

**DELIVERING THE GOODS - EXTENSION IN THE AUSTRALIAN COTTON INDUSTRY****Dr Julie O'Halloran****NSW Department of Primary Industries****Moree, NSW****Abstract**

The Australian cotton industry is one of the most innovative agricultural industries within Australia due in part to its effective extension network. The Australian cotton industry extension model involves Cotton Industry Development Officers (Cotton IDO's) located within each major cotton growing region. These extension personnel are funded by the cotton industry through levies paid by cotton growers on each bale of cotton produced. In addition to their local role, each member of the National Cotton Extension Team contributes to a national extension effort through focus teams in specific disciplines such as Weeds & Diseases, Insects, Water, Environment and Farming Systems. These focus teams interact closely with researchers and associated grower representatives to ensure that consistent messages are extended across the industry with minimal duplication by individual extension officers.

The aim of the National Cotton Extension Team is to enhance returns to industry accruing from the implementation of research and development through influencing the awareness of, knowledge of and attitudes towards the adoption of technologies and best management practices. This extension effort is focused on information transfer (from researchers, consultants and growers), confidence building and demonstration. The primary tools and processes utilised include information transfer, trials and demonstrations and coordination of grower groups.

Integrated pest management (IPM) has been a major focus of the extension effort within the Australian cotton industry over the last few years. The aim of this IPM program has been to reduce insecticide application, particularly broad spectrum chemistry, and off target impacts following increased resistance, environmental and community concerns. This IPM approach has included the promotion of the compensatory ability of cotton, the role of predatory insects and parasitoids and the use of selective insecticide products within an Insecticide Resistance Management Strategy. This paper outlines various tools and processes utilised by the Australian cotton industry extension officers as well as some of the challenges they face. The content of this paper will particularly relate to insect management and integrated pest management as this has been where so much energy has been focused recently.

**The Australian Cotton Industry**

The Australian cotton industry consists of predominantly irrigated cotton production. Cotton producing regions are distributed from Hillston in southern NSW to Emerald in central Queensland. The Australian cotton industry produced 1.5 million bales during the 2004/05 season.



**Figure 1.** Australian cotton growing regions

#### **National Cotton Extension Team – the Australian extension model**

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I am a Cotton Industry Development Officer based in Moree in north-west NSW and service the Gwydir Valley region of cotton production. This area consists of approximately 90,000 hectares of irrigated cotton in an average year. Over the last couple of years this area, and that of the Australian cotton industry, has been significantly reduced by water availability as a result of drought and new government regulations on irrigator allocations.

### **Research and extension linkages**

The Australian cotton industry is a very close, tight-knit industry. Extension officers and researchers interact regularly and work effectively to benefit the cotton industry. Discussions are ongoing between researchers and extension to identify how communication between these two different sectors of the industry could continue to be improved. Both sectors are responsible for ensuring that this communication occurs and research results are successfully presented to industry.

### **Determining extension priorities**

Investment in extension within the Australian cotton industry is significant. To ensure that this extension program is delivering on this investment the extension team regularly conducts evaluation of their activities and interacts with industry groups to assist in setting priorities.

It is important that industry members are involved in the process of determining extension priorities for a region. Identification of extension priorities involves feedback from a reference group in each cotton growing region. These reference groups include members of the regional Cotton Grower Association, Cotton Consultants Association, Cotton Australia (the Australian cotton industry's lobbying group) and local extension staff. In addition to identifying extension priorities for different areas of cotton production this reference group also offers suggestions on the best ways these issues could be addressed. This process of consultation and collaboration ensures that the local industry has some ownership of the extension activities and that the priorities identified are relevant.

A key requirement of the extension network is the maintenance of close links with industry. Extension officers regularly participate in local and industry wide meetings as well as maintaining contact with individual consultants and growers. This allows the extension officer to keep up to date with local issues, provide feedback to researchers and is an important channel for R&D extension.

### **Extension tools and processes**

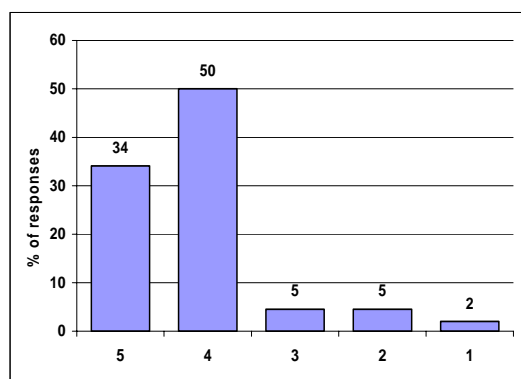
A range of tools and resources are available to and utilised by the Australian cotton industry extension network to communicate information resulting from research and grower and consultant activities including on-farm trials and demonstrations, field days, newsletters and grower groups.

#### **Newsletter**

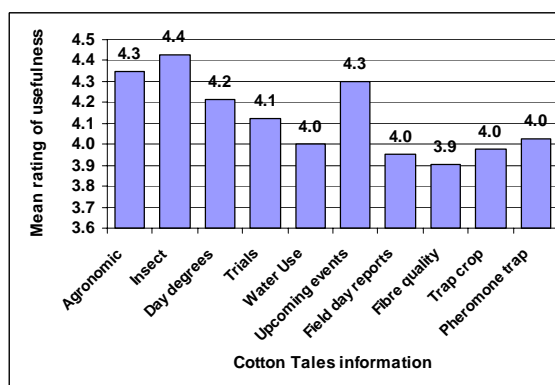
Each extension officer produces a regular 1-page newsletter 'Cotton Tales' that is distributed to cotton growers, consultants and industry within each region. These newsletters are distributed via facsimile or email and present timely, concise and locally relevant information to local cotton growers and industry. The 'Cotton Tales' newsletter aims to promote information in a manner that is concise and brief and can be read at the receivers leisure. The content of these newsletters includes meeting reminders, information on

topical issues that have arisen during the season and results from crop monitoring and local trials. References for further information are always included so that if an individual would like more information they know where they can source it.

A survey evaluation of this newsletter by the Gwydir Valley cotton industry three years ago indicated how the industry perceives this publication. The majority of survey respondents found 'Cotton Tales' to be a useful publication.



**Figure 2a.** Responses to the question "How useful do you find Cotton Tales" with 1 = not very and 5 = very.



**Figure 2b.** Rankings for the usefulness of the different types of information presented in Cotton Tales with 1 = not very and 5 = very.

### **Trials and Demonstrations**

On-farm trials are a key component of the role of the National Cotton Extension Team members. These trials are greatly valued by local cotton growers in each region as national research is adapted at a local level. The purpose of these trials is not new research. Rather, on-farm trials are primarily utilised to gather local data, adapt research from research stations to different cotton growing regions and different conditions, building confidence in recommendations or practices and benchmarking. Cotton IDO's conduct on-farm trials coordinated across all cotton growing regions to address national extension issues. Other on-farm trials are developed and conducted in collaboration with local growers and consultants to address local extension priorities. The results of local trials are collated and presented in a regional trial book which is distributed to cotton growers and consultants within each region or via field days and the 'Cotton Tales' newsletter.

Integrated pest management (IPM) has been a major focus of the extension effort within the Australian cotton industry over the last few years. The aim of this IPM program has been to reduce insecticide application and off target impacts due to increased resistance, environmental and community concerns. This has included the promotion of the compensatory ability of cotton, the role of predatory insects and parasitoids and selective insecticide products. On-farm trials carried out by regional Cotton IDO's have been an effective way of demonstrating some of these factors.

The results of on-farm trials within the local region are very well received by local industry. Usually these trials are carried out in response to feedback from local industry and so are relevant. The industry is also more confident in extrapolating the findings to their own production systems as the work has been carried out on similar soil types and seasonal conditions.

### **Grower Groups**

One of the main processes utilised by members of the National Cotton Extension Team is grower groups. The concept of area wide management groups was widely adopted across the Australian cotton industry as part of integrated pest management promotion, the idea being that pests do not recognise property boundaries and therefore growers could work together on an area wide basis to manage pests. These groups have since expanded to become forums for extension of other issues and a tool for information transfer. The role of extension officers in these groups is largely facilitation and coordination as the most effective groups are those that are grower driven. Group size varies depending on the area, size of enterprises and the social interaction within the community. Generally groups have between 4-12 grower members in addition to consultants.

Grower groups are a participatory extension activity and require time commitment and dedication by the group members. Activities used with these groups include presentation and discussion of trial results, area wide application of chemistry eg attract and kill technology, workshops with information paks, on-farm demonstrations. Monitoring of the *Helicoverpa* egg parasitism levels by the tiny parasitic wasp *Trichogramma* spp over the last couple of seasons has revealed up to 80% parasitism at times during the season. This information has been presented to the local industry through 'Cotton Tales' and grower group meetings as collaborative on farm monitoring programs. This information is beneficial to growers as it can influence spray decision and has resulted in growers choosing not to spray. Some consultants in the Gwydir Valley and other cotton growing regions are now monitoring parasitism levels themselves.

### **Benchmarking**

Benchmarking provides a mechanism for growers to compare their cotton production system to other growers. This is a process of reviewing what has been done and identifying what can be learnt from what others are doing. Profitability is one of the key drivers of practice change and benchmarking provides an opportunity for gross margins from different practices to be compared.

Another example of the use of benchmarking is the Gwydir Valley cotton crop competition has been expanded to promote best management practices and collate data on some of the crops within the region. This crop competition is based on equal components of ginned yield, crop management and estimated gross margin (crop inputs only with standardised costs and bale price). Data is then presented to the local industry at the presentation of the crop competition awards.

Benchmarking has been a successful tool for improving insect management practices across the Australian cotton industry. Recently this tool has also been used to look at water use efficiencies and could be used to optimise fertiliser programs to minimise over fertilisation and associated environmental and cost issues.

### **Collation, distribution and interpretation of regional data**

Extension officers also play a role in the collation, distribution and interpretation of regional data such as pheromone trap data, parasitism levels and insecticide resistance data to the local industry.

### **Information paks**

The Australian cotton industry has produced several information packages covering various areas of cotton production, insect management, weeds, disease management guidelines, spray application, nutrition, soil management and irrigation. These are compendiums of information collated on each of these areas and developed in a collaborative effort by both researchers and extension officers. These information paks are designed to be reference manuals. Recently extension officers have commenced holding workshops in conjunction with the promotion of these information resources following feedback from growers to demonstrate how to practically utilise the information contained in these packs at the field level.

### **Field Days**

Field days are a widely used activity for observing trial results and presenting practical information from researchers and promoting discussion between industry participants. The format of field days varies depending on the purpose and regional preferences. Field days range from short farm walks on a single issue to full day bus tours covering a range of topics.

### **Media**

There is a range of media services utilised by extension officers to effectively raise awareness of new technologies and regional issues such as local and regional radio and print media as well as industry publications like 'The Australian Cottongrower Magazine'.

### **Workshops**

Workshops provide an opportunity for a specific issue to be discussed and demonstrated in greater detail.

### **Computerised decision support**

A range of computerised decision support tools have been developed for the Australian cotton industry to improve the accessibility of research and make it readily usable by industry. These tools include irrigation simulation tools, insect beneficial and pest management tools.

### **Acknowledgements**

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