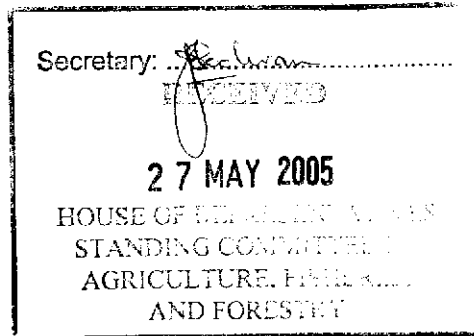




Australian Cotton Cooperative Research Centre

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Mr Alby Schultz
 Chairman
 House of Representatives Standing Committee Agriculture
 Parliament House
 Canberra ACT 2600

Dear Mr Schultz,

Re: Rural Skills Training and Research Inquiry

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 the inquiry into rural skills training, research and extension to further improve and focus resource allocation as well as develop strategies to promote careers and opportunities in regional Australia.

The Australian Cotton CRC provides an excellent example or case study of successful research and education as well as partnership between industry and research providers to ensure rapid adoption. 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 Cotton CRC operates a specialised University Level Course that is specific to the cotton industry at both undergraduate and post graduate level. This course won the prestigious National Business and Higher Education Roundtable award in 2000 for collaborative teaching. This course has lead to the development of other industry courses such as grain.
- With funding from the Cotton Research and Development Corporation the Cotton CRC runs a short course on Integrated Pest Management specifically targeted at farmers. This model of some adult teaching and practical sessions over a crop season has been highly successful and well received by industry.
- The CRC also provides student training and summer scholarships for undergraduate students while CRDC offers industry training opportunities for farmers.

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.



Despite successes, there remain impediments in regional areas

- 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 people, especially in circumstances where there is not professional employment opportunities available to spouses.
- 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
- Lack of interest from students to undertake Post Graduate PhD training. Recommend higher stipends for rural based students that are competitive with graduate salaries. A Post Doctorate program should also be encouraged in rural areas for these students to articulate into on completion of their studies.
- Salaries for research 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 with these organisations move on to the private sector in careers such as sales and marketing.
- Continued promotion of science (DEST) and increased promotion of agriculture in the school curriculum.
- Lack of 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.
- Industries and government need to map their skills requirements to those available, identify gaps and demand, then develop business plans for Government funding.
- Good teachers inspire students. University teaching should involve industry personnel in 1st, 2nd year more to help motivate students. Consideration should be given to programs that encourage industry participation in university teaching. Cross institutional arrangements should also be fostered.
- Competitive funding rounds for government programs creates competition between institutions and academics as they compete for limited funds. Collaborative cross institutional partnerships must be fostered. CRCs help promote these arrangements in partnership with industry.
- Funding for environmental programs such as NHT need to be better integrated with production and social needs. For example, biodiversity research education and training needs to be better integrated with production science.
- Funding for extension by Rural Research and Development Corporations is essential to ensure research is extended to industry.
- Government needs to facilitate agricultural industries in developing strong working relationships with vocational training providers.
- The Australian Cotton Industry needs a specific training package and government assistance is required to develop this training package.
- A recruitment of technically strong or training of people is required to fill the void in higher level RPL assessors.
- Agriculture requires continual financial support to attend vocational training, with attention directed towards permanent farm staff.
- FarmBi\$ needs to be administered at the federal level to avoid State boundary issues with regards to funding.



- Courses should be encouraged that link Industry personnel-researchers-extension officers-students and educators for course delivery. Courses like the Cotton CRC/UNE Cotton 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.

Meeting with Committee

We would like to encourage the committee to make a visit to a place like Armidale, which is the home of The University of New England and a partner of the Cotton CRC and the headquarters of three other agricultural CRCs (beef, sheep and poultry). The Cotton CRC would like to participate in any deliberations if such a visit was possible. As an alternative, we would welcome the opportunity to meet in Canberra.

Yours sincerely,



Guy Roth
Chief Executive Officer

guy.roth@csiro.au

18th May 2005



Submission to Parliament of Australia House of Representatives
Standing Committee on Rural skills training and research
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
IPM	1. Reduced pesticide use	\$250m
	2. Control of Whitefly	\$10m
	3. Delayed Resistance	\$53m
	4. Pesticides in water ways	\$2m
	5. Pesticide spray drift	-
Weeds	6. Adoption of Round up Ready® cotton	\$18m
Diseases	7. Fusarium Wilt	\$184m
	8. Export cotton seed market	\$4m
Water	9. Water use efficiency	\$64m
	10. Deep drainage	\$1m
TOTAL ^a		\$586m

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."

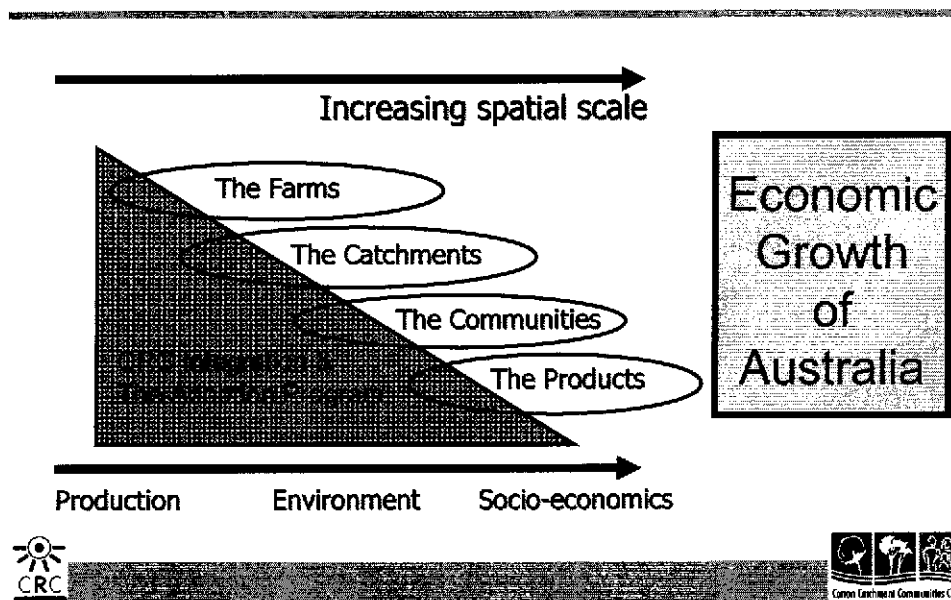


FUTURE DIRECTIONS

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



Vocational Training Needs of the Cotton Industry

The cotton industry has a relatively low participation rate in vocational training courses which has been confirmed in recent discussions with the Queensland Rural Industry Training Council (QRITC). Units of competencies are available for the cotton industry to which training programs can be aligned. However, some of the *main reasons for lack of adoption are listed below?*

- Grower awareness of what is available in VET is poor.
- Growers are not acknowledging the need for official accredited training. Producers not requiring a qualification to be a farmer have resulted in ambivalence towards training for formal qualifications. However, the need for qualifications often arises after these producers decide to leave the industry, eg recently seen in the sugar and dairy industries.
- The funding that is available is becoming more limited. For example, FarmBi\$ is now a maximum of 50% rather than the 75 % when the scheme was introduced.
- The full financial cost of courses seems to outweigh the benefit of completing a course in the eyes of most producers. The exceptions to this rule are where training is compulsory or strong financial incentives exist. For instance, when a restriction to the availability of a chemicals is enforced or before financial assistance packages can be accessed.
- Impression of courses by clients is that competency courses are onerous in paper-work and more suited to younger students at either agricultural colleges or TAFE. This highlights the lack of understanding by producers as to what competency-based training actual involves.

Opportunities

Partnership: A strong alliance needs to be fostered and maintained between industry, R&D organisations such as Australian Cotton CRC, and the Cotton Research and Development Corporation and Registered Training Organisations (RTO) to promote and encourage producers to undertake training.

This includes the commercial promotion of available courses that already exist and how vocational training activities can then be streamlined to matriculate through to tertiary institutions. A process that is currently difficult and not uniformly accepted. An example where this works well is University recognition of students via credit for previous studies for Agricultural College Diploma courses.

The balance between industry and RTO is important, as the cotton industry can provide the technical strong content using world-class researchers and extension personnel. While, RTO's can undertake a fee-for-service approach and provide the administration assistance necessary to access financial resources and provide external accreditation. A current success story is the Australian Cotton CRC Integrated Pest Management Course. This course has been developed in collaboration with industry researchers, leading growers and RTO's to meet a specific need. The format is an intense 5-day (total) course held over a production season (6 months) which meets a level 5 unit of competency. The course addresses numerous cultural, chemical and biological measures for enhancing an integrated approach to cotton insect pest management. To date 200 participants have completed the course with 168 obtaining formal qualifications. FarmBi\$ funding has enabled both large and small cotton producers to access a level 5 training package.

RTO fee regulation needs to be addressed.

Strong Industry Input into Vocational Qualifications for the Cotton:

Currently the training packages that are available for the cotton industry are only specific at certificate 3, (Cert 3 in Agriculture (Cotton Production)). At the Certificate 4, Diploma and Advanced Diploma levels the qualifications are more generic and termed a Certificate 4 in Agriculture. There is no acknowledgement of what the qualifications 'major' in. Was it cotton?, horticulture?, diary? Or perhaps a bit of every thing...



There has been industry representation for the development of the current training packages. However, due to continuous technological change in the industry the current units of competency could be enhanced to enhance the relevance of training that is currently offered to industry. Many current training events are not competency aligned, although they could be for all levels of competency. The current Rural Production Training Package is up for review in 2006; hence this is a prime time to suggest changes to the training packages.

Promotion of Recognition of Prior Learning within the Cotton Industry

The uptake of RPL in the cotton industry is very low. The current situation is primarily related to the perceived lack of benefit of training perse (but also due to a lack of knowledge on the process of RPL). Secondly, within the RTO system there appears to be a lack of content / knowledge based assessors to administer RPL assessment at the higher levels of Certificate 4 up to the Advanced Diploma.

Government assistance and direction could be provided to RTO and Industry representatives to establish this Assessor qualification performing this higher level RPL assessment.

Financial Funding

Financial assistance for the participation in vocational training is an important aspect of improved educational standards within the agriculture sector. Programs like FarmBi\$ 1 and FarmBi\$ 2 were very successful in assisting producers to attend up-skilling programs. Any level of assistance is critical, provided it is effective and not limited through administration.

The Australian Cotton Industry is spread across NSW and QLD and FarmBi\$ is a federal program administrated on a state basis. This creates many administration issues for producers situated near State borders. Program rulings at the State level determine which state pays for the course based on the dominant residential percentage of the group. Therefore a 50 % split in the grower state of origin proved to be a major problem. In addition, the paper work required by each state varied as to the attitude towards which courses should and should not be funded. A more coordinated approach to the administration of the program across states might provide more equity and less confusion from an administration viewpoint.

In terms of financial assistance available within the vocational training arena, the Department of Education and Training - Queensland (DET) and Queensland Rural Industries Training Council (QRITC) are funding sources in addition to FarmBi\$. FarmBi\$ funding primarily covers participants (usually the decision makers) at the Certificate 4 and higher. Certificates 1-2 are covered by the Skills Passport program (DET) in QLD, the focus of this program is on introduction to industry training for seasonal/casual employees only. However, there appears to be a gap for Certificate 3 funding. These people are usually permanent employee staff of farms undergoing training. Financial assistance is often limited for this category, and the review should give this some consideration.

RECOMMENDATIONS on Vocational Training with the Australian Cotton Industry

1. Government needs to facilitate agricultural industries in developing strong working relationships with vocational training providers.
2. The Australian Cotton Industry needs a specific training package and government assistance is required to develop this training package.
3. A recruitment of technically strong or training of people is required to fill the void in higher level RPL assessors.
4. Agriculture requires continual financial support to attend vocational training, with attention directed towards permanent farm staff.
5. FarmBi\$ needs to be administered at the federal level to avoid State boundary issues with regards to funding.





The Australian Cotton CRC Production Course – Tertiary Level.

The Cotton Production Course remains a major initiative of the Cotton CRC.

Outcomes

Over ten years, over one hundred and sixty students have completed the course, graduating with undergraduate or postgraduate awards. These have been cotton growers, cotton agronomists and consultants, trainee agronomists, research trainees and technical staff, industry development/extension officers, sales agronomists and students of agriculture at university. The Cotton CRC cotton production course provides an articulation pathway that is desirable, accessible and relevant to progressive cotton industry personnel.

Spin-offs have been undergraduate elective units in cotton production within three universities (University of New England, The University of Sydney and The University of Queensland) that have introduced cotton as a case study in their latter years of study towards agricultural degrees.

In 2000, The Cotton CRC Cotton Production Course won a prestigious national Award: the Business/Higher Education Round Table (BHERT) Award for outstanding achievement in collaborative education and training. The award recognises the contribution of a truly collaborative team reaching across farmers, researchers, cotton processors, governing associations, private bodies and educational providers. Typically twenty presenters from the Cotton CRC and industry contribute to each of the four residential schools and to the unit materials.

Modern multi-media teaching tools (CDs, internet access) have been developed and incorporated into an adult learning approach, emphasizing facilitation in learning.

All course material is developed in conjunction with cotton industry personnel, grower organizations, consultants, researchers, state departments of agriculture and educators.

Course Aims

The aim of the Australian Cotton CRC/UNE Cotton Production courses is to provide students with the necessary scientific principles and problem solving skills for sustainable cotton production. The course is directed to those people already in the cotton industry and to those wishing to enter the industry in the future. Modern modes of teaching and learning via multi-media learning tools, internet accessibility, and networking with industry and research expertise. Adult teaching approaches are also paramount in the course design, recognising the broad range of experienced industry personnel attending the course.



Industry Standing

The Cotton Production Course is recognised by Cotton Consultants Australia (CCA) as to qualify as an accredited cotton consultant. Students recognise the course as strongly orientated towards employment in the cotton industry or advanced agriculture in general. The content of the cotton course was reviewed six months ago by an expert panel of growers and consultants, cotton organizations (ACGRA, CRDC & Cotton CRC) and UNE educators. The outcome was to continue with the current emphasis on teaching principles rather than competency based skills. This avoids overlap with TAFE styled courses and provides definition for students wishing to articulate into tertiary levels of education from technical courses.

Recommendations

Courses should be encouraged that link:

- 1) Industry personnel-researchers-extension officers-students and educators for course delivery. Courses like the Cotton CRC/UNE Cotton Production Course make these linkages in ways so that relevant input from all participants increases the student's understanding of their subject material, the shape of their industry and the opportunities for employment. This results in an integrated web of experience that best bridges the 'natural' gap that traditionally forms between the training for employment skills and teaching principles.
- 2) 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.



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.

A National Cotton Extension Network

Under the leadership of the Australian Cotton CRC, the National Cotton Extension Network provides a close link between research, industry initiatives and the consultants and growers. The uptake of research is a high priority for the industry with CRDC investing approximately 10% of its R&D expenditure in extension programs (CRDC 2003) to supplement the state department extension services. In particular, this includes Cotton Industry Development Officers (regional extension positions focussed on cotton production), national extension coordination, a technology resource centre, decision support and education. These positions partner with State DPIs, Cotton



Seed Distributors' Extension Agronomists and specialists in the areas of Water Use Efficiency, Irrigation and Integrated Pest Management (IPM) to form the National Cotton Extension Network. Each member of the network is active through their local role and as part of one of the national extension focus teams – Insects, Disease & Weeds, Environment, Farming Systems and Water. Senior members of the extension team provide leadership of these focus teams. This leadership role provides a career development opportunity for team members as well as encouraging the sharing of knowledge and experience.

Key extension methods

Knowledge is developed and shared through a range of extension approaches which can be broadly grouped as:

- Trials and Demonstrations;
- Groups;
- Comparative Analyses;
- Education;
- Information Transfer; and
- Computer-based Decision Support Packages

Information resources are made available to the industry free of charge through the Cotton CRC Technology Resource Centre and local extension staff. These include the COTTONpaks (compendiums of information about a technical issue), CottonTales newsletters (1 page weekly-fortnightly regional news and research by fax or email), Research updates, identification guides, pocket guides and the Cotton CRC Website.

Computerised decision support packages are available for insect and nutrient management (CottonLOGIC) and water management (newly released HydroLOGIC) and a searchable CD of all printed resources. Information is also available via field days and seminars.

Area wide management groups, educational courses and comparative analyses are some of the avenues for communication and development of ideas.

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.

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



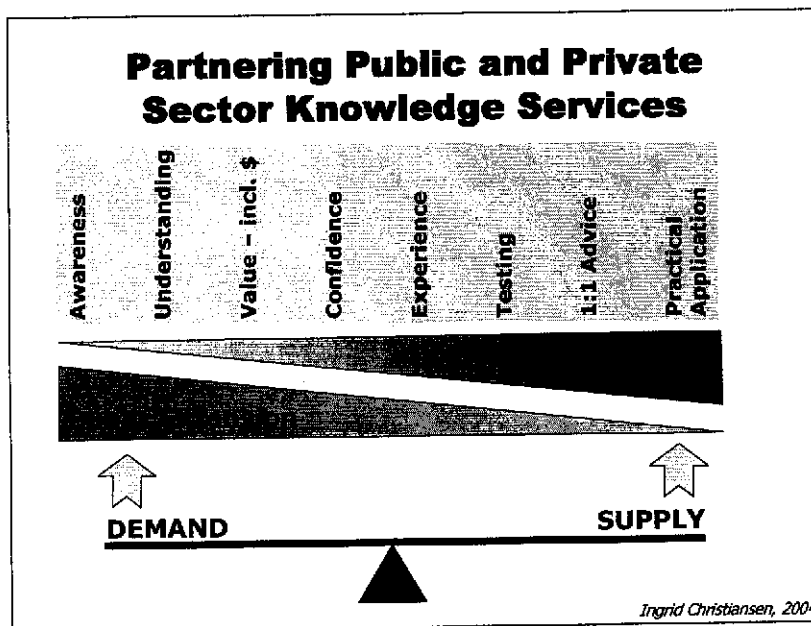
includes raising awareness amongst end-users of new technologies, key issues and the value of making changes.

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).



Source: Ingrid Christiansen^{1,2}, Bruce Pyke^{1,3}, Dallas Gibb^{1,4} and Geoff McIntyre^{1,5}
 © 2003 "Extending extension: Beyond traditional boundaries, methods and ways of thinking".
 Proceedings of the 2003 APEN National Forum, 26 - 28 November 2003, Hobart. Web site
www.regional.org.au/au/apen

Recommendations

Funding via Rural Research and Development Corporations is essential to ensure industry lead initiatives and focus. The cotton industry does not lack the need and willingness to pay for regular technological advice and extension capacity. However, the 2001-2004 drought has created some problems for the industry in ability to recruit skilled or experienced agronomic advisors to replace those who were lost during the period of low production. This highlights the need to develop stronger linkages with agricultural colleges and universities to ensure future skill needs are met.

About the Australian Cotton CRC

The Australian Cotton Cooperative Research Centre (Cotton CRC) commenced operations on 1 July 1999 when it successfully secured a second round of funding under the Commonwealth CRC Program. It succeeds the Cooperative Research Centre for Sustainable Cotton Production, which was established in 1993.

Mission

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.

Participants

Commonwealth Government

CSIRO

State Governments

NSW Department of Primary Industries

Queensland Department of Primary Industry & fisheries

Agriculture Western Australia

NT Department of Business Industry and Resource Development

Universities

The University of New England

The University of Sydney

Industry

Cotton Research and Development Corporation

Cotton Seed Distributors

Queensland Cotton

Western Agricultural Industries

For more information:

www.cotton.crc.org.au



About The Cotton Research and Development Corporation

The Cotton Research and Development Corporation was established in 1990 under the Primary Industries and Energy Research and Development Act 1989. It is one of 14 rural Research and Development Corporations which cover dairy, forestry, fishing, grains, grapes and wine, horticulture, pigs, sugar and other agricultural industries.

The CRDC is a partnership between the Federal Government and the Australian Cotton industry. It is funded through a levy on production with a matching contribution from the Commonwealth. The Corporation also receives income from royalties on seed sales of CSIRO-bred cotton varieties.

The Corporation is accountable to the industry through the Australian Cotton Growers' Research Association and to the Federal Parliament through the Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Richard Colbeck. The Corporation is a member of the cotton industry's peak body the Australian Cotton Industry Council, however the Industry Council is not a stakeholder in the Corporation

The Corporation is based in Narrabri, NSW and is unique among the Rural R&D Corporations for having its headquarters away from a capital city. Narrabri is in the heart of one of Australia's major cotton production areas and is close to the industry's key research facility, the Australian Cotton Research Institute.

The CRDC has a nine-member board with directors being drawn from the industry, community and government. The Chair is Ms Bridget Jackson.

The Mission of CRDC is: To invest and provide leadership in research, innovation, knowledge creation and transfer.

For more information: www.crdc.com.au



