

**COTTON RESEARCH AND DEVELOPMENT CORPORATION**

**Submission to the**

**Standing Committee on Science and Innovation Committee  
Inquiry into the coordination of the science to combat the nation's salinity  
problem**

**Terms of Reference**

The House of Representatives Standing Committee on Science and Innovation shall inquire into and report on the Commonwealth's role in managing and coordinating the application of the best science in relation to Australia's salinity programs.

In conducting its inquiry, the Committee will give particular consideration to the:

- a) use of salinity science base and research data (including the development of new scientific, technical and engineering knowledge) in the management, coordination and implementation of salinity programs;
- b) linkages between those conducting research and those implementing salinity solutions, including the coordination and dissemination of research and data across jurisdictions and agencies, and to all relevant decision makers (including catchment management bodies and land holders); and
- c) adequacy of technical and scientific support in applying salinity management options.

## **INTRODUCTION**

The submission by our close collaborative partner, the Australian Cotton Cooperative Research Centre, will give considerable technical information about the salinity research and extension effort in the Australian cotton industry, much of it undertaken with funding support from the Cotton Research and Development Corporation (CRDC). While we have attached an overview about our current salinity-related research projects and their background, it is not our intention to replicate the level of information provided by the Cotton CRC.

Rather, this submission addresses the pressing need for a nationally coordinated management model for salinity research and extension. Thus, we are addressing the Terms of Reference in a coordinated manner, believing Parts a. b. and c. to be part of the same wider problem and having the same solution.

## **FINDING A SOLUTION TO SALINITY**

The rural research and development corporation model, established in 1989, has proved to be an excellent means of coordinating research, development and extension and identifying 'gaps and overlaps' in research. It has ensured that Australian taxpayers get the best possible return for their research and development investment. With half the CRDC funding coming from cotton grower levies, the model has also had to prove itself from the industry's perspective. There is a widespread acceptance within the Australian cotton industry that its economic and environmental sustainability is underpinned by a coordinated, well-targeted research program, made possible through this funding model.

Every two years, the Australian Cotton Growers Research Association (which is CRDC's legislated industry stakeholder) organises the research-based Australian Cotton Conference, which brings together some 1,200 cotton farmers, researchers, extension and agronomy personnel and other industry participants. CRDC has found this to be an excellent means of sharing and extending knowledge and crystallising the way forward.

### **Recommended model**

The Corporation believes that the rural research and development model of coordinating research, development and extension is best placed to provide a comprehensive and cost-effective approach to solving problems relating to salinity and ensuring that research outcomes are extended quickly and effectively to those implementing salinity solutions.

To be truly effective, this coordinated research and extension effort should be supported by the Australian and state and territory governments, each of which is implementing its own salinity program. This means it is perhaps best initiated through the Council of Australian Governments (COAG) framework.

It should be administered by a research-commissioning organisation, rather than by an organisation that undertakes research itself. Specifically, the Corporation believes that Land and Water Australia (LWA), as a research and development commissioning body operating within the rural research and development model, and with a national reach, is best placed to coordinate and manage such an effort.

It is vital that researchers and other personnel working on salinity throughout Australia, at both the research and implementation levels, have the opportunity to come together on a regular basis. CRDC suggests the Australian Cotton Conference as a typical model. We believe that a research conference held at least every two years, if properly structured and funded, would be an important foundation for a well-coordinated program of salinity research and implementation.

Use of this model should not relieve organisations such as CRDC from their obligation with relation to salinity-related issues within their own industry, nor interfere with their need to pursue such research avenues. Instead, CRDC would expect to work in collaboration and consultation with the national coordinating body in allocating funding for cotton salinity-related projects. CRDC would also expect to maintain its own effective extension team, with salinity-related agronomy issues as part of its remit but also able to collaborate within a wider, national effort.

### **Funding the model**

The Corporation believes that such an important program could not succeed without separate and specific funding. Salinity should not have to compete for funding with the plethora of priorities that face any rural research and development corporation, or other funding body, and it should not come from within existing LWA funding. Rather, LWA should administer the program on behalf of the funding government/s on a cost recovery basis, in addition to the work it already undertakes.

It is a common complaint of researchers that even though salinity is presented as an urgent national environmental issue, they are pushed from pillar to post in seeking funding for research projects and often fail or end up with an inadequate level of funding. CRDC, itself, found the same problems and frustrations in seeking to put together an effective partnership to co-fund and undertake research into deep drainage under cotton fields (see attachment A). Despite the clear establishment of deep drainage as an important area for research, competing funding priorities and 'jurisdictional' issues meant the outcome was not all we would have hoped.

Many of these frustrations could be ended if one body had clear responsibility and appropriate funding to coordinate national salinity research and extension.

The success of a recent research and extension program in southern Queensland highlights the benefits which can be gained from a coordinated and focused approach.

The Queensland government conducted an excellent program to improve Water Use Efficiency on cotton and grain farms. There was a targeted approach and tremendous cooperation between all personnel involved and the farmers. The program was extremely successful and is hailed as a model for both industries in terms of applying research and educating growers in better understanding of efficient use of water. Unfortunately there isn't a program similar to this in NSW. Most farming industries operate in all States not just one state therefore better coordination or a National approach to solve problems is more effective, both economically and in knowledge adoption.

We ask that the Committee give consideration to the suggested model and are happy to expand on, or further explain, this submission should the Committee wish.

*Sub 2  
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2011/10/05*

## **ATTACHMENT A**

### **The Australian cotton industry, salinity and sodicity**

Extensive monitoring and risk assessment has shown that salinity is not a significant problem for the cotton industry or its riverine environments at this time. Sodic soils contain other sodium compounds that, unlike salt, are not transportable but cause soil quality-related problems in growing the crop. Sodicity is currently regarded as a greater problem than salinity in the cotton industry.

Most Australian cotton is grown on grey, cracking soils in northern New South Wales and southern Queensland. These soils are far less susceptible to salinity problems, partly because they are self-mulching, absorbing organic matter as it breaks down. There is little evidence of problems with high groundwater tables in these areas.

The Macquarie valley in central-western New South Wales has a significant cotton industry, some of which has been established in localised areas with prior streams, where salinity problems could develop. While appropriate crop and soil management assist in ameliorating saline soils in these areas, there is still a need to be vigilant regarding the siting of development areas, major channels and storages, as inappropriate siting over prior streams can exacerbate salinity problems.

In recent years a cotton industry has developed in the Lachlan valley in south-western New South Wales, which does not have naturally occurring saline soils. In addition, the newness of the industry in that area means it has been established with the benefit of research and development and agronomic experience gained over the past three decades.

The large majority of cotton in Australia is grown under irrigation and all water that is pumped from streams or is pumped from on-farm groundwater sources contains some salts.

The problem with groundwater in cotton areas is that it has been over-allocated and water tables have been lowered. In some ways this lowering of the water table may assist in long term strategies to combat salinity. The vast majority of groundwater irrigators have avoided developing aquifers with marginal quality or partly saline water.

There is a view that the salinity levels in major streams feeding cotton areas may have been increased by upstream dryland salinity. This needs to be carefully managed at its source. Because evaporation from stream surfaces concentrates salts, irrigation should be relatively close to the original source of the water – and this is mostly the case with cotton.

Cotton farmers generally have ‘closed’ systems where run-off and tailwater is retained and recycled on-farm. Retaining irrigation water on-farm is an important part of water use efficiency and cotton farming best practice.

In the long term this could aggravate salinity problems on-farm and will require ongoing monitoring and R&D. In localizing potential salinity impacts on farms this may assist rather than impact on the downstream environment.

### **CRDC and salinity research: an overview**

While research the Corporation has funded shows manageable salinity risk in cotton growing areas, it has identified those areas where problems have occurred, are occurring and

may occur in the future. It has confirmed, if confirmation were needed, that there is no room for complacency on this important national issue.

The Corporation and the cotton research community, have been taking a hard look at the impact of sodium compounds present in cotton growing valleys, what impact the growing of cotton has on the presence and distribution of these compounds and what impact the presence and distribution of these compounds has on the growing of cotton.

CRDC has invested \$1.2 million over the past nine years on mapping salinity risks in cotton growing areas. About 450,000 hectares have been mapped, using 7,500 data points. In seven cotton-growing districts across five valleys. The information collected and modelled will be used to devise techniques for improved natural resource management, particularly in the Bourke, Warren and Trangie districts in New South Wales, where irrigation salinisation is more likely to create problems than it is other districts.

Considerable research had taken place over a number of years into dryland salinity, much of it funded by organisations such as Land and Water Australia, the Murray Darling Basin Commission and the Grains Research and Development Corporation. In order to extend knowledge in the irrigated sector, CRDC joined with these other organisations in 2001–02 to fund a scoping project “Understanding Deep Drainage for Better Catchment Planning.” The aim of this project was to understand what appropriate research-related activities are restricted because of a lack of information on deep drainage (which is the drainage of water beyond the cotton plant’s root zone) and to design an appropriate research project to fill identified gaps.

This research project confirmed that we know little about deep drainage and its implications and concluded that deep drainage constitutes a greater problem than we had previously believed. A CRDC Farming Systems Forum on Salinity, Sodicity and Hard Setting Soils, which was held in December 2002 and brought together cotton farmers and researchers, also identified deep drainage as a top research priority

Arising out of these recommendations, CRDC is funding major projects, “Quantifying deep drainage using lysimetry,” and “Measuring the influence of water quality on drainage through irrigated cotton soils”. We need to know how much deep drainage is occurring in order to maintain a sustainable balance between running the risk of increasing the salinity of groundwater tables and the leaching of harmful salts out of the soil profile.

A CRDC-funded project in the late 1990s produced a publication, “Trees on Cotton Farms,” which is used extensively by cotton farmers. In the St George, Queensland, district trees and lucerne are used to deal with seepage from water channels and storages that is bringing salts to the surface.

## Current CRDC-funded salinity- and water-related research projects

- AAW4C Sustainable natural resource management for the Australian cotton industry using the Best Management Practices Manual
- CRC37C Measuring the influence of water quality on drainage through irrigated cotton soils
- CRC47C Quantifying deep drainage using lysimetry
- CRC50C Understand the salinity threat in irrigated cotton growing areas of Australia. Phase IV: Interpretation and Extension
- CRC51C Whole farm salinity management strategies for cotton production in the equatorial Valley
- US67C Postgraduate – Edward Cay: Strategies for ameliorating sodic and saline soils of cotton-producing areas in the Hillston district of NSW
- US62C Postgraduate – Sam Buchanan: Hydrological impacts of irrigation in the Murrumbidgee district
- CRC45C Maintaining profitability and soil quality in cotton farming systems
- CRC48C Optimising field and farm scale water use efficiency for cotton farming systems
- CRDC158C Water relations of the cotton plant
- CSP157C Integrated farm water management for cotton production
- NEC8C Postgraduate – Simon White: Partial root zone drying and regulated deficit irrigation for cotton using large mobile irrigation systems
- NEC9C Research and development to support the adoption of centre pivots and other water saving moves in the Australian cotton industry