Cotton
RESEARCH & DEVELOPMENT

Annual, Progress and Final Reports

Part 1 - Summary Details **REPORTS**

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

CRDC Project Number: **DAQ100C**

Annual Report: ☐ Due 30-September

Progress Report: ☐ Due 31-January

Final Report: ☒ Due 30-September
(or within 3 months of completion of project)

Project Title: Extension agronomy for cotton production in CQ

Project Commencement Date: 1 July 99 **Project Completion Date:** 31 June 04

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Signature of Research Provider Representative: David Hamilton

29 Sept '04

Part 3.3 – Final Reports (due 3 months after completion of project)

(The points below are to be used as a guideline when completing your final report. Postgraduates please note the instructions outlined at the end of this Section.)

1. Outline the background to the project.

The direct relevance of southern research to cotton production under the conditions experienced in CQ always has been an issue of debate. In the absence of any personal experience and/or local expertise, CQ cotton growers are wary of the claimed potential benefits of new information/new technology in their own circumstances.

Personal quests by local cotton growers seeking information to build their cotton management and farm business skills always has been a major influence for advancement of the CQ industry. Their adoption of new practices often has identified gaps in knowledge that need to be addressed through local research.

CRDC has recognised this problem and, until 30 June 1999, sponsored an extension agronomist (Mr Michael S. McCosker) to link CQ needs to available industry information so that the lead time in dissemination of new information and local adoption of new technology are not affected by the geographical isolation of the CQ region.

This project sought to continue CRDC sponsorship of a development extension officer and this person will be willing and complementarily supported by the resources of DPI Queensland. An industry-sponsored review of the national extension effort for cotton determined such positions should actually reside within the State Departments of Agriculture.

Exciting new challenges were faced by the industry over the five years of this project; including developments in transgenic cotton varieties, strategies for resistance management and insecticide use, opportunities for integrated pest management, and a move across agriculture generally to "benchmark" production systems against local best management practice.

Modifications required for local management practices to address these issues (among others) are complex. CQ cotton growers' understand and "ownership" of the issues will be achieved best through an "action-learning" approach using grower groups and on-farm participatory problem solving methods of research. In addition, the CQ growers need to be linked to wider national/industry issues, information and expertise through the provision of a general extension service.

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

1. Provide a development extension support to cotton growers in central Queensland that is the identifiable conduit between national directions in the cotton industry and local practices.

2. Facilitate the adoption of transgenic cotton varieties and relevant Integrated Pest Management (IPM) principles by regional cotton growers.

3. Provide cotton growers with a comparative analysis of local production practices to facilitate their adoption of Best Management Practice.

Part 3.2 – Individual or Project Activities

1. Outputs

(These could be grouped against Bennett's Hierarchy or the key methods – trials, information delivery, groups, education, comparative analyses, publications.)

Objective 1 COORDINATED IPM/AWM IN CENTRAL QUEENSLAND

Outputs	*Outcomes*	*Impacts*
• In collaboration with local and national industry, developed management strategy for silverleaf whitefly. *This entailed:* Coordination of local cotton industry groups in identifying what needed to be done to manage the pest. Involved in the development and organisation of CRDC funded study tour to the USA. Development and implementation of local management plan in collaboration with Central Highlands Cotton Growers Research & Technical Group, Dawson Valley Cotton Growers Association, and Area wide management groups. Promotion of the strategy to the wider industry via presentations, media releases etc. • Conduct infield experiments on the compensatory ability of Bollgard II® II® and the impact of moisture stress on plant compensation. Results reported and promoted through newsletter and Cotton Trial & Yearbook. • Conduct detailed study on the agronomic impacts of early season terminal damage of cotton grown in CQ over 3 seasons. This formed the basis for a	▪ Successful management of silverleaf whitefly in central Queensland measured by high adoption of area wide management strategy, reduced insecticide use, and no downgrades of cotton as a result of sucking pests. The template for whitefly management employed successfully has been able to be utilised successfully in other Australian cotton producing regions. ▪ Growers and consultants more aware of the ability of cotton plants to recover from early season terminal damage and fruit loss. This has resulted in fewer insecticide applications on seedling cotton. ▪ Growers more aware of issues associated with aphid ecology and insecticide resistance. This resulted in more informed decision making in regards to control and reduced insecticide use through fewer spray failures. ▪ Industry more aware of current insecticide resistance levels in silverleaf whitefly and able to incorporate this into developing resistance management strategies. ▪ Bunch top samples from CQ added value to	**Impact of extension outputs in relation to silverleaf whitefly evaluated during December (02) and again in September (03). This evaluation measured adoption of management strategy (eg insecticide use), industry opinion (from interviews) and outcomes from an insect (population studies) and fibre quality (classing data) perspective. The evaluation has highlighted:** • A high adoption of the management strategy developed locally as measured by a 99% reduction in the use of early season organophosphates, use of IGR products on 40% of the cotton area, halving of the synthetic pyrethoid use, and 100% adoption of sampling protocol and associated thresholds. • Populations on cotton were significantly reduced compared to the previous season. Parasitism rates from native parasitoid species increased from immeasurable levels in 2001-02 to greater than 60% at the end of the 2002-03 season. • Cotton classing organisations indicated there were no instances of sticky cotton originating

Masters of Science thesis (University of New England) and results also reported and promoted through newsletter, Cotton Trial & Yearbook, and field days. • Ongoing collaboration with Dr Grant Herron (NSW Agriculture) in monitoring insecticide resistance in cotton aphid. 51 samples collected and delivered between 1999-2004. Results reported and promoted through newsletter, Area Wide Management Group Meetings, Annual TIMS road show meetings and Cotton Trial & Yearbook. • Ongoing collaboration with Dr Robin Gunning (NSW Agriculture) in monitoring insecticide resistance in silverleaf whitefly. 17 samples collected and delivered between 2001-2004. Results reported and promoted through newsletter, Area Wide Management Group Meetings Annual TIMS road show meetings and Cotton Trial & Yearbook. • Ongoing collaboration with Drs Lewis Wilson, Amelia Reddall (CSIRO) and Bernie Franzmann (DPI) in monitoring and identifying cotton bunchy top syndrome. 9 samples collected and delivered between 2001-2004. Results reported and promoted through newsletter, Area Wide Management Group Meetings Annual TIMS road show meetings and Cotton Trial & Yearbook. • Collaborated with DPI Biopesticides unit by delivering *Helicoverpa* samples for resistance testing for NPV. • In collaboration with CSIRO Plant Industry developed a protocol for the collection of *Helicoverpa* survivors on Bollgard II® II® crops. 15 samples from CQ collected and delivered. 15	industry wide research effort and subsequent information for growers to avoid the problem. ▪ *Helicoverpa* samples from CQ added value to industry wide monitoring of resistance in NPV products. ▪ Understanding why *Helicoverpa* survivors appear on Bollgard II® crops will aid in overall management of this system. This is ongoing. ▪ Growers who took part in IPM short course have become more actively involved in area wide management and undertaken leadership roles in these groups. ▪ High participation in area-wide management groups which are addressing issues such as minimising odour complaints in town, reducing pesticide use whilst maintaining or improving profitability. These groups capable to the extent of allowing full adoption of strategies such as the management strategy for silverleaf whitefly and very high adoption of IRMS. ▪ A high level of participation into the annual development of the IRMS has resulted in increased local ownership of the strategy and bigh level of adoption. When in-season changes have been necessary, the appropriate channels, via the TIMS trouble shooting committee have been utilised. ▪ Local research developed by DPI entomologists has been successfully adopted. This includes the continued refinement of the highly adopted practice of spring and summer trap cropping.	from Central Queensland. • Whilst there is still some caution, the industry is much more confident in being able to manage silverleaf whitefly long term than it was at the end of the 2001-02 season. • They key drivers behind this change are: **(1)** Increased knowledge and awareness as a result of extension activities, particularly the CRDC funded study tour to the USA, the visit from USA scientist Dr Peter Ellsworth, and ongoing local extension effort. **(2)** Availability of appropriate insecticides, particularly insect growth regulators. **(3)** Area wide management groups allowed effective communication between all of the industry and broad scale adoption of strategy components such as avoidance of broad-spectrum insecticides and host plant sanitation. • Momentum for the area wide management strategy needs to be maintained.

samples from other growing areas collected and delivered. • Promoted Cotton CRC IPM Short course locally, with attendance of 12 people at both courses. Collaborate with IPM course coordinator in delivering courses in Emerald. • Provide technical and logistical support to allow the formation and ongoing effectiveness of Area Wide Management (AWM) groups in Central Queensland. • In collaboration with Central Highlands Cotton Growers Research & Technical group, annually provided feedback to the Insecticide Resistance Management Strategy. Promoted the results of insecticide resistance testing and was involved in the coordination of the collection of eggs for testing. • Collaborated with and provided extension support to local entomologists, Paul Grundy and Richard Sequeira. Included promoting results through newsletter, trial book and field days.		

Objective 2 EFFECTIVE SPRAY APPLICATION

Outputs	*Outcomes*	*Impacts*
• Promoted and took part in spray application workshops in Emerald and Theodore.4 workshops were held in each area between 1999-2004. • Promoted and distributed Spraypak.	▪ Growers more aware of issues associated with correct equipment set-up for weather conditions for increased efficacy and reduced off-target movement. ▪ Outcomes from spray application workshops in November 2002 evaluated by Bill Gordon.	**Reduced problems regarding the application of insecticides.** ▪ Odour complaints in the town of Emerald as a result of pesticides have decreased between 1999 and 2004. ▪ Incidences of pesticide contamination of cattle have decreased in the Central Highlands region from 1999-2004.

Objective 3 DISEASE MANAGEMENT

Outputs	*Outcomes*	*Impacts*
In collaboration with the Central Highlands Cotton Growers & Irrigators Association, develop, nurture and promote an area-wide management strategy to reduce the risk of introduction of weeds and diseases into the Central Highlands. This involved; The compilation of a protocols document to be used by growers in implementing 'on farm' strategies. Establishing a facility for independent inspection of machinery entering the area and maintai8ning a working relationship with the inspector to ensure ongoing maintenance of the program. Promoting the development of on- farm strategies by growers; A wider community/ industry education program promoting the strategy including the installation of large road signs at the entrances to the district promoting the 'Come Clean- Go Clean' message • Promoted to local industry to get unusual plant disorders through DPI pathologists to identify potential emergent problems. Approximately 60 samples processed during the duration of the project. • Collaborated with Dr Joe Kochman in conducting the twice-annual disease surveys in both the Central Highlands and Dawson Callide and promoting results and findings through field days and newsletters.	• High rate of adoption of local disease management and prevention strategy. This has been at both an on-farm and area-wide level. • Observations from the person inspecting contracting equipment entering the Central Highlands indicate that people are becoming more proficient at cleaning their equipment resulting in cleaner vehicles entering the area.	**High adoption of local weed and disease prevention strategy.** ▪ >500 units of machinery being inspected at Rolleston. ▪ No new incidences of previously unconfirmed soil-borne diseases (black root rot or Fusarium wilt) in Central Queensland.

Objective 4 WEED MANAGEMENT

Outputs	*Outcomes*	*Impacts*
• Collaborated with Graham Charles (NSW Ag) in identifying experimental site for herbicide options in pigeon pea trap crops and promoted outcomes through field day and Cotton Trial & Yearbook. • Collaborated with Graham Charles (NSW Ag) in identifying experimental site for management options for bell vine and promoted outcomes through field day and Cotton Trial & Yearbook. • Collaborated with Cotton Seed Distributors (CSD) in conducting experiments on the application window of Roundup Ready® cotton in CQ. Experiments conducted over 3 seasons and promoted outcomes through field days, CSD publications and Cotton Trial & Yearbook. • Promoted WEEDpak through newsletters and field days.	▪ Local growers, equipped with WEEDpak better informed about integrated weed management. ▪ Management and performance of Pigeon pea trap crops improved due to weed control options now available. ▪ Growers and consultants more aware of issues associated with the over-the –top application window for Roundup Ready® cotton. Management of these crops improved as a result.	

Objective 5 FARMING SYSTEMS

Outputs	*Outcomes*	*Impacts*
• Extensive case studies of farms using cotton into wheat stubble. This was promoted through field days and extensive written reports. This report was published in the 2000-01 Central Queensland Cotton Trial and Year Book, Completed a CRC publication in collaboration with David Waters (DNR, Toowoomba) titled 'Planting Cotton into Standing Wheat Stubble'.	▪ Growers and consultants much more aware of benefits, issues and 'best bet management' associated with planting cotton into standing wheat stubble. Growers who have adopted this practice are achieving numerous benefits. ▪ Growers and consultants more aware of the benefits, issues and 'best bet management' of using vetch as a green manure crop. Adoption has	

• In collaboration with Dr Ian Rochester (CSIRO) conducted extensive case studies on farms using vetch as a green manure crop. This was promoted through field days and extensive written reports. This report was published in the 2000-01 Central Queensland Cotton Trial and Year Book, • Conducted annual surveys for each year of the project addressing yield and fibre quality performance by variety, optimal planting date, and soil type. Results reported to all growers in a timely fashion before the seed order date and annual Cotton Trial & Yearbook. • Promoted locally Cotton Comparative Analysis conducted by Boyce Chartered Accountants and CRDC through individual consultation and Central Queensland Cotton Trial & Year Books. • Assisted local growers in conducting on-farm fertiliser trails.	been limited by annual water allocations. ▪ Ongoing positive feedback from annual season summary surveys. No increase in the amount of short staple or high micronaire, although these are heavily influenced by seasonal factors. Move away from varieties that have tendency for high micronaire and short staple. ▪ Up to 7 Emerald farms take part in the Cotton Comparative Analysis. Those participating suggest that is has highlighted areas for improvement in their operations that will increase profitability.	

Objective 6 WATER USE EFFICIENCY

Outputs	*Outcomes*	*Impacts*
• Collaborated with Rural Water use Efficiency Officers (John Okello-Okanya, Stephen Ginns, Toni Anderson) in establishing local networks, identifying trial sites and conducting field days. Promoted project through newsletter and reports in Cotton Trial & Yearbook. • During 2 seasons assisted local growers and consultants with experiments and case studies on implications of cutting final irrigation. This was reported in Cotton Trial and Year Books and newsletters.	▪ In years where water has been limiting, growers have been more aware of the implications of stressing crops and used this in management decisions. ▪ Water use efficiency project highly adopted and evaluated separately.	

Objective 7 TRAINEE EXTENSION OFFICER

Outputs	*Outcomes*	*Impacts*
• Developed and undertook training program of 2 trainee cotton extension officers between 2001 and 2002.	▪ Trainee extension officer deployed to Goondiwindi (2002). ▪ Trainee extension officer deployed to St George (2003). Both trainee extension officers have been able to operate successfully in their respective regions.	

Objective 8 COMMUNICATION AND INFORMATION STRATEGIES

Outputs	*Outcomes*	*Impacts*
• 176 Cotton Tales Newsletters written and distributed between 1999- 2004. Weekly/ fortnightly publication aimed at growers and consultants in local cotton industry Includes timely agronomic information, updates on local research, upcoming events and promotion of insecticide resistance management strategy • 5 Central Queensland Cotton Trial and yearbooks compiled and distributed between 1999- 2004. • 27 press releases issued between 1999-2004 utilising Australian Cotton CRC and DPI Queensland media officers in promoting local research and raising awareness as part of broader extension methodologies. Press releases followed up with television, radio and print media interviews	▪ Ongoing positive feedback for communication tools, particularly Cotton Tales newsletters and Central Highlands Cotton Trial & Yearbook. In a survey of Cotton Tales newsletters conducted in 2001, 93% of respondents ranked the newsletter as very useful or useful. ▪ Ongoing positive responses from media releases via follow-up from media organisations and responses from target audiences on individual issues. ▪ Central Highlands Cotton Growers Research & Technical continues to be a highly active conduit for local research and development work. This includes driving local research and development priorities, annually developing the IRMS, and driving initiatives such as disease prevention protocols. ▪ Ongoing collaborative relationship with all cotton	**Roadside cotton was reduced through changes in practices from local gins and module carriers** ▪ The Central Highlands Cotton Growers and Irrigators received a letter of commendation from local environmental group. **Opportunity for professional development and industry recognition for Senior Developmeut Extension Officer.** ▪ Completed Master of Science in Agriculture through University of New England (Graduated 2004). ▪ Undertook numerous training courses through DPI including scientific writing and presentation skills. ▪ Opportunity for national impact through leadership in the Australian Cotton CRC

- 5 Australian Cotton Grower Magazine articles published between 1999- 2004.
- Involvement in production of video documenting silverleaf whitefly study tour and subsequent management strategy.
- Appeared on Cotton Seed Distributors (CSD) 'Web on Wednesday' net newsletter 5 times.
- Development and nurturing of the Central Highlands Research & Technical group. This group proactively addressed research and development issues locally and were instrumental in such activities and development of IRMS and management strategy for silverleaf whitefly.
- Ongoing support and liaison with grower associations in Central Queensland. This involved regulator attendance at meetings and delivering information when required.
- In collaboration with Central Highlands Cotton Growers Research & Technical developed a plan to reduce the amount of roadside cotton during picking time following negative local feedback. This involved all stakeholders in the issue.
- Visited prospective cotton producing areas of Ord River Irrigation Area (2001) and Burdekin Irrigation Area (2003) to discuss issues associated with cotton production with non cotton producing farmers.
- Collaboration with industry school education program. Spoke to 25 school groups either on farms or via school visits between 1999-2004.
- Team Leader for Australian Cotton CRC Weeds Extension Focus team (1999-2000) and Insect

grower associations in Central Queensland.

- As a result of actions taken from Central Highlands Research & Technical group, roadside cotton was reduced through changes in practices from local gins and module carriers.
- Farmers in the Ord River Irrigation Area and Burdekin Irrigation Area more aware of issues associated with cotton production and able to make better management decisions.
- Regularly invited to speak to industry organisations including Cotton Consultants Australia, Aerial Agricultural Association of Australia and Australian Cotton Growers Research Association.

Insect Extension Focus Team.

- Undertook 2 international study tours.
- Awards received during project:
    - 2002. Australian Cotton Researcher of the Year. Presented by the Australian Cotton Growers Research Association
    - 2002. Professional Officer Award. Queensland DPI, Farming System Institute Award
    - 2002. Service to Central Highlands Cotton Industry. Presented by the Central Highlands Cotton Growers & Irrigators Inc.
    - 2002. Excellence in Communication to the Cotton Industry- Australian Cotton CRC Award
    - 2002. Extension Achiever Award- Australian Cotton CRC National Extension Team.

Extension Focus Team (2001-2004). • Promoted industry to various groups visiting the area. This included government delegations, overseas visitors, and other farmer groups.		

4. Provide a summary of the project ensuring the following areas are addressed:

a) technical advances achieved (eg commercially significant developments, patents applied for or granted licenses, etc.)

No

b) other information developed from research (eg discoveries in methodology, equipment design, etc.)

Sampling and management strategy for silverleaf whitefly adapted from University of Arizona/ USDA to suit Australian cotton. Published in Australian Cotton CRC Research Review.

c) are changes to the Intellectual Property register required?

No

5. Detail a plan for the activities or other steps that may be taken:

Cotton production in Central Queensland will continue to impose a unique set of challenges due to climate and it's remoteness from other production areas. These challenges have been met successfully at an industry level in the past through strong collaboration between growers and local extension work.

The ongoing presence of a cotton extension officer in Central Queensland should ensure that the industry will continue to improve.

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

- Maintain momentum of adoption of components of silverleaf whitefly management strategy long term to prevent the incidence of sticky cotton.
- Maintain momentum in terms of grower awareness of disease/ weed spread and collaborative relationship with vehicle inspectors to allow ongoing success of Central Highlands weed/ disease strategy.

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

- Maintain momentum of currently dynamic local grower/ industry driven groups such as area wide management groups, Research & Technical group.
- Maintain ongoing regular information transfer via Cotton Tales Newsletters with timely information made available to all in the local industry.
- Maintain the use of the annual Season Summary Surveys that benchmarks crop performance (yield and quality) by planting date, variety, and soil type. This has the potential to encompass other issues that may arise on a seasonal basis.
- Maintain the two-way movement and local ownership of locally conducted research findings via the continued production of the Central Queensland Cotton Trial & Yearbook.
- Maintain strong relationships with cotton grower associations in CQ.

(c) for future research.

- One of the key constraints to higher adoption of cotton planted into standing wheat stubble was associated with waterlogging in furrow irrigation. This work could be revisited utilising new furrow optimisation techniques such as Sirmod and Infilt.
- In March 2004, The Central Highlands Cotton Growers Research & Technical Group convened a meeting to address the issue of increasing yields and improving fibre quality in

CQ. This included revisiting basic agronomic factors and how they may be different in light of Bollgard II® cotton. This meeting came up with a number of research focus areas that included.

- Analysing the impact of rotation via benchmarking
- Planting date
- Timing and method of N application in Bollgard II®
- Analysis and detailed case study of high yielding farms and fields

6. List the publications arising from the research project and/or a publication plan. (NB: Where possible, please provide a copy of any publication/s)

Kelly D and Anderson T (2003) Central Queensland Cotton Trial & Year Book, 2002-03. DPI/ Australian Cotton CRC

Kelly D, Sequeira R, Grundy P, Parlato D, & Noone A (2003) Management of Silverleaf Whitefly in Central Queensland 2001-2003. Report presented to CRDC and Australian Cotton CRC.
http://www.cotton.crc.org.au/assets/pdffiles/reports/OccPaper/SLWDK03.pdf

Kelly D, Sequeira R & Grundy P (2003) Management of Silverleaf Whitefly in Central Queensland 2002-03 and Beyond Australian Cotton Grower Magazine Oct- Nov 2003.
http://www.cotton.crc.org.au/assets/pdffiles/CGSW1003.pdf

Kelly D, Wilson L, & Parlato D (2002) Silverleaf Whitefly in Australian Cotton. Australian Cotton CRC Research review.
http://www.cotton.crc.org.au/Assets/PDFFiles/Wflyeco.pdf

Kelly D, Wilson L, & Parlato D (2002) Management of Silverleaf Whitefly in Australian Cotton. Australian Cotton CRC Research review.
http://www.cotton.crc.org.au/Assets/PDFFiles/Wflymng.pdf

Kelly D and Ginns S (2002) Central Queensland Cotton Trial & Year Book, 2001-02. DPI/ Australian Cotton CRC

Kauter G & Kelly D (2002) Silverleaf Whitefly Study Tour, Texas, Arizona, California, July 2002. Australian Cotton Growers Research Association Conference, August 2002.

Kelly D & Noone A (2002) Silverleaf Whitefly Situation in the Central Highlands. Australian Cotton Grower Magazine Mar- Apr 2002.

Kelly D (2001) Central Queensland Cotton Trial & Year Book, 2000-01. DPI/ Australian Cotton CRC

Salmond G, Rourke K, Korteweg M, & Kelly D (2001) Extension of Disease Management in the Australian Cotton Industry. Australasian Plant Pathology Society 13th Biennial Conference Cairns, 24-27 September 2001 (Page 343).

Waters D & Kelly D (2001) Planting cotton into standing wheat stubble. Australian Cotton CRC Research review.

Kelly D (2000) Central Queensland Cotton Trial & Year Book, 1999-2000. DPI/ Australian Cotton CRC

Gibb D & Kelly D (1999) 'Heliothis Thresholds in IPM Systems' Australian Cotton Grower Magazine December – January 1998-99.

Kelly D & Sequeira R (1999) Emerald Trap Cropping Program Shows Promise. Australian Cotton Grower Magazine Nov- Dec 1999

Kelly D (1999) Central Queensland Cotton Trial & Year Book, 1998-99. DPI/ Australian Cotton CRC

Part 4 – Final Report Executive Summary

Cotton production in Central Queensland will continue to impose a unique set of challenges due to climate and it's remoteness from other production areas. These challenges have been met successfully at an industry level in the duration of this project through strong collaboration between growers and local extension network.

Through the duration of the 5 year project, the cotton industry in Central Queensland has met and addressed some of it's greatest ever challenges. The highlights of this include the successful development and utilisation of a management strategy for silverleaf whitefly, and the successful development and deployment of a strategy to prevent weed and disease movement into the region, and the establishment and nurturing of successful Area Wide Management Groups.

The project has been instrumental in developing a management program for one of the biggest insect threats, silverleaf whitefly. Without proper management, the destruction of fibre quality could permanently affect the marketability of Australia's multi-million dollar cotton crop. The management strategy has been developed and adopted through strong collaboration between national and international research and development agencies and farmers and consultants. The template for management of this pest has been able to be transferred to other cotton growing areas in Australia.

The Central Highlands is one of the only cotton producing regions in Australia that has no confirmed cases of Fusarium wilt. The local industry took the proactive step of trying to maintain this status by developing a strategy to prevent the introduction of weeds and diseases into the region. This three-part plan involved 1) the compilation of a protocols document to be used by growers in implementing 'on farm' strategies, 2) establishing a facility for independent inspection of machinery entering the area, and 3) a wider community/ industry education program promoting the strategy including the installation of large road signs at the entrances to the district promoting the 'Come Clean- Go Clean' message. This program has had great success with excellent adoption and a continued 'fusarium free' status.

Central Queensland has been one of the pioneering regions for area wide management following the broad adoption of trap cropping in the late 1990s. Since that time, the momentum of area wide management has continued to grow to an extent where the groups operating in this region are amongst the most dynamic and successful in the industry. The involvement of the extension officer in this project has been paramount to maintaining the momentum of these groups. Outcomes of these groups have included the successful deployment of the management strategy for silverleaf whitefly, the ongoing high adoption of the IRMS and reduced incidences of odour complaints into town.

Whilst the successes of the Central Queensland cotton industry over the past 5 years have been principally been due to the fact that it has industry- wide involvement in all issues, the role of the extension officer in this process has been paramount.