

# Cotton has head start in improving water use efficiency

In the wake of the Prime Minister's recent commitment to restore the integrity of the Murray–Darling basin, the cotton industry can readily demonstrate a head start in improving water use efficiency.

The industry is aiming to emulate the achievements of its top growers by doubling water use efficiency from one to two bales of cotton per megalitre.

This objective has been given top priority by the Cotton CRC, its State Government partners, CSIRO, the Cotton Research and Development Corporation, the Australian Cotton Growers Research Association and Cotton Australia.

Cotton CRC chief executive officer, Guy Roth, said about \$17 million has been allocated to more than 30 projects in four States, involving joint participation by 12 research entities including five universities.

“Water is the major limiting factor for the Australian cotton industry, so growing ‘more crop per drop’ is vital for the industry’s environmental and economic sustainability.

“The Cotton CRC, its partners and growers, are spending millions of dollars to improve water management. This involves a complex array of better cotton agronomy, new plant breeding varieties, good soil management, and efficient irrigation management.

“CRC projects relating to water use and quality range from the field, to the whole farm and its groundwater, storages and wetlands, the river and the channels that connect the two. In other words, the catchment and its components,” Guy Roth said.

## MAJOR PROJECTS UNDERWAY

He noted that the CRC is also undertaking a Climate Change scoping study, due for completion in April 2007, to pull together what is known about climate change in cotton communities and establish the gaps and questions that require future research.

“A major CRC project is investigating the impact of different management strategies on the yield and quality of irrigated cotton. The data will be incorporated into existing crop irrigation scheduling programs such as HydroLOGIC, which can then be used to develop information products and training packages.

“These will aid irrigators and their consultants faced with limited water to make water management decisions that maximise crop profitability where furrow, overhead or drip irrigation systems are used,” he said.

### Bollgard focus

Purchase of irrigation monitoring equipment to compare water requirements and optimal irrigation scheduling for both Bollgard II and conventional cotton crops is enabling rigorous measurements in the CRC’s irrigation research.

Preliminary results from CSIRO Plant Industry research indicate that Bollgard II varieties can be more water efficient. In two experiments, Bollgard II varieties used 10 per cent less water than an equivalent conventional variety under normal full irrigation and also produced higher yields.

Bollgard varieties retain more bolls so they can have a shorter growing season, so need fewer applications of irrigation water.

Biotechnology companies are also in the early phases of researching new water stress plant genes. The CRC will contribute to related commercialisation and agronomic research if and when these genes become available in the future.

Guy Roth said gaining an understanding of the plant’s responses to water and then optimising those responses is an important part of using water efficiently.

“A major project has investigated variations in the plant’s response to the soil water status under different soil and climatic conditions and the consequences for in-crop water management. This project provided a basis for optimising the irrigation strategy for cotton in different production regions.

“It also underpinned the development of WATERpak, a major industry resource bringing together the latest irrigation-related research outcomes and an important tool in implementation of the BMP Land and Water Management module throughout the industry.”

### On-farm storage research

Many cotton farms have large water storages. The Namoi and Gwydir regions have at least 20,000 hectares of storages on cotton farms and there are 18,000 hectares of storages in south-east Queensland.

These on-farm storages provide significant advantages in improving water use efficiency but have one major problem — evaporation. As with all large water storages, cotton farms are losing between 15 and 40 per cent of their stored water to evaporation, depending on a host of variables such as temperature.

A major collaboration between the Cotton Catchment Communities CRC, CRC Irrigation Futures and CRC Polymers is seeking to develop and commercialise evaporation mitigation products and systems that can be applied successfully to storages larger than ten hectares.

These storages also provide opportunities to increase on-farm biodiversity and bioremediate chemicals from pesticides and fertilisers.

### Healthy on-farm waterways

“In early 2006, the CRC released *design principles for healthy waterways on cotton farms*, the outcome of a CRC



research project in which scientists from The University of New England and The University of Sydney collaborated.

“This publication provides a readily digestible summary of key design principles for on-farm storages, dams and reservoirs and how to link them into the farm irrigation system for optimal environmental and economic performance. Other research on birds has shown that these storages provide significant habitat to both wetland and woodland birds.”

He said another CRC project is examining aquatic biodiversity and the ecological value of water storages, identifying the aquatic species present in the storages and seeking to understand the effect of seasonal pumping of water on their abundance and diversity.

### Groundwater studies

“There are considerable gaps in our knowledge of groundwater quality and availability. The University of NSW and University of Technology Sydney are leading groundwater research within the CRC. The recharge of groundwater systems can be directly linked to irrigation practices and CRC research is seeking to understand these systems and how best to manage them.”

Recently completed scoping projects

have assessed the physical and chemical status of aquifer systems in a number of regions, reviewed existing groundwater models for each aquifer and indicators that might be useful as simple measures of groundwater health.

Studies have been undertaken in the Upper and Lower Namoi, Border Rivers/Gwydir, and Condamine. These projects have provided information to guide future groundwater research and monitoring.

### BEST MANAGEMENT PRACTICE PRINCIPLES

In summary, Guy said a cotton Best Management Practices program for improved water use efficiency would include the following principles and practices:

- Good agronomy, including improved cotton varieties, good soil management, crop rotations, crop protection, and best practice irrigation and nutrition management;
- Improved delivery (from river or storage) to the field;
- Maximising storage and distribution efficiency, reducing evaporation and drainage;
- Maximising application efficiency;
- Monitoring water use and calculating efficiency;

- Achieving uniform application;
- Planning, installing and operation of alternative irrigation systems (where applicable) as well as upgrading farm design;
- Use of the Cotton BMP Land and Water Management module to enable a systematic approach to management;
- Incorporation of local science information in the Darling River Catchments on both surface and ground water to better inform decision makers;
- Developing practices and processes which help filter irrigation water for reuse on the farm, including farm wetlands, and in the environment generally;
- Specialist short courses and vocational training for cotton consultants, cotton growers and their staff;
- Continued development of delivery systems and tools that facilitate communication, awareness and rapid adoption of research outcomes; and,
- Provision of technical support to enhance development and adoption of the cotton industry's Best Management Practices.

For further information contact Guy Roth  
02 6799 1509 or 0417 223 179.



www.caseih.com

## GET BETTER PICKING PERFORMANCE WITH CASE IH HI-SPEED SPINDLE CLEANER



Case IH Hi-Speed Spindle cleaner is a water emulsifier concentrate specifically formulated to keep spindles clean, slick & trouble free.

- Reduces stain & wrapping
- Moistens & cleans cotton picker spindles
- Cleans dirt & sap from spindles
- No deleterious effects on doffers & pads

See your Case IH dealer today for better picking performance.

**CASE IH**  
FOR THOSE WHO DEMAND MORE