COTTON RESEARCH & DEVELOPMENT CORPORATION

Spotlight on Cotton R&D

SUMMER 2011/12

YOUR COTTON INDUSTRY

MID-SEASON DECISIONS

10 page feature

Best Practice

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The Australian cotton industry involves a diverse range of participants who all contribute to its innovative culture and ongoing sustainability and success.

IN THE SPOTLIGHT

They say no two seasons are the same, but the cold and wet start of 2011/12 has so far been remarkably similar to last year for many growers. With a large planting achieved and the potential for another record crop let's hope the rest of the season proves to be kind to the Australian cotton industry.

In this edition of *Spotlight* we have sought to provide you with topical mid-season R&D information on management of glyphosate resistance in fallows, overhead irrigation efficiency, how to deal with the sometimes hard to manage feathertop rhodes grass, farm biosecurity and a check list for efficient and safe spraying techniques. This information is based on the latest research so we trust growers and consultants find this useful in managing crops to their maximum potential throughout the remainder of the growing season.

We have also sought to give explanation of our industry, its organisations and their roles in R&D. While CRDC has consciously sought to go about its business in an effective but inconspicuous manner we have been prompted to share the story of our industry R&D effort as a whole by the large number of new growers and by changing circumstances within our sector.

R&D in the Australian cotton industry is arguably the best of its class in the world. This is no fluke, it's the result of decades of commitment that originated with the foresight of pioneer growers and industry organisations. Committed growers, researchers and organisations working together with the support of the Australian Government since the 1980s have underpinned the evolution of the industry we know today.

It's not that many years ago when our industry was a bit like Shrek – "big, with some very unattractive habits and misunderstood". Remarkable changes in pest management, water use efficiency, GM traits and yields gains have seemingly occurred in the blink of the eye.

A key contributor for the past 19 years has been the Cotton Cooperative Research Centre (CRC), which will wind up in June next year. The Australian Government launched the Cooperative Research Centres Program in 1990 through the now Department of Innovation, Industry, Science and Research which provided funding for programs up to seven years. The cotton industry was successful in bidding for the establishment of a CRC for Sustainable Cotton Production in 1993 and successive rounds in 1999 with the Australian Cotton Cooperative Research Centre (CRC) and in 2003 the CRC received its third and final round of funding as the Cotton Catchment Communities CRC.

On behalf of CRDC I congratulate all those involved in the CRC over these years on their contribution to the industry. There is much happening over the coming months to ensure the legacy of the Cotton CRC's R&D contribution continues to provide industry benefits for years ahead.

With the festive season and a new year upon us it's timely to be thinking about achievements and future possibilities. Our industry Vision 2029 tells the story of "Australian cotton, carefully grown, naturally world's best" with its traits being responsible, tough, successful, respected, capable and differentiated ... move over Shrek!

– Bruce Finney

Australian Government
Cotton Research and Development Corporation

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

THERE IS LITTLE DOUBT R&D CONTRIBUTED TO THE SUSTAINABILITY OF THE INDUSTRY THROUGH THE HARD TIMES AND HAS SET IT UP WELL FOR THE FUTURE, AS ELIZABETH TOUT REPORTS.

The new century began a decade ago with what was then a record production of 3.6 million bales of cotton. But as we know all too well, this was followed by a devastating decade-long drought. Hundreds of farmers left the cotton industry during this period. However this was also a time when the impact of decades of dedicated research and development investment by farmers, the industry and government contributed directly to the sustainability of the industry through the hard times, while setting it up well for the future.

And then came the 2010–11 season. An end to the longest drought on record and an Australian record harvest of just below four million bales. At the same time cotton prices rose, allowing growers to repair some of the financial damage of the previous decade. With ample stored water, we look forward to an even better outcome for 2011–12.

The drought's end was not good news for all growers. Some in Central Queensland and on the Darling Downs lost their entire crops to flood waters – an estimated 10 per cent of total planted area was lost and many suffered extensive on-farm infrastructure and soil damage. Others in the northern regions suffered ongoing problems with waterlogged crops.

From an R&D perspective, these conditions 'reality tested' the industry's new R&D delivery system as industry moved from a regional extension service to a more targeted and commercially linked R&D delivery system. CRDC is delighted to say the new cotton industry Development and Delivery Team and the scientists who work with them were well set up to provide timely post-flood advice to growers and consultants on how to manage flood-affected crops. This included recovering seemingly lost yield potential through management strategies gained in years of research into growing cotton in tropical climates.

Helping the cotton industry adapt to post-drought conditions is *Vision 2029* – a joint initiative launched to an enthusiastic reception at last year's Cotton Conference and developed to ensure the whole industry could 'see' its way into the future and head off challenges. Evidence of the early success of Vision 2029 is its role in helping industry plan for the 2012 Cotton Conference.

The 2010–11 season also saw the launch of the new best management practices system, *my*BMP. This new resource is housed in a responsive, interactive online portal which allows individual growers to assess and manage risks and decide their own level of involvement that could range from self-assessment to many levels of certified best practice. The key objective of *my*BMP is to have a single 'place' where producers can access the applied knowledge that comes from R&D.

From CRDC's perspective, the 'noughties' saw a greatly increased emphasis on post-farm gate R&D. The Value Chain Program is heavily involved in the Premium Cotton Initiative, which has partners right across the production chain. This initiative is already demonstrating ways where we can add value to the Australian cotton industry through securing a place in high value markets for Australian premium cotton varieties and ensuring the inherent fibre quality is maintained through the on-farm production, ginning and fibre processing stages.

Above all, the R&D 'learnings' of the drought decade and the years leading up to it would not have been as effective or productive without the engagement of this self reliant industry and its research partners. Cotton growers and ginners continue to provide valuable guidance through Cotton Australia on research priorities, critical review of project design and impact. Equally, these close linkages support strong levels of R&D adoption by industry and a responsive research community.

Australia's cotton industry began with people with vision and the industry has cemented those values in the way it does business these days: characterised in 2011 by growers in southern NSW who voted with their feet and built their own gin, and in doing so, continued the long-standing tradition. Here, Southern cotton's Whitton Gin directors, Tim Commins, Larry Walsh, Gerard Toscan, Scott Hogan, Roger Commins and Whitton Gin manager, Chris Veness, at the construction site. Photo courtesy The Land.

Further information

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Clockwise from front (left) James Kahl, Mike Logan, Bruce Finney, Andrew Watson, Rob Dugdale, Greg Kauter, Paula Jones, Philip Armytage, Peter Graham, Dave Anthony and Adam Kay met this year to discuss the future of R&D past the dissolution of the Cotton CRC in June 2012.

WHERE NEXT WITH COTTON R&D?

A NEW COTTON INNOVATION NETWORK WAS ESTABLISHED TO DEAL WITH A RECENT NATIONAL REVIEW OF RURAL R&D. THIS HELPS DEAL WITH THE RECENT FEDERAL GOVERNMENT DECISION NOT TO EXTEND THE COTTON CRC BEYOND JUNE 2012.

History shows the cotton industry has been well served by its research and development (R&D) investment, provision and delivery of research results. Throughout the changes that have occurred to R&D direction and organisations significant benefits have flowed. These benefits have included improved management practices and locally adapted Australian cotton varieties that have delivered year on year yield and quality gains.

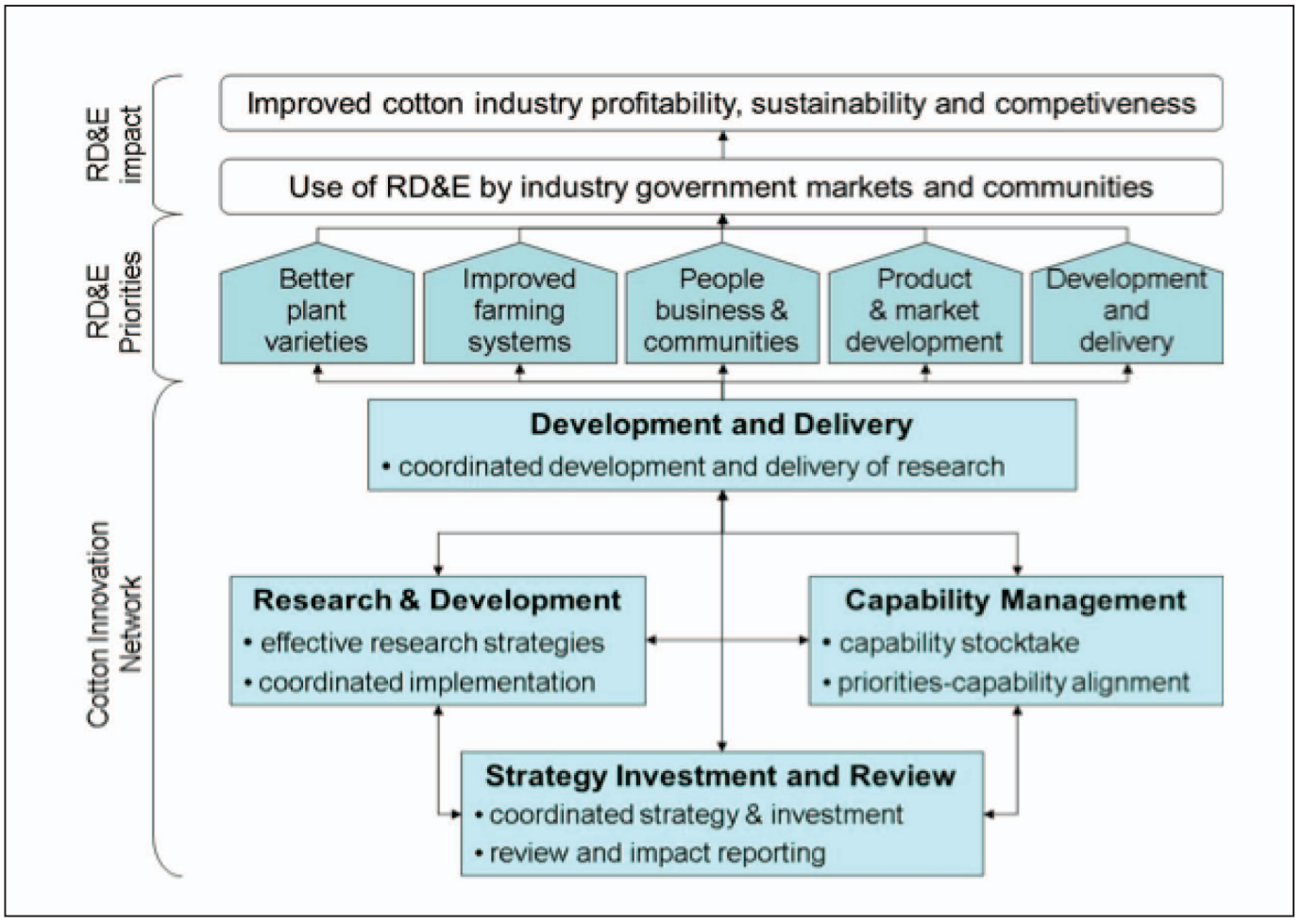
Similarly R&D has provided the knowledge and tools for radical changes in crop, pest, soil and water management practices ensuring the ongoing sustainability and productivity of Australian cotton production.

In more recent years the R&D effort has given life to new and productive industry engagement with our communities and with brand owners, going beyond the traditional end market relationships with spinners. There is much to recognise and be thankful to our industry researchers for their good work.

Our responsibility is to ensure that we continue to lead and invest in R&D that meets both the immediate and longer term needs of the industry to achieve the industry vision "Australian cotton, carefully grown, naturally world's best". Achieving this vision will require R&D to focus on:

- Better plant varieties
- Improved farming systems
- Capable people, business and sustainable communities
- Product and market development
- The development and delivery of research

To do this to best effect we need to keep building upon strong partnerships with government, research agencies and industry more broadly. Understanding and meeting shared needs is critical in maintaining support for R&D. We are indeed fortunate to have a highly effective and supportive industry representative organisation in Cotton Australia as this is a key ingredient in making cotton industry R&D work well for growers.



Our challenge is not only to achieve the vision, but to do this post the cessation of the Cotton CRC in June 2012. Meetings of key industry organisations have occurred to analyse the implications of the cessation of the Cotton CRC to the future of cotton industry R&D. A gap analysis of future R&D functions was undertaken in the process that highlighted the preparedness of industry for this circumstance as well as matters needing attention.

CRDC is progressing with its annual assessment of future investment in research projects, including projects that CRDC would have been undertaken through the Cotton CRC as well as some additional projects that the CRC had proposed to undertake. There are, however, a number of projects that fall outside the scope of the current cotton sector RD&E strategy and CRDC's 2008-13 Strategic R&D Plan. It is possible, but unclear, whether these projects will go ahead in the future.

A more immediate matter is ensuring the ongoing delivery of research results through the cotton industry Development & Delivery team that has been managed by the Cotton CRC. Cotton Australia and CRDC are committed to ensuring that this relatively new model and important pathway for research adoption continues to function well for growers, industry and other end users. The Development & Delivery team are responsible for assisting growers to access the R&D information they need, including during seasonal events such as floods or pest outbreaks, as well as conducting targeted campaigns that meet broader industry goals.

That there are a number of ways growers can access R&D information in our industry is a strength. The cotton industry Development & Delivery team serves a unique role in facilitating communication between researchers, growers, consultants and agribusiness, catchment management authorities and industry. They typically assist with matters not serviced by commercial service providers. That Development & Delivery and *my*BMP are integrated recognises the important linkage between industry R&D, industry performance and support of the community (social licence) for an Australian cotton industry.

That all this change is occurring during a remarkable upturn in cotton production is opportune as the capacity for funding R&D is once again strong and equally over the last year we have developed a plan for cotton industry R,D&E with key industry and research organisations that can collectively guide the future direction and foster collaboration in research.

Some loss of industry R&D scale and scope can be anticipated in the short term as the industry adapts to new institutional arrangements and rebuilds capacity forgone during the drought. Nevertheless there is little doubt that cotton research into the future will continue to be highly effective in serving the needs of industry and the community.

"THE FACT THERE ARE A NUMBER OF WAYS GROWERS CAN ACCESS R&D INFORMATION IS A STRENGTH OF OUR INDUSTRY."

STOP PRESS

The Cotton CRC is developing a documentary on the history of the Australian Cotton Industry. We are looking for footage (VIDEO or FILM) of early cotton growing which can be included in the documentary. The documentary will be finalised and premièred at the Cotton CRC's Science Forum in March 2012. Anyone who has footage that they are willing to have included in the documentary, please contact Paula Jones at the Cotton CRC (02) 6799 2440 or paula.jones@cottoncrc.org.au

The system of collecting production levies over the long term for R&D investment by rural industries to invest in research, development and extension has helped Australia farmers benefit from new knowledge, tools and technologies to remain competitive in global cotton markets.

YOUR R&D LEVIES AT WORK

AUSTRALIA'S FARM BUSINESSES ARE WORLD LEADERS IN PRODUCTION EFFICIENCY, SUSTAINABILITY, PRODUCT QUALITY, INNOVATION AND SUPPLY AND RESPONSE TO MARKET NEEDS.

An effective system of primary industry levies and charges can help businesses work together, pooling their effort and resources to find solutions to priority issues. It can support research and development, promotion and marketing, residue testing, plant and animal health programs.

Usually an industry body identifies the need for a levy or charge to respond to a problem or opportunity requiring collective industry funding. The industry body then puts a levy proposal to its members for discussion and consults with the Department on the proposal.

The levy system has enabled industries to maintain their position in highly competitive world markets. At the time when CRDC was established as a corporation by the Federal Government in 1990, growers agreed to pay a compulsory R&D levy of $1.75 per bale to place long-term investment in R&D on a solid footing. Under this arrangement, cemented in legislation by Government, it also agreed to match the growers' levy.

Fourteen rural industries currently have R&D levies similar to the cotton industry.

Gins collect the R&D levy (now $2.25)on every bale of Australian cotton. Gins remit growers' levies to the Australian Government Department of Agriculture, Fisheries and Forestry's (DAFF) Levies Revenue Service. Government matches grower levies and this is provided to CRDC to invest on approved R&D on behalf of both growers and the government.

In addition to supporting the CRDC R&D program, the levy also provides funding for plant biosecurity programs via Plant Health Australia – the Government agency with national responsibility to manage the nation's biosecurity.

In early 2000 the industry consulted, agreed and then successfully proposed to government that the levy should increase by 50 cents per bale to $2.25.

This increase in the cotton R&D levy lifted the percentage of the industry's gross value of production from 0.39 percent to an estimated 0.49 percent. CRDC saw this as an endorsement of its strategic R&D directions and particularly the new BMP program which had helped transform the industry's environmental performance.

The nature of levies means the income of CRDC rises and falls with the seasons.

Looking back, a decade since levies were last increased, industry levies in the 2000–01 season raised $6.93 million.

In stark contrast, levy revenue in 2008–09 was $2.37 million and in 2009–10, $3.43 million. Managing a stable R&D program in this fluctuating financial environment presents great challenges but CRDC has managed to maintain much of its core R&D program and key scientists by prudent management of reserve funds.

In the current improved environment, CRDC is again building its financial reserves for future downturns in production.

Critically, the system of collecting levies over the long term to invest in research, development and extension has helped farmers benefit to remain productive and competitive in global cotton markets.

see our website

For further information on the levy collection system, go to: www.daff.gov.au/agriculture-food/levies

THE GROWERS' VOICE – COTTON AUSTRALIA

THE MASSIVE REDUCTION IN PESTICIDE USE AND INCREASED WATER EFFICIENCY ARE ONLY TWO OF THE MANY BENEFITS FROM THE RESEARCH LED INTRODUCTION OF BIOTECHNOLOGY. COTTON AUSTRALIA'S DAVID BONE REPORTS THE VALUE OF RESEARCH WITHIN THE COTTON INDUSTRY HAS LONG BEEN PROVEN AND UNDERSTOOD.

Cotton Australia Chief Executive Officer Adam Kay (right) puts forward questions to the now Federal Minister for Sustainability, Environment, Water, Population and Communities Tony Burke on a visit to Moree last year, when he was Minister for Agriculture, Fisheries and Forestry.

Maintaining our pre-eminent research capability is a challenge which must constantly be addressed. The cotton industry works to carefully guide our research efforts, allocating precious grower levies and often-scarce research funding for the maximum benefit.

Maintaining a system which allows direct grower feedback into all elements of cotton research is a critical part of this process.

Cotton Australia holds the important role as prescribed under the PIERD Act (1989) of Representative Organisation to the CRDC. In this capacity, Cotton Australia provides ongoing advice to CRDC on research projects funded by the Cotton R&D levy and matched by the Australian Government.

This advice is formally provided on all current and new research proposals, through Cotton Australia's four advisory panels; Value Chain, Farming Systems, Biosecurity and Human Capacity.

Cotton Australia is truly the growers' voice of our industry. With our system of advisory panels designed to give cotton growers a direct input into the priorities of Cotton Australia, the advisory panels work to align grower research priorities with the strategic direction provided by CRDC's five year strategic plan.

Pathways for input

There are four advisory panels and nominated representatives can be asked to serve on one or more advisory panel, providing a pathway for member input.

The Value Chain Advisory Panel looks at ways to develop contemporary knowledge and intelligence about products, markets and supply chains. The panel also considers research to develop improvements in current products, advancing cotton product processing and facilitate the development of objective measurement of Australian cotton fibre.

The Biosecurity Advisory Panel aims to identify and communicate biosecurity threats, while supporting the industry's preparedness to deal with potential biosecurity threats. This panel also guides research into the management of established, invasive and endemic insect pests, weeds and diseases.

The Farming Systems Advisory Panel aims to build the cotton industry's understanding of climate and natural resource challenges as well as enhancing the capacity of the industry to adopt resilient and adaptive farming systems.

The panel aims to identify, understand and plan for future industry capacity need, and is also charged with improving human resource development and capacity while enhancing the capacity to innovate.

During the 2010/11 financial year these panels provided CRDC with feedback on 20 finishing projects, 60 continuing projects,107 preliminary projects and 72 full research projects.

Key challenges

A key challenge for CRDC and industry R&D has been its steadily declining income due to less levy income collected as a consequence of the drought. The matched contribution formula is based on a three year average value of production which meant the 2010 R&D budget was again reduced due to previous low production years.

Rural R&D was also put under the spotlight this year with a Productivity Commission review looking at the government's return on investment

"MAINTAINING A SYSTEM WHICH ALLOWS DIRECT GROWER FEEDBACK INTO ALL ELEMENTS OF RESEARCH IS CRITICAL."

in this area. Cotton Australia led the cotton industry's submission and also coordinated a cross-sectoral group including over 20 commodity groups in compiling a joint submission. Cotton Australia was disappointed in the draft findings that suggested major funding cuts, and began gearing up for a sustained fight to ensure research dollars continue to flow. When the final findings were handed down, the Minister decided not to accept the recommendations, providing another significant win to Cotton Australia's lobby efforts.

As part of the Australian Cotton industry's adoption of biotechnology, Cotton Australia supports the implementation of cotton industry resistance management and biosecurity strategies.

Cotton Australia plays a key role in providing industry validation of the resistance management strategies for registered biotechnology traits and insecticides as well as leading cotton industry biosecurity initiatives.

The cotton industry Transgenic and Insecticides Management Strategies (TIMS) committee is charged with the development of the major industry resistance management strategies and is convened by Cotton Australia.

Recently major reviews were undertaken for the Bollgard II Resistance Management Plan, Roundup Ready Flex Crop Management Plan and Insecticide Resistance Management Strategies (IRMS).

During the last year, the TIMS Committee also had one of the busiest cotton planting periods in recent seasons with eight Cotton Grower Association requests for variations to the regional Bollgard II planting windows due to the unseasonably wet spring. In addition, there were two in-season requests to TIMS to vary the regional cotton IRMS windows for mectins and primicarb insecticides.

The Queensland floods also presented a challenge for growers of Bollgard II cotton due to prolonged inundation. A number of growers lost pigeon pea refuge crops to flood and the TIMS Committee with Monsanto determined a resistance plan to manage the flooded Bollgard II crops on a regional basis for the remainder of the season.

Cotton Australia also proactively addressed impending threats from new or emerging pests during the season. CRDC funding was provided to develop Cotton Australia applications for APVMA minor use permits for a range of insecticides for the control of locusts and mealybugs.

Further information

Cotton Australia
02 9669 5222 or visit the website
www.cottonaustralia.com.au

see our website

Minister for Agriculture, Fisheries and Forestry Joe Ludwig.

WHY DOES GOVERNMENT INVEST IN THE COTTON INDUSTRY?

THE RURAL RESEARCH AND DEVELOPMENT CORPORATIONS BRING INDUSTRY AND GOVERNMENT TOGETHER TO ESTABLISH RESEARCH AND DEVELOPMENT STRATEGIC DIRECTIONS AND TO FUND PROJECTS THAT PROVIDE INDUSTRY WITH THE INNOVATION AND PRODUCTIVITY TOOLS TO COMPETE IN GLOBAL MARKETS.

The Rural Research and Development Corporation model of joint industry and government funding has been a vital element in the success of Australia's R&D effort. The Council of Rural Research and Development Corporations (CRRDC) is a forum for ensuring that the RDC model continues to contribute to a sustainable and profitable Australian agricultural sector.

The Federal Government is strongly committed to rural research and development, including in the cotton sector.

"The government recognises it plays a vital role in supporting the sustainability, competitiveness and productivity growth of Australia's rural industries, and the communities which depend on them," Minister for Agriculture, Forestry and Fisheries Joe Ludwig said.

"Cotton is an important industry in Australia.

"The government works with the industry when it comes to research and development, making dollar-matching contributions to the Cotton Research and Development Corporation.

"In 2009-10 the contribution was $2.99 million, compared with $2.43 million in the previous financial year."

Minister Ludwig said the success of the RDC model came from the engagement of industry in funding research to develop and generate industry ownership and adoption of research outcomes.

"This model has proven to be a successful mechanism to share the costs of research and development that both directly benefits primary producers and provides wider community benefits," he said.

"The model helps ensure research and development reflects industry needs and priorities and facilitates industry uptake of research outcomes."

Australia is an active member of the International Cotton Advisory Committee (ICAC) and has been a collaborative international partner in the fields of market information and research, harmonisation of international standards and promotion of a healthy world cotton economy.

"Our country is leading the charge for a strategic plan for international cotton research to identify priorities for international research and collaboration," the Minister said.

"This plan would allow for improvements to collaborations across international organisations and for the removal of existing barriers that prevent efficient and effective delivery of research outputs.

"Australia has also been able to contribute its experiences from the operation and subsequent collapse of the Australian wool price stabilisation scheme to provide a unique insight in discussions on cotton price volatility.

"The strategic and collaborative approach taken by the Australian industry and facilitated by our membership to ICAC has supported Australia's status in producing the highest yielding, highest quality and most environmentally friendly cotton in the world."
www.daff.gov.au

see our website

AN INDUSTRY VESTED IN THE VALUE OF R&D

A 40-YEAR TRADITION OF COLLECTIVE INVESTMENT IN RESEARCH AND EXTENSION FIRMLY ESTABLISHED A STRONG INDUSTRY THAT VALUES R&D. ELIZABETH TOUT REPORTS.

Within a short time of the establishment of the modern Australian cotton industry, growers quickly recognised the benefits of reinvesting some income in R&D. The major ginning companies and the then recently formed Cotton Seed Distributors grower cooperative founded the Australian Cotton Growers' Research Association Inc (ACGRA) in 1972 and began to collect a voluntary levy of 25 cents per bale to invest in research.

ACGRA undertook a direct grant model of research investment, mainly involving CSIRO, NSW and Queensland Departments of Primary Industries. Projects were considered and prioritised by a research committee of grower representatives.

This recognition of the importance of collective funding to invest in research and extension of research firmly established a strong industry value on R&D to inform and define best practice in cotton production.

In 1973 ACGRA had met with representatives of the Australian Government Department of Primary Industries to promote their proposal for a matching funding model by industry and government. This vision was finally realised in the mid-1980s with the introduction of the Rural Research Councils, which increased matched Commonwealth funding up to a maximum contribution of 0.5 percent of the annual gross value of production.

The Australian Government imposed conditions on this support that very much set the scene for the high level of accountability for expenditure of taxpayer funds that continues to this day. Among these, it required the new Cotton Research Council to consult with industry and submit for approval a five-year strategic R&D plan specifying the broad strategies the council would adopt to meet its objectives, as well as an annual R&D plan.

Following 1989, legislation by the Commonwealth provided for the establishment of Rural Research and Development Corporations. The Cotton Research and Development Corporation (CRDC) superseded the Cotton Research Council in 1990 and remains the principal cotton R&D investment body.

The Australian Government also launched the Cooperative Research Centres Program in 1990 and the cotton industry was successful in bidding for the establishment of a CRC for Sustainable Cotton Production in 1993 and successive rounds in 1999. The bid for third cotton CRC was successful (and unprecendented as no other CRC has been granted a third term) and the Cotton Catchment Communities CRC was established in 2006 and finishes its term in June 2012.

Following many years of investing in both conventional and GM cotton breeding, CRDC was able to redirect funds when the CSIRO and Cotton Seed Distributors formed Cotton Breeding Australia in 2007.

CRDC then became a key driver of a new industry Premium Cotton Initiative, which is developing partnerships across the cotton value chain to secure higher value markets for Australian premium cotton. This followed a greatly increased focus on post-farm gate R&D in the new century, to maintain fibre quality right throughout the production chain.

ACGRA merged with Cotton Australia in 2008 and Cotton Australia was established at CRDC's official industry representative body. On behalf of industry it reviews existing CRDC projects and makes recommendations on project submissions and collaborates in many other ways.

CRDC and the CRC have worked closely over the years, with a particularly strong relationship with the current CRC aided by an annual $4million investment by CRDC in collaborative research. CRDC's other research partners range from the CSIRO to Cotton Australia, the NSW and Queensland primary industries and natural resources departments, several universities, Crop Consultants Australia and agribusinesses.

A key element of this strong industry R&D culture is the commitment of many individual growers to hosting and/or conducting on-farm trials to assist researchers directly and/or validate research findings in regions and situations where the original research was not conducted. Cotton growers' ability to fund and conduct this level of research would be limited without the professional research management conducted by CRDC – and vice versa.

INDUSTRY'S R&D PANELS

Cotton Australia's nominated representatives are asked to serve on one or more advisory panels. These advisory panels act as a pathway for member input. There are four advisory panels:

Value Chain

The **Value Chain** advisory panel aims to: look at ways to develop contemporary knowledge and intelligence about products, markets and supply chains; develop improvements in current products; facilitate the development of novel products; advance cotton product processing; and facilitate the development of objective measurement of Australian cotton fibre.

Bob Dall'Alba - Chair

- Lyndon Mulligan • Damien Erbacher
- Greg Morris • Wayne Towns
- Nigel Corish • Andrew Garnsey
- Tony Bailey • Cleave Rogan
- Hamish Millar

Biosecurity

The **Biosecurity** advisory panel aims to; identify and communicate biosecurity threats; support the industry's preparedness to deal with biosecurity threats; research the management of established, invasive and endemic insect pests, weeds and diseases; and assure industry capacity to manage the stewardship of biotechnologies and crop protection products.

- Damien Erbacher • Bill Tyrwhitt
- Andrew Greste • John Cameron
- Nev Walton • Andrew Parkes
- Neek Morawitz • Matt Holding
- Rob Lowe • Shane Bodiam
- Cleave Rogan • Stephen Ainsworth

Farming Systems

The **Farming Systems** advisory panel aims to: build the industry's understanding of climate and natural resource challenges; and enhance the capacity of the industry to adopt resilient and adaptive farming systems.

John Cameron – Chair

- Tony Taylor • Joe Robinson
- Geoff Brownlie • Rob Collins
- Hugh Ball • Peter Watson
- Mal Pritchard • Nigel Corish
- Shane Bodiam • Andrew Garnsey
- Rob Lowe

Human Capacity

The Human Capacity advisory panel aims to identify, understand and plan for future industry capacity needs; improve human resource development and capacity; and enhance the capacity to innovate.

Phil Firth – Chair

- Andrew Greste • Glenn Rogan
- Barb Grey

FUTURE FARMING

FARMING SYSTEMS: COTTON IN A HIGHLY PRODUCTIVE FARMING SYSTEM WITH IMPROVED ENVIRONMENTAL PERFORMANCE

CRDC currently directs two thirds of its R&D investment to secure the future productivity of cotton farming systems. In dollar terms, there are four issues currently dominating Farming Systems R&D investment.

- Increasing cotton's water use efficiency.
- Managing pests, weeds and diseases.
- Monitoring insecticide and Bt resistance in key insect pests.
- Developing and evaluating tactics for pre-emptive resistance management, particularly for the Bt technologies.

Respectively these issues account for 10, 17.5, nine and 11.5 percent of total R&D investment. The remaining 20 percent is spread across a range of issues which broadly aim to prepare cotton farming systems for changes in policy and regulation, improve the resilience of cotton farming systems and prepare the industry for exotic biosecurity threats.

While the primary aims of investment are to build the profitability and environmental sustainability of cotton production for cotton growers, there are secondary aims which are also important for the longer term. The program seeks to work with the research community to ensure there are capable researchers for the future as well as for today.

A small number of projects aim to explore 'unknowns' such as developing new research techniques with new technologies, discovering new pest control products and studying aspects of pest ecology. Any of these may reveal a new or unexpected approach for management, however such projects tend to be longer term and in some instances may not result in direct results for growers. Nevertheless they serve as important sources of innovation in research.

The following gives an outline of just some of the projects currently making up the farming systems R&D program.

Increasing water use efficiency

The National Program for Sustainable Irrigation (NPSI) continues the important and difficult task of benchmarking water use efficiency of cotton production, gathering data on commercial cotton farming enterprises.

Through jointly funding with GRDC, consistent water use efficiency benchmarks for cotton and key irrigated grain crops are being collated. Results from this project to date show that the GPWUI (Gross Production Water Use Index) has increased by 40 percent in the decade since the late 1990s – up from 0.79 bales of cotton per megalitre of water used to 1.14 bales.

Ongoing research into the development of dynamic deficits for irrigation scheduling is working to match irrigation to plant requirements in a variable climate**.** This involves further refinement of interactions between vapour pressure, plant stress and soil water.

A post-doctoral fellowship is investigating optimal irrigation of cotton via real-time adaptive control, the ultimate aim is the 'proof of concept' for automating scheduling of irrigations in furrow irrigation. Overhead irrigation systems have been studied previously.

CRDC is committed to supporting completion of the Cotton CRC's Burdekin cotton feasibility study. Cotton grows quite differently in wet conditions and this research is providing vital spin-off benefits for other regions in La Niña-influenced seasons.

Flooding in Queensland in 2010/11 saw CRDC-supported Burdekin cotton researchers provide assistance that aided many Emerald growers in recovering some lost yield potential in a very difficult season.

Pests, weeds and diseases

Across numerous projects, research aims to strengthen cotton growers' ability to adopt Integrated Pest Management (IPM) strategies. Work continues on the ecology of green vegetable bugs, thresholds for cotton stainer bug, green jassid, mirids and stinkbugs and trialling the efficacy of novel products for their control. The need to continue this research was underlined in 2010–11 by the withdrawal of endosulfan, which has been an effective insecticide for the management of these pests over many years within IPM programs.

Other IPM work includes validation of the silverleaf whitelfly (SLW) threshold matrix in southern cotton regions, determining rates of SLW honeydew breakdown on cotton and the consequences for cotton lint quality and surveying alternative plant hosts for cotton bunchy top disease.

Knowledge gained from past CRDC investments into whitefly management has recently been used by the CSIRO team at ACRI to develop the Whitefly Threshold Matrix web tool which can be accessed through the www.cottassist.crc.org.au website.

Researchers are also undertaking a cost:benefit analysis of delaying versus living with glyphosate resistance in weeds in cotton-grain farming systems. Research will focus on improve the cost:benefit to a point where growers are likely to alter their weed management practices.

Following development of the first Cotton Biosecurity Manual, CRDC established projects in 2010–11 to continue disease surveillance and investigating management options. New pathology projects are investigating interactions between disease severity and crop nutrition, disease decline with crop rotation and the screening of new seed treatments. The research teams will also increase their capacity to use new molecular techniques to track the genetic diversity of key diseases.

There has been a renewed emphasis on the farm hygiene program 'Come Clean, Go Clean' to protect farms from soil borne diseases, weed seeds with herbicide resistance and new insect pests, particularly mealy bug. Research also continues to develop capacity to manage cotton viral diseases. Australia's contingency plan for cotton leaf curl disease has been strengthened by new knowledge that several vegetable crops are also hosts, meaning the cotton industry can now collaborate with vegetable industries to achieve more effective surveillance.

CRDC continues to provide support for building the capacity of the cotton and grains industry to improve pesticide application and drift management. As well as delivering workshops to growers throughout cotton regions to achieve high standards in growers' spray application, there is now a network of certified spray application workshop providers in NSW offering advanced level courses across the broadacre agricultural sector.

Monitoring insecticide and Bt resistance

Annually, programs monitor *Helicoverpa armigera*, *H. punctigera*, cotton and green peach aphid, two spotted mites and silverleaf whitefly for changes in susceptibility to insecticides and Bt toxins. Samples are collected from many cotton regions with assistance from crop consultants. Results from all programs are used each year by Cotton Australia's TIMS Committee to ratify the Insecticide Resistance Strategy and evaluate the potential changes for the Resistance Management Plans for Bt cotton.

Tactics for pre-emptive resistance management

Bollgard II technology has made an enormous contribution to the viability of the Australian cotton industry over the past decade. Since its introduction a major research-driven resistance management effort means there has been little change in the frequency of resistance genes from the baselines established seven seasons ago.

The use of refuge crops is a significant part of resistance management. Research shows that at a landscape scale the performance of refuges is inherently variable, but researchers remain confident refuges are paramount to delaying the development of resistance in *Helicoverpa armigera* and *H. punctigera* to Bt cotton. New projects to examine ways to improve management of cotton refuges and look for alternatives to pupae busting are underway. Researchers are also revisiting the ecology of *Helicoverpa punctigera* in relation to migration and overwintering to better understand the implications for the evolution of *Bt* resistance.

Preparing for the future

Following the launch of *my*BMP at the Australian Cotton Conference in August 2010, CRDC continued to provide support to link research, extension and BMP facilitation. Agronomists with agribusinesses such as Cotton Grower Services are achieving accreditation as *my*BMP advisors. Katie and Johno Haire from Goondiwindi and Auscott Namoi are the first cotton growers to be fully *my*BMP-audited.

Researchers remain confident refuges are paramount to delaying the development of resistance in Helicoverpa armigera and H. punctigera to Bt cotton.

A new project is investigating how cotton plants grow in a changing climate. Cotton's physiological responses to sub optimal temperature regimes in combination with elevates carbon dioxide levels are being described.

Another new project seeks to improve the capacity to assess greenhouse gas emissions from broadacre irrigated cropping systems. It has been established on one of the two long-term cotton farming systems experimental sites supported by CRDC at the Australian Cotton Research Institute near Narrabri. Researchers will develop a protocol for assessing on-farm energy use and associated greenhouse gas emissions. The work will enable growers to identify how to reduce energy costs and greenhouse gas emissions on farm. A further project aims to improve the accuracy of energy use measurements.

Continuing research into farming systems aiming to maintain profitability and soil quality has resulted in a comprehensive report containing more than a decade of data addressing current community interest in soil organic carbon (SOC) with data that can assist informed decision-making well beyond the cotton industry.

Analysis of 11 long-term data sets from cotton farms across NSW revealed soils that have been well managed don't display the same level of improvement as poorly managed soils. Temperature was found to be a stronger influence on SOC than management, with SOC storage increasing progressively on moving northwards in NSW from Hillston to Narrabri.

CRDC's 2010-11 Annual Report can be viewed and downloaded at www.crdc.com.au. The full Farming Systems story starts at page 38.

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SEEKING VALUE PAST THE FARM GATE

VALUE CHAIN R&D INVESTMENTS AIM TO ADD VALUE TO THE AUSTRALIAN COTTON INDUSTRY WITH PREMIUM PRODUCTS AND IMPROVED ROUTES TO MARKET.

Australian exports make up more than10 percent of the medium/high medium grade cotton volume in the export market. Industry's R&D investments are now sharply focused on discovering where greater value can be obtained at all levels of the value chain spanning plant breeding, production and beyond the farm gate.

In the main, Australian cotton fibre is purchased by mills to produce high quality fine count yarns for use in the woven and knitted apparel sectors. International competition continually places downward pressure on any premiums, thus productivity and quality gains must be continually delivered by farmers and the industry with an engaged value chain to retain its competitive position.

With CRDC investment support industry recently invested in a survey that saw 35 mills in China, Japan, Korea, Thailand, Indonesia and Australia reveal their views on Australian cotton.

A new premium Australian fibre category, Australian Long Staple (ALS) is under investigation through collaboration with Australian Cotton Shippers Association (ACSA) to test the market opportunities for such a fibre. ALS aims to provide mills with cotton of set and objective specifications that will enable mills to produce higher quality yarns exclusively using ALS. Because the specifications are based on the measured performance of cotton fibre, farmers and gins have the key role in delivering consistent fibre that meets the ALS specification.

Australian cotton has traditionally been ranked second after Californian SJV. The survey showed SJV continues to be seen as superior in staple strength, grade and micronaire but Australian cotton wins out in properties such as low levels of neps, trash content and contamination. The reputation of Australian cotton for low contamination is confirmed by International Textile Manufacturers Federation (ITMF) Contamination Surveys, with the latest survey (2009) rating Australian cotton in the five countries least affected by contamination.

The Dri Glo range of Premium Australian Cotton products made it to stores this year as a result of the Premium Cotton Initiative.

Opportunity

Australian cotton has witnessed fibre length improving significantly over the last eight years and together with anticipated improvements in fibre strength and fineness, real opportunities may now exist to secure new premium markets for Australian growers committed to producing higher quality fibre. By combining fibre quality with the Australian cotton production story through *my*BMP, the PCI program targets three core outcomes: strengthening our reputation for quality, promoting industry values in production and providing value across the value chain.

Over the last four years, the PCI business strategy has focused on establishing collaborative product assessment and development programs with mills and fabric producers, targeted at brand owners and developing new markets for premium fabrics produced from BMP cotton. Working closely with brand owners is a new experience, and opportunity, for Australian cotton.

In 2010–11, shipments were delivered to mills in Hong Kong, China and India to test production of products for selected brand owners who expressed

interest in promoting the uniqueness of the Australian cotton story.

CRDC investments in BMP link to the PCI by developing management procedures and guidelines for growers, ginners and classers, as well as the transport, storage and shipping sectors. On-farm, BMP environmental management guidelines enable the industry to develop data on production performance and related natural resource management, which will provide key marketing material for brand owners.

Australian made

Working collaboratively with ACSA, CRDC has established links with a number of local brand owners to promote Australian cotton and BMP cotton to consumers.

Australian Weaving Mills has launched a range of products under a new premium Australian cotton/BMP brand, promoting the 'field to fabric' focus and the industry's BMP program. The industry will work with further brand owners in non-competing market segments.

Australian Weaving Mills developed a specific promotional program for their Dri Glo line of towels that is actively promoting the farmers who produce the premium cotton and the industry's BMP program.

Similarly, Hong Kong manufacturer Central Textiles is working with Japanese brand owner UNY, which operates about 1500 various specialty stores in Japan.

Together with researchers at CSIRO, CRDC has continued to investigate the performance of new CSIRO ALS cotton in the production of premium yarns. Trials showed this cotton can produce fine count combed ring-spun yarns in the range of 60Ne to 70Ne. More critically, in blends with Extra Long Staple (ELS) cotton, the trials found that a 70/30 blend of ELS/ALS did not result in a practical deterioration in yarn quality and processing efficiency. This is a key finding, as ELS-type cotton can trade at prices 60 to 80 percent higher than traditional Australian cotton.

The new opportunity for marketing ALS cotton will be dependent on the price differential between ALS and ELS raw fibre. If the market can be developed, higher premiums may be secured for Australian growers who produce high quality cotton. Already, the China-based mill Novetex has, through its partners, developed ALS BMP cotton garments for the European market this year.

The cotton industry, through CRDC, has invested more than $1 million in the development of SiroMat (measuring fibre maturity) and Cottonscan (assessing fibre fineness) and these technologies have been combined into one machine – Cottonscope.
Image courtesy CSIRO.

Agronomic factors and fibre quality

The Value Chain program seeks to maintain fibre quality 'from field to fabric'. A major collaborative project with the Cotton Catchment Communities CRC has investigated the key agronomic factors that affect fibre development and subsequent spinning efficiency.

Data developed over the last three years on the impact of the timing of picking and final crop quality has shown that accurate prediction of crop micronaire at harvest can be achieved by considering boll maturity at time of defoliation. While the technique involved assessing fibre quality of immature bolls before harvest, which may not be practical, a useful tool for predicting crop fibre quality may be developed using boll counts and boll maturity (seed coat colour).

Still on the farm, the development of round module machinery coupled with efficient engineering solutions to suit Australian gins has enabled growers to improve their harvest efficiency significantly. It is anticipated that 75 percent of the crop will be harvested with the new machines by 2013–14.

With the support of the industry, CRDC is investigating whether this requires changes to current BMP guidelines in gins.

Ginning research

Researchers at CSIRO have developed and assessed a new moisture sensor for high capacity saw gins - a fundamental problem that has been hard to measure. A provisional patent has been lodged and preliminary discussions have taken place with a potential commercial developer. Additional benefits may include a reduction in total energy use in the gin.

The cotton industry through CRDC has invested more than $1 million in the development of two technologies to measure fibre quality objectively. SiroMat measures fibre maturity, while Cottonscan assesses fibre fineness. Commercial partner BSE Electronics combined the technologies into one machine and released its first prototype in mid-2010 as Cottonscope.

By streamlining the two technologies and employing faster image processing and data analysis, they have reduced the test time to 25 seconds.

To improve mill efficiency, CRDC together with the Cotton Catchment Communities CRC has invested in the CSIRO's development of novel spinning software technology, Cottonspec, to offer accurate prediction of final yarn quality traits such as strength and evenness, based on raw fibre inputs and spinning techniques. Cottonspec is able to predict key properties such as yarn tenacity and yarn evenness and its future will be assessed following review of a business plan currently under development.

For further information, review Value Chain story and report in the CRDC 2010–11 Annual Report, starting on page 30.

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A SURVEY OF 35 MILLS WORLDWIDE FOUND AUSTRALIAN COTTON WINS OUT IN AREAS OF LOW NEPS LEVELS, TRASH CONTENT AND CONTAMINATION.

Best practice employment includes the farm owner/manager and farm staff taking on ongoing professional development. This is an important route for the adoption of new technologies and practices.

POWER IN THE PEOPLE

ACCESS TO FUTURE SKILLS EMERGED IN 2011 AS THE SINGLE MOST IMPORTANT ISSUE FOR OUR FARMERS, WHO MUST REMAIN INTERNATIONALLY COMPETITIVE TO STAY IN BUSINESS.

A Systems Thinking workshop in 2008 set out to discover how CRDC would best invest in its future cotton farming systems. Instead what occurred was a realisation that in excess of half the potential 'intervention' points in the farming system were in fact all about human capacity rather than the technologies that underpinned the modern cotton farm.

Also demonstrated was the number-one impact of GM technology in Australia was seen in managers, owners, advisors and suppliers freed up for the first time to focus on implementing best practices across all facets of their business.

As a result, greater yields have ensued in droughts and beyond, rain-fed cotton has surged in certainty and yields, cotton fibre quality has improved and many other positive outcomes have flowed in very tough times. Notably, this trend has not occurred with most of our competitors, thus Australia's competitive edge is mostly about its people.

However, the access to future skills remains a very challenging issue for all parts of the Australian industry and this issue has already emerged in 2011 as the single most important for our farmers who must remain internationally competitive to stay in business. Recognition of this significant and emerging acute trend is why CRDC has 'human capacity' as a one three strategies for R&D investment.

Much remains to be researched and discovered if human capacity is to secure the very future of the Australian industry. This issue has only been a strategic focus of CRDC for less than five years, whereas plant breeding has more than 50 years of intensive investment to get it to where it is today.

But many changes are underway, best practice human capacity is emerging and new resources are becoming available. On farm, *my*BMP provides useful resources for cotton producers, enabling them to meet their obligations as employers. However, the issue is much more broad and fundamental than simply complying with minimal or legal requirements. Best practice employment includes the farm owner/manager and farm staff taking on ongoing professional development. This is an important route for the adoption of new technologies and practices.

For suppliers, advisors and industry, addressing human capacity requires long term planning to ensure the right skills are in place to assure the services or research enterprise has a viable future.

Employer of choice

Put simply, the number one trend for best practice human capacity development throughout the industry – including farm and services, is for employers to become an 'employer of first choice'. This is well-proven by our leading farms, supply and processing companies. By applying best practice, the best employees naturally migrate to a workplace where the work is best. What happens beyond is ongoing professional development fills the skills needed and information also has a better flow toward a skilled workplace.

A series of focus group meetings with cotton producers and agribusinesses across Queensland and North-West NSW cotton production regions began exploring the bigger questions in mid-2010. It asked: 'what skills do people need in the next ten years to have viable businesses?' This produced a valuable benchmark of current thinking, attitudes, understanding and engagement with professional development activities and recognition by producers and agribusiness that learning is a lifelong issue which must occur in the workplace. The role of informal learning is just as critical, with a user-driven 'just in time' style of learning.

Much new human capacity research is now underway.

Workforce plan

In 2011-12, researchers from the University of Melbourne will work throughout industry to help in the co-development of an industry worforce plan. The Cotton CRC has undertaken a substantial body of research into how cotton communities function and how the economies of water and agriculture play out. From this, new insight into relationships between the cotton industry and cotton communities has emerged. An important initiative from this work has seen CRDC and the Cotton CRC supporting Sustainable Rural Communities conferences – the next is in Narrabri from April 18-20, 2012.

CRDC also supports a range of scholarships and initiatives that are successfully attracting a sharp increase in new entrants to science in universities. The next step will require employers of these future graduates to engage them in the cotton industry and to provide long-term opportunities and effective workplaces to ensure they can have rewarding research careers in this vibrant industry.

A new project conducted for CRDC by the Women's Industry Network – Cotton (Wincott) canvassed women from many sectors across the industry and from all cotton valleys, to gain insight into the perception, understanding and implementation of environmental resource management programs such as *my*BMP and determine future avenues and practices to encourage increased participation in the program. Wincott has subsequently run three focus groups.

Agricultural colleges align

New pathways for training and education have recently emerged.

Both the Australian Agricultural College Corporation (AACC) and Tocal College have worked with CRDC to discover useful e-Learning tools and a 'manage staff' tool is under development to complement the HR module of *my*BMP.

An AACC Centre Pivot Lateral Move tool helps consultants and producers perform a system evaluation of these machines and this tool is under final review in 2011. Tocal College is developing a rapid skills online auditing system, which allows producers to review how they might go in a Recognition of Prior Learning (RPL) assessment.

Finally, Tocal's second e-Learning product under development is a case study of how OH&S can be incorporated into an online system for two industries: the Australian saleyard industry and the cotton industry.

A pilot project to better understand career pathways into the cotton industry was established in 2010–11 and a pilot program initiated with high schools in St George and Goondiwindi is developing improved information and resources for teachers.

Men and women representing the production, agronomy, research, development, agribusiness and marketing sectors, graduated from the CRDC and Cotton Australia industry capacity building Future Leaders course in November 2010. CRDC is supporting the third Australian Future Cotton Leaders program and an upcoming forum for all graduates of the program.

CRDC SUPPORTS A RANGE OF SCHOLARSHIPS AND INITIATIVES THAT ARE SUCCESSFULLY ATTRACTING A SHARP INCREASE IN NEW ENTRANTS TO SCIENCE IN UNIVERSITIES.

A 'Certified *my*BMP Advisor' program was introduced in 2011 to prepare agribusinesses to support growers through *my*BMP – the start of what is seen to be successful.

CRDC provided ongoing support for the Cooperative Partnership for Farming and Fishing Occupational Health & Safety, managed by the Rural Industries R&D Corporation, with the 2010–11 effort concentrating on communications and extension of existing knowledge. The current challenge is developing new ways to package and deliver messages about health and safety. Cotton enterprises surveyed are near the top in adopting farm health and safety plans but with considerable room for improvement, so support for the program will continue.

For further information, see the full Human Capacity story, turn to page 49 in our 2010–11 Annual Report. *The Cotton Australia Strategic Plan 2009-13* details strategy for 'member services and capacity building'.

REALISE YOUR FULL POTENTIAL WITH THE COTTON INDUSTRY

CRDC is encouraging people in the cotton industry who are keen to realise their full potential to apply for the Australian Future Cotton Leaders Program. The key aim of this program is to identify, develop and support emerging leaders to engage and integrate with the industry now, resulting in improved future leadership succession, with focus on the development and application of leadership skills through real life industry based projects.

The program is hosted by Cotton Australia in partnership with CRDC and graduates invariably go on to increase their capacity to lead and innovate, not just in the industry but personally as well. Graduates have gone on to increase their participation and leadership in different aspects of the industry and beyond.

Key program elements include face to face forums, individual integrated industry leadership project, group teleseminars and one on one sessions with facilitator Jo Eady. MentorMatch links participants with a mentor as part of their program. The mentors are current agricultural, business and or community leaders. The purpose of MentorMatch is to introduce emerging leaders to current leaders in an authentic real life context and for program participants to develop a fuller understanding of leadership roles, capabilities, strategies and opportunity.

AUSTRALIAN FUTURE COTTON LEADERS PROGRAM

This is the third program intake and there are 31 graduates to date. Open to emerging leaders from across the entire cotton industry supply chain, the program is free to participants as it is funded by the industry as an investment in future leadership.

Up to 15 people will be accepted into this program intake.

Applications close Thursday January 12 and the course runs until August 2012.

Please contact facilitator Jo Eady, Ruralscope, on 0356 822 811 or 0419 912 879 or e-mail jo@ruralscope.com for more information.

email us

OUR ENVIABLE INDUSTRY

AUSTRALIAN COTTON GROWERS ARE THE WORLD'S BEST BECAUSE THEY EMBRACE THE LATEST TECHNOLOGY ACCORDING TO DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY'S **PETER OTTESEN**.

ABOVE: Department of Agriculture, Fisheries and Forestry's Peter Ottesen meets with cotton growers on regional visits, as above with Brendon Warnock of Maules Creek in Northern NSW, which gives him direct experience to draw on when representing Australia at an international level.

BELOW: The Australian delegation to ICAC plenary meeting in 2009 (at back) Adam Kay, Ralph Shulze, Mike Logan, Bruce Pyke and (front) Richard Haire, Peter Ottesen and ICAC Executive Director Terry Townsend.

Peter is DAFF's General Manager, Crops, Horticulture, Wine and Irrigation and has led the Australian delegation to the annual plenary meeting of International Cotton Advisory Committee (ICAC) for the past three years. As such has first-hand knowledge of how other cotton producing countries regard Australia.

"Our farmers achieve the highest yields and quality, with efficient use of water and low use of chemicals, and the rest of the world covets our gene technology and plant breeding expertise," he said.

"Australians do well because we do the research and then successfully implement and extend it.

"The world average is 750kg of lint per hectare, but in Australia we are growing more than two tonne of lint per hectare in irrigated systems.

"We are highly industrialised producers in Australia, but cotton is also an important commodity for millions of subsistence farmers around the globe."

ICAC does not have a role in setting market prices or in intervening in market mechanisms, however the ICAC Secretariat based in Washington provides valuable information that is timely and relevant to all sectors of the cotton industry in assessing market conditions. ICAC is the premier source of international data on the world cotton industry.

Peter said Australia's participation and contribution to bodies such as ICAC is vital to protect our industry and assure access to markets.

"We export nearly all our cotton so we need access to markets and with access comes security," he said.

CRDC's General Manager of R&D Investment Bruce Pyke was part of the Australian delegation to the most recent ICAC annual plenary meeting held in Argentina.

"The major issues facing world cotton production discussed at the meeting included price volatility, the central role technology plays in productivity enhancement, discussion on and support for progress to be made at the next DOHA round," he said.

"The positives and negatives of promotion and implementation of organic cotton production systems were also discussed."

Bruce said ICAC also received advice and reports from various committees it supports or has created for particular purposes. These included:

A report was received from its Private Sector Advisory Panel which encouraged the improvement of the collection and reporting of cotton statistics.

The Expert Panel on Social, Environmental and Economic Performance of Cotton Production outlined the first comprehensive report, undertaken last year, comparing insecticide use across some of the key exporters including Australia.

A proposal to create an international centre for cotton research was considered, and the different forms and activities that such a centre might undertake, but reported that no consensus had been achieved among ICAC members. Consequently the ICAC recommended that further analysis of options for such a centre be investigated with the aim of achieving consensus among member countries.

In cooperation with the National Organising Committee in India, the ICAC organised the World Cotton Research Conference-5 in Mumbai in early November this year. More than 600 researchers from around the world attended the Conference.

The International Forum for Cotton Promotion (IFCP) emphasised the need to increase awareness of cotton attributes and promote cotton generically and positively to achieve a unified approach to compete with synthetic fibres.

Formed in 1939, ICAC is an international organisation of countries which produce and import cotton. Its charter is to assist governments to foster a healthy world cotton economy. The committee achieves this by providing transparency to the world cotton market, by serving as a clearinghouse for statistics and technical information on cotton production and by serving as a forum for discussion of cotton issues of international significance.
ICAC members are Argentina, Australia, Belgium, Brazil, Burkina Faso, Cameroon, Chad, China (Taiwan), Colombia, Cote d'Ivoire, Egypt, Finland, France, Germany, Greece, India, Iran, Israel, Italy, Kazakhstan, Kenya, Korea, Mali, Netherlands, Nigeria, Pakistan, Poland, Russia, South Africa, Spain, Sudan, Switzerland, Syria, Tanzania, Togo, Turkey, Uganda, United States, Uzbekistan, Zambia and Zimbabwe. http://www.icac.org

WORLD LEADERS IN COTTON BREEDING

THE DEVELOPMENT OF COTTON VARIETIES TO SATISFY OUR NOW BURGEONING INDUSTRY HAS CHANGED DRAMATICALLY IN RECENT YEARS, LET ALONE FROM THE EARLY DAYS WHEN WORDS LIKE GENE AND TRANSGENIC TECHNOLOGY WERE UNHEARD OF.

Today plant breeding is undertaken by the CSIRO Division of Plant Industry scientists who maintain a dedicated cotton breeding program at the Australian Cotton Research Institute at Myall Vale near Narrabri with support from CSIRO biotechnology teams in Canberra. Cotton Seed Distributors (CSD) seed increases and commercialises these CSIRO-developed varieties.

Cotton Breeding Australia

This partnership was formed in 2007 when CSIRO Plant Industry and CSD announced the Cotton Breeding Australia joint venture, to co-fund cotton breeding and targeted research for an initial 10-year term.

The member-owned company CSD, CSIRO Plant Industry, CRDC and its predecessors had worked successfully since the 1980s to deliver high quality cotton varieties for the industry that were well suited to Australian conditions.

The formalisation of this new partnership was an example of where market failure for research has been overcome and it can be funded commercially. This alliance has seen significant increases in research investment in plant breeding for elite Australian cotton varieties.

Both parties contribute equal amounts per annum for research, with CSD also co-funding the cotton breeding previously co-funded by CRDC. As a result, CRDC has been able to redirect its research investment from cotton breeding to other areas of industry priority since the formation of the CBA venture. Formation of CBA also significantly drought-proofed breeding activity as it no longer relied on grower levies via CRDC, which were minimal during the years of drought or adverse weather.

"One of the great benefits of the Cotton Breeding Australia alliance is that long term funding of projects can be assured," says CSD General Manager Steve Ainsworth.

"This makes it significantly easier for both parties to continue to invest in and look more to the long term future of the industry."

CSIRO Plant Industry Stream Leader (Industrial Fibres from Cotton) Greg Constable agrees, saying plant breeding requires long term funding commitments, as it takes nine years to develop a variety up to the commercialisation stage.

"The CBA venture had many positives for the quality and quantity of plant breeding," Greg says.

"It shored up succession planning and surety of jobs for researchers, as previous to CBA, research was under three-year funding projects, which was not long term enough due to the nature of plant breeding.

"It has also increased the number of scientists and researchers from seven to 18, which is a significant number in terms of research capacity."

World-leading

CSIRO-bred cotton varieties are now world-leading, and CSIRO and CSD recognise the important contribution that CRDC and the (recently combined with Cotton Australia) Australian Cotton Growers Research Association made to the Australian cotton breeding program. CRDC and CA provide ongoing membership of the CBA Scientific Committee. >

ABOVE:
At the heart of Australia's cotton breeding team, the CSIRO's Greg Constable, Shiming Liu and Warwick Stiller.

CSIRO has had outstanding success in breeding high yielding, high quality cotton with 100 percent of the Australian cotton crop now consisting of CSIRO developed varieties, the majority of which incorporate Bayer and Monsanto biotechnology traits.

All this changed in a relatively short time, as it was not until the 1960s that the modern cotton industry began in the Namoi Valley with the completion of Keepit Dam. Back then growers were limited to varieties from the US which were not adapted to Australian conditions.

According to Greg Constable, key areas for the Australian breeding and research program include yield, disease resistance, fibre quality improvements, drought tolerance and water use efficiency. Research to ensure adaptation to predicted climate change conditions is ongoing.

"Genetically modified (GM) insect resistant and herbicide resistant CSIRO cotton varieties have been developed from CSIRO conventional varieties using Bollgard II and Roundup Ready Flex traits from Monsanto or the Liberty Link trait from Bayer," he said.

"GM varieties have had a major effect on cotton farming. For example, insect resistant Bollgard II has reduced pesticide use by up to 80 percent."

"Gene technology is now being used to speed up the screening and development of new conventional and transgenic varieties and CSIRO has expanded its research in this area to develop molecular tools and traits to address production and sustainability targets."

The Future

CSIRO is developing cotton varieties with improved disease resistance which effectively combat serious diseases. There has been great progress in developing varieties resistant to Bacterial Blight, Verticillium Wilt and Cotton Bunchy Top. CSIRO is ensuring all its new varieties have a high level of Fusarium Wilt resistance and is continuing to work towards breeding varieties which are more resistant to Fusarium Wilt.

"A strong component of breeding is maintained in developing elite conventional germplasm," Greg said.

"This is the aspect of CSIRO cotton breeding where genuine step improvements are made in yield and other desirable characteristics. Those discoveries are then delivered as new elite transgenic varieties through CSD where suitable."

"Efforts are continuing to improve cotton fibre and to even develop premium fibre varieties to gain access to better prices. CSIRO is also using gene technology to help identify genes responsible for fibre development, so that fibre quality can be manipulated more directly by biotechnology."

Steve Ainsworth said CSD will continue to work closely with CSIRO Division of Plant Industry to have available the best possible varietal performance for the market, combining the attributes of the conventional varieties with the best possible biotechnology performance.

"CSD uses the most modern technologies and infrastructure to bring forward the highest quality planting seed possible, in the quantities and time frames required by growers," he said.

AUSTRALIAN COTTON GINNERS ASSOCIATION

The Australian Cotton Ginners Association was formed in December 1992 as an association of all the cotton processing organisations in Australia. There are currently 14 members comprising 38 gins.

The ginning sector is responsible for taking the raw product and removing seed and trash or other contaminants from the lint. It is a ginner's responsibility to ensure that the grower maximises the dollar value out of every kilo of seed cotton delivered to the gin by maximising lint turn out, seed and lint quality. It is also the ginner's responsibility to ensure they delivers a tidy bale covered in natural fibre wrapping and with the fibre characteristics to meet spinners' requirements.

Through liaison with other industry organisations such as CSIRO, Cotton Australia, Australian Cotton Shippers Association and Cotton Classers Association of Australia, ACGA aims to develop and implement world's best practices and efficiencies.

Its aims are to:

- Promote the common business interests of persons engaged in the cotton ginning industry within Australia;
- Encourage and promote co-operation;
- Sponsor technical development; and
- Seek improvement of communications, education and safety within the ginning industry.

In recent years the association has moved its focus to accommodate a changing industry and incorporate new technologies and issues.

This has included the association developing (in conjunction with CSIRO) a ginning BMP program and audit procedure which continues to be reviewed and strengthened to maintain and improve these standards.

Ensuring the sector has the human capacity to operate at its peak, the association represented the views of the membership regarding ginner training and certification. After the extended drought, the association is currently working with several organisations to resurrect the ginner certification program. ACGA also reviews annual safety results and informs its membership of potential problems and solutions.

Rene van der Sluijs from CSIRO CMSE has helped provide all sectors of the post farm gate industry with Best Management Practice guidelines and auditing procedures.

From a research angle, ACGA reviews research projects submitted by CSIRO that cover all facets of the cotton industry from breeding, growing, harvesting, ginning, spinning and dying to maximise returns on investment and meet end user needs.

A recent major shift has been the advent of round bale cotton pickers. The association has acted as a forum to discuss the impact of round modules on ginners and develops recommendations that are considered by other industry associations.

The ginning sector is also integral in the quality assurance of Australian cotton which incorporates contamination. Bagging standards in particular has been a focus, with ACGA currently working with the developer of an auto bagger, to ensure that the technology uses cotton bagging and can operate at speeds achieved in the Australian gins

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COTTON CLASSERS' ASSOCIATION OF AUSTRALIA

The Cotton Classers' Association of Australia (CCAA) has six members and four associate members.

The aim of CCAA is to promote consistency between classing facilities in Australia, both merchant and independent. CCAA monitors this consistantly through regular internal check tests for visual grade colour and leaf and HVI testing for properties Length, Length Uniformity, Strength, Micronaire, Colour Rd & Colour +b . CCAA is also involved in an international program – Commercial Standardisation of Instrument Testing (CSITC). All data from testing programs are analysed indepently and results sent to classing facilities.

CCAA is firmly committed to its BMP program to ensure Australian cotton growers and end users worldwide have their cotton graded consistently under the best possible conditions.

CCAA Best Management Practice

If Australia is to maintain its reputation as a consistent supplier of high quality cotton it will need to ensure that classing facilities in Australia consistently specify their cotton. To do this the cotton classing sector is assessed independently (among others), to determine compliance to the current BMP for the Classing Handbook, compiled by CCAA via formal audits. These audits are conducted by René van der Sluijs of CSIRO's Materials Science and Engineering (CMSE), as an organisation considered to be independent.

These audits allow individual facilities to make technical and operational corrections to their practice so ultimately the industry can achieve consistent and better prediction of classing grades.

Classing in the Future

The transition to HVI colour is high on the agenda for future classing in Australia. There are still some older HVI models that do not have the colour technology that the modern HVI 1000 has for measuring colour. The number of HVI 1000s is increasing and there will be 10 of these instruments in Australia for 2012 crop.

There are six classing facilities in Australia and five are certified by Cotton Australia as compliant to the current version of the BMP handbook for classing.
These five classing facilities are:

- Australian Classing Services in Wee Waa
- Auscott Limited in Sydney
- Northern Rivers in Moree
- ProClass Pty Ltd in Goondiwindi
- Queensland Cotton in Brisbane

Office Bearers

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AUSTRALIAN COTTON SHIPPERS ASSOCIATION

Australian Cotton Shippers Association represents the mutual interests of members of the Australian merchant community committed to the wellbeing of our industry and the trading and marketing system we enjoy.

These factors are the cornerstones that provide both growers and merchants with the confidence to participate in forward cash markets for cotton up to three and four years "out" from a production season. Broadly speaking, ACSA's role involves:

- Maintaining contract sanctity – at both grower and spinner level;
- Ensuring the orderly movement of cotton to market;
- Identification and development of post farm gate standards to ensure safe and efficient storage and handling of bales;
- Trade delegations to key markets to communicate developments and technical marketing messages to spinning mill customers;
- Industry relations and advocacy on post farm gate issues.

Additionally ACSA collaborates with Cotton Australia, CRDC, CSIRO Plant Industry and CSIRO Materials Science & Engineering on various post farm gate projects. This included facilitating offshore commercial spinning trials for the Premium Cotton Initiative and working closely with Cotton Australia and CRDC on various pilot programmes for the retail promotion of BMP and Australian cotton.

Collaboration with CCAA and ACGA regarding best practices is also vital to assure integrity is maintained along the value chain, as is engagement with organisations associated with the post farm gate sector which includes financial institutions and our export supply chain.

ACSA directors sit on various sub-committees both within and outside ACSA including the Australian Cotton Conference, Australian Cotton Industry Council, Cotton CRC, Committee for International Cooperation between Cotton Associations, International Cotton Association and Australian Peak Shippers Association.

ACSA members are Auscott Marketing, Cargill Cotton, Ecom Commodities, Louis Dreyfus Commodities, Namoi Cotton, Queensland Cotton and Twynam Cotton.

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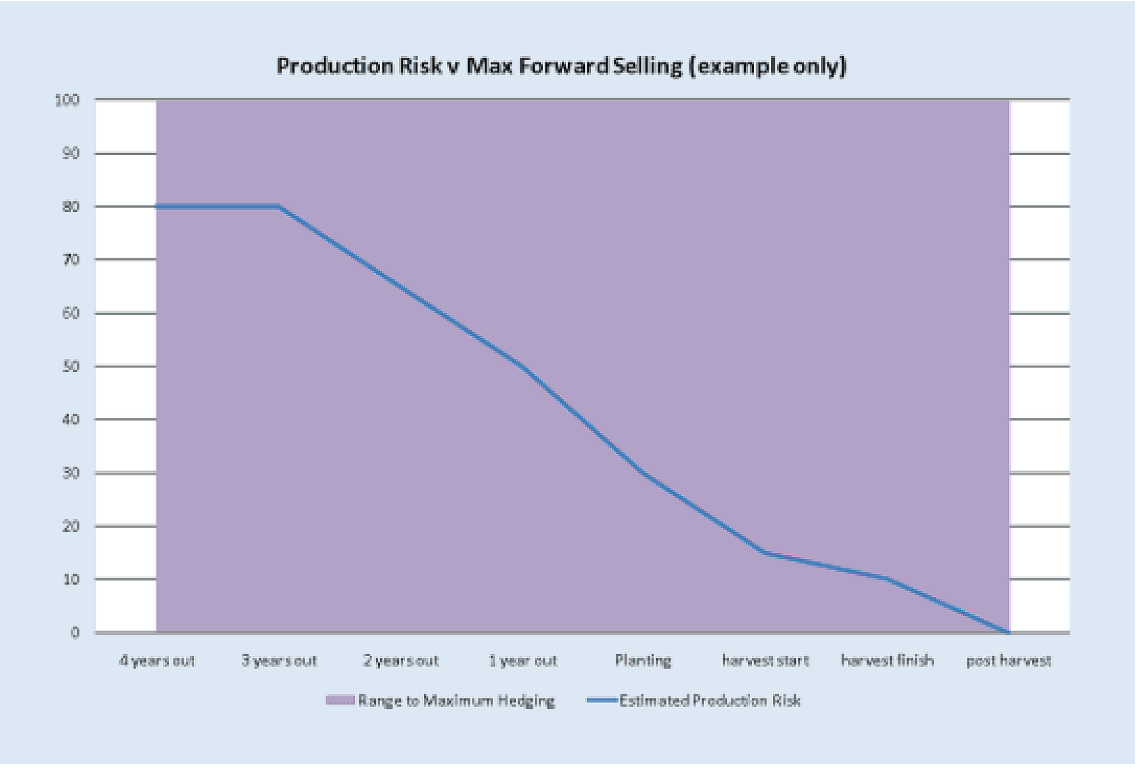
COTTON MARKETING AND RISK MANAGEMENT 101

MARKETING SUCCESSFULLY IS NOT ABOUT THE BEST PRICE, BUT ABOUT CONSISTENTLY PROFITABLE RETURNS.

ROB IMRAY AND PETE JOHNSON REPORT.



Marketing cotton at the farm level is all about balancing risk against return – and marrying your understanding of cotton market dynamics against the requirements of your own farm business.

Through it all, it is critical to keep perspective.

The key elements required to successfully market your cotton are:

- Understand what factors are driving the market and why (this will help you make informed decisions);
- Know your costs and profit levels (marketing successfully is not about the best price, but about consistently profitable returns – ie your bottom line);
- Assess your level of production risk and your appetite for risk;
- Assess your own risk profile (and others in your business). What products are you comfortable with using, and what strategies are you comfortable in implementing;
- Set realistic targets in the market, and change your strategy if need be;
- Marketing is business – keep emotion in the background as much as possible.

TYPES OF CONTRACTS

Cotton is generally sold under several different contract types – and it is important that you consider which type of contract is appropriate for you business:

Cash Contract – for fixed bales (227kg) and a fixed price

Deferred Payment / "Daily Pool" – for fixed bales at a known price, but split payments.

Seasonal Pool – fixed bales but a floating price until pool finalized

Force Majeure / Hectare Contract – fixed (discounted) price / fixed area but variable production.

Hectare Pool – floating price until pool realized / fixed area but variable production.

Balance of Crop – Fixed price / quantity usually confined to a range or min/max bales.

On Call Contract – Fixed bales / grower manages price risk by placing fixation orders on futures, basis and foreign exchange separately.

GMP Contract / Pool – Fixed bales / guaranteed minimum floor price with upside potential.

Unpriced Contract – Usually at the end of the season for fixed bales – grower given longer period to price.

Risk versus return

In essence, marketing strategy is all about risk versus return. In order to lock in known prices, you must take risk.

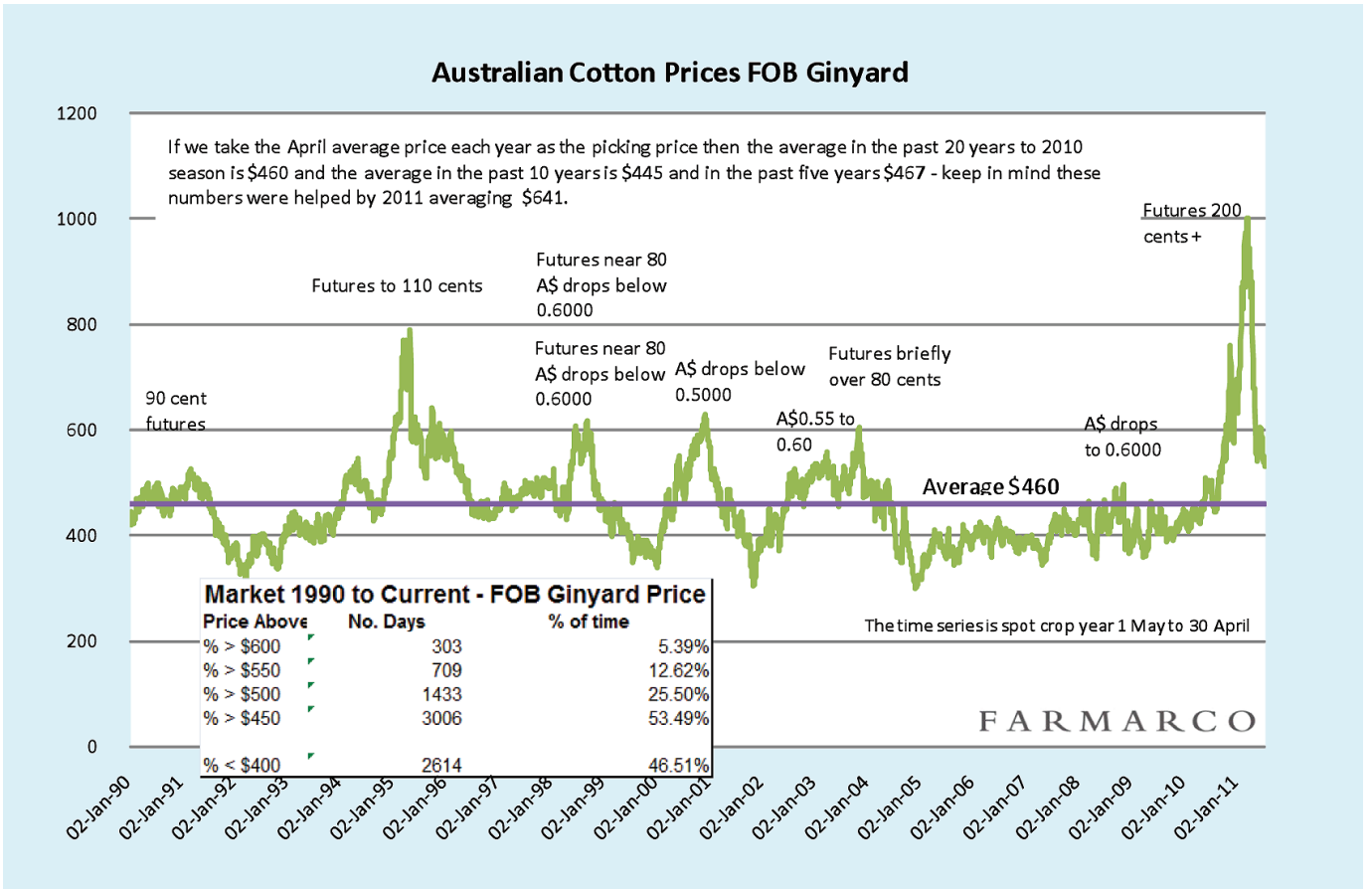
The risks are production risk (failure to produce what is sold) and opportunity risk (unable to take advantage of the market if prices move higher). In return for taking those risks, you are able to act on opportunities to secure a profitable price for your cotton, and therefore reduce the risk that an adverse price move might otherwise have on your overall returns.

There are a number of steps growers can use to develop their marketing "process". These are:

- Outline a strategy for the season (or better still – build it into a business plan).
- Build a marketing plan. This can be formal or informal, but it is important to make the plan flexible enough so that it will not need constant change. Remember, the cotton market is volatile.
- Set out your objectives. It is not realistic to aim for – or achieve – the top of the market. Take a realistic and business-like approach. When prices are profitable and you can reduce your exposure to adverse price movements, then action has merit.
- Assess the current market and market outlook.
- Set your targets and review points. Targets on paper will help you focus on what you need to achieve. If your targets are not achievable, then change your strategy. If the market trend changes significantly, then change your strategy – but do so without being reactive to small market moves.

It is also clearly important to have an understanding of the factors that affect the Australian cotton market.

Given more than 99pc of our crop is exported and primarily driven by international factors, prices of Australian



cotton line prices are highly volatile.

The key price driver are the ICE No 2 Cotton Futures Contract, and the Australian Dollar (AUD/USD). Basis movements can also have a moderate impact over time. Gaining some understanding of these markets and the factors that drive them is important in marketing your cotton.

In terms of "keeping perspective", it is also important to pay attention to historical price movements – and how they relate to key price trigger points (see chart above). Some key points are that marketing at picking (April) does not provide anything better than an average price; and that prices over A$500/bale only occur 25pc of the time. Prices over A$550/bale occur only 12pc of the time.

For further information, contact Rob Imray and Pete Johnson of Cotton Compass Pty Limited

see our website

www.cottoncompass.com.au

QUALITY

Cotton is generally sold in A$/bale, based on the assumption that "Base Grade" cotton will be delivered. In Australia, base grade is considered to be 31-3, 1-1/8", 3.5-4.9NCL, 28GPT, where:
31 is the colour of the fibre
3 is the leaf content in the lint
1-1/8" is the staple length
3.5-4.9NCL is the micronaire
28GPT is the fibre strength

Upon delivery, the final price is adjusted according to a quality matrix, or "Premium and Discount Schedule" – which makes adjustments for parameters that fall outside of the "Base Grade" description.

THE BASICS

Your ex-farm module produces both lint and seed. The lint is sold to a cotton merchant, and the seed can be sold either to a cotton gin as part of the ginning deal, sold to a trader, or kept for your own use.
The cotton lint is generally forward sold to a merchant.
Your module is delivered to the gin in module form, and then ginned into lint bales of approximately 227kg each.
The gin then allocates the bales to merchants in contract order, per your instructions.
As the cotton is being baled, samples are cut from the bales and sent to a classing house, where the cotton is classed in accordance with USDA (United States Department of Agriculture) standards.
Once the cotton has been classified, and any relevant premiums and discounts applied, the grower is paid 14 days after ginning (unless otherwise agreed).

"IT IS ALSO CLEARLY IMPORTANT TO HAVE AN UNDERSTANDING OF THE FACTORS THAT AFFECT THE AUSTRALIAN COTTON MARKET."

– Pete Johnson

CROP CONSULTANTS TURN R&D INTO KNOWLEDGE

CROP CONSULTANTS PLAY A KEY ROLE IN TRANSFER OF KNOWLEDGE BETWEEN RESEARCHERS AND FARMS. **CHRISSY BROWN** REPORTS.

Cotton growers constantly rely on crop consultants as a trusted source of new knowledge for profitable cotton production.

A key mechanism in transferring R&D knowledge to the farm is the agronomists and crop consultants who combine their links with the knowledge from R&D to the direct contact with many cotton growers, explains Matt Holding, President of Crop Consultants Australia (CCA).

Crop Consultants Australia Incorporated has approx 160 financial members, made up of independent consultants, farm agronomists, sales agronomists, chemical & plant breeding company representatives, R&D personnel & other industry people. "Agronomists are a central part of the cotton industry providing technical expertise, feedback and advice which is scientifically based, honest and practical," Matt said.

"They ensure information on the latest technologies, research trials and farming system practices reach the cotton farmer and support its on-farm adoption. Those involved in the crop consulting profession contribute significantly to maximising research outcomes and ensuring best practice implementation is delivered on-farm assisting the industry to remain innovative and sustainable."

CRDC's General Manager R&D Investment Bruce Pyke agrees.

"Cotton consultants (both private and agribusiness) play a significant role in crop management that requires rapid responses, such as pest and water management, or relatively short term planning such as advising for the next crop," Bruce says.

"Therefore consultants play an important part in applying the results of R&D related to Integrated Pest Management (IPM), resistance management, weed management, water management and crop nutrition."

"Agribusiness agronomists also provide support vital services to growers producing GM cotton by processing Technology User Agreements and conducting the required monitoring and auditing under the TUAs."

> The CCA is primarily an association for those that provide agronomic advice to cotton, grains, pulse and oilseed producers in Australia. "Facilitating the transfer of knowledge and research to its members so they can provide the best support to the cotton industry is fundamental to the CCA." Core areas of interest to the CCA are water use efficiency, profitability, reducing the impacts of drought, retaining young people in the industry and supporting the industry in its quest to be as environmentally friendly as possible.

Consultants and the CCA have another important role in cotton R&D in providing feedback to research organisations. CRDC utilises the CCA to gather feedback from crop consultants in an annual comprehensive survey that details cropping practices and chemical use, Helicoverpa egg collections for resistance testing, and targeted projects such as the recent Bunchy Top risk and management survey.

"The annual Cotton Consultants Survey findings are useful to CRDC, and as a result the whole cotton industry, because they can be used to show change in practices and improvements in management over time," Bruce says.

"For example the CCA data on chemical use have been very valuable to demonstrate reductions in insecticide use and changes in herbicide use over many years in relation to adoption of IPM and GM cotton."

"Results are also useful in helping to gauge incremental changes in practice in a wide range of crop management aspects and to identify areas where better information or campaigns may need to be run by the industry's Development and Delivery team to address areas where practices can still improve or where it is clear the latest R&D findings are not being applied to best effect yet."

CRDC Program Manager Bruce Pyke says developing better ways to support the professional development of consultants is a high priority for CRDC.

Recognising the import role of consultants in the implementation of R&D results, Bruce says that developing better ways to support the professional development of consultants is a high priority for CRDC as this increases their ability to utilise the latest outputs from R&D.

"For many years CRDC provided regular updates on R&D issues at CCA winter meetings, but this declined somewhat during the drought. CRDC is keen to start building on such opportunities again for the future," he said.

With their ongoing demand for increasing knowledge, this would be welcomed by the industry's agronomists according to Matt Holding.

"CCA's members recognise the importance of staying up to date with relevant R&D work as a means of ensuring production targets, crop management and environmental values are sustained and improved for the benefit of the cotton industry and the rural communities that the industry supports," he said.

see our website

email us

Crop Consultants Australia Executive Officer Fiona Anderson
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CONFERENCE AT FORE OF INFORMATION DELIVERY

BROOKE SUMMERS TELLS US WHY THE AUSTRALIAN COTTON CONFERENCE HAS BECOME THE PREMIERE EVENT ON THE INDUSTRY'S CALENDAR.

Cotton Australia and the Australian Cotton Shippers Association will host the 16th Australian Cotton Conference on the Gold Coast from August 14 to 16 2012, and while that may seem a way off, the conference committee is well into planning the event and drafting a program to attract all sectors of industry.

With a record five million bale crop on the way, organisers are confident that the 2012 conference will be the biggest ever, with hopes to attract more researchers, research, development and extension staff, growers, agronomists and cotton farming families than ever before.

"We're hoping that next year's conference achieves a number of objectives: helping our quest for sustainable competitive advantage through research, upholding best management practices, promoting Australian cotton, preserving the integrity of our trading industry and advancing industry and community prosperity," Cotton Conference Chairman Lyndon Mulligan said.

"A united conference hosted by Cotton Australia and ACSA allows the industry to showcase its latest research and development, grower innovations and the needs of our international customers who see the Australian cotton industry as global leaders.

"Apart from a great networking and sharing opportunity, the conference plays a valuable role in us understanding our place within the Australian agricultural industry and within the world fibre market."

As always, the conference will be a key platform for industry researchers to share their findings and receive feedback from the industry on future R&D projects and this will be especially important as the Cotton CRC winds up mid-year. A recent strength is that research impacting all levels of the supply chain is incorporated into the program, along with market information, branding and topics around issues affecting the industry, such as water, mining and coal seam gas.

"For over 30 years the Australian Cotton Conference has been at the fore in providing knowledge and relevant information for all stakeholders within the cotton industry. The 16th Australian Cotton Conference organising committee plan to use the same successful recipe of the past to continue providing research information to enable the industry to remain prosperous," Lyndon said.

A varied program delivered by expert speakers is being developed by Guy Roth, along with a host of social and networking activities to encourage interaction between the various industry sectors.

"The program is developed through close consultation with all of the industry organisations about what they think are the key and current topics of interest to their constituencies - growers, researchers, farm workers, agronomists and marketers. From this we narrow down a list of topics to cater for this wide range of interests and identify the best speakers on each issue," Guy said.

"We try to identify speakers who are experts on the topic, have timely data or information, practical advice and are at the cutting edge of their field."

According to the Chairman, the program promises something for everyone and with a strong line-up of social events and child minding facilities, will be a great week for the whole family.

"The Australian Cotton Conference has become a very important networking opportunity and we're encouraging anyone involved in the cotton industry to start planning their week early," Lyndon said.

As in previous years, the conference will be held at the world-class conference facility on the Gold Coast of Queensland, the Gold Coast Convention and Exhibition Centre. This venue also allows cotton families to take a well-earned break, with facilities available for baby-sitting and a hands-on "Kids Club" based at the centre during the conference, which is free to delegates.

www.australiancottonconference.com.au

see our website

INFORMATION THERE FOR THE TAKING

THIS BRIEF GUIDE DETAILS MAJOR ORGANISATIONAL WEBSITES AND PUBLICATIONS.

Cotton Australia

This is the main representative body for the Australian cotton growing industry covering growers and ginners. Cotton Australia publishes a weekly e-newsletter *Cotton Matters*. mailto: talktous@cottonaustralia.com.au or www.cottonaustralia.com.au

CRDC

Since 1990, CRDC has managed industry's R&D investments on behalf of the growers (from levies) and the Government (from matched funds). CRDC has published numerous reports and publications and currently publishes *Spotlight* magazine four times annually. To subscribe mailto:spotlight@crdc.com.au or www.crdc.com.au

Cotton CRC

The Cotton CRC is an industry partnership to lead industry's research, development, extension, education and commercialisation. Cotton CRCs have been the main source of farmer interest publications, educational content, report and the key decision support tools developed by industry since the early 1990s. The Cotton CRC winds up in June 2012, and R&D-based information will then be transferred to an industry portal managed by CRDC. The CRC website will remain functional for a minimum of two years beyond July 2012. www.cottoncrc.org.au

Best Practice Cotton Production

*my*BMP is the industry's primary information source on best practice information based on research. Planned developments for grower and advisor access will ensure industry's primary point of information and production tools will progressively focus on access to R&D information via the *my*BMP website.

For phone support and login information, phone 1800COTTON (1800 268 866) or www.*my*bmp.com.au

Development & Delivery Team

The Australian Cotton Industry D&D team is drawn from all key industry and research organisations and is primarily responsible for providing timely information based on best practice to support cotton producers. The Team has specialists who manage *my*BMP website content, certification of best practice in production and advisory services, and production of industry's publications.

Printed publications (available as e-Publications on the CRDC website and as PDF files on the Cotton CRC website) include:

Cotton Pest Mangement Guide. The comprehensive annual describing all practices for best practice stewardship of GM technologies.

Australian Cotton Production Manual. The annual publication covering all aspects of best practice production.

Pests and Beneficials in Australian Cotton Landscapes. A printed field guide covering all known pests and beneficials.

Symptoms and Diseases (Due for release March 2012). A field guide of all known diseases and disorders (nutritional, environmental) of cotton

Also sources of general, media and agribusiness information sources such as *Cotton Tales*.

The Australian Cottongrower

The longest established and trusted source of R&D and industry information for over 30 years, the magazine is a bi-monthly providing technical and marketing information. The *Australian Cottongrower Yearbook* is also published annually. www.cottongrower.com.au

Cotton and Grains Outlook magazine

A newspaper distributed monthly in Rural Press newspapers; *The Land* and *Queensland Country Life*. Available by subscription mailto: subscriptions.netcirc@ruralpress.com

CSD

Offers a comprehensive suite of information for growers and advisors delivered in a wide range of mediums, from a well-regarded website, regular podcasts and webcasts together with e-newsletters, a periodical newsheet *Seed for Thought*. For full details go to the website www.csd.net.au

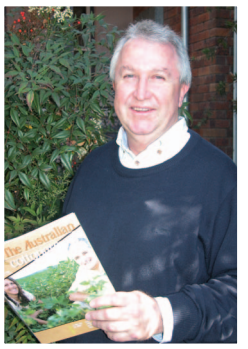
CSIRO

Has an extensive library of research www.csiro.au › Home › Food & Agriculture › Crops › Cotton

NSW & QLD Departments of primary industry

Has extensive research and information available on their websites www.deedi.qld.gov.au www.dpi.nsw.gov.au

FIVE MINUTES WITH DAVE



Dave Dowling has been the publisher of *The Australian Cottongrower* magazine for 26 years and as such has stuck with the industry through thick and thin. His contribution to the dissemination of information and research and betterment of the industry cannot be understated, through publishing and also running the Australian Cotton Trade Show. Therefore we would like to put the Spotlight firmly on this huge contributor to the industry.

How long have you been in the cotton industry and what has been your involvement?

I've actually been involved in the cotton industry for about four weeks longer than *The Australian Cottongrower* has been published – about 32 years. I left UNE at Armidale at the end of 1979 and got a job for a season as a field assistant (bug checker) at the Narrabri Cotton Research Station. Just a few weeks later, and unbeknown to me, the Cottongrower magazine was published for the first time in Toowoomba.

My temporary cotton job lasted for about five years, firstly with NSW Department of Agriculture then Cotton Grower Services at Moree and Roche-Maag (probably now Bayer) at Wee Waa. After five years in hot cotton fields, I opted for some air conditioned luxury in Sydney, working as a journalist for Rural Press.

In 1985, the cotton industry again crossed my path, with the opportunity to buy the magazine from the owners who were well known cotton growers but not magazine publishers. Neither was I of course, but experience is the best teacher. Over the years, and with the help of a few other very talented people, we started magazines in the grain and sugar industries, operate the Cotton Trade Show at Moree and run farm study tours around the world.

What attracted you to this industry?

I knew nothing about the industry originally – except there was an offer of some paid work for a few weeks. But it didn't take me long to realise that this was agriculture as I had never known it before. The growers I met were all smart and switched-on, at least the ones who lasted. It had a real pioneering element to it as first-generation growers from all sorts of backgrounds battled against great adversity at times to succeed. The industry has a can-do attitude about everything and a structure and organisations which actually work and don't get bogged down in agro-politics.

What is the importance of getting the latest information/research out there?

It's fair to say that the industry would never have succeeded without the tremendous research effort by some very dedicated scientists, and the willingness of growers to learn and to adopt new technology and research findings. An integral part of that is good communication between researchers, growers, consultants and the support industries.

What do you see as your role in this?

This communication takes many forms, but I believe *The Australian Cottongrower* magazine has played a vital role by delivering reliable research, extension and other information to the industry. Our policy has always been to stay away from politics. And, unlike most rural media, we are not afraid to publish complex research stories, because cotton growers operate in a complicated environment.

SUMMER FALLOWS WITHOUT GLYPHOSATE

LAST SUMMER'S RECORD RAINS RELOADED WEED SEED BANKS, HEIGHTENING THE NEED FOR STRATEGIC AND VIGILANT WEED MANAGEMENT THIS YEAR. WEED MANAGEMENT SPECIALIST IAN TAYLOR DISCUSSES THE OPTIONS WITH SENIOR WEEDS RESEARCH AGRONOMIST GRAHAM CHARLES AND INDEPENDENT CROP CONSULTANT IAIN MACPHERSON, WHO SHARE THEIR PERSPECTIVES ON WEED ISSUES FACING COTTON GROWERS THIS SUMMER AND THE CONTROL TACTICS THAT OFFER VALUE.

Fleabane has emerged as one of the most successful weeds in minimum and no till systems. "We use the double knock strategy not just for glyphosate management but because fleabane is our major weed. The double knock tactic gives the best control to date," says Goondiwindi-based consultant Iain Macpherson.

ABOVE LEFT: The focus of Ian's Taylor's campaign is to provide the tools that can lead farmers to victory in the fight against weeds. This victory is needed now he says because evolution proves a powerful force that enables the weeds to fight back. Over reliance on glyphosate is presenting our farming system with herbicide resistance problems that will be difficult to overcome unless farmers mark out a new battle line.

The 2011-12 cotton season presents heightened risks of selecting for glyphosate resistance, according to Graham Charles, the cotton industry's most experienced weeds researcher. He says successive generations of weeds setting seed can be a 'game changer' for glyphosate resistance.

Being the herbicide at the heart of effective weed-free fallows in dryland and irrigated systems, and also given the rapid rise in glyphosate resistance in cotton producing areas, he asks, can the war on weeds be won this summer without it?

Graham warns that population explosions greatly increase the chance that the rare individual with resistance will be present. Multiple germinations of weeds in response to rain events adds to the difficulty of decision making.

With above average spring and early summer rain again this season, the focus needs to be on achieving 100 percent control of big populations to avoid selecting resistance.

He says the worst problem with glyphosate is that it is such a great herbicide, being relatively low cost and very effective across so many weeds. The challenge remains, he says, for a manager to restrict its use to just one part of the system.

From his base with the NSW DPI at the Australian Cotton Research Institute, Narrabri, Graham's research over the past two decades has explored the limits of many herbicides for use with cotton.

"Restrictions due to plant back periods and the challenges of incorporation often mean that residual herbicides have little utility when planning ahead for cotton," Graham said.

"Label registrations also limit residual options, with herbicides such as diuron, pendimethalin, trifluralin and metolachlor not registered for use in fallow situations.

"In cotton systems, glyphosate has replaced the use of these products in crop. The farming system has changed significantly, but for many reasons, changes to herbicide registrations have not kept pace, further distorting the balance."

Graham's advice to growers is to be prepared.

"Regularly checking fallow fields allows you to be prepared to make the most out of every opportunity," he says.

"When you're up to date with your weed issues, a forecast of rain in the afternoon could be an opportunity to apply herbicide that morning."

MID SEASON DECISIONS

"Growers need to do whatever it takes to ensure all weeds are controlled before they set seed in fallows.

Graham stresses that if there is any doubt that a glyphosate application won't control all weeds, then it needs to be followed by a second tool such as Spray.Seed, or use cultivation as a double knock.

"If every weed escape is prevented from setting seed, then effectively there has been no selection pressure - it's as though you haven't used glyphosate," he says.

According to Graham, cultivation should not be seen as a dirty word. It's a valuable tool which has a place in integrated systems if used strategically. This is an important consideration for irrigated systems as well.

"A system will only gain advantage from tillage when it used at a time that is relevant for key weeds," he said.

"Ground preparation through winter does little to manage awnless barnyard grass for example, but can be effective in burying fleabane seed, preventing it from germinating through the spring and summer. You need to know the characteristics of the weeds you're managing."

Given the available tools, and probable conditions this summer, Graham says timing is the key and the strength of a farm's weed management program should be measured in terms of the ability to respond in a timely fashion.

Wet weather and wind conditions however can interfere with the success of the double knock strategy, which relies upon there being two opportunities to cover the area only seven to 14 days apart.

Aerial applications have the ability to cover a lot of area in a short time and could be a valuable way of exploiting a spray opportunity.

However, Graham cautions, proximity to sensitive crops will mean that aerial application isn't for everyone in summer.

Budgets should also ascribe a future value to glyphosate as well as consider the implications of having to manage glyphosate resistance.

"Glyphosate is a one in 100 year herbicide," he said.

"There's nothing else that offers the farming system all the flexibility that is enjoyed with glyphosate and diminished performance or complete loss of this valuable herbicide from the system would likely result in enormous challenges for the farming system."

Goondiwindi-based agricultural

Graham Charles says farmers and agronomists need to consider resistance in every weed control decision.

consultant Iain Macpherson agrees that gylphosate may become a victim of its own success.

He says the biggest threat to the dryland farming system is the loss of glyphosate due to resistance.

"A number of cases of barnyard grass resistance are already showing up in the northern region," he said.

"The loss of glyphosate from these systems would result in less effective weed management options for fallow and would require the use of tillage causing a loss of valuable soil moisture and degrading soil structure.

"Glyphosate and no-till have become the cornerstone of dryland or rain-fed farming. We have seen significant improvement and reliability in yields over the past decade.

"This we attribute to reduced erosion, improved water infiltration and soil water holding capacity. This has helped growers keep up with increasing costs."

Despite the limited options, Iain urges the use of alternatives, saying that we should be trying to rotate chemistries to reduce selection pressure on glyphosate.

"With knockdown chemistries we can rotate to paraquat, especially as a double knock," he said.

"There is also potential to use Amitrole for some grass weed spectrums and other problem weeds."

In reflecting on his experiences with the double knock, Iain says the best time for a double knock is seven days post glyphosate.

"But if you're delayed waiting for good conditions, you can still get reasonable results after 14 to 20 days, as long as it hasn't rained and the weeds begun to regrow.

"Then it's a case of back to the beginning, as weeds will have begun to regrow and will be more difficult to manage".

He said some growers question the cost of the double knock, or having to respray a field with a low number of survivors.

"Cost is still an issue and this is where camera spray technology (eg Weed Seeker) can really have an impact. Product use can be reduced by 80 to 90 percent (with these systems)," he observes.

"We recommend the double knock strategy not just for glyphosate management but because fleabane is our major weed.

"The double knock tactic gives the best control to date."

Both Graham and Iain agree that farmers and agronomists need to consider resistance in every weed control decision and design crop rotations that allow for a break in selection pressure.

Since 2008, populations of four different weed species in cotton-grain or grain-based farming systems have been confirmed to have resistance to glyphosate;
20 populations of awnless barnyard grass
8 populations of fleabane
3 populations of liverseed grass
2 populations of windmill grass
It is inevitable that more populations with resistance to glyphosate will be discovered this summer.
Weeds scientists at QDEEDI have identified additional weed species with combinations of biological characteristics that make them just as likely to develop resistance in the cotton-grain and grain-based farming system; sweet summer grass, sowthistle, crows foot grass, button grass, summer grass and redshank amaranthus.
Resistant populations are most likely to be first observed as patches of plants surviving after a spray application. Left unchecked through a wet summer, a resistant population can dominate the whole field within a couple of years.
If you are concerned about a suspect population, send samples for testing. Information on testing and how to collect samples is at www.plantscienceconsulting.com.au and in the *Cotton Pest Management Guide.*

Herbicide resistant barnyard grass.

Further information
Graham Charles 02 6799 1500

email us
Ian Taylor 0427 921 480
mailto:
tayloredagservices@bigpond.com

"IF EVERY WEED ESCAPE IS PREVENTED FROM SETTING SEED, THEN EFFECTIVELY THERE HAS BEEN NO SELECTION PRESSURE – IT'S AS THOUGH YOU HAVEN'T USED GLYPHOSATE."

KNOW YOUR ENEMY:
ATTACK STRATEGICALLY

SEVEN SHORT YEARS AGO FEATHERTOP RHODES GRASS (FTR) WAS CONSIDERED TO BE A WEED CONFINED TO CENTRAL QUEENSLAND. HOWEVER WITH MORE GROWERS MOVING INTO REDUCED TILLAGE SYSTEMS, FTR IS NOW BECOMING A PROBLEM IN SOUTHERN QUEENSLAND AND NORTHERN NSW.

"A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty." - Winston Churchill

Identifiable by its erect silvery white and feathery seed heads, FTR has emerged as a particularly difficult to control weed. DEEDI principal research scientist, Vikki Osten, is encouraging growers with FTR to view this change as an opportunity to improve their integrated weed management (IWM) strategy and reduce reliance on glyphosate.

Focusing the research on FTR's ecology as well as investigating its susceptibility to herbicides has enabled Vikki to develop a strategy that reduces weediness and identifies key opportunities to attack.

She said we now know that most of the seed bank will emerge in the first year, with smaller flushes possible in the second and third year. This short-lived seed bank gives vigilant growers a chance to overcome the problem.

"We know more about the conditions that will trigger emergence," Vikki said.

"FTR can germinate all year around but preference for warmer conditions makes spring and summer the key times. Emergence is more likely to occur as a major flush if wet conditions ensue for three to four days, or will occur as smaller flushes where rainfall is less intense.

Vikki believes a key reason FTR has become a problem weed when tillage is reduced is because the seed remains in the upper soil surface which is ideal for emergence and perpetuation of the weed.

"FTR seeds emerge mostly from the surface and top two centimetres and emergence is greatly reduced from depths of five centimetres," she said.

"This means growers need to be vigilant for each flush during the warmer months for several years after the seed bank starts emerging.

"Strategic use of cultivation has proven very effective and should be considered as a control tactic. Seed burial below 10 centimetres will prevent FTR from germinating.

"The seed has a very short dormancy and this will assist to run the seed bank down. Successful FTR control and seed management requires a planned attack for both the fallow and in-crop phases."

Timing is everything

Based on Vikki's research, targeting small actively growing plants gives the best response to chemical.

"STOPPING SEED SET IS THE KEY TO SUCCESSFUL MANAGEMENT OF THE WEED AND GROWERS NEED A STRATEGY TO ACHIEVE THIS."

MID SEASON DECISIONS

QDEEDI weeds research scientist, Vikki Osten discusses strategies for managing feathertop rhodes grass with land owner, Ray Meaney. Vikki has been researching weeds in CQ since 1987. During this time she has seen weed flora change reflective of the systems changes, especially the move to zero till. Problem weeds of the mid-eighties were perennials such as grey rattle pod, peak downs curse and rasp weed. These have been replaced by glyphosate tolerant and resistant summer grasses.

"Glyphosate alone will only be effective on FTR at the two to three leaf stage and prior to tillering," she said, warning that a delay of only one week, to when plants are five-leaf in size, reduces control by about 20 percent.

"Beyond early tillering, glyphosate is not effective."

Residual herbicides

Research has shown excellent results from the use of double knock tactic in fallows where a robust rate of glyphosate applied as the first knock is followed up with a robust rate of paraquat as a second knock seven to 14 days later.

Adding a residual herbicide to the second knock improves the paraquat knockdown and extends the period of control. However, plant backs, particularly to cotton, and limitations to current label claims for residual herbicides limit the applicability of using residual herbicides.

Research shows that by early tillering stage feathertop rhodes grass is too advanced to be effectively controlled with glyphosate.

"Cotton represents a good opportunity to include other herbicides, and reduce the reliance on glyphosate," Vikki said.

"Products from different mode of action groups are available for use in cotton and should be used in rotation to get good control in the early years before seed banks really build up.

"This approach will also lower the risks of herbicide resistance, particularly to glyphosate."

In Vikki's research experience, where residuals such as pendimethalin and trifluralin are used for grass control, FTR declines, especially if the grass escapes are then targeted and controlled in-crop with glyphosate or the Group-A chemicals such as haloxyfop and fluazifop.

Rotations

Similarly, strategic use of other broad leaf crops such as sunflower, mungbean and chickpea also provide good opportunities for in-crop grass control via alternative herbicide tactics.

Anecdotal observations in Central Queensland suggest that 6000 seeds can be produced by one FTR plant. These seeds would be dispersed via wind and water to adjacent paddocks.

"Stopping seed set is the key to successful management of the weed and growers need a strategy to achieve this," Vikki says.

Using residuals within the farming system is a great opportunity to rotate herbicide groups, reduce reliance on glyphosate and help with difficult to control weeds such as FTR.

Spotlight asked Nufarm R&D Officer Frank Taylor for some advice on using residuals.

He said that growers should consider where residuals fit in their system, particularly in regards to plant back periods.

"Plant back periods will vary depending on rate used, soil type, pH, weather and soil moisture," he said.

"I've seen situations where two kilograms of atrazine was applied in December, and the winter cereal planted in May was completely unaffected, yet in other years, the same situation in a drier year, has resulted in clearly visible crop effects.

"Moisture is a big factor and growers can get caught out.

"It is not the volume of rain, but the length of time the soil is moist that is the critical factor. A couple of storms, where the soil dries out quickly won't contribute as much to the breakdown of residuals, compared with soil staying moist for a few of days.

"Temperature is also important, with warm conditions conducive to product breakdown.

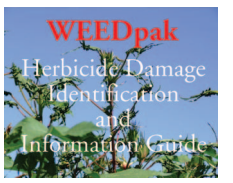
"Depending on the product, pH can also influence breakdown. For example atrazine will have a longer residual period on higher pH (alkaline) soils."

Frank's advice is to test before planting.

"If growers have used residuals and are concerned about the plant back periods to sensitive crops, in the lead up to planting, pot up soil from the treated area and also an untreated area, plant the susceptible crop and compare the emergence. Of course in many situations, there isn't the time," Frank says.

"The presence of susceptible weeds in a treated paddock can also be a good indication."

Further Information



This guide shows some of the more typical damage symptoms seen in Australian cotton from exposure to a range of herbicides, including some key residuals.

www.cottoncrc.org.au/industry/Tools/Herbicide_Damage_Identification

see our website

2011/12 Cotton Pest Management Guide has table of plant back periods.

Acknowledgement
This research was conducted as part of the GRDC funded, 'Continued delivery of applied solutions to CQ weed issues' (DAQ00105).

PIVOT POINTS

EVALUATIONS OF PIVOT IRRIGATORS SHOW IT IS COMMON FOR SYSTEM PERFORMANCE TO BE BELOW POTENTIAL, NOT ONLY FROM A WATER USE STANDPOINT BUT IN TERMS OF ENERGY USE AND CROP YIELD.

The number of overhead systems across the cotton industry is steadily increasing as the government's $5.8 billion Sustainable Rural Water Use and Infrastructure Program rolls out. With upward of 20 pivot evaluations under his belt, QDEEDI Rural Water Use Efficiency extension officer Lance Pendergast knows the value of investigating pivot efficiencies.

Lance's experience over the past three years is that it's common for pivots to be performing well below expectations, irrespective of whether the system is brand new or has been in place for many years.

"Overhead irrigation systems are sophisticated pieces of equipment. It's not surprising that there are common issues that arise in their maintenance," Lance says.

"However some of the issues are linked to the initial purchase decisions so are also relevant to anyone who is considering purchasing a system."

Pressure and performance

Incorrect pressures are frequently a key cause of reduced performance. Every machine is design to operate at a specified pressure, varying throughout its length. Emitters are designed at particular pressures and are therefore matched to specific locations along a machine.

"They are just like a lawn sprinkler - when you vary the pressure, the pattern changes. Loss of uniformity is a symptom of inadequate pressure and malfunctioning emitters," Lance said.

"If a crop is not getting a uniform delivery of water, then there will be patches of water logging and patches of water deficits, both of which cause stress and contribute to yield reductions."

"Some sites require the use of regulators above each individual emitter. This adjustment helps to counter the influence of relative height variation as a machine traverses undulating country.

"However there are limitations to how much variation regulators can counter as they only work within their given designed pressure range.

"Typically pressure regulators require water pressure to be five psi above their design specification. Higher pressure means energy is being wasted, whereas lower pressure will result in reduced uniformity."

Importance of emitters

Another issue Lance has commonly identified is inappropriate emitter packages.

"Approximately 70 percent of identified problems can be attributed to the emitter package, and yet they only account for approximately seven percent of the initial purchase price," he said.

"When it comes to emitters, you generally get what you pay for. Although basic emitters are appropriate in some situations, in many situations they are inadequate.

"The initial selection of the emitter package should be based on site specific conditions."

Soil conditions are of paramount importance. For example sodic soils require lower instantaneous application rates. This is the force with which the droplet hits the ground. In sodic soils high instantaneous application rates can break down the surface structure and can cause long term soil structural issues such as crusting.

The implications of high instantaneous application rate on a susceptible soil were evident at a recent system evaluation.

"There was a teaspoon of dirt in each catch cup at the conclusion of the sample collection," Lance said.

"The force of the water hitting the soil under this system was obviously damaging to this particular soil type and long term use was going to be quite detrimental."

ABOVE LEFT: Lance Pendergast is a DEEDI extension officer with the Rural Water Use Efficiency 4 project. Lance has recently finished his PhD on oxygation of subsurface drip irrigation systems. He has been evaluating overhead systems for the past three years and has looked closely at more than 20 pivots.

Bogging causes

Lance is commonly asked to look at systems causing bogging and wheel rutting, which are very visible symptoms of overhead irrigation systems that are not performing ideally.

Both management and design strategies can be employed to reduce the risk of bogging.

"The potential for labour savings is usually a strong influencing factor in the purchase of overhead machines. Bogging will quickly erode this saving, so it is important that the cause of the problem is accurately identified," Lance says.

"Although site specific conditions increase the chance of wheel rutting, the presence of significant wheel tracks can be a symptom of ineffectual boombacks.

"Boombacks are designed to deliver water behind the wheels and to reduce any interception by the towers themselves.

"Unfortunately evaluations frequently identify misaligned and inappropriately designed boombacks that are not functioning properly. This can drastically affect the performance of the machine, and can create stress on the machine and the owner."

As well as making sure boombacks, are functioning correctly, Lance has seen several other strategies successfully employed by to reduce wheel rutting.

These include running the machine dry prior to first irrigation, applying initial irrigations via a number of smaller application rates and retaining stubble.

Even if the machine is well set up and efficient, optimising irrigation management is still important.

"Overhead irrigation requires a different logic to that used in furrow irrigation. They are sophisticated machines designed to deliver exact amounts at specific times," Lance says.

"Soil moisture probes are essential tools to assist new growers in determining the soil moisture status, allowing them to fine tune their irrigation scheduling technique, and optimise crop growth under pivots."

"APPROXIMATELY 70 PERCENT OF IDENTIFIED PROBLEMS CAN BE ATTRIBUTED TO THE EMITTER PACKAGE, AND YET THEY ONLY ACCOUNT FOR APPROXIMATELY SEVEN PERCENT OF THE INITIAL PURCHASE PRICE."

Lance advises matching the instantaneous application rate to soil conditions to avoid soil degradation over time.

Acknowledgements and further information

Pivot evaluations are undertaken as part of the Rural Water Use Efficiency 4 project, a Qld Government initiative funded through DERM, and administered by Cotton CRC. Lance has also been working in conjunction with the Healthy Headwaters Project to develop a DVD focussed on centre pivot and lateral move machines, taking irrigators from initial purchase decisions through to practical management.

This DVD will be available early in 2012.

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email us

POINTERS FOR INTERPRETING QUOTES

Some aspects to consider when evaluating competing quotes for new pivots:

System capacity – is usually the key element in the requested quote and is therefore readily compared. Remember there is a critical difference between system design capacity and systems operating capacity.

System Design Capacity – the amount a design can deliver if operating 24/7.

System Operating Capacity – accounts for the fact that the machine cannot realistically operate 24 hours/day for seven days a week. In peak demand, cotton can use 12 mm/day.

Specifications of individual components – differences in specifications may be the basis for price differences between quotes, so it is important that these are identified. For example, smaller pipe diameters from the pump to the machine and for individual spans may reduce initial capital outlay but could have ramifications on operating costs due to higher pumping costs for the life of the machine. Compare span diameters and lengths. Ask suppliers to also provide a breakdown of operating costs for the quoted machine. The sprinkler package is another critical systems component. The suitability of the different types of sprinklers for the specific location and crops requires initial research. Although appropriate in some situations, the basic fixed plate sprinklers are not suitable for many situations.

Instantaneous application rate – is the measure of the rate at which water is applied by an emitter to a very small area. Think of a jet of water hitting the surface as opposed to the same rate of application in the form of a sprinkled pattern. Higher rates hit the ground with more force, which isn't suitable in all soil types.

System Uniformity – is a measure of how evenly irrigation is applied across the whole field. Pivots should be rate around 90 percent, however many operate at closer to 80 percent.

Timelines for delivery – delays in delivery can change the initial cropping options which may impact budgets.

REGULATE GROWTH FOR THE RIGHT REASONS

COTTON CROP PHYSIOLOGIST MICHAEL BANGE OF CSIRO PLANT INDUSTRY SPOKE TO INDUSTRY DEVELOPMENT & DELIVERY SPECIALIST SUSAN MAAS ABOUT THE REALITIES OF THE GROWTH REGULANT, MEPIQUAT CHLORIDE (PIX).

Pix is credited with eliciting a range of responses in cotton crop. Reasons for use range from slowing vegetative growth to sticking fruit, inducing cut-out, reducing attractiveness to late season pests, improving crop uniformity, preventing boll rots and achieving a few days earliness. However achieving the right balance of vegetative and reproductive growth from nutrients, water and pest control does not always require applications of a plant growth regulator.

When warm temperatures, ample water supply and high soil fertility combine, rapid vegetative growth (leaves and stems) outpaces reproductive growth (squares and bolls). This results in the size of the crop becoming unmanageable for operations like pesticide applications and harvesting.

Pix's mode of action is to lower the plant's production of gibberellin hormones. Gibberellins are a class of 'promoter' hormone. They stimulate cell division in the shoot apex and internode growth, as well as promoting cell growth and increasing leaf size. Lowering gibberellins causes cell expansion to slow and thus internode growth to slow and leaves to become smaller.

Sources of stress

Mike Bange says the degree of impact Pix has on cotton depends a range of factors, the most critical being whether there are other sources of stress already controlling growth and the dose of Pix applied.

"The need for growth regulators comes about when the cotton plant losses its own ability to regulate vegetative growth," he said.

"Pix has its place, it can play an important role in keeping vegetative growth in check.

"When fruit is lost, such as shedding during prolonged cloudy weather or due to insect attack, there is nowhere for assimilates that are being produced by photosynthesis to be taken up. The plant responds by growing more leaf and stem instead.

"Similarly, when lush growth conditions occur there may also an excess of assimilate above the needs of the fruit growth."

The action of Pix in these situations is like a brake on vegetative growth, where it allows the fruit growth to catch up and re-establish the crop's ability to once again regulate its own vegetative growth and meet the needs of further fruit growth.

In making a decision as to whether Pix can help, Mike advises crop managers to consider the causes behind the excessive growth.

"Excessive vegetative growth can be a symptom of too much nitrogen or water," he says.

"If continual use of Pix is needed it may be worthwhile considering changes in nutrition or water management. Continued excessive vegetative growth will reduce both water and nitrogen use efficiencies.

"If vegetative growth is not excessive, or if environmental conditions cause stress after the application, the benefits of Pix disappear."

Timing and rates

Both the timing and rates of Pix are important considerations as gibberellic acid is needed in other plant growth processes, so complete inhibition of the hormone is not desirable. Too high or too low rates can result in too much or too little plant control. A high rate at an inappropriate time can result in yield reductions.

Mike has also noted that the application of high rates of growth regulator late in the season has become a common practice in many cotton growing regions.

"The ability of Pix to restrict vegetative growth allows the reproductive growth of bolls to match that of vegetative growth causing the crop to cease production of new fruit, which we call 'cutout'," he explained.

"When target fruit counts have been achieved, Pix can assist in timing cutout and ultimately maturity. Using Pix in this way can assist in timely harvest and reduce late growth that does not contribute to harvestable yield.

"This late growth may be attractive to pests, and increase the incidence of immature bolls at harvest which may increase neps and lower micronaire."

Factors in decision-making

Mike suggests that the decisions on cutout application of growth regulator be based on a combination of factors, including whether the crop is already approaching cutout.

"We find that there are many instances where cutout occurs without the need for Pix, in many regions and seasons," he said.

"These often come about with crops with high boll loads towards the end of the season, where growing temperature and solar radiation have decreased, or water and nutrition become limited.

"Where water and nutrition are optimised, the nodes above white flower should fall at the rate of one per 55-65 day degrees.

"If the rate of decline is much slower than this, the other consideration that may favour the use of Pix is the time remaining until the last effective flower date for the region.

"If this date has already passed, then there is a higher probability that there are not enough day degrees left in the season to properly fill the fruit that have recently being produced. In these situations the uses of Pix is one option to help the crop cutout so that crop maturity is not significantly delayed."

Mike Bange suggests when managers make decisions regarding the application of growth regulators they consider the causes behind the excessive crop growth.

Further information

Resources on effective planning for optimised nutrition, water and ways to determine the best timing for applications of Pix at the Cotton CRC website http://www.cottoncrc.org.au Once there, look for Cottassist: Crop Development Tool, Australian Cotton Production Manual, FIBREpak.

see our website

Pix® (mepiquat chloride) is the plant growth regulator registered for use in cotton and is a registered trademark of BASF. Go to P133 of the *Cotton Pest Management Guide 2011-12* for a list of the companies registered to supply the product. The Cotton Pest Management Guide is available online as a PageTurning device for mobile communication tablets at www.crdc.com.au/index.cfm?pageID=140

see our website

Paul Grundy in the Sicot 71 Pix experiment. The cotton on the left has had no Pix whilst the cotton on the right has had total of 2800mL/ha. The reduction in fruiting sites is visually apparent.

RAIN, CLOUD AND GROWTH REGULATION

LESSONS LEARNED IN THE NORTH HIGHLIGHT THE INFLUENCE OF WEATHER ON COTTON'S RESPONSES TO PLANT GROWTH REGULATION BY MEPIQUAT CHLORIDE (PIX). RESEARCH SHOWS THAT BALANCING VEGETATIVE AND REPRODUCTIVE GROWTH IS A CRITICAL SUCCESS FACTOR FOR COTTON IN THE BURDEKIN WHERE FRUIT SETTING PATTERNS ARE OFTEN ATYPICAL.

Experiments show northern cotton is very sensitive to Pix application. The southern Vegetative Growth Rate (VGR) decision making tool can over-prescribe Pix and negatively affect yield potential, particularly in a cloudy year.

Reflecting on their fourth season of research in the Burdekin, Paul Grundy, QDEEDI and Steve Yeates, CSIRO Plant Industry, still believe that crop managers need to 'think like a cotton plant' when making decisions in response to weather.

"Cotton can be incredibly adaptive, but the crop's responses to changes in weather are not always straight forward," Paul Grundy says.

The VGR method traditionally used in southern climates to determine the timing and rate of Pix was problematic for cotton production in the Ord, and Steve Yeates suspected that the Burdekin would be the same.

"We commonly see the need for Pix in northern cotton before squaring because early conditions are vastly different. Cotton is sown into soil temperatures between 25-30°C. Combined with plentiful surface moisture and quickly mineralising nitrogen, it responds with excessive vegetative growth much earlier," says Steve.

Experiments in 2011 (see graph 1) compared 10 treatments of increasing doses of Pix, 200, 400 or 800 mL/ha/application, creating cumulative rates of 0-2.8L/ha. Treatments were applied to three cotton varieties, Siokra 24, Sicot 71 and Sicot 74, between the seven nodes and cut-out growth stages. The three varieties were chosen for their generally strong performance in the region and the differences in their determinacy.

Increasing cumulative doses of Pix reduced the total number of fruiting sites, predominantly second position bolls, and also reduced lint turnout.

The most dramatic impacts were observed with Sicot 71, which was the most determinate of the three varieties.

In response to the problem, a tool is being developed for determining the most appropriate Pix timing. Rather than being based on changes in internode length over time, the northern model combines measurements of total crop height, node number, nodes above white flower (NAWF) and early season fruit shedding each week to determine whether or not Pix is required.

Pictured (left) is a Sicot 74 plant after 1200mL of Pix (3 x 400mL) application. This allowed for production of a large "top crop" that is balanced with the crop canopy and has well developed P2 fruit. The plant at right is from the highest Pix treatment resulting in a compressed cluster of top bolls that are not well balanced with the adjacent foliage resulting in small P2 fruit.

When Pix is required, only low doses of 200-500mL/ha per application will be recommended.

Paul Grundy explained the logic behind low rates.

"Weather conditions change very rapidly in the Burdekin," he said.

"Low rates triggered by the tool keeps vegetative growth in check while still allowing the crop manager to retain the flexibility to respond to situations as they develop. The determinacy of the variety influences the rate chosen."

While caution is needed in selecting both the application rate and timing for Pix, research has identified some advantages for crop management, but neither maturity, nor limiting crop height are among them.

"Interestingly in all the experiments under Burdekin conditions there has been no maturity advantages derived from Pix usage," says Paul.

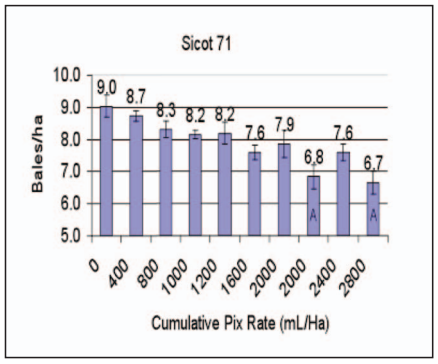
Tall crops can be high yielding crops in the Burdekin. In a wet year, a plant may need 30 nodes, or 140-160 cm, in order to maximise yield potential, thus regulating early crop height allows room for growth later in the season.

Reflecting on his experience with harvesting tall crops, Steve says, even at 160 cm, it's not as difficult as it may seem. In these situations, very little, if any of the fruit is in the lower section of the canopy.

"Wet weather shedding followed by high retention of late fruit means the yield is in the top half of the plant. A picker simply needs to raise the working height of the heads and picking speed may be reduced slightly," he said.

Ultimately there is nothing magical about Pix. Research to date shows Pix cannot overcome yield impacts of low radiation experienced during cloudy weather in the Burdekin.

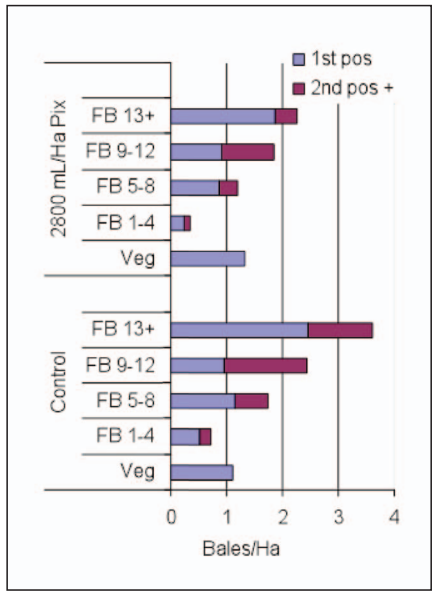
Shorter crops definitely have some advantages for management, such as ease of insect scouting and efficacy of insecticides.



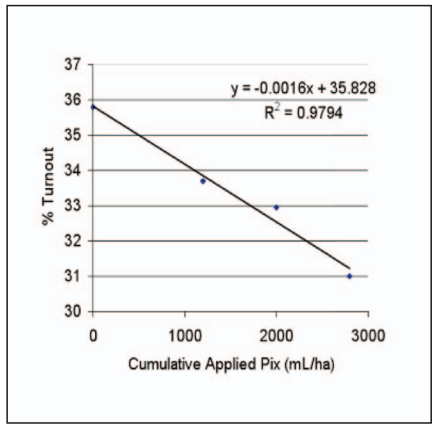
Graph 1. Yield from a Pix experiment on Sicot 71 in the Burdekin during 2011. Increasing dosage of Pix resulted in decreased yield potential. These treatments were applied in cumulative doses of 200mL or 400mL every five nodes except the two treatments marked with (A) where cumulative doses of 800mL and 400mL were used to achieve the combined totals.

"In the tropical environment we know insect pests such as green vegetable bugs and armyworm can invade in large numbers quickly, however reducing crop height for this purpose may come at a significant cost in terms of lost yield potential due to the plant's physiological responses to Pix under tropical conditions," Paul Grundy said.

Ongoing research efforts in 2012 will aim to validate this new Burdekin tool on commercial crops.



Yield loss in this experiment is due predominantly a reduction in canopy expansion (total biomass) and resultant decline in upper canopy P2 fruit.



The most surprising result from each of the experiments was the decrease in lint turnout with increasing Pix application. The impact of Pix on the lint turnout for Sicot 71 in the Burdekin was significant for the 2011 season.

COARSE DROPLETS FOR SUMMER

BILL GORDON OFFERS ADVICE FOR SAFE AND EFFECTIVE SUMMER WEED CONTROL.

Most herbicide applications in summer will require the use of no less than a medium or coarse spray quality to manage the risks of spray drift and to comply with label directions. Fortunately there are options for spray application that achieve coarser qualities without compromising efficacy.

Over recent years CRDC and GRDC funded field trials looking at the impact of application parameters such as spray quality and nozzle type on the efficacy of summer weed control. Trials have shown that for fully translocated products such as Roundup Ready Herbicide over the top of cotton and for other glyphosate products used in fallow, there has been no significant impact on efficacy as a result of using a coarse spray quality, provided nozzles are operated in an appropriate manner.

The timing of the application and the rate of product used still have the greatest impacts on herbicide efficacy, but spray quality, nozzle set up and water volumes play a clear role in maximising weed control.

Factors that effect efficacy were identified in industry funded trials conducted between 2008 and 2011 by Bill Gordon Consulting in association with various co-operators.

Speed

Increasing travel speed above 16-18 km/h requires better control of spray quality and release height to minimise the spray fraction at high risk of drift. This is because travel speed impacts on many parts of the application process, from the production of the spray pattern (sheet formation) and the downward velocity of droplets, to the potential for the escape of small droplets from the pattern (referred to as entrainment) and the aerodynamic effects around the machine.

Typically higher speeds require coarser droplets to reduce the airborne fraction. Choosing nozzles that maintain spray quality at all operating speeds is critical.

Nozzle spacing and height above the target

Nozzle spacing did not impact on efficacy when double overlap was achieved. Similarly, nozzle height only had a significant impact on efficacy when the nozzles were too low above the target or stubble to maintain a double overlap.

From a drift point of view, higher release heights always increase the drift potential.

Set the height to achieve double overlap, where the edge of the fan pattern should reach the target or top of the stubble or crop directly below the adjacent nozzle. Height can be maintained using autoheight control or jockey/touchdown wheels on the boom.

Spray quality

Most nozzles producing standard fan type patterns delivered the same efficacy at Medium (M), Coarse (C) and Extremely Coarse (XC) spray qualities. This was true for glyphosate and paraquat-based herbicides where appropriate water volumes were used.

When marginal rates of products were used with XC spray quality, the efficacy of over-the-top applications of Roundup Ready Herbicide were affected. Efficacy was reduced by up to 10 percent in these situations. There was no impact where optimum product rates were applied.

Once spray qualities approached Ultra Coarse (UC), efficacy was lower where application was made in a larger crop canopy or heavier stubble situation. The only nozzle producing UC tested was the TTI.

Nozzle style and orientation

In recent trials twin nozzles such as the Teejet AITTJ and alternating offset nozzles, like the TeeJet TTI 015, have demonstrated increased efficacy at C and XC spray qualities when compared to other air-inducted nozzles producing a standard fan pattern.

Twin nozzles performed well on larger targets and heavy stubble situations at test speeds up to 20 km/h. However the TeeJet AITTJ should be used in preference to the standard TeeJet TTJ to also minimise the drift potential.

Where drift control is paramount, particularly if considering night spraying, using Teejet TTI nozzles can be appropriate for fully translocated products. The TTI typically produces less than two percent drift, compared to a coarse nozzle which may produce up to 10 percent drift.

Most consistent results for low drift spraying were achieved using alternating offset nozzles, run at pressures of four bar and higher. Full efficacy was maintained with both glyphosate and paraquat-based herbicides. Where this nozzle and pressure set up is not possible, all nozzles pointing forwards is preferable. All nozzles pointing backwards can lead to less consistent results in some situations.

Application volume

Increasing fallow application volumes from 50L/ha to 70L/ha in cotton systems showed no significant difference in efficacy with fully translocated products up to a coarse spray quality in low stubble situations.

In high stubble a minimum of 70L/ha is recommended for all products, including Spray.Seed. Equivalent efficacy was achieved at the same application volumes, even with XC spray quality. The nozzles selected to produce the XC spray qualities were alternating TTI015 at 25cm or TTI02 at 50cm run at pressures of four bar or higher.

Above 70L/ha no significant difference in efficacy was obtained with different spray qualities for fully translocated products in high stubble situations, or for contact type products in most low stubble situations. At typical speeds the choice of nozzle and pressure can become important when using 70L/ha or more. Avoid using nozzles such as TeeJet TTI 025 or larger when targeting foliage. Spray quality will approach UC and reductions in efficacy of up to 10 percent may occur.

Further Information

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PUT YOUR BEST FOOT FORWARD

COME CLEAN GO CLEAN

COTTON IS AFFECTED BY MANY DAMAGING SOIL-BORNE PATHOGENS. COME CLEAN GO CLEAN IS THE INDUSTRY-WIDE CAMPAIGN SUPPORTING BEST PRACTICE IN FARM BIOSECURITY.

DEEDI Cotton Extension Officer and industry Development and Delivery Biosecurity Specialist Susan Maas is leading the Come Clean Go Clean campaign, and stresses that it is not just equipment we have to consider.

"Don't forget feet go into fields too," Susan says.

"Any soil or plant material moving between farms could potentially carry disease, weed seeds or pests.

"The key to successful farm biosecurity is planned simplicity - by having some systems in place, it becomes easy to do the right thing."

Susan recommends anyone visiting farms regularly should carry with them a small pump pack with a solution of 10 percent Castrol Farmcleanse (or equivalent) already made up.

"You can give equipment and boots a quick squirt between fields and farms, reducing the risk of transferring spores of key cotton diseases such as Fusarium," she said.

"Of course Farmcleanse cannot soak through large pieces of mud, so if conditions have been wet, or you are regularly in and out of irrigated fields, it's better to mix as you go."

In these situations it is recommended to carry Farmcleanse (or equivalent), water and an empty container suitable for boot washes. Scrape off the worst of the mud, and then boot wash the rest.

Reducing unnecessary foot traffic is also important and Susan is encouraging growers to communicate with all visitors to the farm about the importance of Come Clean Go Clean.

"*my*BMP outlines some handy, practical steps to improve farm biosecurity. Farm signage is effective for unexpected visitors and it is worthwhile taking the time to talk through your expectations with regular visitors, such as agronomists," Susan suggests.

"These little things can go a long way to creating a Come Clean Go Clean campaign for your farm - hence protecting your biggest asset."

The cotton industry has also identified that investment in a well designed and equipped wash down area on-farm can improve the ease with which Come Clean Go Clean is adopted.

Growers without facilities are encouraged to consider investing in a gravel or cement pad equipped with high pressure hose and Farmcleanse.

"When facilities are available it sets the standard. It helps make washdown part of doing business every day," Susan said.

"If you build it, they will come.... and wash down.

"A strong culture of farm hygiene can be engendered if the right systems are in place.

"You need to be able to leave clean to arrive at the next place clean. It is more likely that utes and field equipment will be washed down if the facilities are in place.

"Best practice should include wash-down in all scheduled vehicle and equipment maintenance."

DEEDI cotton pathologist Dr Linda Smith explains why industry recommends Farmcleanse as a key part of Come Clean Go Clean systems for every cotton farm.

"Research by Dr Natalie Moore in 1999 showed Farmcleanse had the highest efficacy against spores of Fusarium in both infested soil and on metal surfaces. No viable spores were recovered after treatment," Linda said.

"However, be warned that chemical disinfectants are no substitute for thorough cleaning of machinery.

"The more soil and trash that can be removed by high pressure washing, the less chance that diseases will be transported."

ABOVE: Feet go in fields too. Susan Maas says if you're regularly in and out of fields on a number of farms, spray boots with Farmcleanse between stops. When conditions are wet, take the time to remove mud.

BELOW: Build it and they will come ... and wash down. A purpose-built washdown facility on farm is a significant asset for establishing and maintaining a 'Come Clean Go Clean' culture on farm.

Further information

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*my*BMP OUTLINES SOME HANDY, PRACTICAL STEPS TO IMPROVE FARM BIOSECURITY

A NATURAL PROGRESSION FOR NRM IN COTTON BEST PRACTICE

A NEW COTTON INDUSTRY PROJECT WILL SEE 50 FARMERS IN QUEENSLAND AND NSW APPLY BEST PRACTICE ON THEIR FARMS BY INTEGRATING NATIVE VEGETATION INTO COTTON PRODUCTION SYSTEMS TO CONSERVE BIODIVERSITY.

Cotton Industry Development and Delivery Team Natural Resource Management Specialist Jane Trindall.

The project is supported by the Cotton CRC, through funding from the Australian Government's Caring for our Country initiative. Supporting partners include the Namoi Catchment Management Authority, the Cotton Research and Development Corporation, the Border Rivers Gwydir Catchment Management Authority, Gwydir Valley Irrigators Association, NSW Office of Environment and Heritage, TAFE NSW, Job link Plus, and the Australian Business Ltd Apprenticeship Centre.

CRDC's Bruce Pyke said this project is a new opportunity for industry to connect more to its recently proven formula of delivering a broad range of farming systems best practice information through an NRM framework.

"Given NRM is already embedded in the industry's *my*BMP best practice system, and Integrated Pest Management is significantly dependent on a productive environment for beneficial species, this project has the potential to build on our vision for industry best practice," Bruce said.

"Cotton Growers Working Together for a Sustainable Landscape" is an exciting new project giving cotton growers the opportunity to increase two ecosystem services, biodiversity and natural pest control on their cotton farms.

"This plan gives us the potential to work with cotton growers across the country to replant corridors between significant areas of vegetation and along riparian corridors throughout cotton growing regions," said Cottton Industry Development and Delivery Natural Resource Management Specialist Jane Trindall who was instrumental in bringing all the partners together in a successful project application.

Jane said the cotton industry has become increasingly aware of the lucrative benefits of enhancing native vegetation biodiversity on cotton farms and across the landscape. The services provided by a diverse ecosystem around cotton production areas are understood better, particularly in how they provide a breeding ground for natural predators that in turn keep cotton insect pests in balance. This reduces production costs and ameliorates environmental impacts of production.

The cotton industry's long-term commitment to ecosystem services research has progressively developed a valuable suite of tools and products that are underpinned by quality science and best practise, such as *my*BMP. The 2011 new publication *Pests and Beneficials in Australian Cotton Landscapes* has proven a breakthrough product in describing not only the pests but also more about the beneficials that are a fundamental component of IPM.

A recent survey found that on average, cotton farms have 40 percent of land dedicated to native vegetation and nine kilometres of riparian vegetation, eight kilometres of which is already actively managed by growers. This new project will enhance the natural resource management already underway on Australian cotton farms, Jane believes.

"The project will also embrace and enhance the skills of local Aboriginal people in the Narrabri district as part of the cotton industry's commitment to 'closing the gap'. A team of indigenous trainees will trained in partnership with TAFE NSW – New England Institute and will work with growers in the Namoi Catchment to replant corridors and manage weeds and pests.

"The Cotton growers working together for a Sustainable Landscape initiative aims to conserve biodiversity by integrating native vegetation into cotton production systems, and the industry looks forward to working closely with farmers throughout Queensland and NSW in implementing this exciting project aimed at securing a sustainable future for the Australian cotton industry," Jane said.

For more information or to find out how you can become involved in the Cotton Growers Sustainable Landscape initiative contact Jane Trindall at the Cotton CRC on 02 67992402 or e-mail jane.macfarlane@csiro.au

GROWERS NEEDED TO SUPPORT

The Cotton Catchment Communities CRC has been successful in receiving funding for five Aboriginal people to undertake a 12 month traineeship in Certificate II / III in Agriculture. The CRC is seeking support from local farming businesses to host one or more trainees to undertake on the job training for periods throughout the 12 months of the traineeship. Activities could include irrigating, harvesting and planting.

"These positions are fully funded and start in January 2012 and finish in December 2012. In exchange for your participation in this project we will provide you will additional labour at no extra cost to you or your business," Jane said.

TAFE NSW will be providing the training resources and a flexible delivery schedule will be designed to fit within the local farming schedule.

If you are interested in participating or would like further information please contact Jane Trinadall 02 67992417 or 0447 261 014 or e-mail jane.macfarlane@csiro.au

email us