Sandra says there are two ways to access this information.

1. Beside each 'practice' within *my*BMP there is an information icon that takes the user to further details to help them achieve this BMP practice. Further details include information sheets, websites etc. This information is regularly updated and these 'practices' and icons are accessible to all growers/consultants even if not participating in *my*BMP (ie 'not' logged on).
2. If the user has a question relating to a BMP practice and requires further help, *my*BMP has a technical help system available freely to growers participating in *my*BMP (ie are logged on). This allows the user to e-mail a question directly to the relevant Cotton Industry Development and Delivery (D&D) Team Specialist – for example insect-related questions are directed to Sally Ceeney. Sally will then reply to the e-mail, or forward it to the appropriate researcher.

Darrel Martin and Anthony Reichel of Auscott Narrabri have successfully completed the BMP Farm Manager Award and praise the experience and the qualifications they have received as a result.

ACCLAIM FOR FARM MANAGER AWARD

THERE IS ALWAYS A NEW CATCH PHRASE ON THE HORIZON, ONE OF THE LATEST BEING "GREEN SKILLS", OF WHICH IT APPEARS, MANY COTTON FARMERS ALREADY POSSESS. MELANIE JENSON FINDS OUT HOW

In cotton country, the term 'green skilling' could be directly replaced by the term '*my*BMP skills'.

Emerging from the need to cut carbon emissions and find more environmentally sustainable ways of doing business, the universal term of green skills is catching on. As such, green jobs are set to become much more important in the labour market of the future according to University of Sydney Workplace Research Centre Senior Analyst Mike Rafferty.

Mike was invited to write a review about how green skills can be implemented into the workforce for the International Labour Organisation Conference held in Geneva last year. The Certified BMP Cotton Farm Manager Award was an example Mike selected for use as an example in his presentation. This placed Australian cotton-growing on the world stage, and is also a sure sign the industry is on the right track when it comes to managing issues relating to sustainability and natural resource management.

"We looked around Australia to find where people were already attempting to use different work practices and approaches to minimise CO2 emissions," Mike said.

"One of the things we found was that a strong predictor of this was that the industry, occupation or region had already confronted environmental or other problems, had developed collaborative approaches to deal with them and that this involved improving the capacity of people on the ground to make a difference. The cotton industry already has the credentials to compete in this field.

"One conclusion that we came to is that industries don't need to wait for technological advances somewhere else in the world. If they work together and take the challenge as part of building global competitive leadership, they can be the change.

"We found all these attributes in the cotton BMP Farm Manager Award."

Queensland's Department of Employment, Economic Development and Innovation Principal Development Extension officer Mark Hickman explains the evolution of the award.

"Cotton is leading the way in implementing green skills through *my*BMP natural assets and sustainable practices which are benchmarked against industry RDE guidelines," he said.

"The cotton industry's BMP program developed in the 1990s was about establishing the industry benchmarks to reduce off-farm impacts in areas such as pesticide use and water management. Farms that implemented the research and development achieved these standards were certified BMP.

"Years later we realised that the change in farm practices were not the full picture.

"With implementation of these on-farm practices to gain a farm's certification, we saw the skill sets of the grower, their awareness of other environmental issues and capacity to respond to them were also significantly improved.

"A lot of the skills farmers were using were actually green skills, so we developed the Certified BMP Farm Manager award for growers who had these skills, independent of the BMP farm certification.

"We worked with the vocational education system and developed a new Diploma of Agriculture based on life-long learning and practical implementation of what is now termed green skills."

Sustainability is the key driver for farmers today. They want their land to be usable for generations to come, Mark says.

"Those who are succeeding are those willing to access and use the latest research, technology and innovation which is turning our cotton farming systems into more efficient, sustainable and viable operations, of which *my*BMP is a large part."

And while the industry accepts honour of inclusion as an Australian-best example, Mike Rafferty warns the industry not to rest on its laurels.

"This is not the end of the story for cotton," he said.

"We know all sectors can do better, and one way that can happen is if the BMP program is better utilised – not just by leading growers – but across the industry."

email us

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see our website

For full presentation:
http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_143079.pdf

Further reading
http://sydney.edu.au/business/news/2010/green_collar_workers

If you would like to become an accredited *my*BMP farm manager and gain a Diploma of Agriculture qualification, contact Mark Hickman for further details.
07 46 881 206, 0407 113 096
mailto:mark.hickman@deedi.qld.gov.au

CERTIFICATION VITAL TO MARKETING PUSH

*my*BMP HAS BEEN IDENTIFIED AS A KEY MARKETING TOOL FOR THE INDUSTRY'S TWO NEW HIGH END PRODUCTS. **MELANIE JENSON** SPOKE TO CRDC'S DALLAS GIBB TO CLARIFY THE LINK

CRDC and its partners have been working for a number of years towards developing brand differentiation of Australian cotton. 2010 saw the launch of two brands – Premium Australian Cotton and Australian Cotton, with both having Best Management Practice at their heart.

"Premium Australian Cotton" promotes the premium quality characteristics inherent in Australian Long Staple (ALS) cotton and the health and ethical attributes of Australia's Best Management Practice (*my*BMP). In the marketplace, it is marketed as "Cotton Without Compromise".

ALS itself is a class of cotton and is not a promotion of any single variety however the fibre must fall into the quality paremeters that include a minimum 1- 1/4" staple length (min) and 33 GPT strength with micronaire typically in the 3.8-4.2 NCL range. This makes ALS ideal for spinners' whose yarns are for manufacturing 60-70Ne yarns used in "high end" garments.

According to Dallas Gibb, CRDC Value Chain Program Manager, the development of ALS resulted from superior quality cotton bred by the CSIRO breeding team and growers. The 2008-09 crop showed impressive micronaire results, with 77 percent of the crop in the range from 3.8-4.5NCL. These parameters combined gradual increase in fibre strength and length indicate that a small but increasing proportion of our crop is meeting ALS criteria.

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

"A key aspect in future marketing of ALS is the link with the industry's *my*BMP program. To be eligible for down-stream branding under the "Premium Australian Cotton" label, ALS cotton must be grown on an audited Best Management Practice farm. "There is clear evidence from surveys with domestic and international users of Australian cotton that there is an advantage to market quality and sound management practices (*my*BMP) as one product.

"Brand owners recognise the value in promoting and supporting growers that operate under best practice. They also require integrity in the message that they promote to their consumers when using the new Australian brands, it is therefore important for growers to be *my*BMP-accredited with Cotton Australia should they hope to market their cotton under these new brands in the future."

Stakeholders throughout the supply chain must be licensed to utilise the brands and the ALS and/or BMP descriptors must be specified on the raw cotton purchase contracts placed by mills.

The industry is working with mill and brand owner partners to ensure that integrity of the product is secured across the value chain once the cotton leaves Australia.

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Phone 07 4638 5278

see our website

SURVEY TELLS STORY

BRAND AUSTRALIA REQUIRES TRACEABILITY

Traceability, marketability and raw cotton quality are considered key parameters in developing a 'branded' Australian cotton product similar to 'Supima' or 'Fair Trade' cotton, according to a wide ranging survey conducted by the CRDC and CSIRO.

Encouragingly, the survey – whose respondents included spinning mills throughout Asia as well as local brand-owners – showed that Australian cotton was viewed in a generally favorable light against competing growths.

CSIRO Textile Technologist René van der Sluijs said the survey showed that while Australian cotton was generally considered slightly behind California's San Joaquin Valley (SJV) in terms of key contracted specifications of strength, staple and micronaire, we were superior in inherent characteristics such as spinability and contamination.

"On average, the mills surveyed believed standard Australian cotton should trade at about a 3.8 US c/lb discount to SJV, but that we could command a premium of around 2.8 US c/lb over US Fibermax and 5 US c/lb over Brazilian cotton," Rene said.

Additionally, Left Field Solutions principal and head of the industry's Premium Cotton Initiative Pete Johnson said "Brand Australia" was generally highly regarded particularly in the Japanese, Korean, Chinese and domestic markets.

"If the industry wants to go down the track of 'branding' our product then from the customers point of view we have the quality and the marketability pieces of the puzzle in place," Pete said. (see fig.1)

"The challenge is to achieve genuine traceability beyond the spinning mill – and that can really only be achieved through some form of supply chain management or licensing protocols.

"The logical and most efficient process may be for any licensing arrangement to 'piggy back' off our existing BMP programs, providing customers with associated corporate social responsibility benefits."

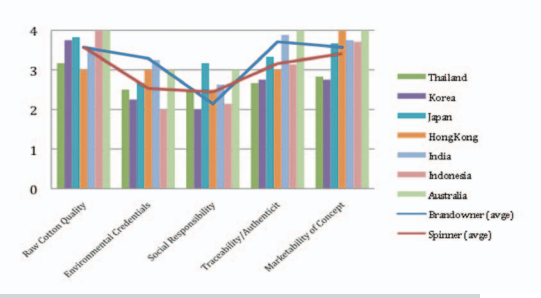
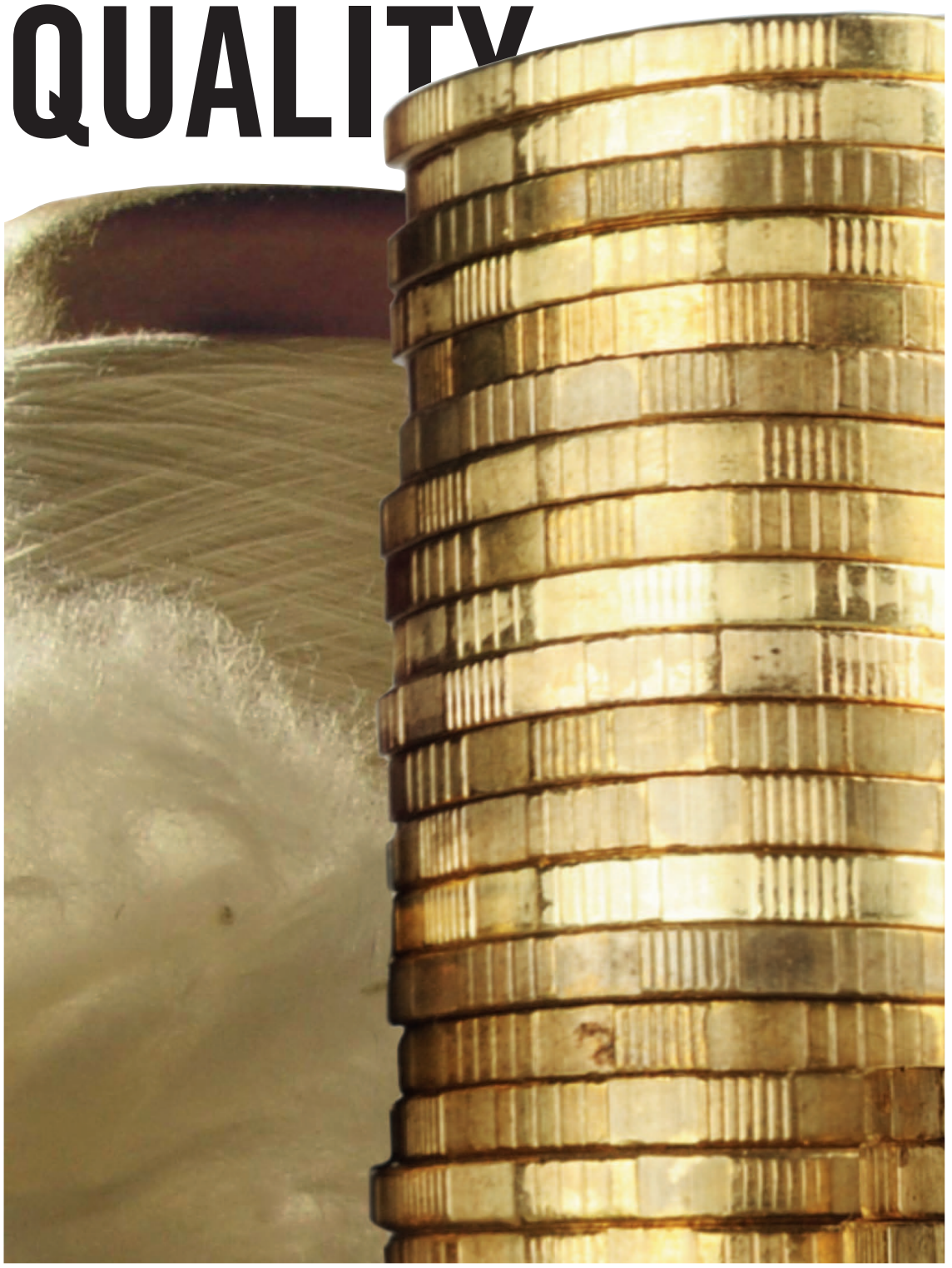


Figure 1. Customers' perception of Product Characteristics

ESTIMATE FINAL CROP QUALITY

TRISTAN VISCARRA ROSSEL

REPORTS ON RESEARCH INVESTIGATING HOW GROWERS CAN IMPROVE CROP FIBRE QUALITY WHICH IS HELPING SECURE AUSTRALIA'S POSITION AS A SUPPLIER OF PREMIUM QUALITY COTTON DUCTION



Ongoing field and production trials by CSIRO Plant Industry in Narrabri in collaboration with CSIRO Materials Science and Engineering in Geelong are generating clear outcomes and confirming recommended growing practices in Australia.

Researchers are attempting to develop rapid and inexpensive ways to predict crop fibre quality before harvest, to help growers pinpoint the best time to apply chemical harvest aid treatments.

According to CSIRO Plant Industry's Dr Michael Bange, Principal Research Scientist at the Australian Cotton Research Institute in Narrabri, the results have been promising.

"We've been able to relate the fibre quality of immature bolls at the time of harvest aid treatment to the final fibre quality of the crop, which offers a simple technique to measure the impact of the treatment," he said.

"Potentially, you could also use this technique to estimate final crop quality."

Boll cutting is already recommended in FIBREpak as the most precise method to determine boll maturity in a crop, especially when crops are not uniform in maturity. This latest research investigated how the boll cutting technique could be applied to predict the quality of the processed fibre.

Across three consecutive seasons (2005–08), researchers varied the timing of harvest aids (including both boll openers and defoliants)to vary the amount of immature, mature and open bolls.

Immature, mature and open bolls defined using the boll cutting technique were collected on the day of treatmentand analysed for fibre quality between bolls, and to investigate the variation within and across seasons.

The collected bolls were processed in Narrabri for HVI micronaire and in Geelong for fibre maturity and fineness. The quality was then related to the time of harvest aid treatment.

Boll fibre quality varied significantly

Within seasons and between seasons, the researchers found that fibre quality varied significantly with the timing of harvest aids and boll maturities (open, mature and immature bolls). They attributed this variation to three factors that influence fibre quality: the numbers and ages of the bolls and the growing conditions during their development.

The average fibre quality variations (across all harvest dates in each season) of immature, mature and open bolls were 1.06–1.53 for micronaire, 0.13–0.14 for maturity ratio, and 28.2–30.7 µg/m for linear density (fineness).

Boll fibre quality of immature bolls related well to final fibre quality

By combining the fibre quality of immature bolls across the three seasons, the researchers developed relationships that predicted micronaire at harvest (Figure 1).

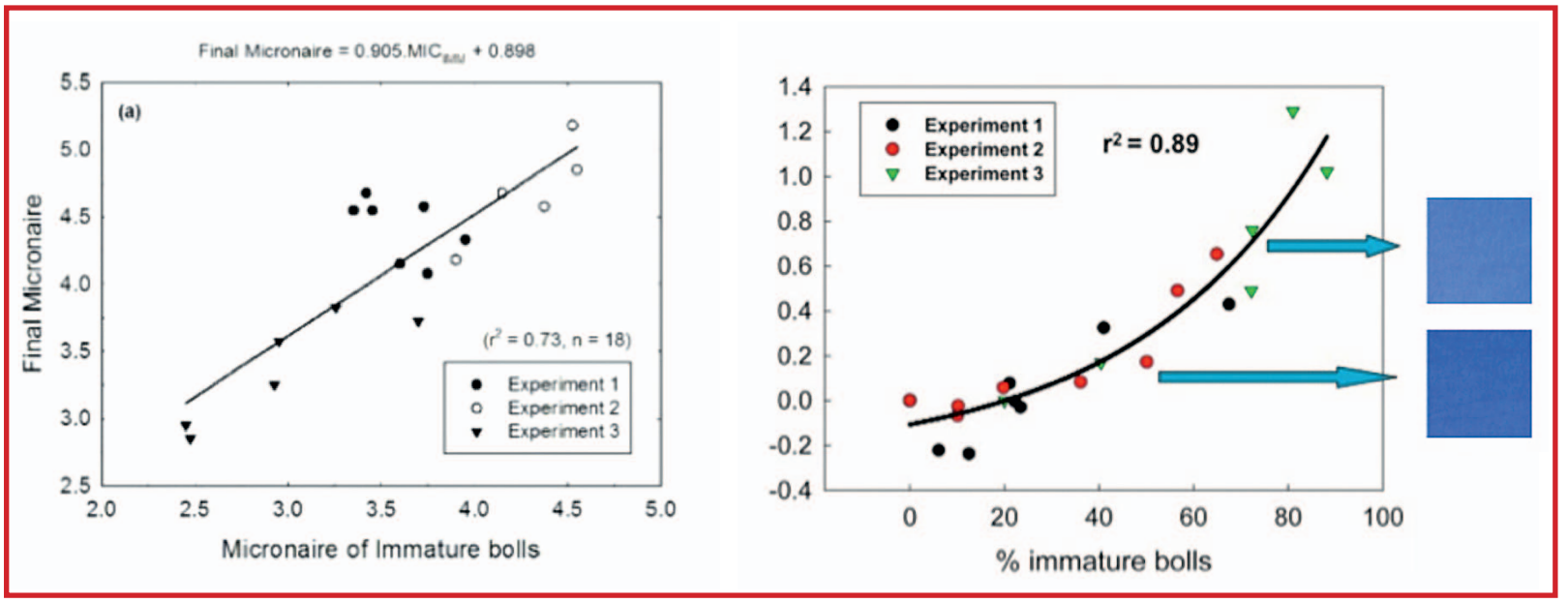


Figure 1. The relationship of fibre quality (micronaire) of immature bolls at harvest to fibre quality of immature bolls at the time of harvest aid treatment

Figure 2. The effect of defoliation timing on the dyeability of manufactured fabric (change in blueness vs % immature bolls)

The responses for the mature and open bolls were also significant, but they were poorer in predicting final micronaire.

The fibre linear density of the immature bolls at the time of defoliation was also significantly related to final linear density. Only models for mature bolls were significant for predicting final maturity ratio.

The researchers proposed that the quality of the immature bolls might estimate final micronaire over a range of treatment times better than mature or open boll quality because of their combined ability to reflect the quality of both early and late developing bolls.

At early harvest aid treatments, immature bolls dominate and thus will reflect final quality. With late treatment while there are less immature bolls, these bolls will much more likely reflect the later growing conditions of bolls that have matured or are close to maturity.

Implications of this research

This study demonstrated a method to estimate the final fibre micronaire following the effect of harvest aid applications.

While the quality of immature bolls provided the greatest precision in predicting micronaire at harvest, using open boll fibre quality provided some level of precision too. Collecting open bolls is much simpler, and the loss of precision may be somewhat compensated by the ease of using this method. Further research could improve the precision of this approach by targeting specific times for sampling open bolls (eg 40 percent open bolls).

Knowledge of final fibre quality and the effect of harvest aidtiming may help to improve quality. If estimates of micronaire are low, and climatic conditions are favourable, harvest aid timing could be delayed to allow further boll development and increase micronaire. Conversely, if micronaire is high, defoliation may occur earlier and safely to avoid issues such as increased neps and poor weather.

Immature fibres negatively affect textile performance

Fibre from those treatments described above were subjected to textile processing.

Measuring yarn and fabric performance

Less mature fibre from the cooler 2007–08 season produced stronger yarns (by 3 cN/tex) and fabric (by 0.39 N/ (g/m^2), but the yarns had more neps. The ribbon width of that fibre was also, on average, lower than the other two seasons, which increased fibre packing density (numbers of fibres in a given volume of yarn) and inter-fibre friction and partly explained the increased strength.

Examining uptake of dye

The researchers then dyed the fabric with a reactive blue dye to show up the effects of immature fibres.

Micronaire and linear density were equally well related to dyed fabric colour dimensions, and were greatly influenced by the timing of harvest aids.

The fabrics produced from early treatments — that contained a higher percentage of immature bolls — were a lighter hue of blue than those produced from more mature, later defoliation treatments.

Dr Robert Long, Research Scientist at CSIRO Materials Science and Engineering in Geelong, explained how the degree of blueness in the fabric related to the level of fibre maturity at the time of harvest aid application.

"Maturity really affected the dye uptake and appearance of the fabric," he said.

"We could relate traditional fibre quality measurements to the appearance of the fabric; to the blueness and the darkness of the fabric.

"By using the boll cutting technique to define the number of immature bolls on the crop, we found a good relationship between crop status and the hue of blue of the dyed fabrics (Figure 2).

"In the future, we might be able to use these relationship techniques to predict the quality of the fabric from differences generated in the field."

Timing application of harvest aids at the current industry recommendation (greater than 60 percent open bolls) is likely to minimise the presence of immature fibre, although this may vary season to season.

"In this case, we used defoliation to manipulate crop maturity, but other factors (eg production and weather related) will also affect crop maturity," Robert said.

"Using the boll cutting technique to determine the status of the crop in its final stage will allow the supply chain to pre-empt some of the processing performance issues of harvested fibre."

"KNOWLEDGE OF FINAL FIBRE QUALITY AND THE EFFECT OF HARVEST AID TIMING MAY HELP TO IMPROVE QUALITY."

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see our website

Website: FIBREpak is on the Cotton CRC website. Go to www.cottoncrc.org.au and enter *fibrepak* into the search panel.

There is a wealth of information available on-line and in print to help growers ensure safety of employees

HARVEST SAFETY FIRST

INDUCTING EMPLOYEES AT HARVEST TIME IS THE FIRST WAY GROWERS AND CONTRACTORS CAN BETTER ENSURE PRODUCTIVITY

Doing a practical safety induction when employees start work can help create a good and positive relationship with your workers if the discussion in the spirit of welcome and concern for the health, safety and wellbeing of all on the property.

One of the busiest times of the year is harvest and with it can come extra hazards employees, who are often new to the industry, need to be aware of. Many tools are available to help with staff inductions, not the least the industry's Harvest Safety DVD.

"We've ensured the 12-minute production is packed with key messages for on-the-job inductions for new employees as well as experienced operators," said CRDC's Rohan Boehm.

"We all have a responsibility to promote and ensure a workplace culture in the cotton industry where prevention of injury during the harvest season is of primary concern to all employers and employees.

"This short film covers safety topics ideally suited to all persons in the cotton harvest workplace and covers worker site inductions, communication, power lines, maintenance, night-work, fire hazards, transport, machinery and equipment."

The Australian Centre for Agricultural Health and Safety advises growers to 'plan' for harvest.

This includes making sure machinery and the working environment has been maintained, adequate staff numbers have been organised, safety inductions are carried out and awareness of potential risks are all key factors in being prepared.

One aspect of safety which is often overlooked and raises its head at harvest time is fatigue. It is important for staff to take regular breaks and have plenty of food and water available.

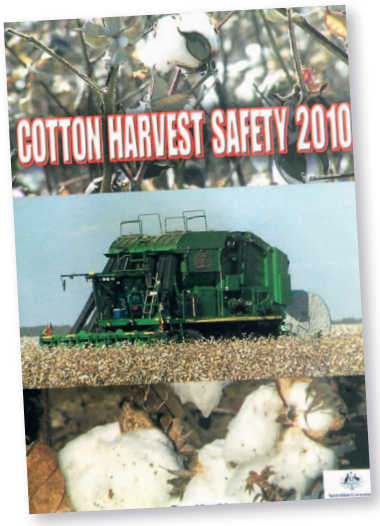
Managing fatigue contributes to the wellbeing of staff and the efficiency of a farm overall. Tired workers are prone to accidents and are not as productive as when they are fresh and alert.

Other major areas of concern at harvest are overhead power lines, crush injuries from module builders and pickers and traffic.

Vehicular accidents are the leading cause of injury and death on farms and at harvest time there is more traffic than any other time of the year. Increased traffic, dust and the higher numbers of people on the ground at this time of year can combine to create possible accidents.

CRDC, Farmsafe Australia and the Australian Centre for Agricultural Health and Safety produced an entire folder of resources relating to safety on cotton farms as well as general information relating to induction and general safety. It is available free for growers and all the hard work has been done, with hazard checklists, induction forms, training and injury registers all printed out and ready to be filled in.

It is a complete file of worksheets and information which can be downloaded from the website http://www.aghealth.org.au, call the Centre on 02 67528210 or mailto:aghealth@health.usyd.edu.au to obtain a copy.



DVDs can be ordered at http//www.crdc.com.au

WHAT IS A SAFETY INDUCTION?

It is the first step that you will take with your workers to be sure they have the information and the skills needed to look after their own safety and the safety of others while at work on your property. Before a new job or activity is carried out, a safety induction is part of showing the worker how to do a job, for example, operate machinery, where to go and what to do in case of accident or emergency.

COME CLEAN – GO CLEAN

"COME CLEAN GO CLEAN" HAS BEEN A MESSAGE FROM THE INDUSTRY FOR MANY YEARS. INDUSTRY BIOSECURITY SPECIALIST SUSAN MAAS DISCUSSES WHY IT'S NEVER BEEN MORE IMPORTANT

PHOTO COURTESY JIM QUINN

Recent biosecurity issues such as mealybug and new cases of fusarium (above) detected this year make Come Clean Go Clean a must-do across all cotton producing farms.

The importance of good farm biosecurity and the Come Clean Go Clean message is now to the fore with recent biosecurity issues such as mealybug and new cases of fusarium detected this year.

Industry pathologists Linda Smith (QLD DEEDI) and Karen Kirkby (Industry & Investment NSW) express concerns that growers may be tempted to believe that to Come Clean Go Clean is no longer relevant or required.

"While new cotton varieties have the ability to deliver more than 20 percent improvement in yield compared with lower F-rank varieties, fusarium still has the ability to cost yield in even the most advanced of tolerant lines," they say.

"When environmental conditions are favourable and inoculum levels are high, only 35 percent of plants will survive in the most resistant cultivar that is commercially available.

"In the field, symptoms can be less obvious in the newer more resistant varieties so stem cutting of stunted or unusual plants should still be part of annual disease survey.

"Proper washdown, including use of product such as FarmCleanse is very important.

"With many farms employing contractors to assist with picking, it is important to ensure best practice when allowing equipment on to farms. Of course it should be remembered that all equipment at all times of the year has the potential to carry weed seeds, pests and disease."

"IF IT IS NOT CLEAN, IT IS DIRTY, AND IF IT IS DIRTY YOU COULD BE CARRYING WEED SEEDS"

How clean is clean?

Natalie Dearden inspects equipment as part of the Central Highlands Come Clean Go Clean protocol and has years of experience inspecting harvesting equipment. As a passionate advocate of farm biosecurity, Natalie is very clear about what level of clean is acceptable.

"If it is not clean, it is dirty, and if it is dirty you could be carrying weed seeds, or pathogens. Farm biosecurity is all about being vigilant," she says.

Armed with a piece of wire, a screw driver, a firm banister brush and a vacuum cleaner, Natalie advises to allow a day for proper clean down.

Time can be saved at the end of the season if the equipment is cleaned down at the end of every day during harvest, but regular cleaning has the advantage of also reducing the risk of fire and allowing for maintenance issues to be identified.

"Start by removing as much material while the equipment is dry before applying water, once the material is wet it becomes sticky and difficult to remove," Natalie says.

"If you are blowing with air, rather than using a vacuum, be careful that you are not simply moving material around and not removing it."

Natalie has identified some handy tools to help the cleaning process. A firm banister or nylon brush works well on grills and baskets. Cleaning spindles can be particularly frustrating and Natalie has found slicing material with a Stanely knife and peeling it off is the most efficient method.

There are a number of problem areas Natalie knows to always inspect as they can be missed in the clean down – inside hubs, around the final drive and around chutes, particularly their joins can be problematic for build up of material.

"Cotton pickers have a rear component near the fuel tanks where there is a two-inch rail, material catches in there and needs to be physically removed," she says.

"The new round-bale pickers can have material build up around the conveyor belts at the rear of the picker.

"Don't forget to clean out the inside of the cab in equipment and accompanying vehicles. Mud and debris will almost certainly be there among the empty drink cans and iced coffee bottles!

"Growers are responsible for their own on farm biosecurity. They should ensure every single piece of equipment entering their farm is washed down with FarmCleanse and they should request a vendor hygiene declaration."

For further information:

www.*my*bmp.com.au

see our website

The site contains useful information in the 'Biosecurity' module – or search for "come clean go clean"

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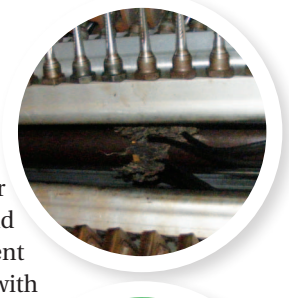
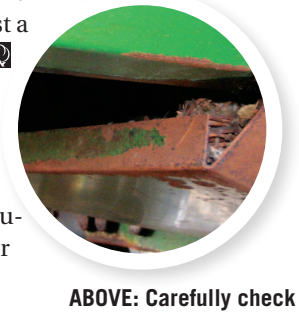




ABOVE: Carefully check all hidden areas of pickers before using and moving this harvest.

INVESTIGATING USE OF COTTON WASTE

BILLIONS OF TONNES OF WASTE ARE GENERATED IN AUSTRALIA EACH YEAR AND AROUND FOUR TO FIVE PERCENT OF THAT LANDFILL IS TEXTILE WASTE. A PROACTIVE APPROACH TO RECYCLING AND REGENERATION OF COTTON TEXTILES MAY CREATE MARKETING ADVANTAGES FOR AUSTRALIAN COTTON.

TRISTAN VISCARRA ROSSEL REPORTS

Textile waste originates from three main sources: pre-consumer waste (fibre, textile and clothing manufacturing industry), post-consumer waste and industrial waste (the commercial and service industries). In 2009, the Australian Government Department of the Environment, Water, Heritage and the Arts estimated that waste growth would exceed population growth (see Figure 1).

Given the growth in waste and the limits to landfill, CRDC is exploring a proactive approach to recycling and regeneration of cotton textiles. This could create advantages for brand owners in marketing Australian cotton and reduce the carbon footprint of cotton by up to 70 percent, given that the majority of GHG emissions occur at the consumer use level during the life cycle of cotton apparel.

Why is this an issue?

Executive Manager of the Technical Textiles and Nonwoven Association (TTNA) Kerryn Caulfield cited three main reasons why waste was generally perceived as a problem.

"Firstly, waste disposal can be harmful to the environment and human health," she said.

"Space for landfills is becoming scarce as councils strive for zero waste targets; and finally, costs are increasing to use existing and replace landfills, so waste is perceived as the end of a products life cycle that causes costly environmental impacts and depletes valuable resources."

Why is textile waste an issue?

In landfill, textile waste contributes to the formation of leachate as it decomposes, which has the potential to contaminate groundwater.

Decomposing landfill releases methane gas – a major contributor to global warming – and decomposing organic fibres and yarn such as wool produce large amounts of ammonia which is toxic in terrestrial and aquatic environments.

Cellulose-based synthetics decay at a faster rate than chemical-based synthetics.

In the past, textile waste was incinerated, emitting organic substances such as dioxins, heavy metals, acidic gases and dust particles, which are potentially harmful to humans and the environment.

How relevant is it to the Australian cotton industry?

According to Kerryn, industry has the power to solve the very problem it has created. She said textile waste was an unrealised source of valuable raw materials.

She said she frequently fielded phone calls from companies who wanted to solve their textile waste issues, such as safely disposing of old company and institutional uniforms.

Kerryn said that regenerating issues, such as the extraction of chemical contaminants and the development of end use products, can only be solved by research and development, and a firm commitment from both industry and government.

CRDC Executive Director Bruce Finney concurrs.

"Kerryn has identified for the Australian cotton industry that the growing issue of wastage from textiles may become a great opportunity for the textile industry to address its own environmental footprint," he said.

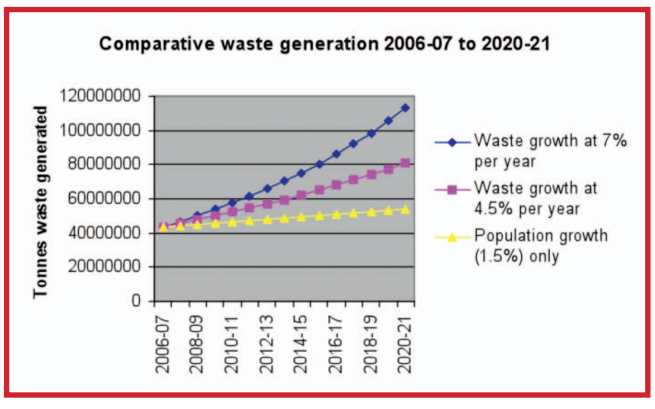
"We now have a good picture of our environmental footprint — and we know that most emissions along the life of a cotton garment are actually generated during its wear and care — but there are many ways that industry can address its waste issue, and generate value marketing at the same time.

"For example, in the US, Levi's recycled jeans contain 17 percent recycled denim, which has been re-milled from ends used for other jeans."

What needs to be done?

Bruce says CRDC is scoping potential investment into textile waste research in the next financial year. This would help the industry take a step towards addressing this important environmental issue and using it to market cotton as a responsible, natural fibre option.

Three main options are available to recover textile waste: recycle or reuse; regenerate; and producing energy from waste. Two options are being explored by CRDC.



Recycle / Reuse

The worldwide recycling industry performs a vital social and environmental function. Garments or household textile (eg sheets or towels) can effectively be recycled by sale or gift to another user. Of the textile waste recovered by charities, 60 percent is items of clothing that can be reworn or reused, and 15 percent can be torn into industrial wiper cloths. Disturbingly, 25 percent is unusable and sent to landfill.

Regenerate

All textile waste streams are often unrealised sources of valuable raw materials that can be repurposed or regenerated into saleable and usable products by intelligent collection, sorting, reengineering and reprocessing.

The investment in developing regenerating capabilities is often large-scale due to intellectual property issues and custom engineering.

Products made by regenerating textile waste include acoustic textiles used for soundproof blocks, insulation, roofing felt, bank stabilisation, and as pollution control filters.

In Australia, there is little evidence of organised recovery of pre-consumer or industrial textile waste specifically for reprocessing. However, with investment in appropriate technology, there are a number ways by which textile waste could be recovered.

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NEW OPPORTUNITIES FOR FUNCTIONAL FIBRES

EVER-STRIVING TO INCREASE MARKET OPPORTUNITIES, THE AUSTRALIAN COTTON INDUSTRY IS EXPLORING FURTHER POTENTIAL USES FOR COTTON FIBRE

Australia is home to one of the largest specialised fibre research facilities at CSIRO Textile and Fibre Technology. This has been enhanced through a new joint facility located at the Centre for Material and Fibre Innovation at Deakin University.

Worldwide, cotton is being developed into materials that can be used for protective garments, fibres with water transfer properties for health and sportswear products, aong with wrinkle and stain resistant materials that are environmentally and user friendly.

"There has been significant growth worldwide in research and development into functional fibres for a broad range of purposes from medical to military to mining," says Dallas Gibb, CRDC Value Chain Investment Manager.

"Most of this market is currently taken up by synthetic materials but there is potential for cotton in functional fibres particularly in non-woven markets.

"Some of the areas of interest in functional fibres within the apparel market include temperature and moisture management, wrinkle, moisture and stain resistance. If treatments for cotton could be developed it could increase potential markets for cotton."

Environmental benefits from materials with these features could enhance their marketability explains Dallas.

"Life cycle analysis research funded by CRDC has shown that most of the energy used in the typical life of a cotton T-shirt is in the washing, ironing and drying.

"A material that is stain resistant, quick drying and wrinkle free could significantly reduce the energy required for maintaining clothing which could give cotton a role in reducing our impact on global warming."

Resources for exploring new opportunities for cotton fibre are excellent. Australia is home to one of the largest specialised fibre research facilities at CSIRO Textile and Fibre Technology. This has been enhanced through a new joint facility located at the Centre for Material and Fibre Innovation at Deakin University in outer Geelong, Victoria.

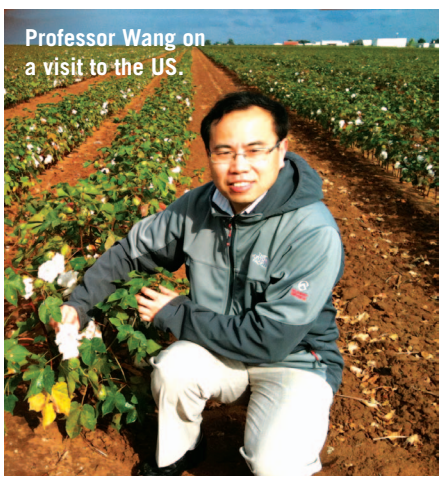
Director of the Centre for Material and Fibre Innovation is Alfred Deakin Professor Xungai Wang, who says research is ongoing (at Deakin) to turn fabrics into functional materials with directional water transfer properties.

"In other words, water can pass through the fabric in one direction only," he said.

"This has applications in sportswear and in health care products."

Professor Wang says if other areas of functional fibre research are successful, they may offer opportunities to expand into new markets for cotton and include:

- Directional water transfer cotton fabrics with good wash fastness
- Exploiting the tubular structure of cotton to enhance its functionality
- Further development of environment friendly, wrinkle resistance treatment for cotton fabrics
- Blend cotton with cashmere and fine wool to make high-value cotton blend fabrics with good wrinkle resistance



Professor Wang on a visit to the US.

- Turn cotton fibres or stalks into activated carbon for adsorption applications
- Explore double roller gin for Australian cotton ginning to increase cotton fibre length for premium applications

The United States has some impressive examples of what can be achieved through functional fibre research.

"Storm Denim™ is a technology that was developed in the US by Cotton Incorporated," Prof Wang says.

According to the website, Storm Denim combines the practicality of a water repellent finish with the comfort and breathability of cotton. Furthermore, as the finish is applied as a last step in the manufacture process, clothing designers can create a fashion garment with added functionality of water resistance.

Professor Wang says another interesting, though less commonly known functional fibre development in the US is cotton is now being used in decontamination wipes, after incorporating activated carbon materials into non-woven cotton fabrics.

"The same materials may find applications in protective garments for military personnel, for protection against chemical and biological agents," the professor said.

"For the Australian cotton industry to participate in functional fibres R&D it will need to form strategic partnerships with key research groups and there will need to be greater off-farm investment for cotton."

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KEEPING LOSSES TO A MINIMUM

GROWERS TAKE STOCK OF WATER LOSS OCCURRING FROM STORAGES AND CALCULATE THE COST OF IMPROVEMENTS, AS **MELANIE JENSON** REPORTS

David Wigginton's project has seen data from 70 cotton farm water storages analysed so far.

Through the Cotton Catchment Communities CRC *Cotton Storages Project* headed by David Wigginton, 135 storages on cotton farms will have initial seepage and evaporation losses measured by June 2011.

The results of 70 evaluations have so far been analysed by the National Centre for Engineering in Agriculture, based at the University of Southern Queensland in Toowoomba, and David Wigginton said this data showed the average seepage is 'very low' at less than 3mm/day.

"We view this as very low, especially considering these are earthen dams," he said.

"This is evidence that many growers have spent a lot of effort and cost at remediating any potential seepage losses over a long period of time and suggests that while the total volume of storages across the industry (≈3150GL) may be large, the level of seepage losses from many individual storages may be acceptable.

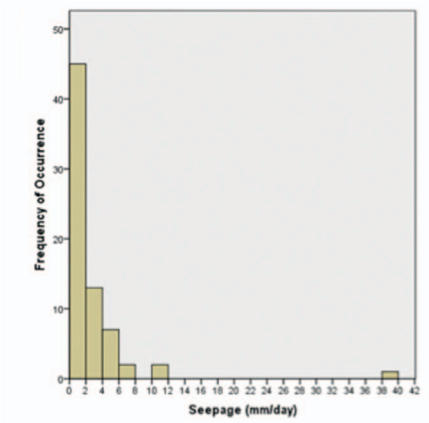
"However, there were still many growers (12 percent) who believed they had low seepage before measurement, but in fact had a seepage rate that could be considered medium or high at more than four millilitres per day."

Meanwhile, evaporation is driven mainly by local climatic conditions, so you would not expect to see big differences between storages, David says.

"Some local factors such as water temperature, storage shape, orientation to prevailing winds and windbreaks will cause some fluctuation which can be about ±15 percent (see Table 1).

TABLE 1. SUMMARY OF MAIN RESULTS

	Mean	Minimum	Maximum
Seepage (mm/day)	2.59	0.5	36
Seepage (m/year)	0.95	0.18	13.9
Evaporation m/year	1.97	1.87	2.39
Storage size (ML)	1665	110	8000



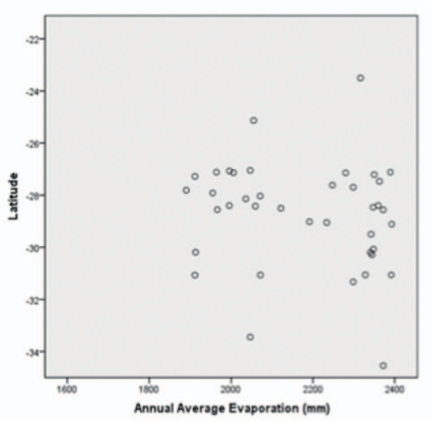


Figure 1 (above) shows the distribution of seepage results. Most storages (≈60%) had less than 2mm/day of seepage (730 mm/year). While seepage rates for some storages are medium to high (4 to 12mm/day), only a single storage had extremely high seepage (36mm/day). This storage was known to leak badly and had not been used for well in excess of six years. The storage was filled during a period of flooding and the water was used as soon as possible so that it only held water for a few weeks. Note that these results are preliminary; as more evaluations are completed, overall trends may change.

The range of annual evaporation for all storages, after taking account of dam factors, is included in Fig 2. This data is based on readily available SILO ET data. The range of annual evaporation is as expected, and the variation in evaporation appears to be due to storage specific characteristics, rather than location (in this case, latitude).

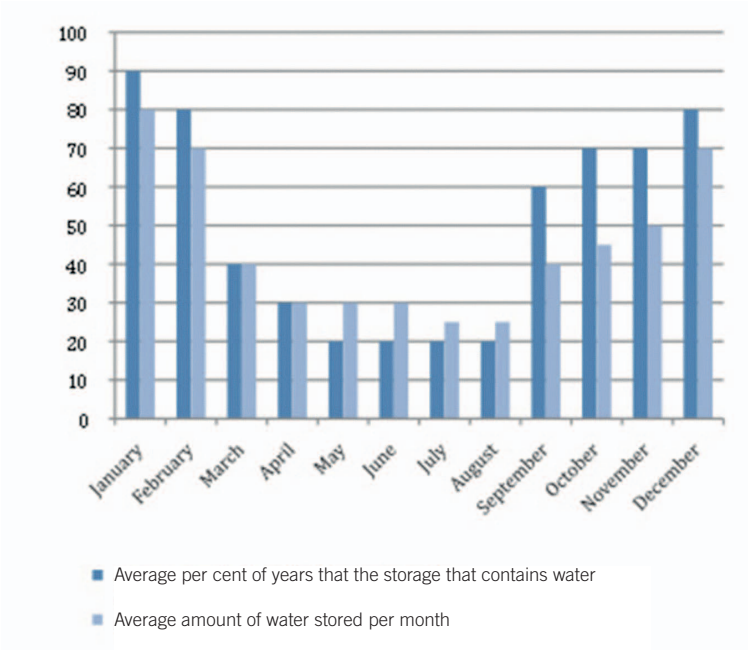
"These differences are reflected in a 'dam factor' which is specific to a particular storage and can be applied to easily accessible climatic data for future use, in this case, SILO data (accessed from the Australian Bureau of Meteorology)."

To put the typical losses into perspective, two real world example storages were analysed so that their seepage and evaporation losses could be converted into a typical average volumetric loss. As indicated in these examples, the volumetric losses for an individual storage will depend on the storage dimensions, how the storage is used and when it contains water. The seepage and evaporation ready reckoner www.readyreckoner.ncea.biz was used to determine these losses.

Typical annual storage pattern

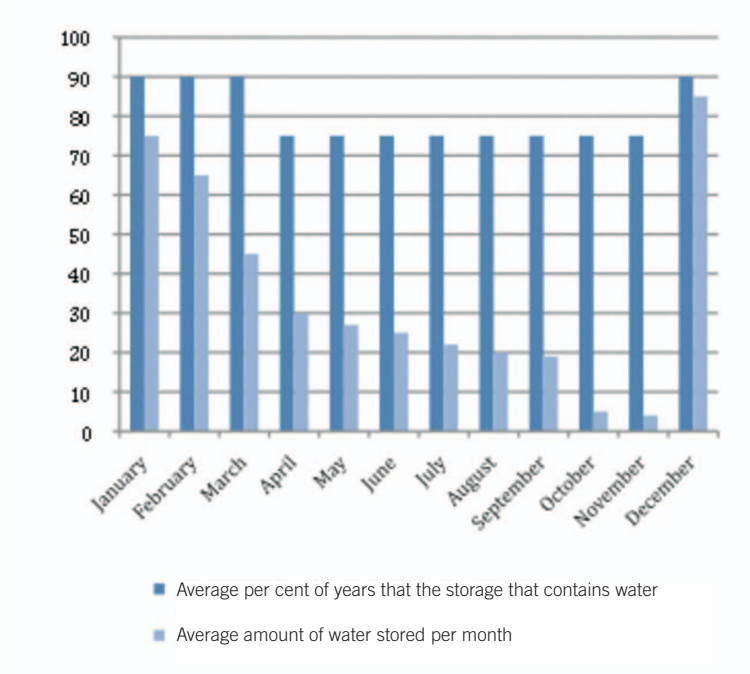
Small Storage in Emerald

AREA:	5.6ha
TOTAL VOLUME	180ML
TYPICAL ANNUAL EVAPORATION	67ML
TYPICAL ANNUAL SEEPAGE (2MM/DAY)	33ML



Medium/Large Storage in Dalby

AREA:	27ha
TOTAL VOLUME	1500ML
TYPICAL ANNUAL EVAPORATION	423ML
TYPICAL ANNUAL SEEPAGE (2MM/DAY)	89ML



The project hopes to test and promote the use of cost-effective tools for measuring storage losses while building capacity for ongoing measurement.

"Commercial consultants are being utilised to determine evaporation and seepage losses from the storages using the Irrimate Seepage and Evaporation Meter. It is hoped this approach will help build the capacity of irrigators and consultants to continue measuring losses when the project is completed," David said.

"This would potentially provide an immediate benefit in the efficient use of those storages measured in the project as well as a mechanism for ongoing evaluation and improvement of all storages across the industry."

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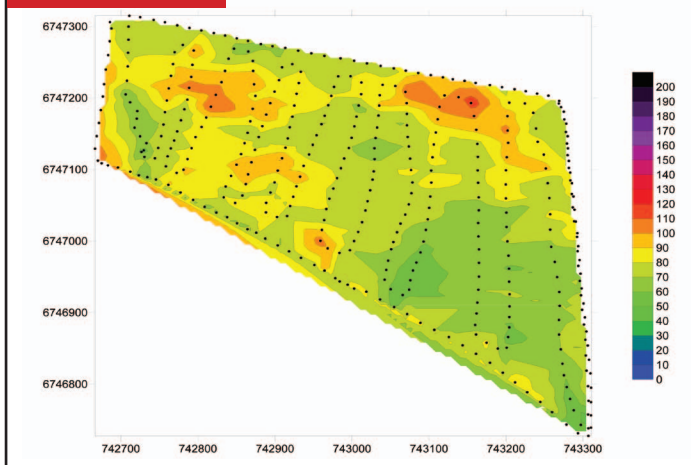
07 4631 1711

CASE STUDY 1:



CASE STUDY PROPERTY: **'Caithness', Moree**
GROWER: **Kelly and Ange Humphries**

Introduction:

In an effort to increase on farm storage after purchasing 'Caithness' north-west of Moree in NSW, owner Kelly Humphries selected an existing storage to renovate. The storage was relatively shallow and had an irregular shape that reflected the course of a nearby waterway. Kelly says the original storage structure did not leak. However, when renovations to increase storage capacity were being carried out a few years ago, water was noticed seeping into the dam from a section of the storage floor that was adjacent to the river. It was assumed that if water was leaking in, it would start to leak out once the storage was filled. Remediation work involved lining the problem area with clay and recent measurements indicate that this has successfully alleviated the seepage.

Background

Prior to commencing renovations to the existing storage, Kelly commissioned SMK Consultants in Moree to carry out an EM-31 survey on the dam to check that the soil material was likely to be suitable. The EM-31 survey map (above) revealed variation in the soil conductivity across the storage area. Immediately following the EM-31 survey, soil trenches were dug using a backhoe to approximately three metres to investigate the soils corresponding to different colours on the EM-31 map. These trenches did not reveal any soil material that would be unsuitable for holding water.

The Problem

Construction began to increase the storage capacity by excavating a further 1.8m of material from the storage floor and an additional 2.5m of material was added to the wall height. As the excavation was taking place, it was discovered that water was seeping into the dam. The original EM-31 survey map was then reviewed and it was realised that some of the green areas on the south eastern corner of the map corresponded with the area where the water was being seen in the dam floor. Using the backhoe that was onsite for excavations, Kelly had numerous pits dug to investigate the soil at depth in those areas revealing a seam of sandy soil in that corner of the storage. It is believed that this sandy seam was part of a previous watercourse that ran underground through to the nearby riverbed and that water must have been seeping into the excavated area from the river. It was likely that once the storage was filled, water would move out of the storage in the same way.

The Solution

To prevent seepage from the renovated structure, the area in the south eastern corner of the storage, where sand had been found at depth, was clay lined. Suitable clay material was taken from other areas of the storage to create a one-meter deep lining which raised the storage floor to the height of the natural ground level outside the dam wall. The clay was spread using a laser bucket which Kelly believes also provided adequate compaction so no further compaction was required.

The Outcome

The dam currently has a water level of approximately three metres. Measurements taken by John Doble, (formerly) of Gwydir Valley Irrigators Association indicate seepage to be approximately 200mm/year demonstrating that the remediation work was successful.
The seepage remediation was estimated to have cost approximately $30,000 which Kelly says "was well worth the expense."

The Future

Kelly questions whether the rate of seepage will be greater when the storage is at full capacity but is happy with the outcome of clay lining.

THE RIGHT NUMBERS FOR BANDED SPRAYS

EVEN THE MOST EXPERIENCED OPERATORS CAN BE CONCERNED ABOUT THE ACCURACY OF BANDED APPLICATIONS. BILL GORDON AND GRAHAM BETTS TAKE YOU THROUGH THE KEY STEPS TO ENSURE THE RIGHT RATES GO TO THE TARGET

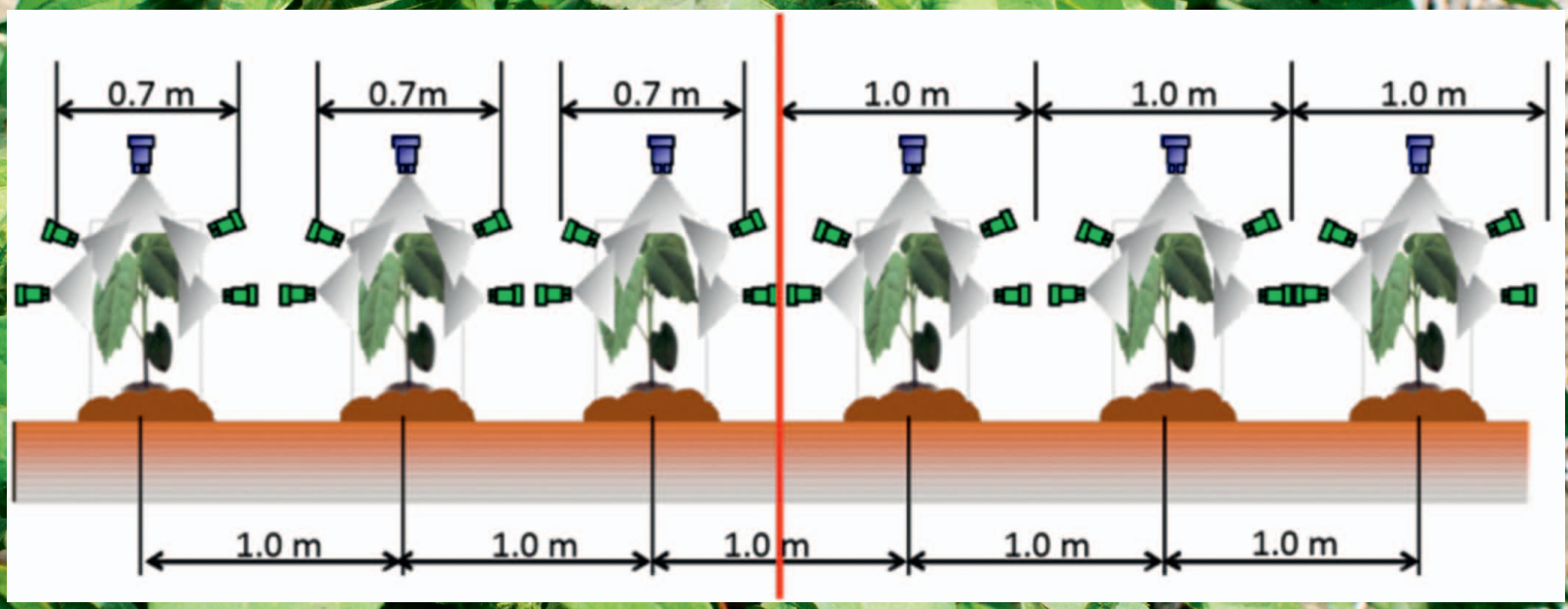


Diagram courtesy of Graham Betts (from his banded spraying booklet).

Banded applications can easily result in confusion that often follows a recommendation from an advisor.

Often people want to know the actual application rate and how much chemical to put in the tank (based on green hectares(ha) or sprayed ha, how far a tank will go (based on paddock ha) and what rate to put in the spray controller. Others want to know what nozzles they should use to achieve a recommendation they have received from their advisor.

What really concerns us is that there is often a big difference between the recommendation they receive, what they think they should do, and what the machine can actually do with the nozzles they have.

The main reason for a banded application is to place the recommended rate of the product onto an area smaller than the whole field – this way we use less chemical over the whole field, but still apply the full intended rate to the actual target area.

To calculate the true application rate we need to know the sprayed width, or average sprayed width for each nozzle, this allows us to calculate the litres per sprayed ha (L/sprayed ha sometimes called L/green ha). Label rates are always given as L/sprayed ha. Advisors should always give recommendations as L/sprayed ha.

To apply the correct L/sprayed ha there are two main things to work out:

1 How much chemical to put in the tank, which is based on L/sprayed ha.

2 What to put into a controller, which is based on paddock ha per tank, (unless you want to play around with section widths).

Selecting the correct nozzle size for a particular job

To work out what size nozzles you need to get a particular L/sprayed ha, you need to know what the required flow rate of each nozzle (L/min/nozzle) should be.

If all nozzles are the same size this is relatively easy, as the flow rate will be the same for each nozzle. For example the average sprayed width per nozzle if you had five nozzles per one metre row at 100% band would be 1m ÷ 4 = 0.2m.

If you had four nozzles per one metre row and a 70% band, then the average sprayed width would be 0.7m ÷ 5 = 0.14m.

To calculate the required flow rate of each nozzle, the formula you need to use is:

L/min/nozzle = L/sprayed ha ÷ 600 x speed (km/h) x average width of each nozzle (m)

If you are using different combinations of nozzle sizes, you can still use the same formula, but it helps to work out the total flow rate for each band (or row), to do this change the average width per nozzle to the band width or spray width per band (row) to get the total flow required per band (row) and select nozzles with flow rates that add up to that total (all at the same pressure).

Once you have calculated the required L/min/nozzle use a nozzle flow chart to identify appropriate nozzle sizes and pressures, and don't forget to check the spray quality produced to ensure it is consistent with the product label.

Bill Gordon (centre) explains correct nozzle selection and use with growers in Northern NSW

"¿¿¿¿WHAT CONCERNS US IS THAT THERE IS OFTEN A BIG DIFFERENCE BETWEEN RECOMMENDATIONS GROWERS AND SPRAY OPERATORS RECEIVE?????????"

For further information, see the easy-to-follow publication from Graham Betts, with all the necessary diagrams and tables to make banded application easy – it will take you through many situations explaining the calculations and how to choose nozzles for different jobs.

To purchase a copy of the publication, contact Contact Graham Betts at ASK GB 0427 622 214
mailto:askgb@bigpond.com

Bill Gordon has worked closely with the cotton and grains industry for many years and runs workshops for farmers and trainers. Contact Bill Gordon Consulting 0429 976 565
mailto:bill.gordon@bigpond.com

FORMULA

The following are a selection, there are many that work.

- Band width in metres – eg a 70% band of a one metre row = 0.7m.
- Sprayed width per nozzle (m) = the band width ÷ number of nozzles per band. For example three nozzles per 70% band of a one metre row is 0.7 m ÷ 3 = 0.23m
- The application rate = L/sprayed Ha. L/sprayed ha = L/min/nozzle x 600 ÷ speed (km/h) ÷ sprayed width per nozzle (m) (Flow rate of each nozzle).
- L/sprayed ha applies to each band (row), whether you spray one band (row), or many rows, whether it is a solid plant, single skip or double skip.
- Number of Sprayed ha per tank = Tank size (L) ÷ L/sprayed Ha
- Amount of chemical to add per tank = Sprayed ha per tank x chemical rate / ha
- Paddock ha per tank (Solid Plant): = Sprayed ha per tank ÷ band width (m)
- Paddock ha per tank (Skip Row Configurations): eg double skip on one metre row spacing (only planted one out of every two rows), this would be the same as only spraying 12 x 1m rows with a 24m boom.
- Paddock ha per tank (skip) = Sprayed ha per tank ÷ the band width (m) x width of boom ÷ row width (m) ÷ number of planted rows under the boom.
- Rate to put in the Controller: = Tank Size (L) ÷ Paddock ha per tank

*this works if you don't want to change the section widths in the controller

TELL YOUR COTTON STORY

A RESEARCH PROJECT TO DOCUMENT THE HISTORY OF THE INDUSTRY NEEDS PEOPLE TO ACHIEVE ITS AIMS

Researcher Dr Wendy Shaw of the University of New South Wales is inviting experienced cotton growers and people from cotton growing communities to gather their stories of cotton growing to contribute to this important Cotton CRC research project.

The historical geography of cotton farming in NSW and Qld will portray the pathways to adaptation of the industry to Australian growing conditions, together with how new technologies were adopted in the 50-year history of the relatively modern Australian cotton industry.

The project will describe how farmers have adapted cotton growing to local conditions and the extent to which they have adopted technological innovations over time.

As well as farmers, local townsfolk who have had long-term involvement in cotton communities will be approached to add their perspectives -and memorabilia. The project will provide the basis of publications and/or documentary DVD on the historical geography, and current best practices (as appropriate), which will be handed back to cotton communities for current and future generations.

Wendy Shaw has invited farming community 'elders' who hold many of the details of the early industry and recent past to work with the research team in 2011.

A comprehensive survey is attached to this edition of *Spotlight* magazine.

Contact Dr Wendy Shaw, Senior Lecturer Geography, School of Biological, Earth and Environmental Sciences, University of New South Wales Sydney 02 93853715 – 0415128103
mailto:w.shaw@unsw.edu.au

Colin Busby and Bruce Mackey have long memories of the cotton industry.

www.sustainingruralcommunities.com.au

Cotton CRC Technology Resource Centre Coordinator Dave Larsen and Aboriginal Employment Strategy CEO Danny Lester at the first National Sustaining Rural Communities Conference in Narrabri last year.

FREE CONFERENCE TRANSFORMS REGIONS

IF YOU ARE PASSIONATE ABOUT YOUR COMMUNITY AND ARE LOOKING FOR WAYS TO HELP RETAIN OR REGROW ITS VIBRANCY, THIS EVENT IS FOR YOU.

Regional Australia again has the opportunity to actively identify and participate in solutions that can transform its future through the second National 'Sustaining Rural Communities' Conference.

The free two-day conference in Narrabri on April 5 and 6 will focus on "Transforming Regional Australia", the theme of this year's event.

A critical component of this event that results from a joint investment of CRDC and the Cotton CRC is to empower people in regional communities. CRDC and the Cotton CRC invest in this conference to pursue knowledge and ideas that will support the resilience of the regional communities who sustain the cotton industry.

The conference is designed to identify how successful and sustainable communities are addressing their resilience and to share their various tools, technologies, infrastructure and policy changes that can be used effectively elsewhere.

Attendance is free and it will enable delegates to put their own ideas and solutions on the table and have them heard well beyond the four walls of the conference. Attendees will all be encouraged to network during and after the event with like-minded people from regional communities all over Australia including a range of agricultural industries, small business, government, mining, manufacturing, finance, tourism, transport, science, education and health professionals.

Open to all people who want to find the best way forward for their community and industry, CRDC and the Cotton CRC will be joined by generous sponsors who will support the attendance of a top lineup of speakers and researchers who will engage the conference attendees to directly plan for the future of regional Australia.

The conference kicks off with a welcome reception at 6pm on Monday April 4 at the Crossing Theatre.

Speakers include Independent Member for New England Tony Windsor, Chair of the Regional Development Australia Northern Inland Mal Peters and many others from across industries and Australia.

Narrabri Shire Council, Namoi CMA, Agri Food Skills Australia, Regional Development Australia and Eastern Star Gas are also major sponsors of the event this year.

Full details of the program, speakers and sponsors are on the website.

see our website www.sustainingruralcommunities.org.au

or contact CRDC Communications Manager Rohan Boehm
email us 02 6792 4088
rohan.boehm@crdc.com.au

INSIDECOTTON IS YOUR WEEKLY RADIO PROGRAM

CRDC Communications Manager Rohan Boehm has been taking research and development to the airwaves and on-line with the help of the industry's Development and Delivery Team Specialists and researchers.

If you want to know what is happening inside research and development in the cotton industry, a new weekly interview program produced by CRDC's Rohan Boehm is well worth tuning in to.

INSIDECOTTON is the new weekly radio program is produced at Narrabri's community radio station 2MaxFM and it features interviews with the industry's leading researchers together with specialists from the industry's Development and Delivery Team who are charged with leading technology adoption and best practice uptake.

The impetus for the new format arose through in-house market research CRDC undertook in 2010 where researchers, extension leaders, agribusiness and farmers were interviewed to determine what information and channels of delivery was going to work best in 2010 and beyond.

A key gap that was identified was in industry's R&D systems to produce and deliver information updates quickly and in a timely fashion. "The market was telling us that not everyone learnt by reading, and many more would if they had the time. Radio and 'pictures of the mind' seemed to be an ideal media for us to adapt to early in 2011 to test the notion, Marketing Manager – Cotton Industry Development & Delivery, Rohan Boehm said.

"Tests with the early programs has well and truly proven the concept, so now we're ready for a weekly delivery on the airwaves."

The other key driver for a change of emphasis on electronic platforms for information delivery was the wholesale change to industry's extension services introduced in 2010. This change saw industry agreeing that it could no longer invest comprehensively in regional extension services – hence the launch of industry's D&D (Development and Delivery Team) headed by Ken Flower.

Initially, the INSIDECOTTON is broadcast on Tuesday and Thursdays on 91.3 2MAX FM, based out of Narrabri. The station covers a large swath of cotton country from the Queensland border south to Quirindi.

For those outside the listening area, the programs are available on the CRDC website as an MP3 File. INSIDECOTTON is produced in an MP3 format and all editions of the radio-magazine can be accessed on the CRDC website – files are uploaded weekly.

INSIDECOTTON will expand by mid-2011 to become a weekly e-newsletter targeting all producers and consultants. This information will be augmented with news from around the world of cotton where CRDC will glean news items appearing worldwide in publications, radio and online resources that can inform the Australian producer and the industry. The full range of social media systems will be incorporated into the e-news media to allow for interested people to discuss the topics and suggest new ideas for INSIDECOTTON.

email us

For information on INSIDECOTTON or to subscribe to the e-newsletter, contact Rohan Boehm at CRDC. 02 6792 4088 mailto:rohan.boehm@crdc.com.au

see our website

We're on the web: Download your MP3 files at http://www.crdc.com.au go to the INSIDECOTTON tab to view all current broadcasts.

TIME TO GET MORE MOBILE

To pave the way for mobile technologies as a key part of daily life on cotton farms, CRDC is rapidly developing its capacity to make the knowledge from R&D available in the paddock.

With the ever-increasing capability of mobile technology now readily available, mobile phone applications (APPS) for both iPhone, iPad and Android operating systems are in the early stage of being developed specifically for cotton growers and consultants. CRDC is also working closely with GRDC and publishers of the *Australian Cottongrower* to develop the content and marketing of the mobile APPS.

"Right now I need 'cotton test pilots' to try out APPS that that we've got in the early development phase," said CRDC Communications Manager Rohan Boehm.

"Our aim is to have these APPS co-designed by growers and consultants to be sure they have immediate value and use on farm from day one.

"Among the applications being developed are a pest and beneficials field guide, energy calculators, ground spray nozzle and boom configurations, knowledge search tools, natural resource management, nutrition and irrigation calculators.

" I think many of the well-known tools and publications we have relied on can be readily adapted to provide immediate value in the paddock.

"The demand and uptake of this technology is only limited by the demand from growers for these types of services and tools.

"For any farmers who are looking forward to working with APPS to help in the paddock any time soon, I'm inviting you to work with us in the development phase."

Any producers or consultants interested in working with CRDC as an 'official test pilot', contact Rohan Boehm at CRDC. 02 6792 4088 mailto:rohan.boehm@crdc.com.au

CRDC INVESTMENT IN RESEARCH WILL HELP ANTICIPATE FUTURE EMERGENCE OF RESISTANCE IN WEED SPECIES THAT ARE CURRENTLY SUSCEPTIBLE

YOUNG INNOVATOR RECOGNISED BY NATIONAL AWARD

Resistance to pesticides and herbicides presents a major challenge to current farming practices.

Most agricultural industries, including cotton rely heavily on glyphosate as a cost-effective herbicide to control weeds. There are five weed species in Australian cropping systems known to be glyphosate resistant, however globally there are 21, highlighting the potential for more weed resistance to occur here.

However the cotton industry has an able ally in James Hereward, the 2011 winner of the CRDC-sponsored Science and Innovation Award for Young People in Agriculture, Fisheries and Forestry.

As such, James will develop and publish molecular markers for several weed species to test relationships between the 'population genetics theory' and resistance in the field. The PhD student from the University of Queensland was named as the award recipient at a ceremony in Canberra on March 1.

While a number of studies have looked into the reduction of genetic diversity as a probable cause of weed resistance, James says these results may be affected and reflect the inbreeding effect that can result from such studies.

Through the sponsorship from CRDC, James will test laboratory-generated resistance predictions in the field to create a better understanding of the processes underlying the evolution of herbicide resistance.

IMAGE COURTESY STEVE KEOGH PHOTOGRAPHY

CRDC Executive Director Bruce Finney, James Hereward and guest presenter at the ABARES award function, science broadcaster Bernie Hobbs from ABC Television's *The New Inventors.*

"Current farming systems in the cotton industry could suffer if species continue to build resistance to glyphosate," James said.

"I will test predictions of population genetics theory and thus determine whether genetic diversity can be used to anticipate the ability of a weed to adapt to glyphosate selection.

"The research will help anticipate future emergence of resistance in species that are currently susceptible.

"These identified species could then be included to Integrated Weed Management plans to help optimise responses to high-risk weeds."

According to DEEDI weed specialists Jeff Werth and David Thornby, glyphosate has allowed minimum and no-till farming systems to succeed, however resistance poses a threat to the success and sustainability of these practices.

They say resistance is a major concern as it will make it difficult to continue using farming systems based on glyphosate.

According to CRDC's Farming Systems Investment Manager Tracey Leven, Integrated Weed Management strategies can reduce the threat of resistance and include deliberate rotation of chemical groups, the use of spot spraying (eg Weedseeker) technology and careful monitoring and management of weeds to ensure they don't survive spraying are valuable tactics to include in weed management programs. The use of cover crops in fallows also hinders weed growth at a critical time.

Tracey said growers can currently assess the risk of developing glyphosate resistance on their farms using DEEDI's internet-based Glyphosate Resistance Risk Assessment Tool, which allows growers to check current level of risk of developing resistance on their farm, paddock by paddock.

Growers and advisors enter information on current practices performed on a specific paddock, including crop rotation, crop density and weed control tactics, and identify which weed species they usually have to control. The tool will then calculate a glyphosate resistance score for each part of the rotation in that paddock, and a level of risk for each weed identified.

The toolkit is available online at www.deedi.gov.au

For more information and support about glyphosate resistance
David Thornby
mailto: David.thornby@deedi.qld.gov.au

Southern Qld
Jeff Werth
mailto: jeff.werth@deedi.qld.gov.au

Central Qld Vikki Osten
mailto: Vikki.osten@deedi.qld.gov.au

NSW Graham Charles
mailto: Graham.charles@dpi.nsw.gov.au

CRDC supports and rewards young scientists for their exploration of concepts, novel solutions or engagement in the pursuit of scientific breakthroughs and new knowledge. This prestigious award has for many years allowed young scientists working in cotton to be recognised among peers in other rural industries.

CRDC welcomed the quality of the scholarship project proposals received after widely advertising the opportunity. Applicants demonstrated innovative research methodology to address emerging scientific issues of value to the cotton industry and other cropping industries. CRDC has a key strategy in place to invest in people engaged in improving the value of cotton products, reducing the industry's environmental footprint while concurrently improving the productivity and resilience in the systems of production, fibre value and people.

HIGH DEMAND MANUAL GETS 2011 MAKEOVER

Due for release at the Cotton Trade Show in May, the *2011 Australian Cotton Production Manual* is expected to be in high demand following the overwhelming response to the first edition.

The manual provides a snapshot to all key aspects of cotton production in one accessible package and was developed by the cotton industry Development and Delivery Team of specialists in association with Greenmount Press – publishers of the *Australian Cottongrower* magazine.

Ken Flower, Cotton Industry General Manager for Research Implementation and *my*BMP says "Important updates include new information about crop nutrition and varieties and calculating spraying rates in banded applications.

"Cotton Australia has also provided extra information regarding phenoxy herbicide damage and the importance of using CottonMap for field awareness."

Ken says there is also new information about Integrated Pest Management (IPM) and the natural environment, particularly how to scout for beneficials in non-crop areas to help with IPM decision making incorporating the whole farm system.

Importantly, the publication includes both irrigated and dryland production information and provides for growers who utilise or incorporate both systems to produce cotton under limited water availability conditions.

The first edition of the *Australian Cotton Production Manual* launched at the 2010 Cotton Conference produced and overwhelming response and highlighted the value and importance of releasing updated versions as new knowledge and technology becomes available as shall be seen in the 2011 edition.

Helen Dugdale compiled the manual and has assisted in ensuring the manual is updated with latest R&D information.

"The *Australian Cotton Production Manual* has been a joint industry project with significant contribution in producing the publication from the Development and Delivery Team, researchers, Cotton Australia, CSD and supplier sponsors," Helen says.

"Not only is it a fantastic first reference for growers, it also contains useful information on where growers can go for further information if necessary."

Copies of the 2011 manual will be mailed out to growers following the Trade Show. Growers should check to make sure their mailing contact details are up to date by contacting Dave Larsen at the Cotton CRC on 02 6799 1534.

E-copies of the Manual will be available through a download from the Cotton CRC website www.cottoncrc.org.au and will be viewable online in a PageTurning format from the CRDC website http://www.crdc.com.au

Plans have been underway since the release of the 2010 manual for a new and improved version this year.

FIELD TO FABRIC SET DOWN FOR AUGUST

The Cotton Field to Fabric course is being held this year from August 23 to 25 at CSIRO Materials Science & Engineering in Belmont, Geelong, Victoria.

The course is designed for people involved in any part of the cotton industry from grower to technologist and aims to provide an understanding of how each part of the industry operates and relates to one another.

The program will include:

- global perspective
- variety selection
- agronomy
- fibre properties
- harvesting
- ginning
- classing
- marketing
- environmental issues
- yarn manufacture
- fabric formation
- dyeing, finishing and printing
- textile quality assurance

For more information go to http://www.csiro.au/events/Cotton-Field-To-Fabric-Course.html or contact Rene Van Der Sluijs, Textile Technologist, Materials Science and Engineering
03 5246 4738
mailto: Rene.VanDerSluijs@csiro.au

see our website

email us

QUEST FOR SUSTAINABLE, COMPETITIVE ADVANTAGE ON TRACK

BY BRUCE FINNEY

TOP: Cotton CRC's Paula Jones, CRDC Executive Director Bruce Finney, Cotton Australia CEO Adam Kay, CRDC Director Mary Corbett, CRDC Farming Systems Program Manager Tracey Leven, Cotton Australia's Bob Dall'Alba and CRDC Chairman Mike Logan.

The CRDC's 2008-2013 Strategic R&D Plan seeks to deliver "sustainable competitive advantage" to the Australian cotton industry through the achievement of three goals;

- Add value to the Australian cotton industry with premium products in improved routes to market;
- Cotton in a highly productive farming system with improved environmental performance; and
- A culture of innovation and learning.

As part of its business process, CRDC regularly monitors its progress towards achieving these goals and seeks to adjust the currency of the Plan to adapt to changing landscapes that impact on the cotton industry.

Representatives from Cotton Australia, Department of Agriculture, Fisheries and Forestry, Australian Cotton Shippers Association and Cotton Catchment Communities CRC joined the CRDC Board of Directors and its management in conducting a mid-term assessment of the Plan in early February.

An independent scan of publicly available reports and media that relate to the cotton industry and its R&D operating environment was conducted against the CRDC's planning assumptions and the critical uncertainties identified in the industry vision – Vision 2029. The scan highlighted that the assumptions and uncertainties, with some changes in importance, were still contextually relevant which included:

- That the competitiveness of cotton with man-made fibres is at a moderate risk level given ongoing innovation in man-made fibres with cotton like characteristics. The cotton industry needs to examine this risk closely.
- That the global competitiveness of Australian cotton is at risk. Australian cotton has some competitive advantages it is uses well, and others it is yet to fully exploit.
- That the opportunity for product differentiation and end market R&D is ongoing.
- Water variability and availability are certain to remain uncertain.
- That variability in cotton production and grower dedication will be ongoing and may increase.
- That future industry profitability is uncertain given cost/price squeeze and limits to yield.
- The competition of food versus fibre is an ongoing uncertainty but potentially of less pressure.
- That change is accelerating and the need for transformational rather than incremental improvement is ongoing.
- That the need for investment in policy orientated R&D is ongoing
- That climate change and energy consumption is of increasing importance.
- That environmental pressures are increasing

The participants collectively discussed the results of the scan and changes they had identified in the operating environment relevant to the Plan direction and its implementation. The relative importance of a number of these issues was assessed as well as whether issues fell within the scope of the current Plan.

It was concluded that there was no need to make changes to the strategic plan goals or strategies – trends and assumptions still hold true, and some in fact have strengthened. There are, however, interrelated concerns around resourcing and the delivery timeframes for outcomes from the R&D programs.

Mike Logan, Chair of CRDC concluded that "it's about the four Ps – people, policy, PCI (Premium Cotton Initiative) and production.

Investing in people is the most difficult of all investments because of the inherent inaccuracy of measuring the return on that investment. However, every time we talk about research we come back to the need to build the capacity of the people who deliver, receive and manage the research.

Cotton R&D can have a strong but indirect role with regard to policy. CRDC has a licence in research to anticipate the needs of the policy environment on a three to five-year scale. We are allowed to be wrong, but prepared to advise policy when needed.

The PCI is integrated deeply across production and industry communication. It may be our legacy to the industry if we can get this right. It will not always be the case that we cannot grow enough cotton to meet the demands of the market – as is the case today. There will come another time when we have more cotton than the market needs and we will have a strategy to see us through that time.

What do we need in production R&D that could be transformational? The research always moves forward in increments but every once in a while we get a leap forward that can be transformational. We have to have our minds sufficiently open to be able to see those opportunities when they arise"

Acknowledgement: CRDC notes its appreciation of the time and input provided by:

Cotton Australia's John Cameron, Bob Dall'Alba, Damien Erbacher, Adam Kay, Greg Kauter and Michael Beeston with Allan Grant and Peter Ottesen from the Department of Fisheries and Forestry, ACSA's Philip Sloane, Cotton CRC's Philip Armytage, Ken Flower and Paula Jones, the CRDC Board and management.