



January, August & Final Reports

REPORTS

Part 1 - Summary Details 2001

Please use your TAB key to complete part 1 & 2.

CRDC Project Number: **DAQ90C**

January Report: Due 29-Jan-01 **J**

August Report: Due 03-Aug-01

Final Report: Due within 3 months of project completion

Project Title: Cotton Industry Development Extension Officer -
Border Rivers

Project Commencement Date: 30/06/98 **Project**
Completion Date: 30/06/01

Research Program: Technology Transfer and Extension

Part 2 - Contact Details

Administrator: Ms Vicki Battaglia
Organisation: Dept of Primary Industries Qld
Postal Address: Leslie Research Centre, PO Box 2282, Toowoomba Qld 4350
Ph: 07 4639 8883 Fx: 07 4639 8881 E-mail: battagv@dpi.qld.gov.au

Principal Researcher: Ms Mascha Raymond
Organisation: Dept of Primary Industries Qld
Postal Address: Locked Bag No 2, Goondiwindi Qld 4390
Ph: 07 4671 6711 Fx: 07 4671 2782 E-mail: raymonm@dpi.qld.gov.au

Supervisor: Mr Geoff McIntyre
Organisation: Dept of Primary Industries Qld
Postal Address: PO Box 993, Dalby Qld 4405
Ph: 07 4669 0801 Fx: 07 4662 4966 E-mail: mcintyg@dpi.qld.gov.au

Researcher 2 (Name & position of additional researcher or supervisor).

Organisation:
Postal Address:
Ph: Fx: E-mail:

Signature of Research Provider Representative: _____

Part 3 – Final Report Format

The points below are to be used as a guideline when completing your final report.

The project was established in response to grower support to promote the adoption of new technologies into sound management practices in the Border Rivers irrigation area from Goodnowindi to Mungindi. As part of the Cotton CRC extension program it involved the development of a framework of regional trials/demonstrations (in liaison with researchers) as part of a group adoption process to facilitate better communication between farmers, advisers and researchers from government and agribusiness.

The Industry Development Extension Officer would co-ordinate demonstration trials, take a role in information transfer with the region's growers associations and assist grower direct and respond to gaps in the current research base as well as adapt existing technology to local needs.

The adoption of new technologies, AWM, IPM and BMP play a large role in meeting the cotton industry's objectives of maintaining and promoting the most sustainable and profitable practices, for benefit of the industry as a whole and the communities/areas where cotton is grown.

In earlier times much research was left on the shelf by growers because of the perception that it was not applicable in their situation or locality. Many growers carry out on-farm trials and demonstrations to help them fine tune management. An extension officer takes a role as an intermediary enabling this on farm trial and demonstration work to continue on a coordinated basis as well as ensuring the latest research is incorporated into these trials.

1. List the project objectives and the extent to which these have been achieved.

- Develop a partnership with the Macintyre Valley and Mungindi Cotton Grower Associations and evaluate regional needs and priorities;
- Establish a liaison with Cotton Consultants of Australia;
- Water management - collaborate with the Rural Water Use Efficiency Initiative project to develop optimum water use strategies for the region;
- Pest management - demonstrate and develop Integrated Pest Management for both conventional and transgenic cotton;
- Farming systems - extrapolate and adopt the results of the CRC farming systems experiments in the Border Rivers area;
- Best Management Practices - participate in the implementation of Best Management Practices and work in collaboration with Cotton Australia grower managers.

The extent to which these have been achieved:

Partnership with the CGAs

A partnership has been developed through my associate membership with both the Macintyre Valley and Mungindi Cotton Grower Associations. Local regional needs and priorities were identified through organised priority planning meetings involving local consultants and local growers. Presentation of information and research findings at various meetings has also contributed to meeting these objectives.

Liaison with CCA

I have established a liaison with Cotton Consultants of Australia through direct contact with consultants in the area, through inclusion in meetings and through attendance at CCA meetings and seminars.

Water Use Efficiency

Collaborated with Cotton CRC RWUE Project Extension Officer, (formerly Sandra Cameron) with the establishment of the WUE trials and demonstrations in the Border Rivers region and in organising grower extension meetings.

Pest Management

Plant Compensation Trials

Plant compensation trials were conducted in the Border Rivers regions for the first two seasons. Information was extended through field days, trial reports and Cotton Tales. Experts in this field were also invited to speak at AWM meetings in the past season. According to the priority planning meetings, with growers and consultants, these sort of trials have achieved their objectives in the Macintyre Valley, and there is no further need for plant compensation trials in this area.

Trap Crops

The adoption of early and late season trap crops varied from season to season according to the water availability and seasonal conditions. Use of trap crops was greater in the Boggabilla Landcare group, with other groups and areas following the trend in 2000 and 2001. In the east side of the valley, the trap cropping program has shifted from a focus on Spring trap crops to late season traps for this coming season. Experts in this field were also invited to share at various AWM meetings in 2000.

Egg collections

Consultants in the Border Rivers region continued with egg collections for resistance testing, with reminders through Cotton Tales Newsletters. I was also involved in some collections
2000 - 2001 when egg pressure was low.

AWM Groups

Five AWM groups were active in the 2000/2001 season. Growers from four of these groups undertook benchmarking of their practices with Chris Wicks. While activities varied, the common theme from the groups was delaying the use of hard chemistry, the use of trap crops and improved communication amongst neighbours.

The Boggabilla Landcare Group, though it has completed its third season of benchmarking has just committed to another season of the study. The basic trends of the Boggabilla and Callandoon-Toobeah groups included lower costs in insect control whilst gaining in gross margin profits. The group representative is Iain Macpherson, who calls meetings during the season to discuss insect management options with other consultants for the group. Some growers also attend these meetings. Adherence to the IRMS is one of the focusses of this group.

The Callandoon-Toobeah group has remained the most active with the greatest number of meetings during the season. The grower representative continues to be David Turner from Macintyre Downs and Riverview. Areas of interest for the Callandoon growers has included an obvious focus on insect management as an area wide group, plus chemistry options for each stage of the IRMS, beneficial insect identification, cotton nutrition, soils (with soil pit day), water use efficiency, benchmarking, spray efficiency workshops and various guest speakers over the two past seasons. This group is large (with over 20 growers/managers attending meetings, plus many consultants/resellers). The group has discussed separating into two groups but decided that they are working well together and learning from each other.

The grower representative for the Boomi group has been John Fergusson. With much of the area covered by RMI farms, two consultants dominated the eastern area. The group found that it was too large to be effective. However, the Boomi group has since separated into the Boomi Road group which is in the east side of the valley and the Boomi West Group, which includes large corporates such as Koramba and some smaller growers. The Boomi group undertook benchmarking with Chris Wicks, and are continuing with the study. A few farms opted out in 2001, having their own consultants do a similar study with other farms. The commitment to trap cropping varied slightly, however, there was a decided commitment from some of the group to use IPM methods and delay the use of hard chemistry. The two Boomi groups will continue to meet this season.

The East Gundy Growers (EGG) AWM group has been active since 2000. A number of the growers have been involved with the benchmarking study. Activities for meetings focussed on insect control, however the growers have expressed interest in other areas for the coming season, such as soils and further studies into beneficials. Grower representative Mark Norman is a keen advocate of IPM and AWM and has led the group to become one of the most active of the five (now six) in the Border Rivers region.

The Mungindi AWM group became more active in 2000-2001, but still requires a greater local commitment. Grower representative has been Rob Harpham from Yarramildi. Areas of interest at meetings included insect control, trap cropping, soil nutrition, water use efficiency, and variety trial inspections. Numerous growers undertook trap cropping but found that the crops were eaten by ducks/emus or did not flower well due to lack of water. Commitment and interest in the Mungindi area varies greatly from people such as Greg Hamilton, who are releasing beneficial insects and avoiding the use of hard chemistry to growers who are using pyrethroids on winter chickpeas and spraying cotton early in the

season. This has made it difficult for some growers in the area to see the real value of AWM, however the general feeling is still positive and growers are continuing to meet this coming season. Interest in AWM in Mungindi is spreading.

Earliness Trials

Earliness trials were conducted in 1999-2000 and 2000-2001 and results have been presented in the Border Rivers Yearbook. The Macintyre Valley Cotton Field Day in February 2000 was located at two of the earliness trial sites, which acted as demonstrations and discussion points.

Fusarium awareness

Together with the Macintyre Valley Cotton Growers Association and the local Cotton Australia representative, farm hygiene protocols were published and distributed widely in 2000. Mungindi growers have also been given a copy of the farm hygiene protocols at AWM meetings and field days. Disease surveys were undertaken with DPI staff from Indooroopilly and by ACRI staff on the NSW side of the border.

Best Management Practices

- BMP in the Macintyre Valley has been supported through collaboration with the Cotton Australia grower services manager for the Border Rivers region, both individually and at field days and AWM meetings. The promotion of IPM and AWM and the practice and promotion of good farm hygiene to minimise the spread of fusarium and other diseases has also promoted BMP.

2. How has your research addressed the Corporations three outputs: Sustainability, profitability and international competitiveness, and/or people and community?

As part of the CRC National Cotton Extension Team, all activities are aimed at addressing the mission of the CRDC as follows:

Sustainability of Natural Resources

- Collaboration on the WUE initiative;
- Identifying and promoting IPM options.

Profitability & Competativeness

- Assisting with benchmarking projects;
- Working collaboratively with local CGAs in establishing protocols to reduce the chance of introduction of Fusarium Wilt.

People & Communities

- Contributes to the transfer and adoption of technology strong working relationship with local cotton grower associations.
- Acting as Treasurer of the Macintyre Valley Cotton Field Day committee, which promotes cotton to the community, people and communities were included in the planning of the field day and cotton crop competitions. Organisations includes in the events are the local kindergarten, junioir leagues club, rugby club, rotary club, the cultral centre, banks, shops, catering services and the community at large.

- Communities have been included through speaking arrangements at the Goondiwindi local high school and primary school and for college students visiting Mungindi on a cotton tour.

3. Detail the methodology and justify the methodology used.

The extension program is based on the establishment of demonstration trials and the coordination and facilitation of grower groups in collaboration with growers and consultants. This program is supported by a range of publications, in particular the Cotton Tales newsletter and the Border Rivers Yearbook.

4. Detail results including the statistical analysis of results.

Refer to the Border Rivers Yearbook for 1999-2000 and 2000-2001.

5. Discuss the results, and include an analysis of research outcomes compared with objectives.

- Greater awareness of the plant's ability to compensate for early season damage;
- Awareness of beneficial/predator insects and the roles they can play;
- Greater understanding/knowledge of the role they (growers) can have in pest management/control decisions - the ability to be able to question their consultant's decisions;
- Greater communication between growers and consultants.

6. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. Where possible include a statement of the costs and potential benefits to the Australian cotton industry and future research needs.

A strong partnership has been established with the CGAs, the CCA and Cotton Australia.

Six AWM groups have been formed leading to the wider adoption of IPM strategies and the achievement of the associated benefits to the industry and to the community and the environment.

7. Describe the project technology (eg. commercially significant developments, patents applied for or granted licenses etc).

NA

8. Provide a technical summary of any other information developed as part of the research project. Include discoveries in methodology, equipment design, etc.

NA

9. Detail a plan for the activities or other steps that may be taken;

(a) to further develop or to exploit the project technology.

(b) for the future presentation and dissemination of the project outcomes.

NA

10. List the publications arising from the research project.

Cotton Tales Newsletters.

Border Rivers Cotton Yearbook for 1999-2000 and 2000-2001.

Various newspaper articles, including local information in the Argus, local updates for the Australian Cottongrower, and information in the Cotton Magazine through Cotton World, with Donald Turner.

11. Are changes to the Intellectual Property register required?

No

Part 4 – Final Report Plain English Summary

Provide a half to one page Plain English Summary of your research that is not commercial in confidence, and that can be published on the World Wide Web.

This project provided for the employment of the Cotton Industry Development Extension Officer, initially Steve Parker, followed by Mascha Raymond (nee Korteweg) in Border Rivers region. The position's brief was to take the products of research from the research centre to the field for familiarisation, to promote adaptation into individual farming systems and enhance adoption. The focus has been on major industry problems, including water and insect pest management, insect pest resistance management, and disease issues. Local priorities were negotiated with the growers and consultants. The work involved on-farm trials and/or demonstrations and grower meetings for extension of results and other industry information. The results of this trial/demonstration work have been disseminated to all growers in the region via small group meetings, field days and publications, particularly the Cotton Tales newsletter and the Yearbook.

Strong partnerships have been established with the regional grower associations, the CCA and Cotton Australia.

Six AWM grower groups have been formed leading to the wider adoption of IPM strategies and the achievement of the associated benefits to the industry and to the community and the environment.

The awareness of Fusarium has been established. Farm hygiene protocols have been established in the region.

The Industry Development Extension Officer is a member of the Cotton CRC industry extension team and maintains close ties with CRC, CRDC and departmental extension and research officers in Queensland and New South Wales.

Priority issues are:

- Insect Pest Management, including Area Wide Management.
- Farming Systems, in particular soil related issues and rotations.
- Water Management.
- Disease Management.

Droplet Spectra Analysis of RAD Technology Aerial Rotary Nozzles

Project Summary

The Wind tunnel research facility located at the University of Queensland, Gatton campus and funded by the University of Queensland and the Cotton Research and Development Corporation was used to measure the droplet size generated by a RAD technology aerial rotary nozzle.

The project compared the droplet spectrum (by volume) emitted by a RAD aerial rotary atomiser mounted on a standard bracket, a RAD atomiser mounted on a extra long (XL) bracket and a Micronair AU5000 nozzle mounted in a high velocity airstream. The influence of air speed and liquid flowrate on the droplet spectrum (by volume) emitted by a RAD aerial rotary atomiser with extra long (XL) bracket mounted in a high velocity airstream was also determined.

The droplet size (VMD) results and rotational speeds were summarised into composite graphs that can be easily interpreted by aerial operators.

The following conclusions were drawn from this test program.

- The RAD nozzle produces larger droplet sizes than the AU5000 for any given rotational speed
- There is no difference in droplet size generated by a RAD nozzle mounted in a standard bracket and a RAD nozzle mounted in an XL bracket
- Increasing rotational speed (by decreasing blade angle) decreases droplet size
- Increasing air speed decreases droplet size for all nozzle type and settings tested.
- Flow rate has little influence on droplet size (there is a trend to slightly increase size with increasing flowrate)
- Increasing flowrate through both rotary nozzles decreases cage rotational speed
- A blade angle setting of 1 on the RAD nozzle (rpm > 10,000) should not be used on fixed wing aircraft.