

Cotton Research & Development Corporation

www.cottonnews.com.au/spotlight

Spotlight

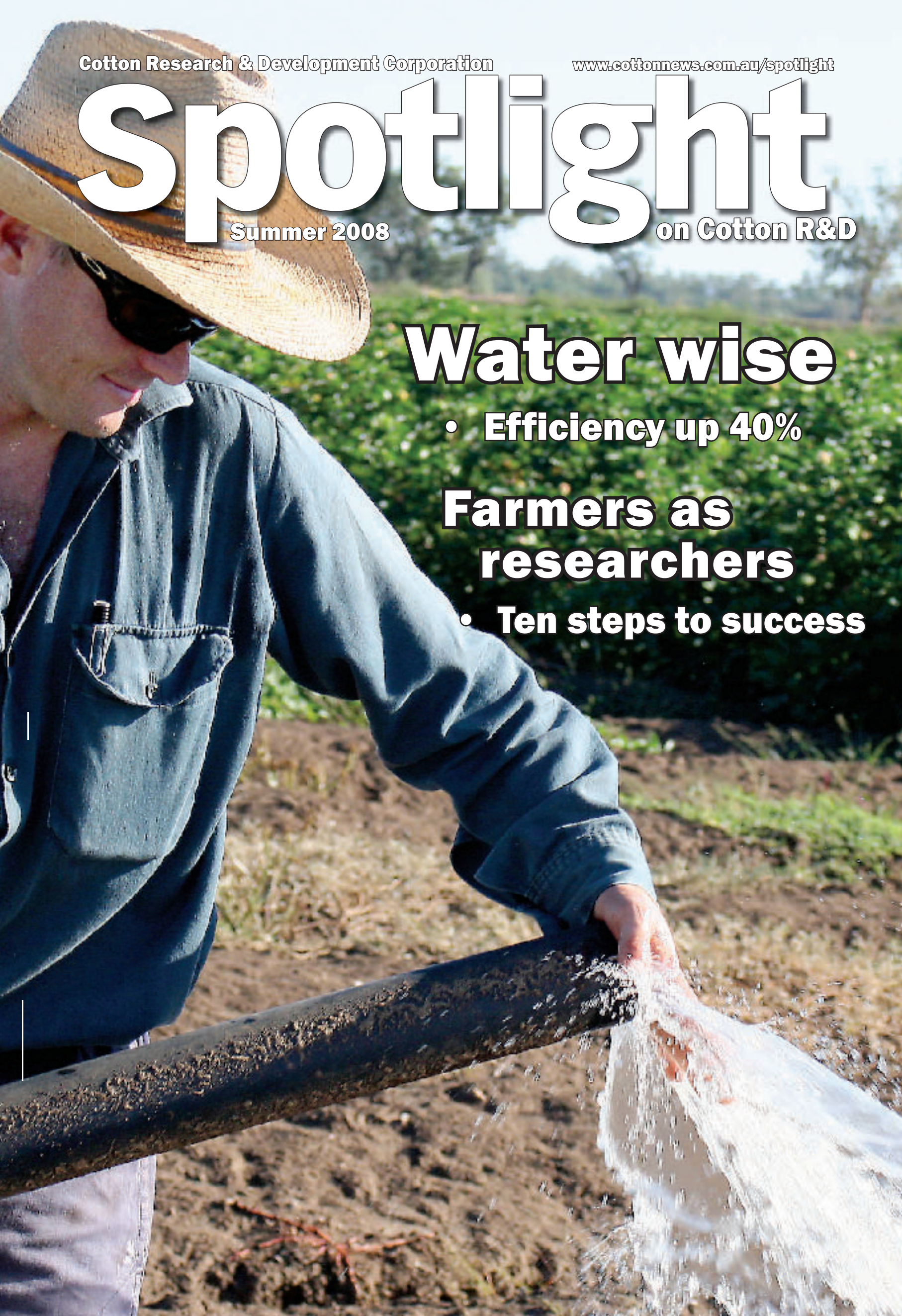
Summer 2008 on Cotton R&D

Water wise

- Efficiency up 40%

Farmers as researchers

- Ten steps to success





Australian Government
**Cotton Research and
Development Corporation**

Summer, December 2008

Spotlight is brought to you by Australia's cotton producers and the Australian Government through the publisher Cotton Research & Development Corporation (CRDC).

CRDC is a research and development partnership between the Australian cotton industry and the Australian Government.

**Cotton Research and
Development Corporation**

ABN: 71 054 238 316

2 Lloyd Street, Narrabri NSW 2390

Our vision: A globally competitive and responsible cotton industry

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

Our outcome: A more sustainable, profitable and competitive cotton industry providing increased environmental, economic and social benefits to regional communities and the nation.

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 Growers' Research Association (ACGRA). CRDC is responsible to the Australian Government through the Minister for Agriculture, Fisheries and Forestry, Tony Burke MP.

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.

All inquiry concerning Spotlight, contact:

The Editor

Postal: PO Box 282

Narrabri NSW 2390

Offices: 2 Lloyd Street,

Narrabri NSW 2390

Tel: 02 6792 4088; Fax: 02 6792 4400

Email: spotlight@crdc.com.au

Web: www.crdc.com.au

Spotlight Online: Most copy and many of the images that appear in this and other editions of Spotlight are available online. Conditions apply for the use of content.

See www.cottonnews.com.au/spotlight

Spotlight email: spotlight@crdc.com.au

Editor: Rohan Boehm

Editorial coordinator: Melanie Jenson

Writers: Melanie Jenson

Terri Ann Crothers

Mary Ann Day

Rossina Gall

Tristan Viscarra Rossel

Megan James

Layout, composition & print coordination:

Craig Hensley

Courier Print, Narrabri

Spotlight

Bruce Finney Executive Director, CRDC



As this edition of Spotlight goes to print, most cotton growing areas are receiving rain, which puts the crop in good stead for the remaining season.

In-crop rain has often been a must for irrigators' crops in recent years of low allocation.

However in these past dry seasons, the cotton industry has made huge advancements in terms of how efficiently we use our water, as outlined in our lead Page 3 article on Dave Williams recent benchmarking study into water use efficiency, which shows that since 1999 the industry has improved Water Use Efficiency (WUE) by 40 percent.

The Williams' study is an important document for a number of reasons, firstly it allows growers and regions to benchmark themselves, identifying what is being achieved and what is achievable.

The study showed further overall improvement is possible on a broader scale, if all farms achieved the results of the 'top 12' Gross Production Water Use Index (GPWUI) most efficient farms, whose GPWUI was an average of 1.26 bales/ML.

It also allows the industry as a whole to benchmark itself against other agricultural enterprises.

Last, but not least, it is heartening to see that efficiency is rising through investment and uptake in technology and research as well as farmers themselves seeking to improve their practice through their own experiments and trials.

Farmers are, after all, researchers as well. Australian farmers are world-renowned for being innovative, risk takers and not prepared to settle for the status quo. However in some cases farmers may not fully realise the value to the broader industry of their 'new' or 'different' management strategies.

CRDC wholly supports the notion of farmers as researchers and aims to bring 'more value' to this work through its Strategic Plan 2008-13.

As CRDC Research and Extension Manager Bruce Pyke says, farmers are doing research anyway, so the idea is to extend this further, by making on-farm research more valuable by encouraging the use of proven methodologies and improving the integrity and communication of results

To help growers on their way, included in this edition are 10 steps to become your own on-farm researcher from some of the cotton industry's most innovative thinkers and a case study from 2008 Cotton Grower of the Year Andrew Watson, who last season grew a cotton crop without the use of sprayed insecticides.

Contributors: Editorial and photographic contributions to Spotlight are welcomed. All intending contributors should in the first instance contact the Editor.

Cover Photo: The Australian cotton industry has made great gains in water use efficiency.

Further information: ? Where this symbol appears, readers are invited to access further information from the identified source.

Copyright © CRDC 2007: This work is copyright protected. Apart from any use permitted under the Copyright Act 1968, no part may be reproduced by any process without the written permission of the Communication Manager, Cotton Research and Development Corporation.

Disclaimer and Warnings: CRDC accepts no responsibility for the accuracy or completeness of any material contained in this publication. Additionally, CRDC disclaims all liability to any person in respect of anything, and of the consequences of anything, done or omitted to

be done by any such person in reliance, whether wholly or partly, on any information contained in this publication. Material included in this publication is made available on the understanding that the CRDC is not providing professional advice. If you intend to rely on information provided in this publication, you should rely on your own appropriate professional advice. CRDC, the Cotton Catchment Communities Cooperative Research Centre (or its participants) and the topic authors (or their organisations) accept no responsibility or liability for any loss or damage caused by reliance on the information, management approaches or recommendations in this publication.

Trademarks acknowledgement: Where trade names or products and equipment are used, no endorsement is intended nor is criticism of products not mentioned.

Subscriptions: Spotlight is mailed to cotton producers, people in cotton industry organisations, research agencies and stakeholder organisations. If you want to subscribe, or unsubscribe, please either email or mail your advice to Spotlight.

Online applications for surface mail or e-Newsletter subscription, go to: www.cottonnews.com.au/spotlight

Efficiency up 40 percent – and rising

David Williams, Melanie Jenson

The cotton industry continues to improve its natural resource record, with a recent study showing an average 40 percent increase in water use efficiency since 1999.

Water use figures were collected by David Williams, NSW DPI/Cotton CRC, across 36 cotton farms from Hillston to Emerald during the 2006-07 season and showed that the average Gross Production Water Use Index (GPWUI) had risen from 0.79 bales/ML in 1999 to 1.13 bales/ML – or about 40 percent.

Perhaps even better news is that the study showed further overall improvement is possible, if all farms achieved the results of the ‘top 12’ GPWUI most efficient farms, whose GPWUI was an average of 1.26 bales/ML, or a 59 percent increase.

The last study was undertaken by Tennakoon and Milroy, released in 2003, using data from three seasons from 1996-1999.

William’s study, using Aquatech’s on-line calculator, WATERTRACK RAPID™, aimed to capture the water use information so it could be benchmarked from region to region.

“Benchmarking irrigation is crucial if an irrigation enterprise is going to improve its water use efficiency,” says Dave Williams.

“Knowing how you are performing compared to your region or industry facilitates continuous improvement in management and water use.

“Unfortunately irrigation benchmarking data has in the past not been well recorded, the performance indicators not generally well defined and calculations

“Benchmarking irrigation is crucial if an irrigation enterprise is going to improve its water use efficiency,” says NSW DPI’s Dave Williams.

have not been standardised across the industry. “We talk about bales per megalitre but what do we mean?”

The cotton industry has been developing an ongoing process to capture water use information from growers and consultants.

There are currently web-based tools available to collect this information including the Cotton CRC/CRDC Water Benchmarking Tool and the commercially available WATERTRACK RAPID™. The significance of these tools is that the calculations of water use indices are standardised and defined.

Dave collected data from the farms in the study, including yield from ginning reports, several water input values (incorporating combinations of rainfall, soil water, storages, harvested, pumped), irrigation dates and the identification of soil type based on water holding and infiltration characteristics.,

“When this data is collated anonymously with data from other growers it is possible to then compare the data collected within a given region and across the whole industry,” he said.

There are three water use indices used to benchmark irrigation water use (See Figure 1).

Crop Water Use Index (CWUI) relates total production to the amount of water consumed by the crop – or crop evapotranspiration.

Although interesting to see what amount of water the crop has actually consumed, this index is dependent mostly upon non-irrigation related factors such as variety, disease, pests, nutrition and soil constraints and can only be improved by increasing yield. It



is not a useful index for benchmarking irrigation water use but it is useful for estimating potential crop water use.

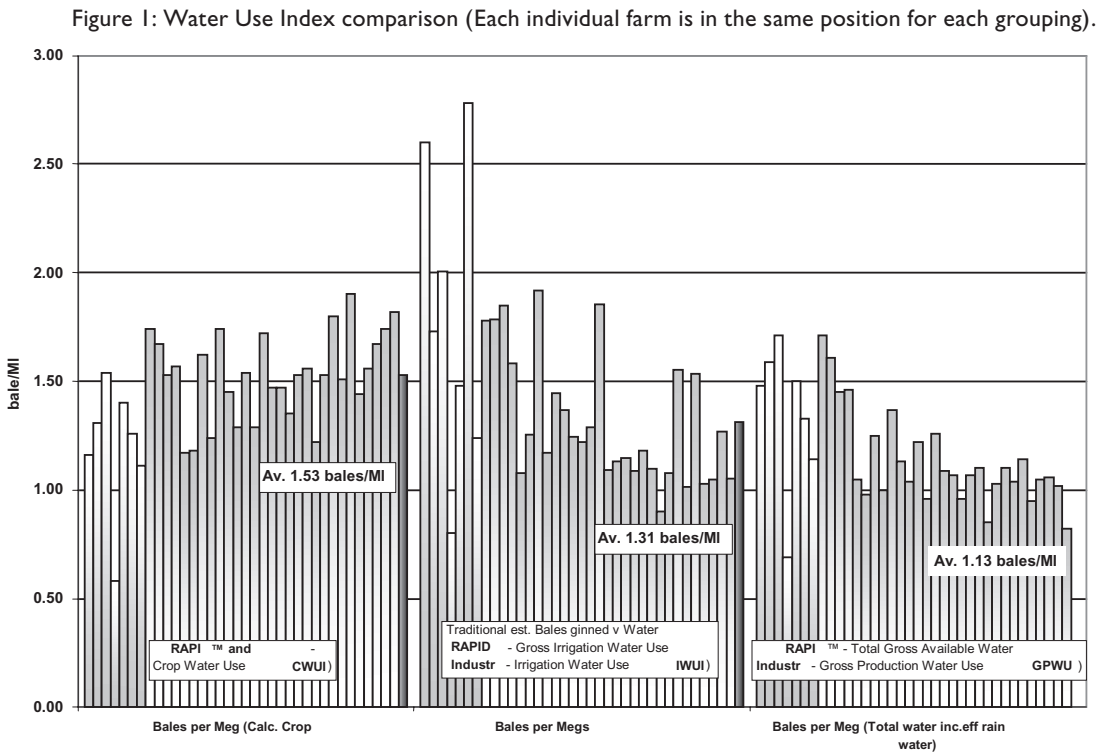
The Irrigation Water Use Index (IWUI) relates total production only to the amount of irrigation water supplied to the farm (or pumped). It does not include rainfall or soil moisture and is therefore only useful for comparing nearby fields or farms in the same season. The average IWUI was 1.31 bales/ML, ranging between 0.90 and 1.92 bales/ML.

A more meaningful water use index for comparing irrigation water use between farms and regions and across seasons is the Gross Production Water Use Index (GPWUI) as it relates total production to the total amount of water used – all sources i.e. irrigation water, effective rainfall and soil moisture. The average GPWUI was 1.13 bales/ML, ranging between 0.82 and 1.71 bales/ML.

The significance of these results is that the collection and calculation of the water use indices has been standardised enabling meaningful comparison between the farms surveyed. The average IWUI is 1.31 bales/ML compared to the more meaningful GPWUI of 1.13 bales/ML. This is a significant difference and using the IWUI may give a false sense of security in irrigation performance.

The average GPWUI of 1.13 bales per megalitre is the figure that is representative of the cotton industry water use in 2006/2007. It is this figure that can be used to benchmark water use so industry can gauge if it is further improving and the rate of improvement over time.

Tennakoon and Milroy (2003) obtained production and water use data from 25 cotton farms and over 200 individual fields over three seasons, 1996/97, 1997/98 and 1998/99. They found the industry average GPWUI at this time to be 0.79 bales/ML. The data collected in this survey for 2006/2007 shows a significant increase in GPWUI of around 40 percent to 1.13 bales/ML.



performance
effectiveness
potential ...

Establishing a benchmark for future comparison is a valuable tool for improvement

Water use
efficiency
on the rise

Potential for bales per megalitre

The data collected for the RAPIDTM survey provides an interesting insight to the potential theoretical water use indices that can currently be achieved as well as providing projections to what could be achieved in the future.

The average CWUI for all farms was 1.53 bales/ML (refer Figure 1). It relates yield to the crop water use (E_{tc}), not total water delivered to the farm and therefore there are no water losses.

There were 12 farms that had a CWUI greater than 1.53 and these 12 farms are presented in Figure 2a. We can assume that crop management on these 12 farms allowed the crop to produce more lint (bales) per ML of water consumed by the plants (E_{tc}). That is, crop stress from pests, disease, nutrition or water management were minimal. Therefore these farms

could represent a useful potential benchmark high point that the rest of industry can move towards.

These 12 farms had an average GPWUI of 1.26 bales/ML (refer Figure 2b) compared to the average GPWUI of all farms, 1.13 bales/ML.

The average yield for these 12 farms was 11.12 bales/Ha.

Taking into account the crop water use (E_{tc}) for each farm and assuming that the best irrigation practice results in a total water loss of 1.5ML/ha, Figure 2c shows the theoretical potential GPWUI for each farm. The average of these farms therefore represents the industry GPWUI that growers should be targeting, which is a GPWUI of 1.39 bales/ML.

Using this same scenario, but assuming a yield of 14 bales/Ha, the potential GPWUI is 1.64 bales/ML, which is significantly higher than the current 1.13 bales/ML 2006/07 survey average.

Figure 2. An estimated Target GPWUI based on current best practice

These 12 farms had an average GPWUI of 1.26 bales/ML (refer Figure 2b) compared to the average GPWUI of all farms, 1.13 bales/ML.

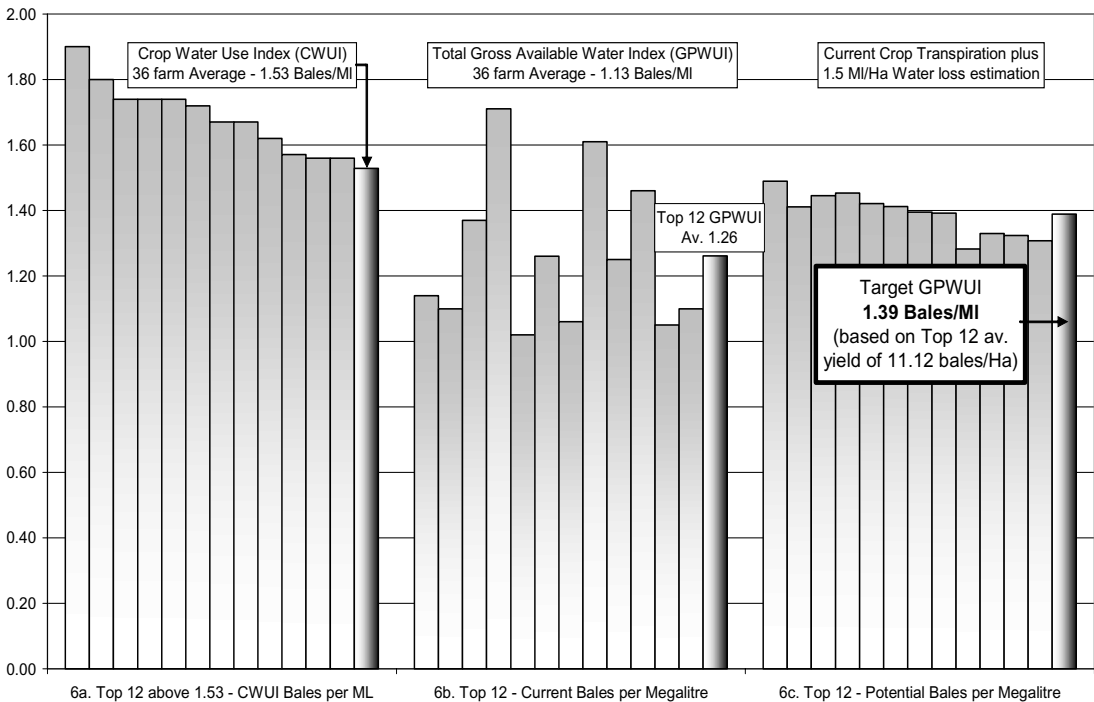
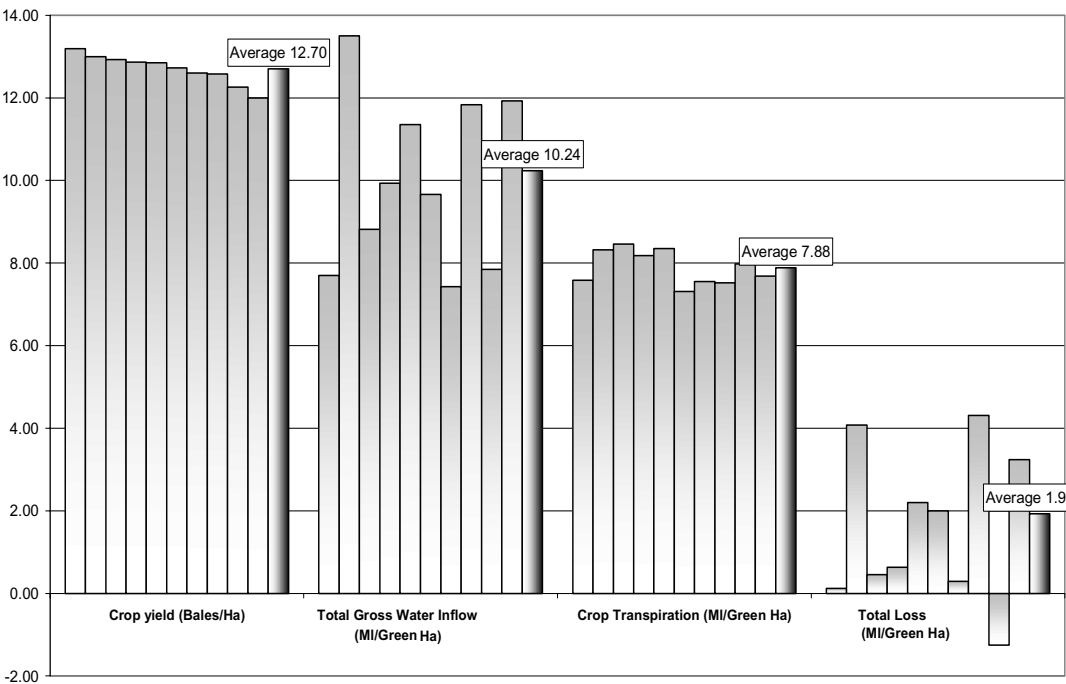


Figure 3. Highest 10 whole farm yields



Yield comparisons – Highest 10 whole farm yields

Figure 3 compares the RAPIDTM results from the top 10 yielding farms in the sample of 36 farms. On average these farms grew 12.70 Bales/Ha using 10.24 ML/Ha of water. The crop was estimated as requiring 7.88 ML/Ha of water to grow, leaving an average loss per farm of 1.93 ML/Ha. The variation in yield and crop transpiration was minimal, whereas the total water inflow and total farm losses are quite varied. This variation could be attributed to a number of factors including differences in rainfall, soil moisture storage, irrigation scheduling, farm design and storage management.

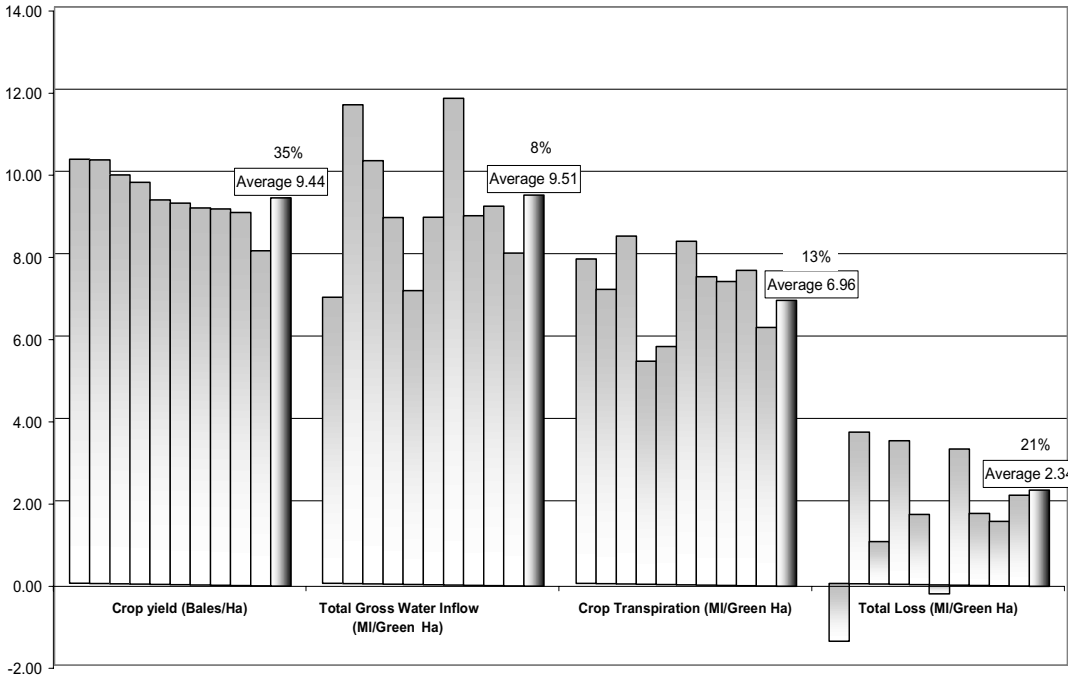
The impressively low loss figure demonstrates what can be done, but this situation was far from a normal setup.

Yield comparisons – Lowest 10 whole farm yields

Figure 4 compares the RAPIDTM results from the lowest 10 yielding farms in the sample of 36 farms. On average these farms produced 35 per cent less cotton with 8 per cent less water compared to the average of the ten highest yielding farms. The crop was estimated as requiring 6.96 ML/Ha of water to grow.

This is 13 per cent lower than the average crop transpiration for the 10 highest yielding farms, although these 10 lowest yielding farms experienced cooler seasonal conditions which would result in lower crop transpiration. On farm water losses were 21 per cent higher with an average loss per farm of 2.34 ML/Ha.

Figure 4. Lowest 10 whole farm yields (with % difference from top 10 average)



Variations in whole farm water losses

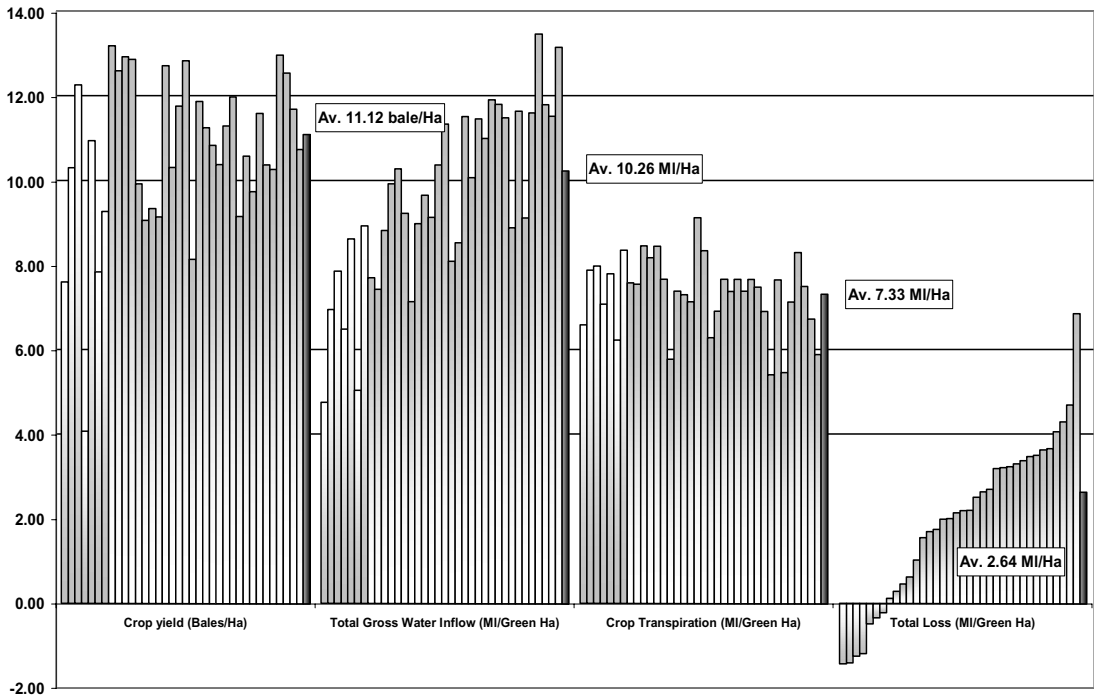
Figure 5 shows the 36 farms ranked by their Total Water Loss per Hectare. Each farm is in the same position for each grouping. Also shown are the corresponding Crop Yield (bales/Ha), Total Water Inflow (ML/Green Ha) and Crop Transpiration (ML/Green Ha). All averages were only calculated on the farms that had a positive loss (i.e. the negative losses are not included in the averages. All averages only include 29 farms).

Seven farms reported a negative water loss. It is likely the Total Water Inflow figure has been underestimated in these cases. If these seven farms have under estimated their Total Water Loss, then

it could be assumed that some of the farms with losses greater than zero have also underestimated their Total Water Inflow. If this is the case then the average Total Water Loss could be higher than stated.

The average water loss (from the 29 farms with positive losses only) was 2.64 ML / green Ha. This was around 25 percent of all water used on farm for the crop, that is, water diverted from river and/or bores, water harvested on farm, effective rainfall and soil water. Therefore on average, the farms were able to utilise around 75 percent of their water through the plant productively. In this survey, the 6 farms with the highest combined farm water losses were only averaging around 60 percent of their total water through the crop in a productive manner.

Figure 5 Variation in Total (whole farm) Water Loss compared to Yield, Total Gross Water Inflow (includes rainfall and soil water) and Crop Transpiration



Conclusions

Dave Williams says the process of collecting Water Use data for the 2006 / 2007 Cotton season has been a valuable exercise.

“The information obtained is very useful at all levels of the industry. It has provided a benchmark to gauge how industry Gross Production Water Use Index (GPWUI) has improved since the last attempt to estimate industry WUE by Tennakoon and Milroy (2003),” he said.

“It will also be used as a benchmark for future comparisons of water use indices. The process was simple and quick and more importantly, utilised a consistent approach which included rainfall and seasonal weather conditions, allowing on farm water use to be compared across the industry.

“The calculation of the water use indices were standardised and defined enabling meaningful comparison.”

The survey has highlighted the need for better measurement of water volumes. For the process to improve further and become more valuable, the inaccurate estimation of water volumes on farm needs to be addressed.

“Determining where water is used and lost across a whole farm can be a challenging exercise,” David said.

“However, identifying where losses are occurring is fundamental to achieving greater farm water use efficiency.

“Whilst it is possible to perform some basic calculations at the whole farm level, it can be quite difficult to partition water use and loss to different components of the irrigation system.

“This requires increased measurement opportunities and more accurate measurement on farm through better monitoring and the adoption of more accurate metering equipment.”

References:
Tennakoon, S.B and Milroy, S.P. (2003) Crop water use and water used efficiency on irrigated cotton farms in Australia, Agricultural Water Management, Vol. 61, pp 179-194.
Acknowledgements: The authors would like to acknowledge the cooperation and assistance provided by the growers and consultants who assisted with this work

Study cotton production in 2009

The University of New England is now taking undergraduate and graduate enrolments for the Cotton CRC's Cotton Production Course for 2009.

The Cotton Production Course is a set of four units that cover the production, crop protection, and environmental management of cotton crops in the Australian industry.

The course was developed by the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC) and is offered through the University of New England.

The cotton units neatly combine to form a Graduate Certificate in Rural Science (majoring in cotton production) or can be used towards a series of agriculturally oriented degrees, diplomas and masters programmes. The first unit in the series 'Cotton Production' is also offered through the University of Sydney and the University of Queensland in some undergraduate courses.

Irrigation and crop nutrient management are integral parts of the course which culminates in an on-farm consultancy covering production, environment and farming business issues.

The units that make up the Cotton Production Course are:

- COTT300/500: Applied Cotton Production
- COTT301/501: Cotton Crop Protection
- COTT302/502: Cotton and the Environment
- COTT303/503: Cotton Farm Systems and Technology Transfer

Opportunities to include the Cotton Production Course units in your studies are many and varied. For more information contact Dr John Stanley, the Cotton Course Coordinator at UNE on 02 6773 3758, e-mail jstanle4@une.edu.au or visit www.cottoncrc.org.au

"Spatially varied irrigation is a term used to describe systems that are able to deliver differential amounts of water to different areas of the field."

Spatially varied irrigation

– water where it's needed

Student Alison McCarthy is developing a simulation framework, called VARIwise, to simulate and evaluate adaptive control strategies for variable rate irrigation of cotton with lateral moves and centre pivots.

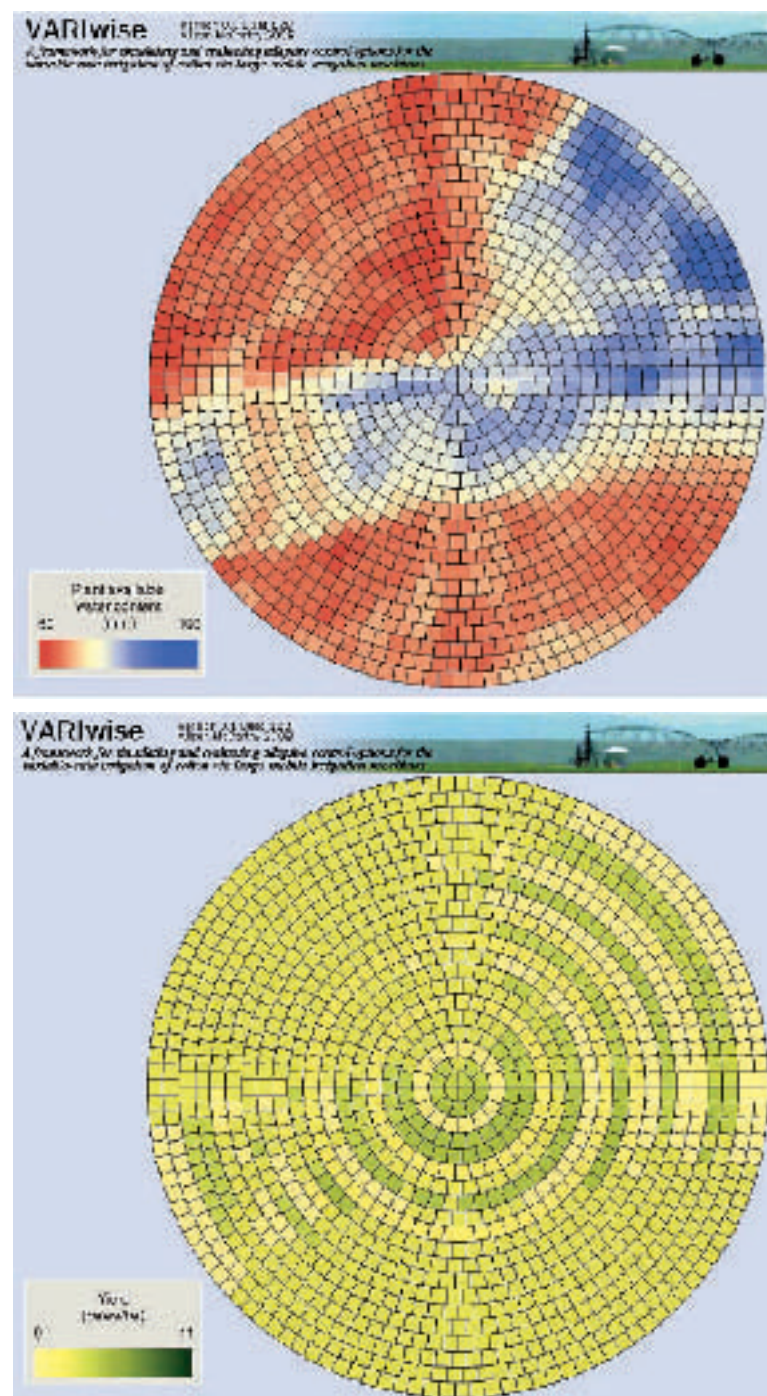
The impetus for Alison's research stems from the fact that irrigation application in cotton is traditionally discharged at a constant rate within each field, delivering the same volume of water to each plant. However this assumes that the requirements of each plant are exactly the same.

Not all plants in a field require the same volume of water due to many variables. This may result in lower volumetric and water use efficiencies.

Although about eight percent of cotton crops are currently irrigated by large mobile irrigation machines, this is expected to increase to approximately 30 percent by 2020.

It is hoped the new framework will help growers optimize irrigation timing and allow variable in-field irrigation rates, improving irrigation efficiency, yield, quality and reduce losses of inputs such as water and nutrients.

VARIwise uses historical data and/or quantitative measurements of crop status, weather and soil, either singularly or combined, to automatically adjust the irrigation application. It allows for field scale variations in input parameters and will allow for the application of the various levels of control strategies for site-specific irrigation at different spatial scales.



"Using VARIwise we will be able to simulate and evaluate adaptive control strategies under a range of spatially varied conditions and targets," Alison says.

"From these evaluations we may then explore optimal control strategies for irrigation, temporal and spatial scale requirements for irrigation control, and the usefulness of additional sensors."

Spatially varied irrigation is a term used to describe systems that are able to deliver differential amounts of water to different areas of the field.

Researchers at the National Centre for Engineering in Agriculture at the University of Southern Queensland anticipate that control strategies that use physical and agronomic principles to vary irrigation applications within fields will improve water use efficiency by 15 percent to 44 percent.

Alison envisages that VARIwise will be used initially to evaluate the costs and benefits of implementing variable rate control on centre pivots and lateral moves. Components of the software may subsequently be used with new generation real-time control systems for these machines.

Acknowledgements: Australian Research Council and Cotton Research and Development Corporation.

📞 Contact Alison McCarthy, phone 07 4631 2633, or email mccarthy@usq.edu.au



Aquatech's Jim Purcell and Anthony Fairfull.

WaterTrack the Savewater! winner

by Lou Gall

The cotton industry's focus on investing in water use efficiency R&D has been recognised in a national award taken out by the joint-venture group that has taken on the risk to successfully commercialise the technology.

WaterTrack, a joint venture between Aquatech Consulting, Sustainable Soils Management and Scolari Software won the category for Product Innovation at the 2008 Savewater! Awards®. The awards are now in their sixth year and are regarded as the leading water sustainability awards in Australia.

At the presentation evening during the Savewater Awards, the judges indicated that they believe water saving and management in agriculture is a winning strategy and the WaterTrack products can be valuable tools that target water management on farms.

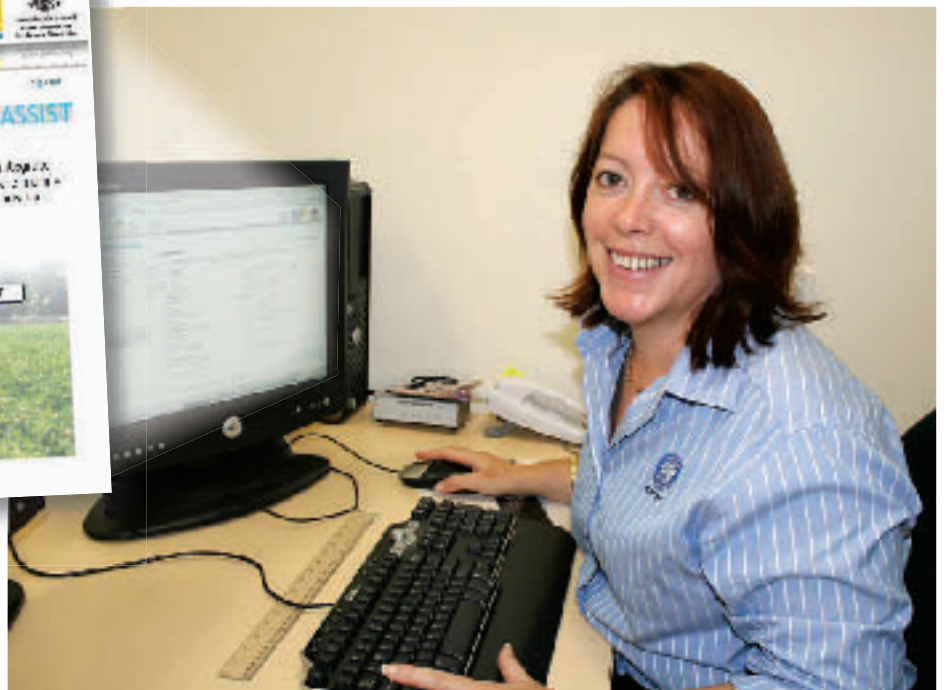
The focus of the awards is on water conservation achievements in 10 categories to acknowledge and promote excellence in sustainable water practices.

WaterTrack director Jim Purcell said irrigators can develop a better understanding of what is happening to water once it is on farm and

WaterTrack programs target water use efficiency through the measurement and analysis data. He said WaterTrack Optimiser™ and WaterTrack Rapid™ help growers understand more about water use and that the more that is known about efficiencies and losses, the easier it is to make adjustments and benefit from the savings made.

WaterTrack Optimiser provides daily information to calculate the water balances over their farm unit. Optimiser has simulation capabilities that enable growers to model various infrastructure and management scenarios and also predict benefits in water volume and production. Using historical weather data for wet, dry or average seasons scenarios are modelled to help irrigation decision.

WaterTrack Rapid provides a season-long snapshot of water use efficiency. Being web-based, it provides a means of calculating irrigation performance indicators for any farm, according to Jim Purcell.



Free assistance at hand

CSIRO's CottASSIST software developer, Loretta Clancy, says the site has been significantly upgraded to improve its functionality and security

Cotton managers now have free web access to a new generation of computer extension tools called CottASSIST. To promote and support the adoption of best-practice in cotton crop management the improved web-based tools provide users with access to the latest research findings. The research project's team leader, CSIRO Plant Industry's Dr Michael Bange, says CottASSIST includes all previously available tools, but has more features and is more user-friendly. "Cotton managers monitoring their crops can utilise CottASSIST to assess their crop progress and to assist

with complex decision making so that crops are grown efficiently," he says. CSIRO's CottASSIST software developer, Loretta Clancy, says the site has been significantly upgraded to improve its functionality and security. "It is easier to maintain and allows us to incorporate features we were not able to include with the old website, such as sharing information across tools. It will also allow us to develop new tools more easily and more rapidly in the future," she says. "The current online registration of the CSIRO/Cotton CRC web tools is 418 users and in the last

cotton season 113 crops across the industry were monitored using the crop development tool.

"We expect the upgrading of the program will attract even more users."

CottASSIST was developed by CSIRO and the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC) in Narrabri. The Cotton Research and Development Corporation (CRDC) also supported the project.

"CSIRO, the Cotton CRC and CRDC are all strategically committed to

extension of research and to develop tools and techniques to help cotton be more productive and efficient in the farming system," Dr Bange says. The CottASSIST website went 'live' this last month and enhancements to existing tools will be completed within a year.

Further Information:

Dr Michael Bange, CSIRO Plant Industry ph 02 6799 1540, 0428 991 540, Michael.Bange@csiro.au
Visit the CottAssist website at: www.cottassist.cottoncrc.org.au

Learn to Lead

Australian Future Cotton Leaders program graduates step up to new roles and many have represented the cotton industry on regional, state, national and international levels, says Cotton Australia Chair Joanne Grainger.



Are you committed to the future of the cotton industry and have an interest in developing your leadership knowledge, skills and experience? Then apply to join the 2009 - 2010 Australian Future Cotton Leaders program today!

Applications to join the Australian Future Cotton Leaders Program (2009-2010) will be accepted until Friday December 12 from aspiring leaders from right across the cotton supply chain who derive the majority of their income from the cotton industry. A partnership between the Cotton Research and Development Corporation and Cotton Australia, the program seeks to identify potential industry leaders and provide them with skill development and application experience through the identification and development of a project goal.

Participants will meet for two face to face forums, develop a partnership with an industry leader and attend cotton industry activities to further develop their leadership skills and networks. The program starts in May 2009 and concludes in May 2010. Joanne Grainger, Chair of Cotton Australia and the program's steering committee, says the key purpose of the program is to prepare participants for future leadership roles in the cotton industry. "The program is proving to be a great success in supporting leadership succession plans; already we have seen graduates step up to new roles and many

have represented the cotton industry on regional, state, national and international levels," she said.

The 2009 - 2010 program will accept up to 12 people from across the cotton industry supply chain.

Why be part of the program?

- Meet other like minded people in the cotton industry
- Hear from industry leaders
- Take away new information and tips for your future from inspiring speakers
- Set your own goals and develop a plan to achieve them
- Attend face to face meetings in regional Australia with funding support
- Experience new friendships and ideas

The Australian Future Cotton Leaders Program is an initiative of Cotton Australia in partnership with the Cotton Research Development Corporation and is facilitated by RuralScope Pty Limited

* Applications close on Friday 12 December 2008
** Program Face to Face dates are 3 - 5 June 2009 and 9 - 11 September 2009.

Information Kits And Application Forms Available Now. Contact Program Facilitator, Jo Eady
Phone: 03 9787 8458, Mobile: 0419 912 879
Email: jo@ruralscope.com



Future Cotton Leader and Emerald farmer, Ross Burnett, 26.

"The program gave me the confidence to provide ideas and input into the local industry."

Four new faces for CRDC Board

The Minister for Agriculture Fisheries and Forestry, the Hon. Tony Burke MP, announced the appointment of seven directors to the CRDC Board in October. Four new directors were named, bringing the current CRDC Board up to full numbers.

The new Board brings together a diverse set of skills and experience with the re-appointed Directors Leith Bouilly, Lisa Wilson and Glenn Fresser with new appointees: Kerry Adby (NSW), Peter Hayes (SA) and Dr Mary Corbett (Qld) and Juanita Hamparsum (NSW).

CRDC Chair Mr Mike Logan and Mr Bruce Finney, Executive Director, have welcomed the announcement and would like to take this opportunity to sincerely thank the outgoing directors Dr TJ Higgins, Mr David Connors and Mr Richard Browne for the significant contribution they have made to the CRDC and the cotton industry.

Bruce Finney, Executive Director

Bruce Finney joined the Cotton Research & Development Corporation as Executive Director in 2004. Prior to this appointment he worked in corporate agriculture in various corporate, management and agronomy roles in Australia and an advisory role in Argentina. He is a past chair of the ACGRA, past director of the Cotton CRC and the Irrigation Association of Australia. Bruce is a graduate of the Australian Rural Leadership Program and of the Company Directors Course of the Australian Institute of Company Directors.



Mike Logan, Chair



On August 24 2007, Narrabri cotton farmer, Mike Logan became the Chair of CRDC. Mr Logan brings a wealth of practical industry experience and a strong vision to the position for the three years of his appointment. Mr Logan has long been a strong advocate of best practice use of natural resources in the Australian cotton industry. His cotton farm was the first in the world to gain ISO certification for compliance with world's best practice principles for environmental management. Mr Logan also spent six years on the Board of Land and Water where he played a leadership role in a number of key programs dealing with irrigation and climate variability.

Kerry Adby – Director



An investment banker and a solicitor in the ACT and NSW and Managing Director of Copernican Securities Pty Ltd. She also holds several non-executive positions on various Boards such as the NSW Work Cover Insurance Investment Fund Board and the Australia Malaysia Institute. Ms Adby has extensive experience in government and private sectors and has worked in senior executive positions in Australia and Asia including with AIDC Limited. She has a specialisation in infrastructure finance and in the feasibility and funding of irrigation and water saving initiatives.

Dr Mary Corbett – Director

Managing Director of Australian Business Class Consulting and Training Organisation, non-executive Director of Food Science Australia and a member of the Review Panel for the University of Queensland's Centre for Nutrition and Food Science. Dr Corbett has a strong science background and has extensive experience in the private sector with specific emphasis on capacity building and training. Dr Corbett is a former non-executive director of the Sugar Research and Development Corporation Board.



Peter Hayes – Director



A self-employed Wine Industry Strategist and Adviser. Prior to this he worked as a national viticulturist, with roles in industry relations and grower relations management for Southcorp Wines/Fosters Wine Estates. Mr Hayes has extensive knowledge and experience in strategic planning and in the international commercial environment. Mr Hayes is a former Executive Director of the Grape and Wine Research and Development Corporation.

Juanita Hamparsum – Director

Director of the Hamparsum Family Trust and Kalori Pty Ltd where she is the corporate trustee, accountant and finance manager for the family farming agribusiness of irrigated and broad acre cropping of cotton, wheat, sunflowers, chickpeas and sorghum. She also manages 'ONI', a small family business producing healthy gourmet food products. Prior to returning to the farm, Ms Hamparsum worked as a chartered accountant with Goldman Sachs in London and Ernst and Young in Sydney.



Leith Bouilly – Director



Chairman of Bouilly Pastoral Company Pty Ltd and Managing Director of @the crossroads. Ms Bouilly is also a Board member of Murrumbidgee Irrigation Ltd and the Agrifood Industry Skills Council and Chairman of the Great Barrier Reef Marine Park Authority's Water Quality and Coastal Development Reef Advisory Committee.

Glenn Fleischfresser (Fresser) – Director

Owner-Manager-Farmer of Mayfield Farming Company and part-owner of Nandi Cotton Loading Trust. He is also a Queensland Department of Primary Industries and Fisheries Ambassador and a committee member of the Cotton Industries Best Management Practice program. He was recently a finalist for Innovator of the Year for the Australian Cotton Industry Awards. He won the 2008 Australian Cotton Industry Service to Industry Award and is a previous winner of the Darling Downs Cotton Growers Inc Service to the Industry Award.



Lisa Wilson – Director



Chief Executive Officer of the Australian Dairy Farmers Limited since February 2008. Ms Wilson acted in the position of Executive Director of the Australian Leadership Foundation and has more than 20 years experience in the agricultural sector. She is a Victorian Advisory Group Member of Landcare Australia Ltd and an Albert Park Advisory Group Member for Parks Victoria. Her past non-executive directorships include Deputy Chair of the Australian Rural Leadership Foundation.

2008 Grower of the Year



Andrew and his father John were jointly awarded the Cotton Grower of the Year Award (over 600 acres category) in 2002



Andrew Watson

The 2008 Cotton Grower of the Year, Andrew Watson, is the second generation operating and managing his family's long term farming enterprise, Kilmarnock Farming Pty Ltd, on the "Kilmarnock", "Brigadoon" and "Nandewar" properties at Boggabri, NSW.

But this is not the first time he has received this award.

The first time was in 2002 along with parents John and Robyn, in the Cotton Grower of the Year (over 600 hectares) category. Andrew is also a Nuffield Scholarship winner and 2004 NSW Farmers' Federation Young Farmer of the Year.

The Watson's enterprise is an irrigated and dryland cotton and grain farming system combined with a well integrated pasture based grazing system adjacent to the Namoi River. The focus is on profitable farming within the constraints of responsible environmental management.

The basic business philosophy is to grow commodities rather than products and maximise profits through increasing yield and volume of production while reducing costs.

His detailed farm mapping has also been very beneficial as a tool for improved farm management. Andrew is well known for his excellent farm management practices, and especially for the extensive bush regeneration he has undertaken on his properties. He has fenced off river banks from stock, planted native trees and shrubs to create vegetation corridors, and has committed several areas of his farm as permanent heritage trust sites.

He believes that the cotton industry must adopt the mentality of farming in harmony with nature, and view it as a beneficial extension to established farming practices.

Andrew has high hopes for the future of the Australian cotton industry and would like to see it continue to gain wide acceptance as one of the best managed agricultural industries in the world.

River banks have been fenced from stock, native trees and shrubs planted to create vegetation corridors, and several areas of the farm committed as permanent heritage trust sites.

Below: Beneficial predators, like this shield beetle, are highly valued by the Watsons on their farms.



No sprayed insecticides?

State of crop determines

In the 2007-08 season, Andrew Watson grew a cotton crop without using any sprayed insecticide.

With optimal growth rates, beneficial insects and a plant monitoring approach, it is possible to grow a Bollgard II cotton crop either without or with reduced reliance on insecticides according to Australian Cotton Grower of the Year Andrew Watson of "Kilmarnock" near Boggabri.

Andrew is a grower who finds great satisfaction in cotton growing and in terms of success, his recent achievements speak for themselves, but the innovative grower is not one to rest on his laurels, and his journey to improve is a continuous one.

His 'ambitious' quest to grow cotton without pesticides the proof of this.

"The Australian industry is an innovative industry that challenges the status quo," he said.

"Growers know to remain successful they must ask questions on how to make production more sustainable and profitable.

"In cotton production, we growers are faced with a broad range of pests; insects, weeds and diseases and pesticides are the traditional approach to pest management.

"But I wondered, 'can we grow a cotton crop without spraying pesticides, specifically insecticides?'"

The challenge starts at the beginning – planting.

"At this stage it is uncommon not to use soil-applied insecticides or seed treatments at planting and generally, this decision is made to ensure the crop gets off to the best possible start," Andrew said.

"Soil-applied insecticides can minimise the need for replanting, offering young seedlings protection and allowing even establishment of the new crop which is necessary for a successful IPM approach.

"Unfortunately, there are few alternative IPM tools for soil pests, however it may be feasible not to use

these insecticides (but careful consideration should be given to the impact of wireworms or heavy infestations of sucking pests and potential setbacks to the crop)."

Establishing beneficial insects in the early season is also valuable practise in the effort to reduce pesticide use.

"The impact of surrounding vegetation as a source of these beneficial insects is not fully understood; but trees, shrubs and pastures are likely breeding grounds," he explains.

"Creating a cotton crop conducive to ladybeetle, damsel bug and lynx spider populations is central to the management of Helicoverpa and mirids throughout the season.

"The use of soft chemistry that does not disrupt beneficial insects or flare pest species is important."

Another factor that has impacted on the innovative farmer's pesticide free vision is the introduction of Bollgard II® to the Australian cotton landscape.

"Bollgard II has definitely contributed to improvements in IPM, and there is no doubt that it has reduced the reliance on conventional chemistry," he says.

"Industry data demonstrates that in the majority of situations there is no need to apply additional insecticides for Helicoverpa control.

"Provided growers adhere to all aspects of the Resistance Management Plan (RMP), the technology should be a key insect management option in the long term.

"Secondary pests now receive more attention and there are many perspectives on when to spray if at all," he said.

Secondary pest management is something Andrew has been looking into for the last two seasons. He



management decisions

Andrew Watson is a farmer who continually questions the status quo, which has led him to making some amazing management discoveries

believes the decision to spray is not based solely on pest numbers, but needs to consider crop growth, beneficials and the season.

IPM involves the use of all available tools, and the comprehensive crop mapping system he has implemented is one of those.

On a weekly basis, he measures plant heights, internodes and fruit numbers.

This information is plotted and the management team are able to see how the crop is progressing.

Using the plant map information, Andrew has avoided mirid sprays, even when numbers were above threshold, without having a significant impact on yield.

In situations where mirids are at or above industry thresholds, the decision to spray is based on the state of the crop.

If fruit numbers are high, it may be possible to leave the mirids. How many fruit is enough will vary between varieties and with the season.

Andrew is convinced that it is important not to stress the plant by optimising management factors including irrigation timings, furrow depth and nutrition and likes to see the crop growing at its optimum rate.

“If we can achieve this then I am more comfortable with the impact some fruit loss will have. If the crop is not growing well or fruit numbers not robust, secondary pest control decisions become more critical,” he said.

“Plant mapping is an important IPM tool; it enables growers to assess how their crops are growing.

“With this information, they can make decisions that maximise their profits.

“With optimal growth rates, beneficial insects and a plant monitoring approach, it may well be possible to grow a Bollgard II cotton crop either without or

with reduced reliance on insecticides.”

Andrew is also interested in how the industry reacted to cotton stainers last season.

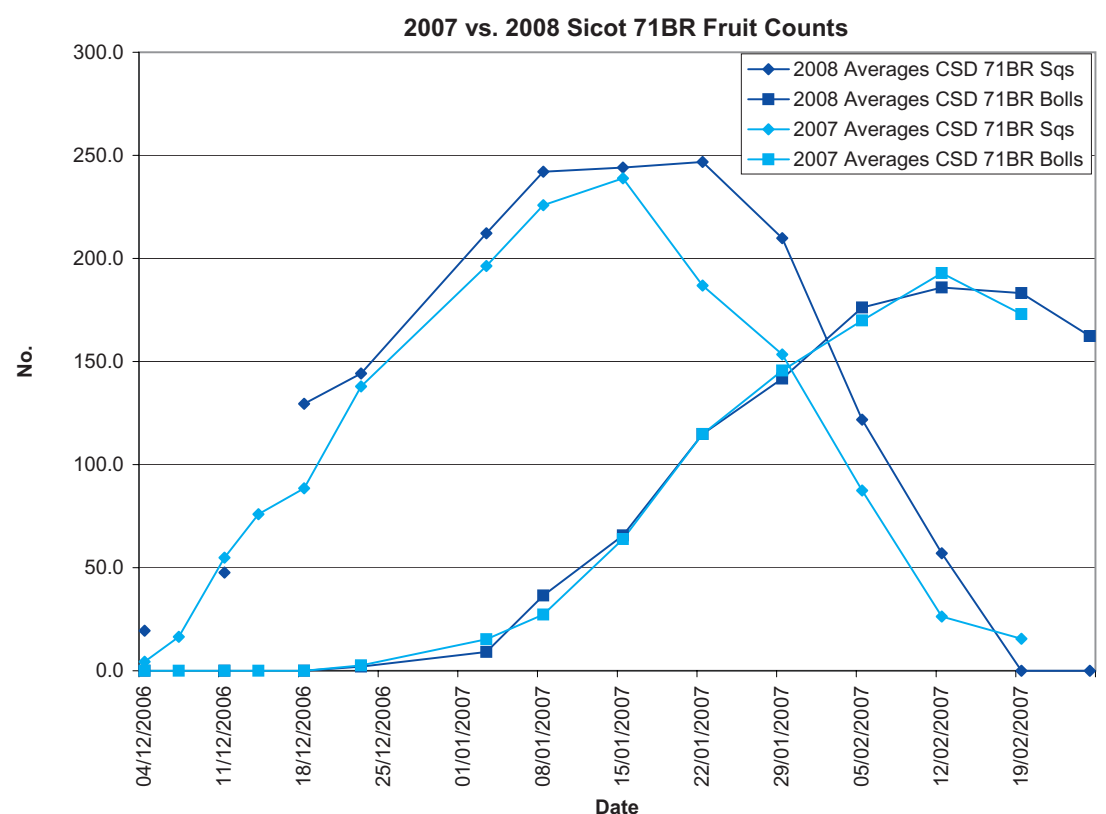
His decision not to spray may have caused a small amount of tight locking but did not have an unfavourable impact on yields, which has lead him to question the need to spray them with the intensity he saw in some cases.

The information collected on “Kilmarnock” over the last two seasons has raised questions about the

possibilities for growers to control insect pests, and offered some suggestions where the results have spoken for themselves.

But the Grower of the Year is still questioning how best to approach insect management, and he has now firmly set his sights on the approach to insect monitoring.

“I have been asking myself for several seasons ‘with Bollgard II, do we need to count heliothis eggs? - Would it be more constructive to count beneficial insects and focus on plant changes?”



This graph shows that without the use of insecticide sprays the squaring in the 2008 crop was higher than the 2007 average.

10 steps to effective farmer-led research



By Megan James

“We would like to make on-farm research even more valuable by encouraging the use of proven methodologies and improving the integrity and communication of results”

Cotton growers you are inherently researchers. Every season is an experiment with the timing of irrigation, trying new varieties, adapting fertilizer applications and managing all the inputs in a complex farming system.

With some forward planning and professional support, growers can turn their constant on-farm trials into meaningful results that will benefit both the farm and the industry. Importantly, farmers may be eligible for CRDC R&D investment dollars in the event that the R&D is formally approached, completed and communicated.

In the five-year Strategic R&D Plan 2008-2013 launched in July 2008 and created following extensive farmer input, CRDC identified on-farm research as a priority area for future R&D investment activity.

According to Bruce Pyke CRDC Research and Extension Manager, “farmers are doing research anyway, so the idea was to extend this further.

“We would like to make on-farm research even more valuable by encouraging the use of proven methodologies and improving the integrity and communication of results,” he said.

With the help of Bruce Pyke, research extension officer Sally Ceeney, agronomist Damien Erbacher and grower Andrew Parkes, Spotlight has developed

the ten steps to effective on-farm research.

What types of R&D investment is available, and when?

While the discussion below focuses on a farming system based research project, farmer-led research funded through CRDC R&D investments can equally apply to a broad range of topics and discovery.

CRDC calls for preliminary research proposals annually around July each year for research that expected to begin in the following financial year.

Inquiries and proposals to CRDC for farmer-led R&D investments are welcome at any time. While farmer-led investment proposals would receive the same high-level scrutiny by CRDC as any other investment, farmers or farmer group proposals can cover any aspect investigating the farming system, harvest and post-farm gate.

Capacity building through travel to learn new farming or post-farm techniques, or to discover new technologies, and any aspect of management of labour and farm business is always welcome, Bruce Pyke says. The CRDC website (www.crdc.com.au) and the CRDC Strategic R&D Plan 2008-2013 are the vital first steps for embarking on R&D.

The results of all R&D must be effectively managed, recorded and communicated to industry.

DIY R&D

"It would be great to see growers having more input into where the research dollar gets spent"

STEP 1: Be clear about your question

Sally Ceeney, Macquarie Regional Cotton Extension Officer, NSW Department of Primary Industries and Cotton Catchment Communities CRC, said the most vital part of getting on-farm, and any other type of research right, is being very clear about what question you are trying to answer. "Keep it simple – focus on one issue, and don't try to answer too many questions at once," she advises.

STEP 2: Get background information first

"It's important to get all the information you can on a topic first before launching into a research project," says Damien Erbacher, Agronomy Consultant of Dawson Ag and Australian Cotton Growers Research Association (ACGRA) representative based near Theodore. Extension officers compile booklets and/or CDs on trials and research in their region so get your hands on a copy of those.

"Talk to your agronomist and other farmers and find out what's been done on your area of interest and keep up to date by attending field days and conferences when you can."

STEP 3: Get support

Some farmers shy away from research because they are not experienced in research methodologies and analysis of data. Damien Erbacher says, do not let this stop you!

"You don't have to know all the nitty gritty of the why or the why not – that's what the scientists are for. It's OK to let the scientists still do the scientific work on farmer-led research."

Sally Ceeney encourages farmers to contact their extension officer. "If you have an idea for a trial, give your local extension officer a call. They can let you know if a similar trial has already been done, they can support you with additional background information and help you develop the trial design."

Andrew Parkes, manager of "Keytah" – one of Australia's largest privately owned cotton production properties, located 38 km west of Moree, said the support of both independent researchers and agribusinesses had allowed them to undertake on-farm research with gusto.

"Get the companies involved," says Andrew Parkes. "Whether it is a new nitrogen product, water saving device or plant variety, there are researchers, government departments and companies that have the resources to support your trial."

Andrew Parkes said if you are not sure how to connect with the research community or the available funding, then go through the ACGRA. "If you have an idea that's been on your mind for a while, then take the time to tell your local grower organisation and your ACGRA representative about it," Andrew Parkes said.

"Every year we call for growers to submit their research gaps to ACGRA and we don't get much response. It would be great to see growers having more input into where the research dollar gets spent."

STEP 4: Design the trial

The type of trial design will depend on the question you are trying to answer and your resources. According to Sally Ceeney, the most common are:

- Control plot or a nil strip (also referred to as a demonstration trial). The method is very simple and involves leaving an untreated strip in the field to compare against the treated area. To increase level of confidence in the results, this can be repeated across more than one field.
- Replicated trials - One or more treatments are repeated across a field with a control or nil strip. The more replicates the better, however, at least three are generally required. In order to analyse statistically the results, the layout of the replicates must be random to avoid bias, with the control or nil strip forming one of the replicates.

Damien Erbacher says on farm trials can be brilliant, especially if you do replicated trials rather than just one block. However, he warns, take it one step at a time. "You need to plan it and try not to get rushed, think about how you are going to keep records and evaluate it – before you start. It's also important to select the right part of the farm – ask yourself is that paddock right for that research."

Sally Ceeney says it is easy to get too complicated; so keep it simple. "Start off with something like nutrition trials. The first step might be to leave a set out of a particular nutrition program to assess the differences. Experimenting with different irrigation scheduling is another area type of trial that can be set up without too much difficulty."

While it is important to get the methodology right, Sally Ceeney says not to panic if your trial is not scientifically robust. "Demonstration trials may not stand up to the proper scientific scrutiny but they are still a valuable way to test if a theory has any promise." Further detailed research can be undertaken if required.



Damien Erbacher



Andrew Parkes



Sally Ceeney



Bruce Pyke

➤ The CRDC website (www.crdc.com.au) and the CRDC Strategic R&D Plan 2008-2013 are the vital first steps for embarking on R&D.

DIY R&D

STEP 5 Believe in what you are doing (but do not be reckless)

According to Damien Erbacher, a grower must have conviction and be willing to do a little extra work while being aware of the timeliness of research and being on the ball.

"Have faith but not blind faith. If you have 500ha, do not put 400ha into a new idea. It's better to take it one step at a time."

Andrew Parkes agrees. "You have to approach research believing that it's going to give you a result one way or the other. But, if you are approached to run a trial and you don't think it's going to give you a result that's of value, then just don't go there."

STEP 6 Think beyond your own farm

Bruce Pyke suggests networking with other growers for your research. Consider if another farmer in your district could run a complementary trial to give greater credence to your results. Involve your agronomist, grower group, land care group or contact your local extension officer to see if there would be benefit in running a trial across a number of properties.

STEP 7 Keep records

Answers from research are not just in the final results. It is important to keep records along the way, Sally Ceeney advises.

"Record all significant events such as when the crop was planted, when every treatment was applied. Record any variables that may influence results, like differences in insect pressure and weather conditions. This will come in useful when trying to account for unexplained differences in treatments at the end of the trial."

"Before you start, consider what in-crop monitoring may be required to provide data for your trial," she said. Depending on the question, data could include plant height, internode, length, leaf sampling, sap testing, insect counts and boll weights. Taking many photos throughout the trial period is also a useful tool.

"It's also really important to record the row numbers of each replicate just in case trial pegs go missing, and keep a copy of the trial 'map'. It can be very disappointing to put a lot of effort into setting up a trial only to discover halfway during the session that the pegs are gone and you are no longer sure which replicate is which," Sally Ceeney said.

STEP 8 Measure the results

Sally Ceeney says it is important to follow through with evaluation of the results, as visual assessments do not always tell the full story. Detailed evaluations are required to pick up small differences.

Consider how you are going to measure the results, yield (bales/ha), water use efficiency (bales/meg) and/or quality.

When assessing yield there are a few different measurement methods:

- Picker scales – these are more time consuming than other methods but are good for small areas and are accurate if calibrated properly
- Yield monitors – easy to do and reasonably accurate if well calibrated. Good for showing a relative difference between plots, even if the actual yield number is not accurate
- Module weights – simple to do and accurate but requires larger plot sizes as you must be able to pick enough from each replicate to make a full module.

Bruce Pyke says the challenge is sometimes to get farmers to see a trial through to the end. "Sometimes, you'll do a visual check and think – that didn't really work. However, you might come across subtle but important differences when you receive the ginning reports. It may have made more of a difference than you realise."

STEP 9 Keep an open mind

In addition, if it does not work the first time, Damien Erbacher says, then keep an open mind. "Think about why it didn't work. Do a critical assessment the trial. Was it the product or was it the way we set up the trial?" If you feel the trial may be worth re-running, get additional support to develop the improved methodology, collection and analysis of results.

STEP 10 Share your findings

Bruce Pyke says one of the key results CRDC encourages is effective sharing of results. The research extension officers produce trial booklets so you can review all the trials done in your region.

"It's also something that crop consultants already play an important role in. Consultants are encouraged to get their farmers together to run trials across a number of farms. This work can be followed up with networking days where local farmers can get together and share their findings."

He suggests using existing networks such as grower groups or land care groups to facilitate these communication events as a first step.

Darling Downs District Trial Booklet

NOW RELEASED!

Queensland DPI together with Cotton Catchment Communities CCC and Darling Downs Cotton Growers has recently released a booklet (available on CD) packed with information about cotton trials conducted on the Darling Downs from 2000 – 2007.

📞 Contact Geoff McIntyre or Jenelle Hare 07 4669 0800.



OUR TEAMS**PLANTS AND SOILS**

James Hill – team leader
Sally Ceeney
Dallas King
Kate Lightfoot
Helen Dugdale
Bec Smith

This team aims to deliver latest research and information to growers and industry in the fields of plants and soils. Current activities include:

- Nitrogen Use Efficiency regional trials and benchmarking.
- Promotion of protocol for soil and plant tissue sampling, which provides better measurements, increased confidence in results and enabling precision application
- Collation of information into information sheets which compares different fertiliser sources and applications
- Development of a crop rotation guide.

CROP PROTECTION

Susan Maas – team leader
Lauryn Hanna
Mark Hickman
Dave Larsen
Jane McFarlane
Stacey Spanswick

This team extends best practice information in the areas of integrated insect, weeds and disease management. Current activities include:

- Production of the Cotton Pest Management Guide
- An update of the Integrated Disease Management manual
- Development of a web-based insect, weeds and diseases identification guide
- Establishing an aphid calculator to assist in management of thresholds
- Development of a weed management guide in Round Up Ready Flex.

WATER

Janelle Montgomery – team leader
Jenelle Hare
Lance Pendergast
Rod Jackson
James Houlahan

This team works collaboratively to increase the awareness and adoption of best irrigation practice across the cotton and grains industries. Activities of the team include:

- A consultant mentoring program.
- Training through the Cotton and Grains Irrigation Workshop Series.
- On-farm demonstration sites.
- Facilitation of BMP adoption through increasing awareness of best irrigation practice.

For further information, go to the Cotton CRC website: www.cottoncrc.org.au



Growers, researchers and agribusiness alike are encouraged to make use of the National Priority Teams.

Cotton teams drive knowledge flow

The Cotton CRC's National Cotton Extension Team works together in key national priority areas to deliver information products, training and extension activities based on emerging scientific knowledge to the whole of industry. These key areas of priority are identified by ACGRA, CRDC and directly aligned to the strategic outcomes of the Cotton CRC.

The industry invests in its cotton extension teams through investments made by CRDC and Cotton CRC incorporating partnerships between NSW DPI, QLD DPI&F, CSIRO, CRDC, Cotton Australia and several Catchment Bodies.

Team members work together in their areas of expertise to coordinate information in terms of National Priority Teams (NPT). The NPTs are designed to be the first point of contact to assist growers looking for more information and detail on key topics. Additionally, they are there supporting researchers to get information out to growers or to assist in undertaking industry-wide trials.

"The NPTs enable the national extension team to collaborate across key areas. They draw together a multitude of research to provide consistent and concise information in forms that the growers or industry participants require," says Cotton CRC Extension and Knowledge Manager, Letitia Cross.

"The extension team is always looking for ways to improve the services provided to the industry in Cotton Farming Systems and as a result this season the NPTs have undergone some changes in order to better meet the changing environment circumstances and industry priorities."

In 2008-09, the National Priority Teams focus on:

- Plants and Soils
- Crop Protection
- Water and irrigation

National Priority Teams are responsible for:

- Collaborating with research scientists and industry to consolidate and package information



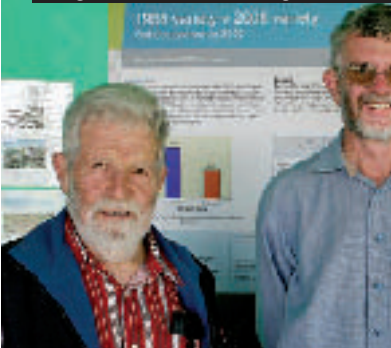
Cotton CRC Extension and Knowledge Manager Letitia Cross

- Developing crop management strategies based on best management practices and practical applications
- Producing information resources and extension activities to ensure the dissemination of emerging information and scientific knowledge, and
- Ensuring regional availability and application of research findings across the industry to meet the needs of industry

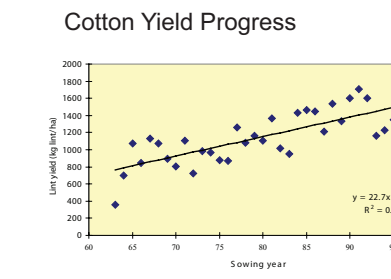
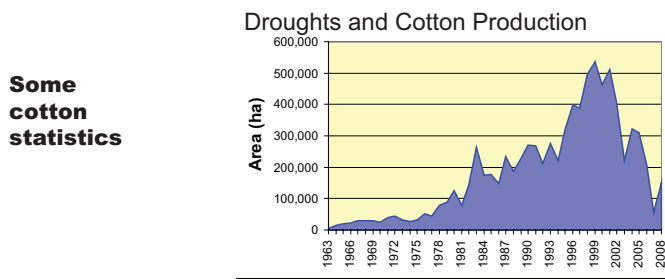
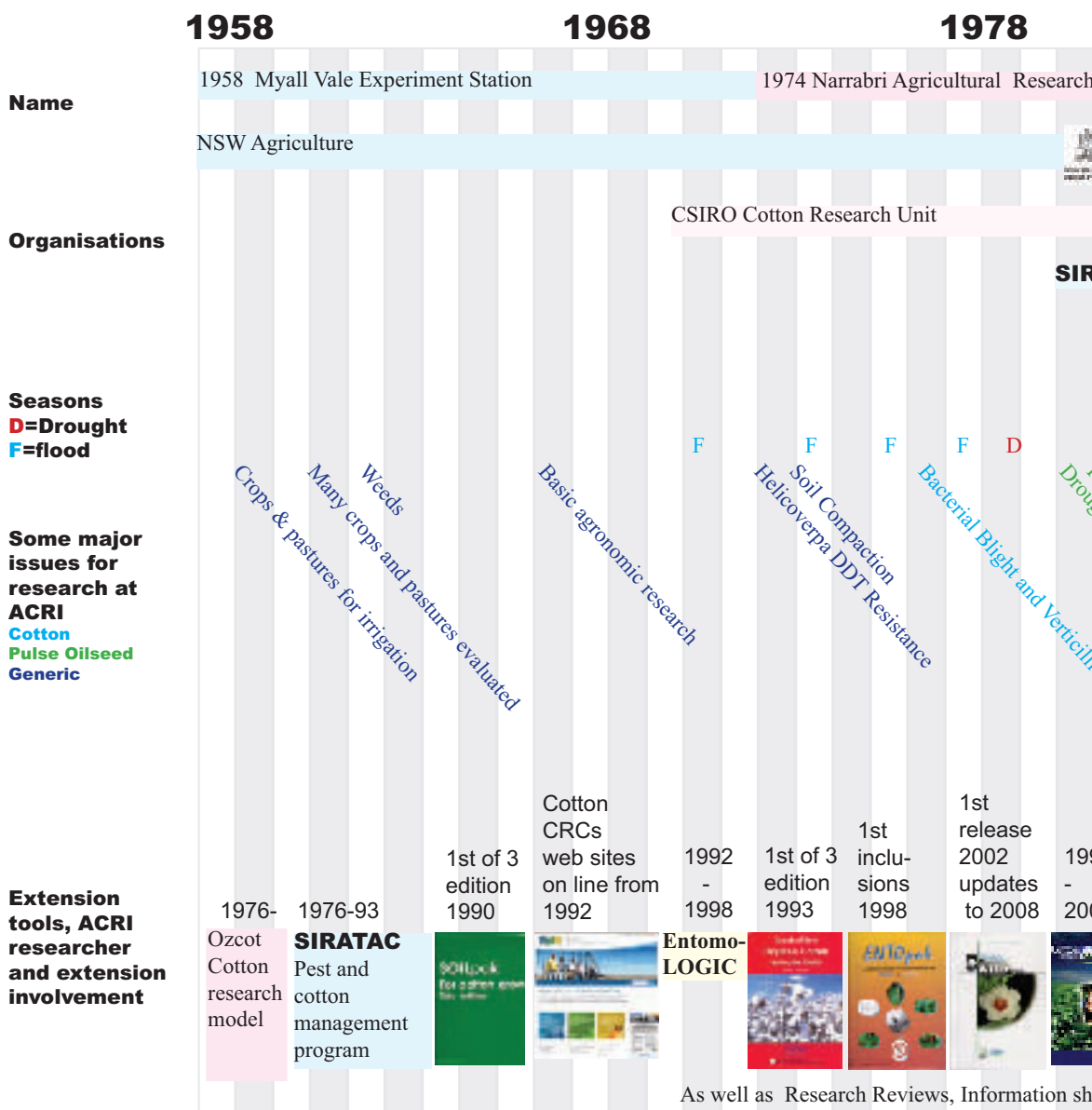
Letitia Cross said she encourages growers, researchers and agribusiness utilise the NPTs. "They are here to assist in the development and distribution of emerging information and research to the whole of industry".

Contact your team leader:
James Hill, 02 6799 31608
Susan Maas, 07 4983 7401
Janelle Montgomery, 02 6750 6302.

“Australia is a world leader in producing high-yielding, quality cotton, largely due to the availability of science based solutions and advancements fostered at ACRI,” he said.



Australian Cotton Research Institute Overview





Industry Dr TJ Higgins, Dalby Executive Director Bruce Finney, and the Cotton Research Unit technician Lindsay Heal and Movement and Production.



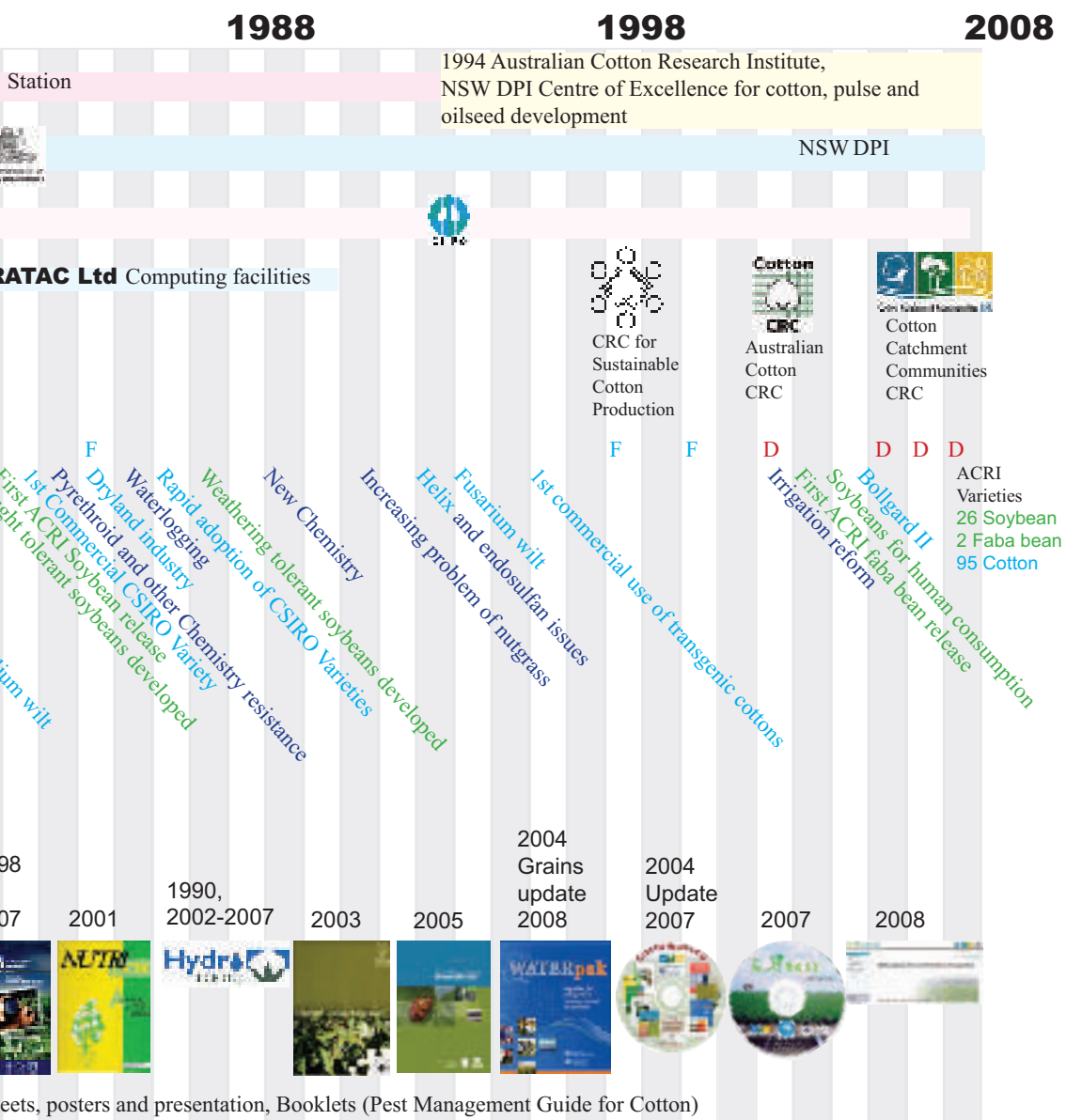
ABOVE: Research Agronomist, Irrigated Grains, Verity Gett and Technical Assistant Carolyn Palmer.
BELOW: Tour guide Trudy Staines shows visitors the results of the cotton ginned through the centre's 'mimi-gins'.



ABOVE: Ralph Schulze, cotton industry pioneer.
BELOW: Mrs Alison Busby of Narrabri and Mrs Judy Brown of Barraba made the trip to ACRI to enjoy the 50-year celebrations.



Review 1958 - 2008



Narrabri farmer Colin Busby and early cotton grower Bruce Mackey.

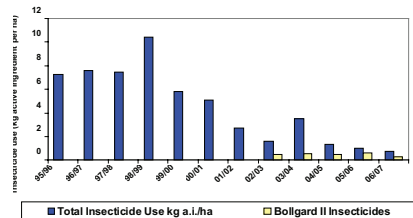


Helen Cain, Narrabri, enjoyed the ACRI open day with friends..

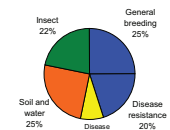


Gordon Cain could well be the Namoi's truly first cotton grower, having grown a small plot in 1956 at his Bohena Creek property as part of a high school Ag project.

Chemical use - (Active / ha)



Components of Yield Progress





Barnyard grass has developed resistance to herbicides in some farming systems.

Zero seed set decreases the risk of resistance

By Lou Gall, with contributors Andrew Storrie, Chris Preston and Steve Walker

It is not unknown for farms to become ‘unfarmable’ due to herbicide resistance to a number of herbicide groups occurring at the same time.

With cases recently recorded of resistance to Group A, C and M herbicides, only recently have farmers in cotton regions realised that herbicide resistance has become a contemporary problem and action is now required industry-wide.

Herbicide selection and application effectiveness are the critical steps required to minimise the onset of herbicide resistance. For those who have already taken the approach farm-wide, the primary principle of ‘Zero Seed Set’ has become the target catchcry. With this target, any weeds not controlled by the recommended rate become potentially resistant individuals capable of creating and sustaining resistant populations into the future.

Should these survive and continue to set seed, the proportion of the remaining population that can and do become resistant to the herbicide (and all other herbicides with the same mode of action and in the same group of herbicides) rapidly escalates until the farming system itself collapses. It is not unknown for farms to become ‘un-farmable’ due to herbicide resistance occurring with number of herbicide groups at the same time.

Factors that increase herbicide resistance risk include:

- Persistent use of the same herbicide mode of action in successive crops and seasons
- Persistently high weed survival
- Lack of control of weed survivors by not applying other tactics such as tillage

In cotton farming systems there has traditionally been a wide range of tools utilised for weed control; chipping, cultivation and herbicides. As it is an intensive system there has also been more attention to control of all weeds present – hence the zero seed set approach adopted generally.

Herbicide manufacturers conduct widespread trials and set recommended rates to maximise the level of control in the majority of situations, but in the environment, soil, weather and growing conditions, all influence the effectiveness of any given herbicide. Label rates (see www.croplifeaustralia.org.au) take these variables into account and provide the best control under most conditions.

The updated list of Groups is available in the



Andrew Storrie



Steve Walker

resistance management area of the CropLife Australia website. Additionally herbicide groups are listed on the front panel of product labels.

Introduction of Roundup Ready and Roundup Ready Flex opens the potential for increased reliance on glyphosate (Group M) during all phases of cropping such as pre-plant knockdown, infield crop applications and fallow control.

Reliance on glyphosate alone will increase the pressure on the group M herbicides. The glyphosate resistance gene is rare compared to genes responsible for resistance to group A or B herbicides in weed populations. In all cases where glyphosate resistance has occurred, there has been intensive use of glyphosate, often over 15 years or more, few or no other herbicides used and limited or no tillage (Preston 2005).

Growers concerned about the development of resistance to glyphosate or other herbicides should consider the following risk decreasing practices;

- Monitoring and preventing weed control escapes from setting seed
- Planning and implementing an IWM strategy to

reduce the weed seed-bank

- Adopt some tillage in fallows, and prior to sowing
- Strategically apply alternate herbicide modes of action, including residual herbicides, in crops and fallows
- Apply herbicides at robust rates to small weeds for maximum control
- Using double-knock glyphosate applications followed by tillage, or better still, apply an alternative herbicide with a different mode of action, again using robust rates
- Applying stewardship plans which cement a long-term view of weed management and avoidance of resistant survivors when growing all crops, particularly glyphosate-tolerant crops
- Implement a stringent farm hygiene plan that prevents any opportunity for importing and moving resistant seeds from one field to the next, and one farm to the next

Managing weed resistance requires the use of all the tools available, and a 'stacked tactic' plan ensures that there is zero seed set.

Are you concerned?

Any managers concerned that there may be resistant weeds present in your farming system or practices in place are likely to result in resistance, should firstly consider other common causes of herbicide failure when survivors are present.

- Was the herbicide applied in conditions and at the rate that should kill the target weed?
- Did the suspect plants avoid herbicide contact or emerge after the herbicide application?

If resistance is still suspected, arrange for the suspect weed population to be tested. It is important not assume that resistance exists because formal testing provides confirmation of resistance and enables the farming systems to adjust appropriately.

- ❓ Contacts who can to arrange testing are:
- QLD: Steve Walker, Queensland DPI & F:
Phone 07 4639 8838
 - Northern NSW: Andrew Storrie, NSW
Department of Primary Industries:
Phone 02 6763 1174
 - Southern NSW: John Broster, Charles
Sturt University: Phone 02 6933 4037

References:

Heap 2005 – Ian Heap 2005, Criteria for confirmation of Herbicide-Resistance Weeds – with specific emphasis on confirming low level resistance, retrieved 10th September 2008 from www.weedscience.com

NGSWG 1 – National Glyphosate Sustainability Working Group, Keeping glyphosate resistance rare in Australian cropping, retrieved 10th September 2008 from www.weedscrc.org.au/glyphosate/glyphosate_articles_media.html

NGSWG 2 – National Glyphosate Sustainability Working Group, Glyphosate Resistance - Frequently asked questions, retrieved 10th September 2008 from www.weedscrc.org.au/glyphosate

Preston 2005 – Preston, C, 2005 Australian Glyphosate Resistance Register, National Glyphosate Sustainability Working Group, retrieved 10th September 2008 from www.weedscrc.org.au/glyphosate

CropLife 2008 – CropLife Australia Herbicide Resistance Management Review Group, Herbicide Mode of Action Groups as at 10th September 2008 retrieved from www.croplifeaustralia.org.au



Technology adoption

– CCA surveys farming practices

Reports from the 2008 Cotton Consultants Australia Inc (CCA) Surveys of Cotton Consultants and Growers were completed recently providing the Cotton CRC and CRDC with a wide range of information relating to cotton production practices and R&D over the past five years.

The 2008 results revealed that water use efficiency improvements, utilisation of different cotton varieties including genetically modified (GM) cotton, improvements to crop nutrition and nutrient management were considered by both consultants and growers as particularly important factors contributing to improvements in cotton production.

Forty one consultants responded to the Cotton Consultants Survey providing advice to almost 240 cotton grower clients throughout NSW and QLD. A further 79 cotton growers were surveyed directly in the Cotton Growers Survey.

“The CRDC was interested in looking at management practices that consultants and growers have implemented over the last five years to increase yields and reduce costs and how this may correspond to adoption of R&D,” explains CRDC’s Bruce Pyke.

In the 2008 Cotton Consultants Survey, consultants were asked to list management practices used by their clients to boost the value of cotton production through increased yields over the past five years.

Seventy percent of the 33 consultants who responded to this question had implemented water use efficiency practices to increase cotton yield and 35 percent had used cotton variety selection. In addition, 28 percent attributed an increase in yields to improved fertiliser efficiency.

Of the 30 consultants who listed the management practices their clients had implemented to reduce the cost of cotton production over the last five years, 10 listed pest control strategies, nine had used GM varieties and eight had adopted more efficient fertiliser management.

Consultants were also asked to describe what equipment, technology and research results had the most positive impact on their management advice during the five years, which Mr Pyke believes will assist the CRDC to evaluate adoption of R&D and what sort of return on investment this represents.

GPS equipment was reported by 10 out of the 29 consultants who responded as having had a positive influence on their management advice. C-probes were listed by six of respondents and a further five mentioned other probe devices as having positively influenced their management advice.

By Chrissy Brown

The most common response by consultants in describing the research results that had the most positive impact on their management advice was research into cotton varieties.

When asked to describe technology that had positively impacted on their management advice, 53 percent of the 32 consultants who responded listed GM cotton. A wide range of other technologies were also mentioned by the respondents including communication technology, variable rate application, precision agriculture and EM surveys.

The most common response by consultants in describing the research results that had the most positive impact on their management advice was research into cotton varieties. The second most common response was irrigation scheduling, followed by fertiliser management and pest control management.

Mr Pyke says that the surveys indicate that the two main improvements consultants see as particularly important in terms of practices are water management and nutrition management. In addition, consultants see improved varieties (including Bollgard and Round-up Ready varieties) as very important.

In the 2008 CCA Cotton Grower Survey report, cotton growers were surveyed directly to gain their perspective on a smaller number of topics covered in the consultant’s survey. Growers were asked a number of questions regarding adoption of new technology and changes that had occurred specifically with regard to water use efficiency.

Growers were asked to specify the three most valuable technologies, equipment or changes based on research results that had been adopted on their farm in the past five years.

Of the 77 growers who responded to the question, Bollgard (69 percent), GPS technology (45 percent) and water use efficiency changes (36 percent) were the top three responses.

In response to questions specifically targeting information regarding changes in water use efficiency, it was revealed that 97 percent of cotton growers surveyed had made improvements over the last five years.

Just over half of these respondents indicated that this was due to both improved yields and less water being applied as a result of management changes. The implementation of an objective irrigation scheduling technique was the most common type of change to water management that respondents had made.

The CRDC is now using results from both the CCA’s 2008 Cotton Consultants Survey and the Cotton Growers Survey to inform an analysis of changes in cotton production due to adoption of research and new technology over the last five years. This information will be of value to a triple bottom line review of CRDC’s recently completed Strategic Plan for 2003

Insight from India

By Tristan Viscarra Rossel

The Australian Rural Leadership Program challenges our industry leaders to investigate solutions to invigorate regional Australia.

The current crop of participants has just completed the course with a week of lobbying in Canberra and CRDC scholarship recipient, Mark Morton, is trying to give something back to the industry.

Mark has always been “pretty passionate” about the economic structure of the Australian cotton industry and he wants to engage growers to regain their international competitive advantage.

“The cotton industry has been going through a very significant structural adjustment over the last seven to eight years, which has evolved around the fact that its cost of production was increasing at a rate exceeding its productivity improvements,” he said.

“Then we bring on water insecurity, and we’re starting to build a bit of a cocktail.”

Historically speaking, Mark outlined four key factors that gave the industry a competitive advantage until the release of Bollgard cotton.

“We had a freight advantage to southeast Asian markets. We had a quality advantage comparable to San Joaquin Valley cotton. We were the lowest cost producer per bale internationally. And we were very, very smart at producing cotton,” he said.

“But since GM cotton, that sort of ‘intelligence’ has been made redundant, and cotton has become a relatively easy crop to grow.”

Mark spent September travelling with 32 Australian rural leaders through India — a developing nation that will have significant economic implications for Australian agriculture.

“Internationally, we find our competitors have been able to take far greater advantage of the GM technology, and India is a classic case in point,” he said.

“In the five years to June 2008, India’s annual cotton production soared from 13.6 million bales to 31.5 million, predominantly off the back of GM cotton.”

In the two week-long trip Mark visited a number of dryland cotton areas in the 800 mm rainfall zone near Hyderabad and he recounted some observations.

“Their cotton was a reasonable quality. The growing crops I saw would be comparable to any dryland cotton I would have seen around Edgeroi–Bellata.”

When Mark asked an Indian grower why they’ve gone from producing 13 million bales to 31 million, he replied, “it’s just so easy; we plant it, we fertilise

it, and we let it go”.

Mark is not claiming to be an instant expert on the rise of cotton in India, but he feels confident that he saw enough to say, “We have an issue”.

“This is what we’re competing with. All of a sudden, what was our most significant competitive advantage — being the lowest cost per bale producer internationally — has now disappeared,” Mark said.

“My conclusion coming away from India for the Australian cotton industry is that we really need to discover a competitive advantage that will enable it to resume its place in regional economies,” Mark said.

“Our international competitiveness is paramount, and our research and development needs to focus on how we can rebuild a cotton industry that can compete with the cotton grown in developing countries.”

Mark believes that dryland growers have proven their capacity to make decisions based on a number of parameters. Irrigated cotton growers are starting to explore the capacity to utilise their previous skills to be efficient cotton producers and apply the same thinking on a broader context to irrigation farming systems.

“Our own growers have now becoming more adept at managing risk and are concentrating on what it is they do well. They can choose to grow crops other than cotton and cotton will eventually take its place as a commodity in a range of products that a grower produces,” he said.

“Australian growers are in the most powerful position they have held for a considerable period. They are in the position to choose where they employ their capital.”

The Indian industry does pose a significant threat but Mark said that we should bear in mind that India’s population is 1.4 billion and growing by 50 000 a day; they need to satisfy their human consumption requirements first.

“We need to make people in the cotton industry aware that we can’t think that as soon as water turns up next week, everything will be right,” he said.

“My concern is that if we just focus on water security without addressing the economic fundamentals, we are only dealing with half of the problem. And I’ve only been to India; I haven’t been to Brazil.”

More information

Mark Morton, Phone: 0427 525 842,
Email: mark@psystems.com.au

“My concern is that if we just focus on water security without addressing the economic fundamentals, we are only dealing with half of the problem. And I’ve only been to India; I haven’t been to Brazil.”

Mark Morton toured India in September 2008 as part of the Australian Rural Leadership Program





Bill Gordon takes workshop participants through the critical elements of spray rig operation to avoid drift.

Spray Wise at Warren

Spray Drift Management was the hot topic at Warren recently, with 35 participants including landholders from Warren and Narromine, consultants and Cotton Catchment Communities extension CRC staff attending an Application Technology and Spray Drift Management Workshop.

The workshops took place at "Auscott" in Warren and the Narromine Aero Club, conducted by Spray Application consultant, Bill Gordon. The workshop was a part of Bill's CRDC's project which invests in improved pesticide application practice. According to Bill, spray drift has become a greater problem in recent years as a result of night spraying that is now far more prevalent as a result of applicator machines equipped with GPS guidance. He says high-risk weather conditions, particularly involving inversion layers are more likely to occur at night.

Other factors playing a key role in off target sprays is the larger capacity machines together with operators spraying for longer periods between checking weather conditions outside the cab. Weather conditions change frequently without operator realising it, Bill contends.

The drought has also meant not as many opportunities to control summer fallows. Fewer rainfall events increase intensity of spraying and with the increase in the price of glyphosate, more 2,4-D is used.

Sally Ceeney, Cotton CRC Cotton Extension Officer said that understanding spray drift is extremely important. She said that

in the last season, 2,4-D drift caused significant damage and losses across the Macquarie Valley, with up to 50 percent total crop visibly affected resulting in average losses of one bale/ha, while 25 percent of this was extensively affected with an average loss of 2.5 bales/ha.

"This equates to over \$120,000 loss to the Macquarie Valley total crop in lint and seed," she said.

"The workshops assisted local growers and applicators develop a deeper understanding of the relationship between droplet size and the target, the mode of action of the product and selection of the ideal conditions for spraying," Sally said.

"This information can then be used to establish what kinds of nozzles each grower should be using based on the capabilities of their machines and the way in which they operate"

Despite another season of low water allocations, there will still be areas of cotton planted across the Macquarie Valley from Narromine to the north of Warren. Due diligence must be taken when using any 2,4-D products. "The major cause of chemical drift is application during unsuitable weather conditions. Monitoring of meteorological conditions and reacting to changes in temperature, humidity, wind speed and direction are some of the easiest and most effective strategies for preventing spray drift," Sally concludes.

For more information about the project, contact Bill Gordon bill.gordon@bigpond.com or Sally Ceeney on 02 6883 7101 or e-mail sally.ceeney@dpi.nsw.gov.au

Brigalow-Jimbour Flood Plain (Darling Downs) croppers have largely been able to eliminate spray drift through the efforts of committed growers groups, education and practice change facilitated by subsidies to change to coarse and extremely coarse nozzles.

Phenoxy cure an industry-wide response

The 2007-08 season saw a rise in the number and intensity of incident reports of phenoxy (namely 2,4-D) damage to cotton crops. Severe decreases in yield in some crops together with some entirely destroyed occurred in almost every cotton growing valley.

Two incidences of phenoxy damage have already been reported this season, a reminder that from November onwards the problem generally arises and now is the time to take action to halt the threat of damage caused by drift.

In an effort to curtail the problem that is both costly economically and environmentally, the industry is busy developing resources and solutions to the problem so that it can be eliminated through adoption of best practice.

Cotton Australia has developed a campaign on behalf of cotton growers in an attempt to reduce crop damage due to 2,4-D spray drift, by encouraging growers to be part of an area-wide management plan and to open the lines of communication with neighbours.

The body is also continuing to work with the Australian Pesticides and Veterinary Medicines Authority (APVMA) and agricultural chemical resellers, individual growers and grains industry organisations.

Lower Balonne extension officer Dallas King of St George (where damage was most extensive last season) and Bec Smith of CA are taking steps to promote co-operation between neighbours through facilitation of an area wide approach to management in collaboration with industry partners and promotion of best management practices for reducing spray drift.

The pair has produced a sensitive crop map for the St George

Irrigation Area for distribution to all growers to show the location of different crops and sensitive areas (e.g. native vegetation) so that all growers in the SGIA are aware of the sensitive crops in the area as a means of reducing herbicide damage from off target spray drift.

According to Dallas there has been evidence of one grower changing practice by moving crop type to fit in with the neighbours' crops by having similar crop types in the one area.

Similar projects are underway on the Darling Downs, Macintyre and Mungindi with maps of cotton and other 2,4-D sensitive crop locations being produced by Cotton Australia and the local CGA.

In the hardest hit area of NSW last season CRDC and Cotton Australia are supporting an initiative of Spraywise Decisions (www.spraywisedecisions.com.au) to develop a regional map of 2,4-D sensitive crops that will extend from Moree to Mungindi and across to North Star. The map will be provided to agricultural chemical resellers in the region as point of sale information.

Pesticide application consultant Bill Gordon who works in a CRDC project that seeks practice change through improved knowledge and skills, says that areas like the Brigalow-Jimbour Flood Plain on the Darling Downs have largely been able to eliminate spray drift through the efforts of committed growers groups, education and practice change facilitated by subsidies to change to coarse and extremely coarse nozzles.

Cotton Australia has also made available resources for growers to download from its website including a draft letter which



Young cotton crops damaged this season by 2,4-D drift.

Cotton Australia website takes action

Cotton Australia has taken a pro-active stance in the herbicide damage field and lists the following resources for immediate use.

- Notification letter for cotton growers to send to neighbours including information on the potential risks of 2,4D applications. (Suggested template in Word format for ease of editing).
- Spray Drift Factsheet from the Grains Research and Development Corporation.
- Article from Bill Gordon on best practice spray application.
- Photos of damage to cotton crops and examples of product in the 2,4D Phenoxo herbicide range.
- Grains Research and Development Corporation article entitled "Air Induction Nozzles Are Different": (<http://www.grdc.com.au/uploads/documents/5807%20GRDC%20N-Upd%20news%20letter%20issue%2044%20v3%20final.pdf>)

For more information or assistance, or if you would like any of these documents mailed to you, contact Cotton Australia on (02) 9669 5222 www.cottonaustralia.com.au

More information about spray drift from DPI&F offices, 'Spray right - reduce drift' on the DPI&F website or from the Business Information Centre.

The regulator is taking phenoxy spray drift very seriously

requests neighbours to notify each other when they are using 2,4-D based products and links to other useful information regarding best practice spray application and guidelines for phenoxy use.

Apart from the monetary losses of phenoxy damage there is the ultimate possibility of tightened control or even loss of the use of the product, Cotton Australia's NSW Policy Manager Greg Kauter says.

The use of phenoxy-based chemicals is currently under routine regulatory review by the APVMA, he said.

"How farmers handle the chemical and the incidence of drift would be likely to have a bearing on the outcome of that review.

"Any increase in the regulator's awareness of incorrect use could affect the outcome of that review.

"We have already seen the regulator restrict the use of high volatile ester formulations of 2,4-D to the winter months as part of the [section 32] review and additional restrictions are possible for the whole phenoxy group.

"This could include identifying buffer zones, reducing allowable maximum wind speed, mandating droplet size and mandatory neighbour notification.

"The old saying is that if self regulation doesn't work it will only result in stricter product label directions including more mandatory use requirements.

"The APVMA is charged under legislation with minimising the impact of ag chemicals on human health, the environment and export trade. Because off-target herbicide drift is

symptomatic of greater environmental problems, the regulator is taking phenoxy spray drift very seriously."

Mr Kauter said that the most frustrating aspect of the phenoxy drift issue was that "more considerate decision making" and following APVMA spraying guidelines could overcome it.

"The sad part is it is avoidable through best practice," he said.

2,4-D herbicides can drift up to 10km from the source if not applied in ideal conditions, or if label restrictions are not followed correctly.

"We ask growers and spray contractors to take particular care when applying 2,4-D herbicides this summer and to ensure label requirements are closely followed," Cotton Australia CEO Adam Kay said.

"The 2,4-D group of herbicides is valuable to all of agriculture, and it would be a shame for access to be restricted due to a few farmers not using best practice.

"We need to make sure that manufacturers, distributors and users of the phenoxy herbicide group of chemicals are aware of the potential damage they can cause to susceptible crops like cotton, as well as native vegetation and waterways," Mr Kay said.

Symptom of a larger problem

"The likelihood of causing damage to a sensitive crop several kilometers downwind is greatly increased when night spraying, particularly on large flood plains where broad acre cropping and cotton coexist," Bill Gordon says.

"Phenoxy damage to cotton is just a symptom of a much larger problem with the movement of chemicals away from the site of application."

The real problem is a lack of control over where chemical ends up.

This is largely due to poor nozzle selection, not monitoring conditions closely enough and having a general disregard for surrounding crops and the environment by continuing to spray when conditions are simply not suitable.

Sometimes the best decision is not to spray.

The problem won't be fixed until the whole cropping industry makes the required changes to how and when they operate their spray rigs.

This is becoming a reality with the new Cotton Australia initiative and also the CRDC and GRDC funded project "Drift management extension strategy for the Northern Region".

Delivered by Bill Gordon Consulting, it addresses the issue of spray drift on a number of fronts, by completing trials and working with chemical and application equipment suppliers, resellers and advisors, training providers, and directly with the applicators themselves.

"When we can get people involved in learning about how spray drift occurs and how to prevent it, more than 80 percent of participants in our training make positive changes to how they operate their spray rigs," he says.

For more information or to run a workshop for your clients on how to manage drift and improve their application, contact CRDC 02 6792 4088, or Bill Gordon on 0429 976 565.

Investing in capacity: it's about people

Attracting, developing and retaining capable people has long been recognised as the key to cotton's success.

This long-term objective is now central to the five-year R&D investment program.

Beginning afresh with a new strategic R&D direction beginning in 2008-09 involves leveraging industry development with the establishment and nurturing of strategic partnerships. CRDC will begin to broadly support initiatives which encourage adaptiveness to change and target investments in human capacity.

The result of successful implementation of the CRDC investment program in capacity building will be innovative people in the cotton industry which can lead to supporting a sustainable industry and viable regional communities.

Beyond 2008 there will be renewed focus on research and innovation, management of change and risk and enhanced adaptation and adoption of technologies. Innovative individuals will find greater recognition and reward for their contribution to industry.

The starting-out point for many on farm in capacity building is about attracting and retaining staff. Many avenues to further education and skill building of employers and employees are explored in Spotlight. Experienced growers Von Warner and John Hamparsum share their experiences in the following articles.

There are many more opportunities and avenues available. Below some are listed. Further information regarding Recognition of Prior Learning, obtaining a Diploma or attending the many industry courses on offer, contact CRDC, Cotton

Australia, Cotton CRC, or National Cotton Training Coordinator Mark Hickman (details below).

Mark Hickman
National Cotton Training
Coordinator, Cotton CRC
Subprogram Leader (Specialist
Extension)
Principal Development Extension
Officer, Sustainable Farming
Systems, Plant Science / Delivery
QLD DPI&F Cotton Catchment
Communities CRC ph 07 46 881
206, fax 07 46 881 472, mobile
0407 113 096, mark.hickman@dpi.
qld.gov.au

Resources that teachers can use to
implement the program within the
school curriculum -
www.skillsonline.net.au : Cotton
Basics

Cotton Intermediate Skills
Recognition program information
sheet Cotton Australia

UNE/Cotton CRC Cotton Production Course

The University of New England is now taking undergraduate and graduate enrolments for the Cotton CRC's Cotton Production Course for 2009. The course includes four units of study: Applied Cotton Production; Cotton Protection; Cotton and the Environment (BMP) and Cotton Farming Systems

Irrigation and crop nutrient management are integral parts of the course which culminates in an on-farm consultancy covering production, environment and farming business issues.

Contact: Dr. John Stanley
(Cotton CRC/UNE) or e-mail
jstanle4@une.edu.au or www.cottoncrc.org.au

Cotton Field to Fabric Training Course: Managing for Quality

Three-day course at CSIRO Materials Science & Engineering in Geelong, Victoria, designed for people involved in any part of the cotton industry from grower to technologist. It aims to provide an understanding of how each part of the industry operates and relates to one another.

Contact: Rene van der Sluijs
Ph: 03 52 464738 or Email: Rene.vandersluijs@csiro.au

Cotton and Grains Irrigation Management course.

This is an innovative course as it is mapped to national training competencies, an irrigation certification program and the Land and Water module of the Australian cotton industry BMP guidelines. This course is providing a good example of further training platforms.

Workshop series Flier: Cotton and Grains Irrigation Workshop Series: Recognition for your skills

Contact: Mark Hickman, 07
46 881 206, fax 07 46 881 472,
mobile 0407 113 096 or e-mail
mark.hickman@dpi.qld.gov.au

Vocational Education Training in Schools

This involves the alignment of national competencies from the Vocational and Technical Education sector into key areas known as Cotton Seed (Certificate II), Cotton Basics (Certificate II-III), Cotton Intermediate (Certificate IV) and Cotton Advanced Certificate (IV-Diploma). NSW Farrer Memorial Agricultural College delivered the Cotton Basics modules to 34 Year 11 students.

Cotton Basics is a Certificate II in Agriculture (specialising in Cotton production)

Contact: Graeme Harris, Head
Teacher Agriculture / VET
Coordinator Farrer Memorial
Agricultural High School,
026748660, 0438656692 or fax
0267648669

The ability to achieve more

By Melanie Jensen

Von Warner



Giving young people practical farming skills while still at school and up-skilling current employees is imperative for the future of agriculture, according to former farm manager Von Warner.

"We need to do this for the future or there will be no farmers left," is his warning.

Mr Warner met Farrer student Jason Herbig at the 2006 Australian Cotton Conference, which he was attending as part of his studies in the high school's pre-vocational program Cotton Seed.

Mr Warner offered to host Jason for a couple of weeks work experience over the school holidays. Two years later, his 'student' is in employment at Bullamon Plains near Thallon, where Von was managing at the time.

"I think the vocational educational training is a great idea, for both students and farm workers," he said.

"The course offered as Farrer is a great way to get people into the industry, as is offering the opportunity to get your Diploma in Agriculture like I did.

"It provides an opportunity to get ahead."

Mr Warner started as a farm hand himself and three and half years later became farm manager.

To attract people to the agricultural industry, he now believes strongly that these types of opportunities ought to be promoted.

"It is like going to uni, or taking on an apprenticeship. I now have a Diploma of Agriculture which I gained without going to university. I am ticketed to operate all different types of machinery and have a range of other skills that are needed on farm. These skills also include welding and fabrication and management, all of which offer many avenues for employment as well," he says.

"I left school in Year 10 and never thought I would have a Diploma – but now I do – through farming."

Mr Warner's says school leavers can be attracted to the industry, "if they know there is a future for further education and qualification and increased earning capacity."

He says the lifestyle of country living is also a positive for the industry, adding that with competition from big money mining jobs, "when you add up the benefits of living on-farm, the gap quickly closes.

"I have done the figures, and when you add everything up they level out when comparing say mining jobs to agriculture.

"By the time you factor in the savings by living on farm, which often include no rent, electricity, fuel costs (no driving to and from work), meat and general cost of living, working as a farm hand is a good deal. Especially when these are the exact costs that are rising most at the moment.

"In agriculture, the opportunity is there to gain qualifications and management positions."



Brad Newman, an employee of the Hamparsums, who (with help from other staff members) took their 30-year old Gyrat Seed box and converted it from a reverse seed feed box to a trail behind forward feed seed box. Brad designed and manufactured the pivoting front wheel assembly as well. The air seeder box has been a great success and has helped to convert their irrigated wheat to minimum till row crop planting. This is an example of “the exciting approach our staff have toward innovation and implementation of ideas, improving farm productivity, water efficiency and saving money by rejuvenating old machinery”, John Hamparsum says.

Strategies for success

John Hamparsum oversees a family-run mixed farming operation at Breeza with his sister Juanita, and had analysed the how and why employers need to take action to attract and retain good staff.

The Hamparsum's have developed a range of strategies which has brought success through the so-called 'labour drought'.

John says these days, he has focused on attitude rather than skills, based on the pretext that skills can be learned, and if a positive attitude to work and learning is present this provides a solid foundation for the rest to follow.

But firstly, staff must be attracted to the industry before this can take place.

“While fair dollars for fair work, good accommodation and conditions are always important, the drivers for people to be attracted to the agricultural sector are not always money,” John says.

“Some people returning from the mining sector for instance, are seeking the flexibility of agricultural employment, such as more flexible work hours, time off, and the variation of tasks.

“Agriculture can offer a great work-life balance not found in many other industries and living on the land offers a lifestyle different to any other.

“There is the opportunity to have

such things as a communal veggie garden and farm meat stock, which in tough economic times is attractive to potential employees.”

Knowing there are opportunities to learn new skills and gain qualifications is also an attractive proposition.

With the belief in employing for attitude rather than skill, it is then important to be prepared to train staff and foster their learning and involvement in the farming enterprise.

An ‘on-farm learning community’ is how John describes it.

This includes identifying and nurturing existing ability and interests, through further education in skill-specific courses at TAFE, attending field days and conferences and suiting skills to tasks performed on-farm.

Giving staff the opportunity to learn and improve is imperative without fear of skilling staff to a point they find different employment—don't be disappointed if they move on.

“Don't get hung up if a worker leaves,” John says, “Change is inevitable.”

The Hamparsums have found that by implementing an inclusive management style, where staff ideas and innovations are encouraged and valued is a good start.

This makes workers feel valued and gives them a form of ‘ownership’.



Brother –sister team John and Juanita Hamparsum have successfully focused on measures to help them attract and retain staff

“Staff are encouraged to participate in regular farm meetings on an equal level, where opinions and ideas to make the operation run better are encouraged, but you must be prepared as an employer to have your own ideas challenged,” John said at the recent Australian Cotton Conference, where he was part of a workshop addressing employment.

“This shows that the employee's opinions are valued, building self-esteem and an attitude of responsibility in their role.”

Also building self esteem and a feeling of being valued by your employer – an important element of any job - is the Hamparsums idea to invite neighbours and other industry people to the farm to see how staff have contributed to innovation and productivity.

Another strategy tried and tested by the progressive employer is time off in lieu.

TOIL as it is commonly referred to, is an option that allows employees to

bank excess hours and then take the equivalent time off and be paid for the hours banked at later time. This can be an important stop gap in quiet times, wet weather, or when staff have family or other commitments they would like to attend without suffering any reduction in pay.

This flexibility adds to the positive work-life balance, allowing more time with friends and family during the quieter farming periods. Employers need to communicate closely with employees to implement this system and they must have the employees' consent before implementing this strategy.

“At the end of the day agriculture is one of the best places to work and we need to promote the natural advantages we have over other workplaces” John said. As one of his farmhands, an ex-Sydney bread baker, says when he arrives at work each day “Best office in the world mate, best office in the world”.



Contamination of the cotton crop is still a serious problem for Australian growers who need to be constantly vigilant and tackle the problem on an ongoing basis. That is the warning from contamination specialist Rene Van Der Sluijs, Textile Technologist with CSIRO Materials Science and Engineering, who has been involved in extensive research into how and why cotton becomes contaminated.

Growers and picking contractors are warned to be vigilant about machinery maintenance to avoid machinery parts becoming part of the module, which cause serious damage at gins and downgrade the product

Picking poses greatest contamination threat

By Mary Ann Day and Rene Van Der Sluijs

Despite the fears, however, Australia is still considered to be one of the countries least affected by contamination - its ranking amongst cotton growing countries (for contamination free cotton) slipped from five to nine between 1999 and 2003 and to six in 2005 and went to third in 2007.

Data from the International Textile Manufacturers Federation (ITMF) shows that the incidences of contaminated Australian cotton increased from five percent in 1989 to eight percent in 1999 and to 13 percent in 2003 and 2005 and seven percent in 2007.

The ITMF conducts surveys of cotton spinners on their perceptions of contamination found in world growths. In the survey, spinners are asked to rate the degree of contamination in cotton lint and it was found that of the 16 categories of foreign materials woven plastic, plastic film, Jute and Hessian were among the worst.

"The degree of contamination varies widely from region to region," Mr Van Der Sluijs said.

"The most contaminated cotton continues to originate from India, Turkey and Central Asia. In contrast the least contaminated cotton continues to originate from Zimbabwe, the USA, Israel, Australia and some countries from West Africa.

"No growths are contaminant free.

"Analysing results of the surveys from 1989 it is notable the degree of contamination or percent of cotton deliveries to spinning mills that were contaminated, steadily increased from 14 percent in 1989 to 26 percent in 2003.

"But we saw a decrease to 22 percent in 2005 which was maintained in 2007.

"The biggest source of contamination is organic matter such as leaves, feathers, paper, leather, etc., which has steadily increased from 30 percent in 1989 to 50 percent in 2003, although it decreased to 40 percent in 2005 and 2007.

"The next most prevalent contaminant is fabrics and string made from cotton, woven plastic, plastic film and jute/hessian. There has been a general reduction in the incidence of oily substances/chemicals and inorganic matter since 1989."

Mr Van Der Sluijs said contamination, even if it is a single foreign fibre, can lead to the downgrading of yarn, fabric or garments or even the total rejection of an entire batch and can cause irreparable harm to relationships between growers, ginners, merchants and textile and clothing mills.

Most contamination arises from impurities being incorporated into the bale because of human interaction during harvesting, ginning and baling.

Contamination represents a significant cost to spinning mills and this has led them to implement methods to cope with contamination.

To complicate matters there are no international standards for acceptable levels and size of contaminants in fabrics.

In order to objectively identify the major sources of contamination found in Australian cotton and the industry segments in which it is introduced, a study was conducted in the past three seasons and all the operating gins in Australia have participated in a





Lunch wrappers and general rubbish are nasty contaminants and educating ground crews and promoting a clean environment by providing rubbish bins is a simple step to avoiding the problem. Make sure a site inspection of the module pad is undertaken to avoid incorporating contaminants that may already exist on the ground.

Leaves, feathers, paper, plastic, string, rust, grease, oil and even metals are some of the dangers that lurk on the farm and could lead to severe contamination.

survey, collecting and recording all contaminants found in modules delivered to the module feeding area of the gin.

Gins also recorded the costs of repair and replacement of parts due to damage caused by contaminants. Over 600 incidents of contamination were recorded from a total of 157,316 modules processed between 2006 and 2008.

“Most contamination occurs during picking and to a lesser extent in ginning. Managers of farms and gins need to be proactive in regards to contamination. Significant contamination problems can be very easily avoided,” Mr Van Der Sluijs said.

He said the problem of contamination has arisen for a number of reasons.

- The picking and ginning process bring the fibre in contact with a range of people as well as machinery.
- People become a source of contamination via their clothing and accessories (mobile phones, watches, newspapers, plastic bags etc.) and food and drink wrappers/ containers.
- Machinery has the potential to contaminate via components, tools and lubricants.
- Module covers and module ropes are another source of contamination if module covers are not in good condition and if ropes are not correctly tied or not made from cotton.

Mr Van Der Sluijs added that in last two to three years labour has been a bit of a problem as many skilled workers have left the industry, leaving the industry with less experienced workers so contractors and

farm and gin managers need to address these issues in training and vigilance.

“Certainly in the last year things have improved, but the crop is smaller and it is important for growers not to get complacent – they need to be vigilant and aware of the dangers of contaminants getting into the crop,” he said.

“For example, if they are having lunch, they should make sure plastic bags and food wrappers are put in bins and are not left to lying around and eventually accidentally get into the crop.

“If they suspect that some contamination has occurred the gin manager should be advised who can pay special attention to the affected module.

“Vigilance and attention to detail is the key, so that we can stop any contaminants at source.

“We now have a Best Management Practice on the farm and are in the process of implementing BMP in the ginning sector which will hopefully be extended to the picking sector, which should make people more aware of contamination and how to overcome it and our studies have shown some key areas where improvements could be made.”

With the current oversupply of cotton world wide and the emergence of other high quality growths on the export market, Australia needs to offer consistently high quality fibre.

“So it is vital for the industry to continue to control contamination, which is considered to be one of our major strengths, and be constantly vigilant,” Mr Van Der Sluijs concluded.

How to avoid it

✓ Site inspection

A site inspection prior to putting down a module is a must. Rocks, a common form of contamination, can be avoided or other substances are on the ground – a piece of rag, remnants of a fertilizer bag, a piece of wire.

✓ Educate employees

Often contamination occurs because of ignorance. All module building crews should be trained to watch out for contaminants. The actions of people involved at harvest time can often inadvertently lead to substantial down grading of a grower's cotton - the lunch bag that blows into the module builder, the leaking module tramper ram that is left unattended can result in severe oil contamination.

Make them aware of the potential problems and provide them with the facility to clean up and isolate rubbish.

✓ Sweeping up

When ground crews sweep up cotton that has spilled around a module make sure they don't sweep up contaminants or excessive dirt and place it in your module.

✓ Machinery cleanliness

Failure to clean the top grids on a regular basis leads to unwanted waste and very dirty cotton getting in with the more valuable lint from the basket.

✓ Machinery maintenance

Make sure there are no leaking hoses, rams etc on module builders, pickers and boll buggies and that regular maintenance is carried out to avoid pieces falling off machinery into baskets or builders.

From Moura to Memphis

A global cotton community



Greg Hutchinson

"As cotton producers we are not competing against other countries such as the US, India and China in the production of cotton but we are competing against polyester as a substitute for cotton," says Moura grower Greg Hutchinson, who has recently returned from the International Cotton Institute Course in the US.

"Therefore we should all be working together globally to promote cotton as the fibre of choice for mills to use."

Greg is one of the third generation involved helping manage the family operation growing cotton in the Dawson Valley where they have been growing back to back cotton since 1980. This year has seen a full plant of irrigated cotton go in with the potential of increased water allocations and better price prospects going forward compared to other commodities such as sorghum.

The CRDC together with the Dawson Valley Cotton Growers jointly funded the trip to Memphis Tennessee, where Greg spent eight weeks learning from industry leaders from around the world about every facet of the industry from planting the seed right through to selling the final product to the consumer.

A feature of the experience for Greg was the opportunity to listen to and network with the 46 other participants from around the world

as well as cotton industry leaders who included Robert Weil II, Weil Bros, Allen Terhaar, Cotton Council International and Joe Nicosia, Allenberg Cotton CEO who gave an inspiring talk about his personal journey in becoming an industry leader.

"The cotton industry is a small one and it is essential to get to know others in the industry from around the world as we all have similar issues that are affecting us and you never know when these contacts could help you in the future," Greg says.

Another skill Greg has bought home is knowing how to manually class cotton.

"Each year we have had to deal with classing issues and the skills that I acquired highlighted how easily it was to make mistakes when classing," he says.

"Hopefully with continued investment in HVI (High Volume Instrument) technology it can improve to a level where the subjectivity of classing is minimised."

Also at farm level, Greg has improved his marketing skills and says now he has the know how and the contacts to allow him to export cotton directly to overseas which given the continued drop in merchant competition in Australia could well prove valuable in coming years.

"I have gained confidence to invest

in the agricultural sector as huge opportunities are going to present themselves in coming years. Everyone I spoke to was extremely bullish on agricultural commodities.

"Australian cotton is in considerable demand overseas given our ability to grow high quality contamination free cotton, the real problem we have is the ability to supply it consistently every year.

"One of the ways that this could occur particularly in Central and Northern Australia is increased investment in water infrastructure and the continued development of the industry in these regions."

Greg also heard of many ways the industry may learn from the US.

"Given the advancement in HVI technology we should actually be classing each individual bale like they do in the US and using this data allowing growers to participate in true module averaging," he said.

"If this data could also be collated between the various classing rooms and made available to growers and researchers similar to what the USDA currently does it could only be of benefit to the industry.

"I would also encourage the Australian cotton industry to sign up as a signatory to the USDA Cotton Standards.

"Since we are using their standards to classify our cotton if we are a

signatory then hopefully we will have some say over future changes to the standards."

The funding model for research and development in the US was also of interest to Greg.

"There are also opportunities to look at ways in which we can copy the way the US cotton industry gets funds for research & development – making grower levies compulsory but also look at trying to levy cotton imports as well."

The opportunity to attend the course is one that should be extended to more young Australians involved in the cotton industry, according to Greg.

"Overall, this was a fantastic learning experience, and I think that the industry should be sponsoring someone to attend the course each year as the opportunities and experience that it provides you with are well worth the investment," he said.

"As a participant in the inaugural Future Cotton Leaders Course I was able to use the skills I acquired during the course and develop them whilst overseas which will hopefully enable me to take on a more active leadership role in the industry in the future.

"More importantly it gives you the opportunity to be an ambassador for Australian cotton on the world stage."

Celebrating successful partnerships with the cotton industry

You will have received a 2009 Cotton Communities and Natural Landscapes calendar with this edition of Spotlight. This calendar celebrates community life in Australia's cotton growing regions and showcases community events from Emerald in the north to the Riverina in the south. It also highlights environmental partnerships with the cotton industry and illustrates how growers, consultants, researchers and extension staff are working together to achieve best management practice and manage natural resources. The calendar is jointly funded by the Namoi Catchment Management Authority, the Department of Agriculture, Fisheries and Forestry and the Cotton Catchment Communities CRC.

The 2009 calendar showcases the relationships between cotton, the community and our natural environment



Cotton Communities

The cotton industry plays an important role in providing farming communities with a secure income. The wellbeing of cotton communities was recently measured for the 2005-2006 period across seven Local Government Areas from Warren to the Darling Downs. In economic terms:

- Cotton growing accounted for around \$400 million in regional product when aggregated across all the areas.
- The impact of the cotton industry on GRP (both direct and flow on impacts) contributed between six percent in the Darling Downs and 29 percent in Moree Plains.

The study found that drought conditions and the energy and mining boom are two events having an impact on these communities in real ways, both economically and socially.

The impact of the drought was assessed in the small north-western NSW town of Wee Waa. Here, the impact has been felt by many sectors including local businesses, schools and health organisations.

Cotton communities are however, highly engaged communities with generally a positive attitude to life, and in Wee Waa, the community is already

looking at positive and achievable options that can improve their wellbeing.

Cotton industry managing its natural resources

The cotton industry has some noteworthy achievements when it comes to managing natural resources, such as:

- Over 85 percent of the Emerald Irrigation Area is covered by property management planning.
- 25 percent of cotton consultants in the Condamine have improved confidence, skills and knowledge in water use efficiency.
- 71 farms in the Namoi Valley have undertaken the Cotton Industry Best Management Practice Land and Water Module.
- 110,000 hectares of land are now under best practice management in the Namoi Valley.
- 15 cotton farms in the Lower Namoi have improved their WUE by 15 percent, saving at least 5000 megalitres over 8000ha of irrigated cropping land.
- Five cotton growers are planting over 3500 trees to establish 10.5km of native riparian vegetation in the Namoi Demonstration Reach.

Partnership

Cotton CRC and Namoi Catchment Management Authority (Namoi CMA) partnership is a commitment of both parties amounting to \$2.4 million with aims to improve the health of the cotton growing areas in the Namoi catchment.

The partnership also represents a significant investment of time and resources by the growers themselves, with industry contributions making up at least half the investment in on-ground changes.

Together the Cotton CRC, Namoi CMA and cotton growers have implemented water use efficiency measures on almost 4450ha, conserved nearly 60km of riparian vegetation, revegetated 14km of riparian vegetation.

They have constructed eight in-stream structures to stabilise river banks and provide fish habitat on cotton farms in the Namoi catchment.

The Namoi CMA has also invested in Cotton CRC training, education and research in such areas as water use efficiency, groundwater, soils, biodiversity, riparian management and best management practises.

People in cotton

Gillian Hogendyk



2005

'Burrima' coolibah wetlands 2005.



03.02.2008 06:16

2008

'Burrima' coolibah wetlands 2008.

Showing how natural resources can be conserved while still benefitting rural agricultural communities is the vision of passionate environmentalist, conservationist, author and advocate of the cotton industry, Gillian Hogendyk.

Gillian lives at Warren on an irrigation and dryland farming property with her two teenage boys and husband Chris who is the General Manager of Auscott's Macquarie Valley operations.

The qualified veterinarian no longer practices and now dedicates her time to family and voluntary work that includes raising awareness of the Macquarie Marshes and how agriculture and nature can co-exist in a sustainable, positive way.

Describing herself as an 'amateur naturalist', for some years Gillian has worked on a revegetation plan for Auscott, as a community representative on the National Parks and Wildlife Community Advisory Committee, Secretary-Director of the Australian Environment Foundation and as a wildlife carer for WIRES (NSW Wildlife Information Rescue and Education Service).

In 2007, Gillian launched her book; *The Macquarie Marshes: an Ecological History*. It was launched by Don Burke of *Burke's Backyard* fame.

"The book was the culmination of three years of careful research and I am very proud of this achievement and delighted with the support shown by the community," she says.

MRFF (Macquarie River Food and Fibre) supported Gillian in the writing of the book, and more than 200 people turned out at the launch, held at "Burrima" a showcase property in the Macquarie Marshes.

In 2005 Gillian was one of 30 Macquarie River Food and Fibre members who formed a trust to purchase the property with the aim to manage it for conservation outcomes.

"Burrima" adjoins the North Marsh Nature Reserve and over three years the MRFF group has achieved some astounding results. In 2005 the property bore the scars of prolonged overgrazing. There was very little understorey apart from Noogoora burr, and the reed beds were chewed off to stumps. The new owners removed the cattle, and now a thick carpet of native plants is gradually choking out the weeds. The reed beds have regenerated in a spectacular fashion, and are spreading throughout the flood country. New wetland vegetation is returning "Burrima" to a healthy functioning wetland, where water is filtered and ponded to keep the area much wetter for much longer than before.

The property is now regularly visited by school, university, research and natural resource management groups as an educational resource highlighting the uniqueness of the ecosystem of the marshes and the possibilities achievable for regeneration through careful management.

– agriculture and nature co-existing

“The work here will help show how natural resources can be conserved while at the same time benefiting rural communities”.

The property, Gillian and husband Chris were recently thrown into the spotlight when ABC television’s *Four Corners* program aired a story on the Federal Government’s water buy back policy, featuring “Burrima”.

“The irrigation industry in the Murray Darling Basin views the current paradigm of buying water as the sole means of achieving environmental outcomes with concern,” Gillian said.

“Over time this is likely to destroy many of the rural communities who depend on irrigated agriculture without giving any real environmental benefits.

“In the Macquarie Marshes there is a mixture of private and public land tenure of high conservation value wetlands.

“By purchasing Burrima and managing it for conservation we have shown that huge environmental benefits can be gained without further water purchases, but by better management of the environmental water we already have.

“The work here will help show how natural resources can be conserved while at the same time benefitting rural communities.

“Local community groups can purchase and manage for conservation purposes private land of high conservation value.”

Gillian believes this could be achieved by redirecting some of the current government funds which are earmarked for water purchase and by forming corporate partnerships.

Her vision is that the properties could be managed by locals under the guidance of Catchment Management Authorities.

“There would be an opportunity to develop ecotourism or commercial hunting of feral animals along with some level of industry, such as controlled grazing or cropping which would be required to cover ongoing management costs.

“The properties could help break down the increasing rural-urban divide by giving city dwellers an opportunity to experience these important wetlands.”

She has derived some of her ideas from the activities of Australian Wildlife Conservancy (AWC) and Bush Heritage Australia (BHA). These two non-government organizations buy land and manage it for conservation, and Gillian has been a member and supporter of both for many years.

Furthermore, Gillian is keen to use the knowledge she has gained through her involvement in the Marshes to help other communities who have wetlands which are in need of conservation or regeneration, and to educate government, farmers and community organisations about how and why this can be done.



2005

‘Burrima’ river gum forest understorey 2005.



21.06.2008 12:42

2008

‘Burrima’ river gum forest understorey 2008.

What has become clear in recent years is that many of the big challenges facing both the cotton and grain industries are common.



Cotton farmers are increasingly growing irrigated grain crops in their farming system, but the supporting farming systems R&D is disjointed.

Cotton and grains: looking for R&D leverage

By Bruce Finney

Regularly flagged on the back page of *Spotlight* is discussion concerning the importance of collaboration in rural R&D. Improving effectiveness of R&D investments has also been a *Spotlight* magazine focus.

In this issue we wish to extend the discussion by announcing that Cotton Research & Development Corporation (CRDC) and Grains Research & Development Corporation (GRDC) have agreed to formally investigate the opportunities for greater collaboration in R&D. In the past, collaborative investments between CRDC and other industry-based R&D corporations have been many and in the main, quite successful. These however would have been to address specific knowledge gaps or capacity rather than an addressing a whole-of-industry need, which is the case now with this formal investigation.

In assessing the new challenge, our scan initially suggests opportunities are many. These are likely to range from enhancing current research interactions to establishing closer business ties. Importantly we are entering into the investigation with an open mind and a primary focus of improving outcomes for growers, our industries, government and our research partners.

WHY ARE WE DOING THIS?

We are undertaking this investigation in response to the changing operating environment for rural R&D and a realisation that the R&D needs of our common grower stakeholders are progressively coming closer together, and this trend is heightening when we look at the trends in global markets and see daily evidence that demands for food and fibre are increasing.

Beyond the unique R&D needs of cotton and grains where there

remain numerous separate questions to solve, there are many areas of shared R&D interest, particularly in the irrigated and northern farming systems. What has become clear in recent years is that many of the big challenges facing both industries are common. For example, variable future climates, the need for improved natural resource management and on-farm responses to future government policy surrounding the carbon pollution reduction scheme are themes that sees R&D at their core.

The impact of climate change could potentially result in more cotton and grain production in northern regions of Australia, mostly under irrigated conditions. Farmers who specialise in cotton are increasingly growing irrigated grain crops in their farming system while the supporting R&D needs of these farming systems is disjointed.

For example, fertiliser usage, water use efficiency and integrated pest management practice are common issues to both irrigated grains and cotton production, yet the R&D responses delivered by grains and cotton industries are separate. The potential to move our existing R&D collaboration from beyond coordination to integration of scientific research and its pathway to adoption is exciting.

CRDC believes the results of this study will assist us to respond better to the Australian government's challenge for greater collaboration across industry sectors. It can also focus attention given to national strategic R&D issues. As individual organisations, CRDC and GRDC argue for a strong alignment of strategic R&D Plan goals and synergies taken in research decisions. Additionally, we have

common research providers and it seems only prudent that we consider these matters in parallel. As federal and state governments are working through a coordinated assessment of primary industries research and development capacities nation-wide, the focus is on the R&D capacity of our industries and how we sustain them in long-term

We believe this review is paramount. This is particularly so given the needs of our farming enterprises to improve productivity while remaining competitive in the face of converging global challenges for food production, climate change and sustainable use of resource.

Independent consultants are now engaged on their task to complete the investigation over the next three months, concluding early 2009. The objective of this consultancy is to identify and critically assess a range of opportunities by which CRDC and GRDC could work together more effectively to enhance the delivery of R&D benefits to shared stakeholders.

The terms of reference include:

- Assessing the strategic drivers for and against closer collaboration;
- Identify functional areas where closer collaboration will deliver the greatest benefit; and
- Assessing critically, improved collaboration across a range of delivery options

The consultants will seek input from industry, government and research partners during the investigation and CRDC looks forward to informing industry about the findings as they become known.

? Contact Bruce Finney for further information 02 6792 4088

