

1699 Integrating natural resource management into mainstream extension in the Australian cotton industry through partnerships

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A desire to achieve integrated Natural Resource Management (NRM) is not new in the Australian cotton industry. Growers are driven by a need to use their resources in a sustainable manner and demonstrate this to the wider community; the cotton industry is aware of its obligations to the environment and legislative reform processes call for more efficient use of the resource base. In addition regional NRM bodies are influencing growers, industry and government through their planning and investment strategies. In response to these factors, the Cotton Catchment Communities Co-operative Research Centre (Cotton CRC) obtained funds to support specialist environmental extension staff strategically located within cotton growing catchments. The environmental extension staff have formed productive working relationships with cotton extension, research and Cotton Australia staff, cotton consultants and other NRM 'providers' in the regions to deliver NRM services to the industry within the framework of the industry's Best Management Practice program.

Keywords: Best Management Practice, Extension , Natural resource management

Introduction

NRM in Australian Cotton Industry

Natural Resource Management (NRM) and minimising the impact of cotton production on the environment are priority issues for the Australian cotton industry (Anon., 2005). The industry as a whole is looking to demonstrate environmental stewardship and individual growers want to protect their natural resource base and farm in a sustainable way.

The cotton industry is responsive to change, willing to learn and readily shares information and knowledge (Callan *et al.*, 2004). There is a need for this information to be scientifically sound, relevant and applicable to cotton farming systems (Callan *et al.*, 2004).

The industry has undertaken a number of initiatives to address environmental issues to date. These initiatives include

- Rural Water Use Efficiency projects;
- Australian cotton industry environmental audits in 1991 and 2003 commissioned by Cotton Research and Development Corporation (CRDC, 2005);
- Publications such as 'Managing riparian lands in the cotton industry' (Lovett, 2003);
- A review of biodiversity research in the Australian cotton industry (Reid *et al.*, 2003)
- An industry-wide soil health survey (Shaw, 2005) and

- Development and implementation of Best Management Practices (BMP) program particularly the Land and Water Management module launched in 2005 (Cotton Australia, no date).

Natural resource management is a key component of the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC) with \$20m expected to be spent from 2005 to 2012. This investment represents 20% of the CRC budget (Anon., 2005).

Service delivery in the Australian cotton industry

There are a number of key organisations and groups that service the Australian cotton industry. The industry is well-served by professional cotton consultants and there is also an emerging group of consultants who offer more specialised resource management services (eg. water scheduling and soil management services).

Research funds for the industry (grower levies matched by Commonwealth government funding) are channelled through Cotton Research and Development Corporation (CRDC). The Cotton Catchment Communities Co-operative Research Centre (Cotton CRC) is charged with responsibility for delivery of research and extension services for the industry. Funding for the Cotton CRC is provided by government as well as CRDC and partners organisations which include research institutes, private companies and NRM bodies. The extension group within the Cotton CRC consists of regionally-based staff supported by a network of specialist extension positions in NRM, water use efficiency and education.

The Australian cotton industry operates a voluntary Best Management Practices (BMP) program. The program is owned by CRDC and Cotton Australia, the prime grower advocacy body for the Australian cotton industry responsible for its delivery. This delivery is undertaken by Cotton Australia's Grower Services Managers located in the cotton-growing areas.

NRM planning and investment processes

The cotton industry does not operate in isolation. Concurrently, external drivers for NRM change include legislative reforms processes (e.g. with respect to land and water management) and community expectations of land managers. State government departments and agencies responsible for primary industries and natural resources work with and influence the industry through delivery of information services and administration of legislation. In addition, regionally-based NRM bodies influence on-ground change through their catchment scale planning and federally funded investment processes.

Investment in NRM extension in the Australian cotton industry

The cotton industry recognised the need for specialist NRM extension services and successfully obtained funding for five NRM extension positions through Queensland Sustainable Agricultural State-level Investment Program (AgSIP) of the National Action Plan for Salinity and Water Quality (NAPSWQ), Department of Agriculture, Fisheries and Forestry (DAFF) and the lower Namoi Catchment Management Association (CMA). Whilst the basic approach is the same, there is a slightly different model for NRM extension in New South Wales. This paper will focus on the Queensland based AgSIP funded project.

In Queensland, under the "Enhanced NRM outcomes in irrigated cotton and grains" project two environment extension positions were funded to cover large geographical areas. The roles were designed to work closely with and complement other projects, people and organisations delivering services to the cotton industry. The nature of the roles allowed the staff to work across their regions of responsibility within Queensland and contribute also to national NRM strategies. The positions were employed within a state government agency and based through the Cotton CRC.

Methods

The "Enhanced NRM outcomes in irrigated cotton and grains" project commenced in September 2004 and aimed to

- form a key link between the regional planning processes and the cotton industry;
- contribute to the achievement of NRM body objectives on a catchment scale;
- work with Cotton Australia to implement the Best Management Practices (BMP) Land and Water Management module;
- provide technical information to give growers confidence to undertake on-ground NRM activities and
- support the extension of NRM research funded by the cotton industry.

Extension officers funded under this project are integral members of the Cotton CRC national extension team ensuring strong links are maintained with other cotton extension staff, projects and researchers.

The project work has relied heavily on forming and maintaining successful working relationships with a range of organisations, people and projects including cotton growers, Cotton CRC, private consultants, CRDC, NRM bodies, Cotton Australia and government agencies. These partnerships are essential to ensure NRM in the Australian cotton industry is adequately resourced in terms of data, information, technical expertise and funds. These relationships also helped to reduce duplication and overlap.

Awareness raising of regional NRM issues

The NRM extension effort initially focussed on building greater awareness of regional NRM planning processes and issues amongst cotton growers and industry service providers such as cotton consultants. It can be difficult to get interest in NRM issues particularly when they are discussed in isolation from the production process. Hence the project objective has been to link NRM outcomes such as improved water quality to practical production activities such as appropriate on-farm fertiliser and chemical application. Soil health and water use efficiency have also provided direct links to production outcomes. Other issues such as native vegetation management, biodiversity and nature conservation have been more difficult to 'sell' to the industry in tough economic times. There has been research funded through the Cotton CRC and CRDC linking the existence of healthy native vegetation to the provision of habitat for beneficial species (e.g. beneficial insects and bats). It would be wrong, however, to assume that cotton growers only respond to NRM messages that can directly improve their production system in the short-term. Growers want to ensure their farms are productive well into the future and as members of the community they are keen to contribute to a healthy environment.

Implementation of the Land & Water Management module

The cotton industry BMP is an established mechanism for change in the industry. The Land and Water Management (L&W) module, which was introduced to the existing BMP program in early 2005, widens the emphasis of the program from on-farm risk management to management of the farm located within a catchment. This project has provided technical support to the implementation of the L&W module and the BMP program was used as a framework to bring together the industry and other NRM stakeholders. This approach allowed the delivery of NRM extension combined with practical, production-related messages. Further details of this approach are provided later in this paper.

Project staff identified the information required to work through the L&W module and assisted Cotton Australia staff to locate data sets and information. This is an on-going process and there are some areas where data is limited or not available. The project also provided NRM training to Cotton Australia Grower Services Managers and the wider extension network to enable them to work directly with growers on NRM issues. The project staff also prepared NRM fact sheets and written resources to assist growers recording NRM activities. Given that there is a large amount of general NRM information and resource material available, project staff located existing resources and where necessary adapted them for cotton production systems.

Regional planning processes

In early 2005 each of the regional NRM bodies were required to submit a regional NRM plan to access Federal government funds to implement the plans. These plans were prepared after consultation with stakeholders and covered a range of NRM issues including water quality, water use efficiency, soil health, river and riparian management, native vegetation, biodiversity and nature conservation. In Queensland the cotton NRM extension project works with three separate regional bodies. Natural resources management (NRM) extension activities in the cotton industry have facilitated a link between these NRM bodies and the cotton industry by communicating the existence of the bodies and their planning and investment strategies. The ultimate aim is to ensure the industry is aware of its obligations under the plans, has the ability to respond to these requirements and communicates improvements in NRM to the NRM bodies and the wider community.

The NRM bodies invest funds to address the targets outlined in their regional NRM plans. Funds are invested across land uses and can be used by groups or individuals working on a single issue or a range of issues. The linkages between the NRM bodies and the cotton industry fostered by the NRM and water use efficiency extension projects have enabled these NRM bodies to invest resources in the cotton industry. Under the funding arrangements in place the investment by the NRM body is at least matched by growers. The NRM bodies have contributed funds and technical expertise towards a range of activities and projects such as mapping for property planning, equipment for monitoring soil moisture, weather stations, and riparian fencing. The cotton extension officers involved have focussed on practical activities that assist growers to better management their resources.

Bringing the Land & Water Management module and NRM planning process together

Traditionally the cotton industry has not worked closely with the NRM bodies. Cotton CRC extension staff together with Cotton Australia and NRM body staff recognised this and identified the opportunity to work together in the implementation of the L&W module of the BMP program. As a result of discussions between the various organisations, a workshop

process was developed. This approach would meet industry requirements as well as help the cotton industry contribute to the relevant targets within the regional NRM plans.

The workshop introduced the L&W module and brought together technical staff from different projects and organisations to assist growers understand the NRM issues raised in the module. The module covers many of the issues found within the regional NRM plans including salinity, water quality, soil health and riparian and vegetation management. A property map for each participant was a key tool used at the workshop. In small groups, with a technical specialist, growers identified their on-farm NRM issues. At the end of the day each grower had a clear set of actions required to meet the minimum requirements of the L&W module of the BMP program. Further one-on-one assistance to complete the action plans is provided by Cotton Australia staff. In some areas, the growers identified catchment scale issues (such as salinity management and environmental weeds) that needed to be progressed as a group. In these areas the group has continued to work directly with the NRM bodies. The initial workshop process developed in Queensland has been adopted and adapted in other cotton growing regions of the Australian cotton-growing regions.

Results and Discussion

An evaluation survey was commissioned by the project to determine its impact and provide direction on the future delivery of NRM extension services in the Australian cotton industry (Coutts J&R, 2007). It was an 'informed persons' survey covering a range of stakeholders – growers, consultants, NRM body staff, Cotton Australia, CRDC, Cotton CRC and extension staff. People were nominated by the project team to participate in the survey based on their knowledge of project activities and staff. The risk of participants' direct involvement with the project and the staff influencing their responses is balanced by their ability to provide an informed response to the questions posed. In addition the survey was conducted by an independent evaluation firm allowing participants to provide honest feedback. The results of the survey align with informal feedback from stakeholders gathered by project staff over the life of the project.

Results from the survey indicate that the project was seen as valuable in raising the awareness of NRM issues in the cotton industry, had an impact on improving understanding and knowledge NRM issues and influencing on-farm decision-making. The majority of survey participants indicated that the project also helped to improve their collaboration with others NRM stakeholders.

The evaluation survey also provided direction on the future delivery of NRM extension in terms of highest priority issues, preferred extension methods and who should be involved. Soil management and water use efficiency still remain critical issues for the Australian cotton industry. Biodiversity, nature conservation and salinity are also of interest. Emerging issues mentioned by participants included greenhouse gas emissions and use of fossil fuels. Extension methods that actively involve participants such as field demonstrations, grower groups and one-on-one extension rated highly. More passive activities such as seminars and training programs and information that had to be sourced (e.g. web-based) rated less favourably. Future delivery of NRM extension was considered to be a shared responsibility across the whole cotton extension team plus Cotton Australia and NRM body staff. Survey results indicate that BMP was considered to be a valuable framework to assist the delivery of NRM outcomes in the Australian cotton industry.

Concluding remarks

The Australian cotton industry identified the opportunity to further its NRM efforts through NRM extension projects and to demonstrate its contribution to catchment targets. The thrust of the project has been the creation of linkages and joint activities with different projects and organisations working in NRM in cotton-growing regions.

In recent years there has been a subtle change in the terminology used within the Australian cotton industry. There is an increased focus on management of cotton production systems within cotton-growing catchments. This is an acknowledgement of the potential impact of agricultural production systems on the environment beyond the farm boundary and the need to manage many NRM issues on a catchment scale.

There is still more to be done. At the service industry level there needs to be a stronger emphasis on combining production and NRM messages, better coordination of resources and services across the region and between industries and greater emphasis of involving consultants in NRM issues. This will ensure greater participation from growers and on-ground action to address NRM issues.

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