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The R&D challenge beyond 2012

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The Cooperative Research Centres (CRC) Program was established in 1990 to improve the effectiveness of Australia's research and development effort. It links researchers with industry to focus R&D efforts on progress towards utilisation and commercialisation. It involves collaboration and cooperation across a wide range of organisations, focusing their researchers and extension people towards key strategic outcomes for the industry.

The cotton industry has been one of two agricultural industries to have enjoyed the benefits of the CRC program almost since its inception and currently we are around mid-term in our third cotton related CRC. The current funding for the Cotton Catchment Communities CRC ("Cotton CRC") ends in June 2012.

The key element in CRCs is collaboration. Through collaborative arrangements for research and education, CRCs overcome the need for critical mass of expertise within individual research institutions as the expertise comes from around the nation in a closely integrated format rather than relying on single centres of excellence.

They have been important in bringing research providers in line with industry needs. CRCs break down the barriers between national research organisations, state agencies and universities and often include private companies. CRCs have also been

important in providing funding for so-called "common good" areas that industry may not be able to fund adequately but which nevertheless impact significantly on the industry such as catchment and community issues.

The current Cotton CRC will bring over \$100 million in research effort to the cotton industry, its catchments and communities between 2005 and 2012. Its aim is to deliver an additional \$1 billion of benefits to the industry.

Significant benefits

The benefits that have arisen from previous Cotton CRCs include significant gains in Integrated Pest Management (IPM), insect resistance management, Fusarium wilt management, gains in water use efficiency, training of cotton operators through the Cotton Production Course, funding of extension staff across the industry and building the overall research capabilities by funding many PhD students to work in the industry.

The previous Australian Cotton CRC has been independently assessed with the analysis showing \$7 benefit for every \$1 invested by the CRC. While 2012 may seem some time away the industry needs to be planning well ahead for its research needs and subsequent funding support. We are also seeing the evolution of changing irrigated agricultural systems across the Australian cotton belt. Current trends suggest that while cotton is likely to remain the major crop in most regions, farming systems are becoming more diversified with people looking at farming systems rather than a single crop focus.

Cotton will continue to be the world's most important natural fibre and second in total fibre market share to chemical fibres. Cotton consumption will continue to grow worldwide. But dramatic changes in the world markets for grains, oilseeds and legumes have made these options increasingly attractive.

Across the Australian cotton belt, especially the northern Murray Darling Basin (including southern cotton areas), a greater mosaic of crops is likely and may include "biopharma" (medical) crops in time. Added to this will be the continuing and perhaps increasing volatility in water availability with traditional fully irrigated cropping making way for greater combinations of full irrigation, supplemental irrigation and dryland practices in a farming program.

The complexities of farming across different crop production systems, natural resource management, possible greenhouse gas emissions management and commodity marketing will be significant. This creates a new challenge as to where producers will access



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the appropriate research and extension services to underpin these new farming complexes.

Knowledge and innovation created by cotton research and development will continue to be relevant but won't meet their total needs. On the other hand, the grains industry has not traditionally focussed research in irrigated grain based farming systems. So opportunities exist for a broader based CRC or similar functioning organisation.

Planning for future R&D

Recently the Australian Cotton Industry Council (ACIC), a forum representing all sectors of the Australian cotton industry, endorsed a proposal for the industry to commence planning for a future R & D arrangement beyond 2012 including the possibility of a broader based CRC to address many of the issues highlighted above. The ACIC believed it was essential that a high level of collaborative R & D investment as provided by the CRC process be continued beyond 2012.

In looking at future proposals the industry planning process being developed is considering a range of options including:

- Farming systems that are environmentally sustainable and profitable across a complex mosaic of irrigated and dryland crops in the areas traditionally growing cotton.
- Extension and further development of the science capacity and knowledge from within the Cotton Catchment Communities CRC (and others finishing such as CRC for Irrigation Futures), as well as new capacity from other investors and providers including the grains industry.
- Best Management Practice to become the region-wide irrigated and dryland cropping systems approach to improved productivity, environmental performance and capacity building.
- Marketing opportunities from regional quality assurance and environmental branding.
- Research to assist the Catchment Management Authorities and responsible bodies for natural resource management (such as the Condamine Alliance) in their delivery of outcomes from allocation of funding from any government funding initiatives.
- Adaptation and mitigation of greater climate variability and/or climate change in the northern Murray Darling Basin and other cotton areas.
- Regional planning modelling to guide capital infrastructure of new cropping systems.
- Skilled workforces to adapt to the changing cropping programs.

Specific R&D issues

Some examples of specific R&D issues which will be of importance to the industry and the mosaic of northern Murray Darling Basin cropping enterprises in the future include:

- Managing the interface between complex farming systems and the natural environment.
- Achieving greater production efficiencies and cost savings.

- Developing new and adaptive irrigation techniques.
- Managing and mitigating for possible increasing climate variability.
- Devising lower energy farming systems.
- Promoting higher carbon sequestration and reducing greenhouse gas emissions.
- Developing sophisticated IPM programs (insects, diseases and weeds) across and between crops.
- Synergies and challenges for crop nutrition in a multi-crop scenario.
- More genetically modified traits to support sustainable agriculture and the associated stewardship requirements.
- Coping with changing needs for capital investments.
- Developing the human capacity in changing skills.
- Exploring community issues including impacts on and opportunities for regional communities associated with agriculture.

The R&D challenge

While the cotton industry and irrigated agriculture as a whole has been battered by the continuing drought, industry leaders are looking to the future. They are well aware of the importance of R & D to agriculture's long-term prosperity and the sustainability of rural communities. The challenge is to continue to develop innovative and resilient farming systems that successfully integrate the mosaic of multiple crops within the overlaying challenges of climate, economics and policy imperatives. The cotton industry leaders will work with the industry and other industries to develop a collaborative R & D structure beyond 2012 and welcome input and ideas on this issue.



Future research will have to address a diverse range of cropping options.