



# Australian Cotton Cooperative Research Centre

---

Australian Cotton Research Institute  
Locked Bag 59  
Narrabri NSW 2390  
Ph: (02) 6799 1500  
Fax (02) 6793 1171  
[www.cotton.crc.org.au](http://www.cotton.crc.org.au)

Mr Peter Corish  
Chair  
Agriculture and Food Policy Reference Group  
GPO Box 858  
Canberra ACT 2601

Dear Peter

## Re: Submission to Agriculture and Food Policy Reference Group

The contribution of agriculture to the development of Australia and the partnership of farmers and agribusiness, with research scientists, extension and education officers is one of the great success stories of this nation. We welcome this opportunity to provide comments to your group. I have focussed on issues in Part C of your paper in relation to education and research.

The Australian Cotton industry is one of the original agricultural participants in the Cooperative Research Centre program. The industry has strongly supported its CRCs, which has led to the approval of a 3<sup>rd</sup> Cotton CRC, known Cotton Catchment Communities CRC, which will commence operations later this month.

As a result of our experience, **the CRC concept is integral to the successful adoption of commercialised technological innovations**, ensuring that they are quickly adopted across disciplines, institutional and State boundaries. Cooperation, coordination and good will are vital to success. Creating greater incentives and opportunities for the private sector to participate in R&D and CRCs is needed.

The Australian Cotton CRC provides an excellent example of successful research and education as well as partnership between industry and research providers to ensure the rapid adoption by end users. For example;

- An independent **economic evaluation of the payoff** of some programs of the Australian Cotton CRC investments was completed in March 2004 by the BDA Group, Melbourne. It found the outcomes were estimated to deliver benefits of \$586m to the Australian cotton industry. Accounting for price effects, 87 per cent of these benefits would be captured within Australia, or \$510m in total representing a net return of \$438m or **\$7 for every dollar invested**.
- An Independent Review Panel concluded in 2004 on the CRC "The success of the CRC is reflected in the exceptionally high levels of adoption of its innovative research developments"

The CRCs in the agriculture and food sectors and relevant environmental CRCs fill an essential role in coordinating major national initiatives that require research solutions, effective commercialisation/adoption and education/training.

**CRCs break down the barriers between federal, state and universities** and provides a sense of research outcome ownership and direction.

**CRCs have had a significant impact on agricultural education, training and university courses.** In addition, wherever, there is a CRC on a university campus where agriculture is taught its influence on students and staff generally is very evident such as at The University of New England. Impact of research can, of course, be demonstrated in very many different ways – research informs teaching; research informs public policy; research adds to existing knowledge and understanding; CRCs brings academics, students and industry together.



**Extension has shifted from being solely a public sector role to a mix of public and private services. There is opportunity for these sectors to effectively partner rather than compete in the knowledge value chain.** Where these specialised skills are not readily available a CRC can work to encourage the demand for and build the supply of independent services. Encouraging demand includes raising awareness amongst end-users of new technologies, key issues and the value of making changes. This creates a viable consulting opportunity to attract skills to the regions to assist end-users to adopt proven technologies. This is one part of building the “supply” side of knowledge services. The other is in building regional capacity through training. The relative roles of the public sector, which raises awareness and creates demand along with the private sector that delivers the specialised one to one advice are shown in the attached submission.

Through collaborative arrangements 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.

Commercialisation and adoption is central to the requirement of every CRC and this has helped change the culture in research and extension to help accelerate the uptake of new technology through private sector and public good initiatives. **The definition of commercialisation should include utilisation and uptake of technology by farmers.**

Rural Research and Development Corporations have been major cash investors in the CRCs. Their **processes are complimentary** and their industry synergistically benefits.

**This submission contends that the CRC framework is an excellent model for collaborative R & D, delivering proven excellence in research, adoption, education, training, independence and integrity with industry partners.**

**The CRC framework leads to collaboration and synergies among research providers and with industry partner. Hence, duplication is avoided, with the benefit of the CRC’s access to specialized skills and resources across State and industry boundaries.**

**It is our contention that the CRC framework and investment by the Commonwealth (DEST) provides the glue, stimulates the synergistic benefits and accelerates innovation and adoption by a number of years.**

## **Despite many great successes, there remain impediments in regional areas for research, education and innovation and opportunities.**

- Most technological innovations occur through lengthy and time-consuming research, which requires a reservoir of skilled personnel in numerous areas of research and technology. These skills are not always freely available in rural or remote regions. **Incentives are needed to attract and keep researchers in regional areas close to their associated industry.** A major problem is for young professional couples and the lack of employment opportunities available to spouses in small communities.
- Remote regional research infrastructure and facilities are generally poorly resourced. Infrastructure improvements are vital to attract and maintain interest among research individuals and their families in regional communities. **Government needs specific strategies to target science in the bush.** Many current reviews are city centric.
- There is a lack of interest from agricultural students to undertake Post Graduate PhD training in crop sciences as there are plenty of graduate jobs which offer attractive careers. **It is recommended higher stipends (\$30,000 tax free) for regionally based students** that are competitive with graduate salaries. These students may enrol through a city university, but their base should be in the regions to be eligible.
- More importantly a new Post Doctorate and mid career scientists program should also be



encouraged in rural areas for these students to articulate into on completion of their studies. **100 new young and mid career positions over three years would really stimulate activity in R&D.**

- **Salaries for research and extension scientists** who are largely employed by State and Federal Governments are not competitive with the commercial sector. Thus, the best people while stating their careers as researchers and extension officers with these organisations move on to management, sales and marketing rather than a career as a research scientist or extension officer trying to solve the pressing problems of this nation. Our best people take on management roles because they need higher salaries. They would be better remaining in the front line actually working with the farmers or doing good R&D&E.
- **Continued promotion of science and increased promotion of agriculture in the school curriculum is essential. DEST have some good initiatives.**
- There is a **lack of agricultural-environmental research** scientists in rural regions. There are lots of “coordinators”, but most environmental scientists live in the cities along way from the day to day experiences of landholders. Decentralisation strategies are needed for our large institutions.
- Industries and government need to map their skills requirements to those available, identify gaps and demand, then develop business plans for funding.
- **There is no doubt good teachers inspire students and career directions.** It is suggested that university teaching should involve industry personnel in 1<sup>st</sup>, 2<sup>nd</sup> year more to help motivate students. Industry people are keen to help, but there seems to be reluctance from the universities. Consideration should be given to a **program that facilitates industry participation in university and school teaching.** Funds provided to cover travel costs of industry personnel may help. Cross institutional arrangements should also be fostered as we cannot afford to teach every discipline at each university.
- **Three year agricultural degrees now means students do not undertake the four year degrees.** Fees need to be removed for the fourth year.
- Competitive funding rounds creates competition between institutions and researchers as they compete for limited cash funds. **Collaborative cross institutional partnerships must be fostered.** CRCs help promote these arrangements in partnership with industry.
- Funding for environmental programs such as **NHT needs to be better integrated with production** and social needs. For example, biodiversity research education and training needs to be better integrated with production science. While biodiversity is a national research priority, research per se is pretty limited. The same applies to water.
- **Funding for Rural Research and Development Corporations is essential.**
- **Industry target university units/courses** should be encouraged that link Industry personnel-researchers-extension officers-students and educators for course delivery. Courses like the UNE Cotton and Grains Production Course make these linkages in ways so that relevant input from all participants increases the student’s understanding of their subject material and the shape of their industry.
- The recent decision by the Federal Government to remove **Undergraduate Certificates** as recognised Higher Education University Awards should be re considered. This has removed the ‘certificate’ as a qualification and its ability to attract the Commonwealth Government Student Support Scheme (previously HECS). Removing the qualification and the assistance leaves the ‘certificate’ course far less attractive to busy industry personnel wishing to improve their understanding and qualifications. In effect this decision has made the diploma (i.e. an eight unit, 48 credit point award) the smallest recognised university award which, due to the extra length, is a significant deterrent to enter the program.



- An initiative should be developed that encourages linkages between agricultural colleges and relevant industries. For example, **a targeted program that involves CRCs with agricultural colleges** would bring many benefits to these colleges.

I would welcome the opportunity to meet with any members of the reference group to clarify these issues.

Yours sincerely,



**Guy Roth**  
**Chief Executive Officer**

[guy.roth@csiro.au](mailto:guy.roth@csiro.au)

18<sup>th</sup> July 2005



# Background Submission to Agricultural and Food Reference Group

Prepared by

The Australian Cotton Cooperative Research Centre

## ROLE OF THE COTTON CRC

The Australian Cotton CRC is highly regarded for its strength in technology transfer and education programs for industry. The CRC learning and adoption systems have been developed and continually improved to adapt to differing issues and target groups. Deploying modern extension methodologies and specialised staff has allowed the CRC to develop a highly effective extension and education network that is now one of Australia's leading rural extension models.

Recent research shows that cotton growers and consultants are experiential learners who actively seek information and experiences to develop their knowledge. Strategies are needed to aid experiential learning for assisting substantial changes in issues that cannot be easily "learnt by doing". Knowledge services are moving towards partnerships between growers, consultants, agribusiness, research and extension.

The role of crop science research is to generate new knowledge for use by farmers. However due to many challenges, including information overload, this knowledge is not always useful or used. Research highlights opportunities and partnerships to improve the uptake and use of research and industry learnings.

Research has identified that the cotton industry is responsive to change and willing to continually learn, with all sectors prepared to share information. The Cotton CRC's adoption strategies have contributed to innovation in industry that is considered to be on par with leading firms in business. Regular local testing and application of research from a trusted source such as the Cotton CRC has been identified as a critical part of this strategy.

**This submission contends that the CRC framework is an excellent model for collaborative R & D, delivering proven excellence in research, adoption, education, training, independence and integrity with industry partners.**

**The CRC framework leads to collaboration and synergies among research providers and with industry partner. Hence, duplication is avoided, with the benefit of the CRC's access to specialized skills and resources across State and industry boundaries.**

It is our contention that the CRC framework and investment by the Commonwealth (DEST) provides the glue, stimulates the synergistic benefits and accelerates innovation and adoption by a number of years, because it sees environment and communities as directly related to the industry's bottom line.

## Economic Benefit

An independent economic evaluation of the payoff of some programs of the Australian Cotton CRC investments was completed in March 2004 by the BDA Group, Melbourne. It found the outcomes were estimated to deliver benefits of \$586m to the Australian cotton industry. Accounting for price effects, 87 per cent of these benefits would be captured within Australia, or \$510m in total representing a net return of \$438m or **\$7 for every dollar invested.**



TABLE 2: SUMMARY OF ESTIMATED BENEFITS

Output Area	Industry Outcome	Benefits
<b>IPM</b>	1. Reduced pesticide use	\$250m
	2. Control of Whitefly	\$10m
	3. Delayed Resistance	\$53m
	4. Pesticides in water ways	\$2m
	5. Pesticide spray drift	-
<b>Weeds</b>	6. Adoption of Round up Ready <sup>®</sup> cotton	\$18m
<b>Diseases</b>	7. Fusarium Wilt	\$184m
	8. Export cotton seed market	\$4m
<b>Water</b>	9. Water use efficiency	\$64m
	10. Deep drainage	\$1m
<b>TOTAL<sup>a</sup></b>		<b>\$586m</b>

Note: Benefits reported in present value terms.

### Delivering the knowledge

The Year 5 review of the Cotton CRC was conducted in June 2004 by an Independent Review Panel comprising; Professor Daniel Kreig, International Cotton Specialist, Texas Tech University (Chair), Dr Michael Keller, Deputy Head of School of Agriculture (Entomologist) University of Adelaide, Mr Hamish Millar, Vice Chairman, Australian Cotton Growers Research Association and cotton grower, Dr John Williams, former Chief CSIRO Land and Water, and Professor Henry Nix (Centre Visitor). The review panel's Executive Summary reported;

*"This CRC has been extremely successful over the past five years as measured by a number of criteria. The reasons for the success include:*

- A. *Intelligent, dedicated Research Scientists addressing real-world problems in a scientific manner.*
- B. *A Technology Transfer Team that truly interacts with the Research Scientists to develop state-of-science programs for the Cotton Industry using a variety of delivery mechanisms.*
- C. *The CRC has been effectively and efficiently managed using a relatively small administrative structure and a management committee that truly fosters collaborative research and extension efforts for the good of the Cotton Industry and the community at-large. It has truly developed a spirit of cooperation and collaboration among Industry, Government and University personnel that has no equal in the scientific world. No single agency could ever achieve the degree of success enjoyed by the CRC.*

*"Very importantly, the CRC benefits from serving an Industry that is well educated and eagerly seeking immediate, feasible solutions to their on-farm production problems as well as long-term solutions addressing sustainability of their environment for future generations. The industry demonstrated to us that they are not only totally supportive, but provide leadership and interact strongly with the research activities, and the technology transfer approaches used to deliver solutions to the major problems associated with cotton production in Australia. Therefore the CRC benefits from Industry through financial, political, and emotional support*

*"This CRC has been extremely successful in solving some of the most-pressing problems of the cotton industry and demonstrating both economic and environmental benefits to the producers they serve and to the community at-large. The success of the CRC is reflected in the exceptionally high levels of adoption of its innovative research developments and in the 7:1 financial returns on investment from its outputs. These accomplishments are truly "Crown Jewels" of which all in this CRC can be very proud."*

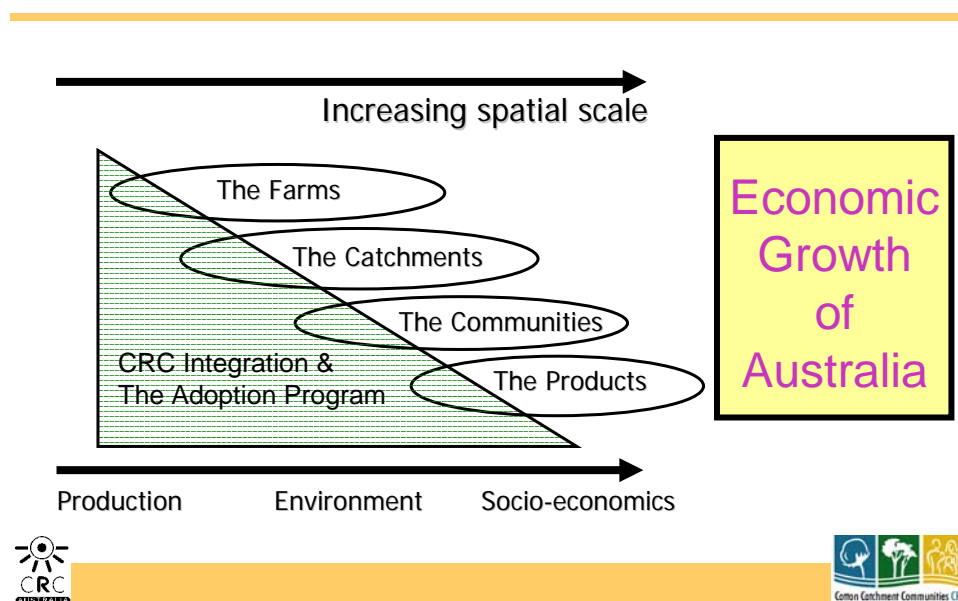


## FUTURE DIRECTIONS

In July 2005, the current CRC will be replaced by a new Cotton Catchment Communities CRC (CCC CRC).

The new CRC will build on these strengths and the established trust, respect and CRC “brand” that have been developed in the industry. It will be client driven and innovative to deliver outcomes to an even wider diversity of end-users, including cotton farmers, agribusiness, cotton shippers, international and domestic spinners, governments (Local, State and Commonwealth), community organisations, indigenous groups and catchment authorities.

## A plan for the future



## Extension - Delivering the goods to industry

### Background

The management of a cotton crop requires a high level of knowledge and timely decision making. The cotton industry has developed a strong demand for information and learning avenues to develop its knowledge and skills base. Since the modern cotton industry began to grow in Australia in the 1960s there have been strong linkages between industry and research. The Australian Cotton Growers Research Association (ACGRA), formed in 1972, provides grower input into planning, priority setting and critical review of research. ACGRA advise Cotton Research and Development Corporation (CRDC) project investments and host the biennial Australian Cotton Conference. Since 1993 the Australian Cotton Cooperative Research Centre and its predecessor have enhanced research prioritisation and linkages across agencies and with industry. The major investor in extension has been the Cotton Research and Development Corporation.

There are a wide range of mechanisms by which growers and consultants contribute to setting priorities for research and extension. Regional reference groups in each valley and for



specific programs help to set priorities for local and national extension programs. Grower learning groups such as area wide management groups also identify priorities, needs and interests for extension and research. Cotton Consultants Australia host technical forums and are involved with many research and industry committees.

Many researchers, growers, agronomics consultants, agribusiness and other industry participants take an active role in the knowledge system. Agronomic consultants are a key part of the cotton industry, particularly in the area of insect management and their focus is now expanding to whole farm agronomic management.

### **Key Objectives for Cotton Extension and Research**

The Cotton Research and Development Corporation and the Australian Cotton Cooperative Research Centre provide the primary leadership for research and extension in the Australian cotton industry. CRDC's core outcome is for "a more sustainable, profitable and competitive cotton industry providing increased environmental, economic and social benefits to regional communities and the nation". CRDC's five year strategic plan highlights for Program 1, People and Knowledge, an aim towards "Improving the capacity of industry and the community to use the knowledge and innovations gained through research and development. A continuing culture of innovation in the cotton industry, which creates viable rural communities" (CRDC 2003). Similar themes of uptake of research and knowledge apply across all programs.

Similarly, the Australian Cotton CRC aims to "enhance the development and growth of the Australian cotton industry through the application of collaborative research, education and the adoption of sustainable farming systems". Through a coordinated national network providing extension, support and educational support to the cotton industry, it strives for benefits of widespread adoption of sustainable management practices, increasing the industry skill base and an industry perceived to be a responsible corporate and community citizen. Each of the partner agencies also work towards similar objectives of sustainable production.

### **The changing face of extension**

This review challenges us to "extend extension: beyond the traditional boundaries, methods and ways of thinking". With so many changes in the extension context, traditional approaches need to be queried, adapted, abandoned or progressed.

Recent years have seen significant changes in the profession of extension. The tradition of an extension officer who would spend 20-30 years in a single region, developing their local knowledge and delivering that to the growers in their community is rapidly disappearing. In its place we see a young, mobile workforce, with temporary contracts and many extension professionals moving on to new projects after 3-5 years. Extension workers are coming in from and moving out to a wide diversity of roles. The extension role is also now shared across many players including researchers and consultants.

### **A changing Partnership between Public and Private Sectors**

The majority of cotton farms employ the services of a cotton consultant or on-farm agronomist who visit each farm two or more times a week during the season to check crops and advise on pest management and other aspects of crop agronomy. For more information about cotton consultants, contact Cotton Consultants Australia [www.cottonconsultants.com.au](http://www.cottonconsultants.com.au).

The CRC-based cotton extension network will partner more closely with the private sector in the future. In adopting new technologies, end-users will often require individual advice or monitoring services from specialised independent consultants.

Where these specialised skills are not readily available in cotton regions, the CRC will work to encourage the demand for and build the supply of independent services. Encouraging demand includes raising awareness amongst end-users of new technologies, key issues and the value of making changes.



This creates a viable consulting opportunity to attract skills to the regions to assist end-users to adopt proven technologies. This is one part of building the “supply” side of knowledge services. The other is in building regional capacity through training.

The CCC CRC’s targeted education programs will ensure that skilled consulting services are available to industry that promote new research findings. Accreditation of this training helps the end-user to choose quality consulting advice

Extension has shifted from being solely a public sector role to a mix of public and private services. There is opportunity for these sectors to effectively partner rather than compete in the knowledge value chain.

The relative roles of the public sector, which raises awareness and creates demand along with the private sector that delivers the specialised one to one advice are shown below. The diagram below outlines the relative continuum of activities from awareness raising to building perceived value (eg of a new practice), confidence building through to practical application. As depicted, the cotton extension network (public extension) focus more strongly on the industry wide elements (left hand side) whilst the private sector provide the detailed advice (right hand side).

