



# FINAL REPORT

## *Part 1 - Summary Details*

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

**Cotton CRC Project Number:** 5.03.05

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**Project Title:** Opportunities for Linking Research, Decision Support and BMP

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**Project Commencement Date:** 01/07/2007    **Project Completion Date:** 30/06/2008

**CRC Program:** The Adoption

## *Part 2 – Contact Details*

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### **Background**

There are many critical issues facing the cotton industry, ranging from drought and water supply; yield and profitability; fibre quality and export price; nutrition; sustainability-catchment management, and BMP implementation. To assist these issues this project sought to investigate linkages between research, future decision support, and BMP. Sandra Deutscher, a specialist in providing linkages between research and extension worked with key industry working groups scoping opportunities and identify future investment that will facilitate possible linkages. Additionally CSIRO's cotton Decision Support group based in Narrabri was discontinued because of an increased industry focus on BMP and lack of funding as a result of the drought. The DSS group ceased on 30 June 2007. This new project provided funding for one software developer to maintain the CSIRO/Cotton CRC web decision support tools while a new strategy for decision support is developed that may compliment BMP implementation and uptake. This project also provided important technical supervision needed to continue the CRC/Telstra project 'New generation scouting tools'.

### **Aim and Objectives**

The primary aim of this project is to identify opportunities and methodologies to assist linkages between research, decision support, extension and industry's BMP initiative. Specific objectives include:

- Scoping opportunities and planning future investment into activities that will enable connections with research, decision support and BMP; and
- Maintaining the CSIRO/Cotton CRC web tools while a future strategy for cotton decision support is developed.

Table 1: List of objectives and Milestones achieved during the course of the project.

<b>Obj No.</b>	<b>Objective</b>	<b>Milestone</b>	<b>Performance Indicator</b>	<b>Yr 1</b>	<b>Achieved</b>
<b>1</b>	<b>Scope opportunities and develop plans for future investment into activities that will enable research and decision support linkages with BMP</b>	<b>Participate in industry working groups on implementation of BMP</b>	<b>Documented plan and actions taken to link research, decision support and BMP</b>	✓	✓
			<b>New funding proposals developed and submitted for funding consideration.</b>	✓	✓
<b>2</b>	<b>Maintain functionality and improve Cotton CRC website capabilities</b>	<b>Continuous availability of CRC website decision tools and improved capability through upgrades and design changes</b>	<b>Evidence of frequent use and improved capabilities</b>	✓	✓

			<b>Upgrade CSIRO/Cotton CRC web tools to Microsoft.NET environment</b>	✓	✓
			<b>Documented plan and actions taken to ensure future delivery of CSIRO/Cotton CRC web tools beyond 2008</b>	✓	✓
			<b>Web decision support tools available to industry beyond July 2008</b>	✓	✓

## Methods

This project ran for one year. The first component of this project involved Sandra Deutscher participating in industry workshops to discuss opportunities for linking research, decision support and BMP implementation. In addition she worked closely with key industry representatives in research, extension and funding support to gather information and identify approaches to develop a future strategy. The key outcome of this component of the project will be a report that identifies:

- Opportunities to facilitate linkages across research, extension, decision support and BMP
- Strategy and actions.
- A timeline of actions as well as key investment decisions by industry to ensure success.

As a consequence of the cessation of the decision support team at Narrabri all development on new decision support tools has ceased. However, there was consensus from CSIRO, the Cotton CRC and CRDC that current decision support web tools be maintained. There were 418 registered users of the CottonLOGIC web tools at this time. The second component of this project supports the:

- Employment of one software developer (Loretta Clancy) to maintain the web tools, and provide technical supervision of the Cotton CRC/Telstra Scouting Tools Project.
- Development of a report that documents strategies and actions for maintaining the web tools beyond the life of this project.

## Results

### ***Enabling research and decision support linkages with BMP***

This part of the project was undertaken by Sandra Deutscher. Activities were limited as Sandra was on maternity leave until April 2007 and from that time on was only working on a part time basis. Funding restrictions did not allow for a person to replace Sandra during her maternity leave, or for the remainder of her part time role on her return. Despite these

restrictions a number of activities were completed that met the aims of this project, they are described below:

- Research and BMP - Sandra Deutscher and Louise Adcock identified that the first focus of activity will be around greenhouse emissions relating to fertiliser use and soil carbon losses. They formed a working group led by Sandra including Ian Rochester and Nilantha Hulugalle. A set of criteria were developed on which growers could identify what practices would meet a basic level of management that will help to reduce greenhouse gas emissions. This part of BMP is now ready for testing in focus groups across the industry. Other priorities for BMP development were also established and will proceed once the greenhouse component has been finalised.
- Research and Extension - Sandra working with Lewis Wilson (and others) planned the redevelopment of the pest and beneficial guide. From a survey conducted by Sandra she has gauged from growers and consultants a preferred format and layout. It has been decided that a booklet form will be produced. Sandra has also identified new material that will be included in the guide.
- Research and Extension - Sandra Deutscher and Michael Bange attended the extension workshop held in Toowoomba in May 2008. They both facilitated a session to plan the development of a web-based tool to assist regional extension officers in identifying the appropriate person and/or key information resource for specified issues. Sandra worked alongside the regional extension officers and Loretta Clancy (web developer) to develop this resource. Extension officers have provided feedback and in the new project, researchers will be approached to populate this resource with the appropriate information. The tool although still under development is already available to extension officers through the 'staff lounge' on the CRC's website (Figure 1).
- Research, Extension and BMP – In meeting the objectives of this project in scoping opportunities and develop plans for future investment into activities that will enable research and decision support linkages with BMP, we developed a project submission to CRDC and CRC to allow Sandra Deutscher to ensure effective linkages between research, extension and industry BMP. Sandra Deutscher would liaise frequently with research teams, extension leadership (Letitia Cross CRC) and with the BMP Manager (Louise Adcock) to develop new information in an immediate and dynamic (say a 3 to 4 day turnaround) to update industry, pre-empt possible future industry issues, or respond to current issues (e.g. a new disease, waterlogging events, Jassid outbreaks etc.). This could include web material (with David Larsen); web tools (with Loretta Clancy); demonstration field trials; field days/walks; brochures; pod casts or video. Examples of key areas where she may be involved in delivering research outcomes and promoting linkages with key areas of: water, nutrition, energy, greenhouse, climate change, pests, systems, physiology and agronomy. Sandra has extensive knowledge of the industry and with her skills in both research and extension is uniquely positioned to lead such an initiative with its underlying complexity. This project is now funded and activities in all areas described are continuing.

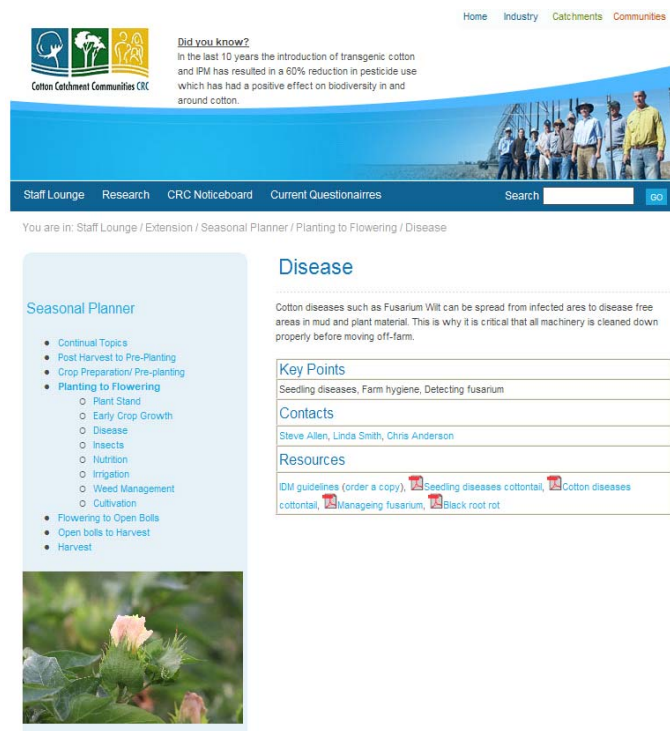


Figure 1: Screen shots of the seasonal planner to assist extension officers access appropriate information in a timely manner.

### ***Maintaining functionality and improving Cotton CRC website decision tool capabilities***

This part of the project was undertaken by Loretta Clancy. Following the demise of the Cotton Management Support Systems team responsible for computer assisted decision aids, it was decided that the CottonLOGIC tools on the web, were to be retained and upgraded. We have renamed the tools ‘CottASSIST’ and they are available on the cotton CRC’s website. Version 1 currently consists of the: Crop Development, Helicoverpa Diapause and Moth Emergence, and Last Effective Flower Tools, NutriLOGIC, and the Water Quality and Silo Day Degree Calculators. Key features of the new website are:

- From a user perspective there is improved screen resizing functionality (less scrolling), every page is available via the menu, each tool has an introduction and an about page, and there are now printer friendly pages (see Figure 2).
- From a technical perspective, the website will be easier to maintain and upgrade (only one development language and one database), it has better security, and has improved reporting capabilities that help decipher who and how many users there are (Figure 3).

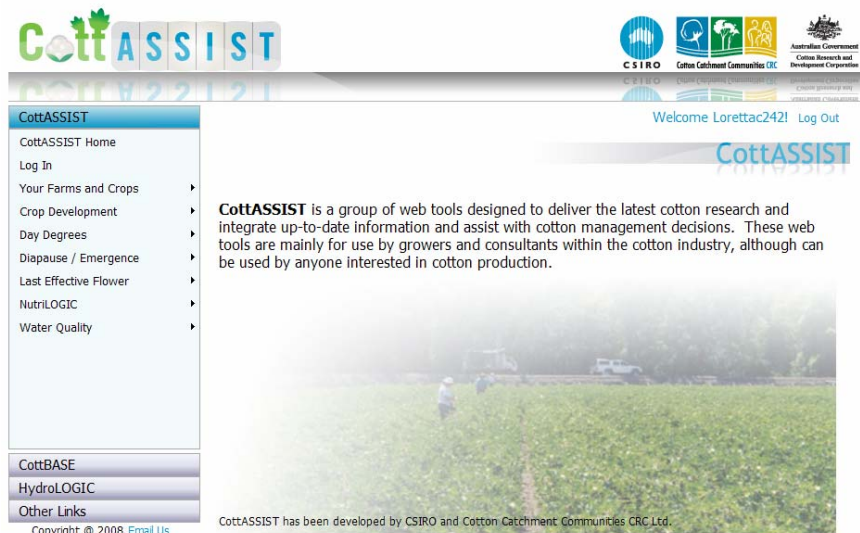


Figure 2: A screen shot of the CottASSIST home page.

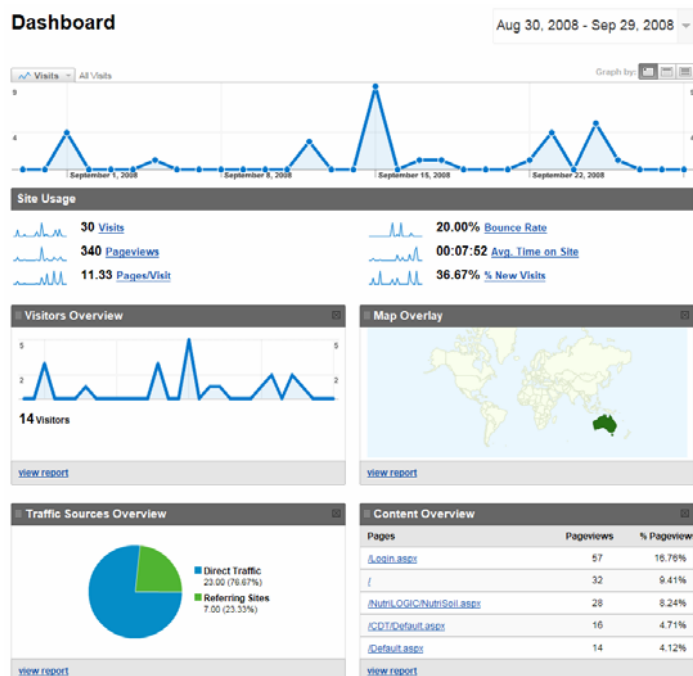


Figure 3: CottASSIST is using the Google dashboard to better provide reporting on website usage.

In terms of the future of computerised extension tools a new project proposal was supported by the CRC with the aim to deliver the latest research and technology to improve farm practice to meet production, social and environmental targets by:

1. Designing, developing and delivering timely, focussed and user friendly web tools that integrate and deliver research to assist with complex decision making so that resources are managed more effectively.
2. Liaising with research, extension, and BMP initiatives to identify issues where web tools could increase adoption of research.

This project is linked explicitly with the other project involving Sandra Deutscher titled 'Linking Research, Extension and BMP – Facilitation'. This new project would support Loretta Clancy who has specialist skills with design, development and support of web decision tools. Specific activities include the enhancement of the CottASSIST suite of web tools. New opportunities may include:

- Upgrading NutriLOGIC – graphical display that highlights whether the results are bordering or nearing deficient or luxurious conditions. This flags the need for refining future nutrient management strategies. In addition a dynamic calculator that estimates nutrient removal from differing cotton yields would assist growers with a nutrient replacement strategy will be added.
- Crop Development Tool (CDT) –Key features of the last effective flower tool and the CDT will be combined to better flag when a season may end so management can be planned to maintain yield while managing effects of weather impacting defoliation and fibre quality.
- Data sharing with eBMP – Growers are entering data into the CottASSIST suite and careful design of new tools will enable data sharing and direct linkages between these technologies to allow growers to gain best value for monitoring and data collection activities.
- Helicoverpa Diapause Induction and Moth Emergence Tool – Working with QDPIF there the Helicoverpa development model would be included to better predict timing and levels of infestation of Helicoverpa in crops. It may assist with decisions on when to pupae bust or help to prioritise those fields that are most at risk of moths entering diapause.
- Aphid and mite calculator predicting effects on their population on yield – it will assist growers determine when it is appropriate to control these pests to limit effects on yield and quality. The Aphid calculator is an objective of the extension insect and weed priority team.
- CottBASE (Climate Change) – CottBASE will be expanded to assess management practices under climate change scenarios for different regions. It uses pre-run simulations of the OZCOT cotton simulation model to assess climate and management on yield.
- User interface of OZCOT – In collaboration with D. Johnson (CSIRO) this project will enable it to have an interface that will allow a greater researcher access (eg. physiology, agronomic and climate change research).

## **Publications and Online Resources**

CottASSIST home page  
<http://cottassist.cottoncrc.org.au/>

## ***Final Report Executive Summary***

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**Project Title:** Opportunities for Linking Research, Decision Support and BMP

**Principal Researchers:** Ms L. Clancy, Ms. S Deutscher and Dr M. Bange

There are many critical issues facing the cotton industry, ranging from drought and water supply; yield and profitability; fibre quality and export price; nutrition; sustainability-catchment management, and BMP implementation. To assist these issues this project began initiatives enabling linkages between research, future decision support, and BMP. This was only a one year project with objectives to:

- Scope opportunities and plan future investment into activities that will enable connections with research, extension, decision support and BMP; and
- Maintain the CSIRO/Cotton CRC web tools while a future strategy for cotton decision support is developed.

The project was successful initiating activities that involved research and extension contributing to the industry BMP initiative. Sandra Deutscher and Louise Adcock (Industry BMP Manager) identified that the first focus of activity will be around greenhouse emissions relating to fertiliser use and soil carbon losses. They formed a working group led by Sandra including Ian Rochester and Nilantha Hulugalle. A set of criteria were developed on which growers could identify what practices would meet a basic level of management that will help to reduce greenhouse gas emissions. This part of BMP is now ready for testing in focus groups across the industry. Other priorities for BMP development were also established and will proceed once the greenhouse component has been finalised. Other activities that were undertaken to assist linkages were: the development of a seasonal planner web tool to assist extension officers to identify the most appropriate information/or people on a specific issue relating to cotton production and specific times through the cotton season; and planning for the upgrade of information in the cotton pest and beneficial guide

The second component of the project involved maintaining and upgrading the CSIRO/Cotton CRC web tools previously named 'CottonLOGIC tools on the web'. The web tools are now called 'CottASSIST' and have been redeveloped such to improve their user friendliness, and provide a secure and stable environment for computerised extension tool development. The new web environment developed by Loretta Clancy will mean that web tools can be developed quickly with a consistent look and feel, and linked to only one database which is secure.

The final component of the project was plan future activities for linking research, extension and BMP. Two new projects have been supported that provide resources for facilitation activities and extension tool development. The aim of these new projects is to deliver the latest research and technology to improve farm practice to meet production, social and environmental targets by: facilitating the development of timely, relevant and consistent extension tools (including web tools) and information from research; improving the flow of research outcomes and its adoption by identifying linkages and synergies between research, extension and BMP initiatives; and explicitly supporting the industry's implementation of its BMP program by helping to achieve goal 1 that aims to "improve farm performance through the adoption of BMP" by "delivering the latest research, development, technology".