



Australian Government

Cotton Research and
Development Corporation

FINAL REPORT 2014

For Public Release

Part 1 - Summary Details

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

CRDC Project Number: CMSE1301

Project Title: Cotton Field to Fabric Training Program

Project Commencement Date: 01/07/2012 **Project Completion Date:** 30/06/2014

CRDC Program: 4 People

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Date Submitted: _____

Part 3 – Final Report

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

Background

1. Outline the background to the project.

Recent years have seen an increase in cotton production and an influx of new people into the industry. Understanding spinners' requirements remains of the utmost importance to assist the Australian cotton industry to continue to deliver quality cotton and maintain a competitive position in the international market. This project has sought to convey information about the importance of fibre quality and the conversion of fibre to fabric with three initiatives.

These are:

- 1) The Cotton Field to Fabric Roadshow. This initiative entails visiting a number of local cotton growing areas with leading researchers and experts representing various organisations and industry bodies making short presentations on subjects such as fibre quality, ginning, agronomy, marketing and classing.
- 2) The Field to Fabric in Schools course. This initiative entails presenting an overview of the cotton production pipeline to secondary school teachers and students in NSW and Qld, enrolled in science, agriculture and textiles. The course aims to educate/inform students and teachers of the industry as well as generate interest for those seeking employment in the industry.
- 3) The three day Cotton Field to Fabric course. This initiative entails presenting courses at CSIRO in Geelong on cotton processing, from the farm gate to finished product. This three day course provides an in-depth overview of practices and processes that transform the fibre into a textile, with a view on fibre quality effects in each process. The Course is targeted at growers through to end users of cotton yarn or fabric; as well as agriculture and textile industry students.

Objectives

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

The objectives of the project were to:

1. Present annual Cotton Field to Fabric Roadshows to local cotton growing areas in NSW and Qld with the help of local extension staff.
2. Present the Cotton Field to Fabric in Schools course initially to teachers and students enrolled in science, agriculture and textiles courses from NSW. This course will be aligned to their curriculum and will be expanded to Qld in the second year.
3. Deliver at least one Field to Fabric course per year on cotton processing, from the farm gate to finished product with a focus on the impacts of fibre quality, to personnel within the growing, ginning, classing, merchant, and textile manufacturing sectors. This course is a continuation of the eleven courses presented between 2005 and 2011; the number of editions in each year presented in brackets. 2005 (1), 2006 (3), 2007 (2), 2008 (2), 2009 (1), 2010 (1) and 2011 (1).

Methods

3. Detail the methodology and justify the methodology used. Include any discoveries in methods that may benefit other related research.

We have identified a number of phases in the preparation and delivery of the various initiatives. These are;

Cotton Field to Fabric Roadshow

1. Contact all industry extension officers in cotton production areas to agree on schedule and timelines.
2. Approach industry organisations and associations to agree on content and nominate presenters.
3. Prepare content and presentations.
4. Conduct the Field to Fabric Roadshow

Cotton Field to Fabric in Schools course

1. Contact various schools in NSW & Qld with the assistance of Ms. Trudy Staines.
2. Approach presenters to deliver program in accordance with school curriculum.
3. Prepare content and presentations.
4. Set course dates.
5. Presentation of the course over one day/school group. It is envisaged that three courses will be presented over a week.
6. Obtain feedback from participants.
7. Assessment of feedback on the course. The course will be assessed after delivery to ensure the course satisfies the needs of participants.

Field to Fabric Course Geelong

1. Research and update course content, incorporating feedback from participants.
2. Preparation of multimedia presentations and course notes for participants in both electronic and paper formats.
3. Set Course date and advertise for enrolments.
4. Presentation of course over three days. It is envisaged the course would be presented at least once a year.
5. Obtain feedback from participants.
6. Assessment of course. The course will be assessed after each presentation to ensure it satisfies the needs of participants.

Results

4. Detail and discuss the results for each objective including the statistical analysis of results.

1) Cotton Field to Fabric Roadshow

The Cotton Field to Fabric Roadshow entailed visiting a number of local cotton growing areas with leading researchers and experts representing various organisations and industry bodies making short presentations on subjects such as fibre quality, ginning, agronomy, marketing and classing. This initiative has been presented four times since 2005 to over 600 people.

With assistance from the Cotton Info Team, two Roadshows were scheduled and presented in 2013 and 2014 in cotton growing areas in NSW and Qld. The first Roadshow was presented from 11 to 15 February 2013 with the second Roadshow presented from 18 to 20 February 2014.

Each Roadshow entailed four 20 minute presentations, highlighting the specific requirements and concerns that cotton spinners have regarding fibre properties and how fibre quality can be improved along the cotton production pipeline.

2013

Table 1 provides details of locations and presenters for the 2013 Roadshow.

Table 1 Venue and Presenters for 2013 Roadshow

Venue	Date	Fibre Quality	Agronomy	Ginning	Marketing
Dalby	11 February	René van der Sluijs	Mike Bange	Tobin Cherry	Phil Ryan
Dirranbandi	11 February	René van der Sluijs	Mike Bange	Bobby Irons	Phil Ryan
St George	11 February	René van der Sluijs	Mike Bange	Bobby Irons	Phil Ryan
Theodore	12 February	René van der Sluijs	Mike Bange	Rick Jones	Phil Ryan
Emerald	12 February	René van der Sluijs	Mike Bange	Rick Jones	Phil Ryan
Goondiwindi	13 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Phill Sloan
Moree	13 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Phill Sloan
Warren	14 February	René van der Sluijs	Mike Bange	René van der Sluijs	*
Griffith	14 February	René van der Sluijs	Mike Bange	René van der Sluijs	*
Gunnedah	15 February	René van der Sluijs	Mike Bange	Mark Humphries	*

* No Presentation

The ginning presentation was presented by representatives from the Australian Cotton Ginners Association and the marketing presentation was presented by representatives from the Australian Cotton Shippers Association (ACSA). Unfortunately we were unable to present the marketing presentation in the Southern areas due to the fact that ACSA did not nominate a representative.

Despite the circulation of newsletters about the Roadshow to growers and industry participants, the workshops were not as well attended as was hoped in 2013. There were a few reasons for this:

- 1) The Cotton Info Team was in the process of being appointed which hampered the promotion of the workshops.
- 2) The Cotton Info Team was in the process of familiarising themselves with their respective areas of responsibility.
- 3) Unfortunately there were a number of other events held which clashed with the workshops. For example a machinery workshop in Emerald resulted in a lower than expected turnout and a CSD field day resulted in only a handful of people attending the Moree workshop.

However despite these issues a total of 103 people attended the 2013 Roadshow. It was pleasing that we had participants from all ages, with 31% of the participants being growers. The rest of the participants were either marketers, consultants, agronomists, ginners, teachers or extension officers.

2014

In order that the issues highlighted above were not encountered in 2014 we ‘claimed the date’ to ensure that there were no clashes with other industry events. We also started planning and arranging the Roadshow much earlier which provided ample time for advertising and promotion.

From discussions during the 2013 Roadshow it became apparent that Classing was not very well understood and of major concern to participants. Hence contact was made with the Cotton Classers Association of Australia who agreed to participate and make presentations on classing at the various venues at the expense of the marketing presentation.

Table 2 provides details of the people that presented the 20 minutes talks at the various workshops.

Table 2 Venue and Presenters for 2014 Roadshow

Venue	Date	Fibre Quality	Agronomy	Ginning (ACGA)	Classing (CCAA)
Hillston	18 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Trangie	18 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Wee Waa	19 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Boggabri	19 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Moree	20 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Mungindi	20 February	René van der Sluijs	Mike Bange	Andrew Vanderstok	Greg Parle
Dalby	20 February	René van der Sluijs	Mike Bange	John Robinson	Greg Parle

A total of 130 people attended the Roadshow. As was the case with the 2013 Roadshow, participants were from all ages. A breakdown by occupation showed that at 40%, the largest group of participants were ginnerers, followed by 23% growers, 15% agronomists, 8% students with the with a small number of extension officers, marketers, teachers and researchers.

2) Cotton Field to Fabric to Schools

The Field to Fabric to Schools course provided an overview of the cotton production pipeline to secondary school teachers and students enrolled in science, agriculture and textiles. This course was presented either at the Australian Cotton Research Institute (ACRI) or at the school. The course duration was three hours during which industry experts gave talks and practical demonstrations on how to grow and process the fibre.

All participants were provided with a course pack which included the following:

- a) Booklet with presentations.
- b) Cotton CRC – ‘FIBREpak’ manual
- c) Cotton CRC – ‘Contamination and its significance to the Australian Cotton Industry’ booklet

- d) Sample packs – which included fibre (seed cotton and cotton lint as well as polyester and polyester pellets), products from the various processes in the spinning mill (i.e. sliver, roving, noil, and yarn) and fabric samples.

2013

As all previous workshops were presented in New South Wales (NSW) to local schools in the Narrabri area, it was decided to branch out into Queensland (Qld). It was first planned to present a number of workshops in Theodore, Taroom, Banana, Baralaba, Biloela and possibly Moura, but unfortunately issues with the National Curriculum resulted in schools concentrating on the prescribed curriculum.

In 2013 we presented three courses in Narrabri and three in Queensland. The three courses in NSW were presented at the ACRI in Narrabri. Two courses were presented on 17 September to Year 11 pupils from Gunnedah High School and Calrossy Anglican School in Tamworth, with one course presented on 18 September to Year 11 students from Coonabarabran High School. The three courses in Qld were presented at the Gateway To Training Centre in Goondiwindi and at the St George State School. The course at the Gateway To Training Centre was presented at an industry forum on 18 September which was open to the public. On 19 September we presented two courses to Year 9, 11 & 12 students from St George High School.

Table 3 provides details of the various modules and presenters for 2013.

Table 3 Presenters for 2013 Schools Program

Venue	Date	Fibre Quality	Agronomy	Harvesting & Ginning	Classing	Textiles
Narrabri	17 September	René van der Sluijs	Nicola Cottee	Geoff Dunlop	René van der Sluijs	René van der Sluijs
Narrabri	18 September	René van der Sluijs	Nicola Cottee	Geoff Dunlop	René van der Sluijs	René van der Sluijs
Goondiwindi	18 September	René van der Sluijs	Alex North	Geoff Dunlop	René van der Sluijs	René van der Sluijs
St George	19 September	René van der Sluijs	Alex North	Geoff Dunlop	René van der Sluijs	René van der Sluijs

A total of 93 people attended the six courses, of which 76 were students, 6 teachers and 11 people from the local community. Feedback from the participants showed that 66% rated the course as excellent with the remaining 34% rating the course as good, with 94% of the participants indicating that the course met their expectations/requirements.

2014

In 2014 we presented one course on 8 May in NSW at the Australian Cotton Research Institute in Narrabri, to Year 12 pupils from Narrabri High School. Table 4 provides details of the various modules and presenters for 2014.

Table 4 Presenters for 2014 Schools Program

Venue	Date	Fibre Quality	Agronomy	Harvesting & Ginning	Classing	Textiles
Narrabri	8 May	René van der Sluijs	Nicola Cottee	Geoff Dunlop	René van der Sluijs	René van der Sluijs

A total of 17 people attended the course, of which 14 were students and 3 teachers. Feedback from the participants showed that 67% rated the course as excellent with the remaining 33%

rating the course as good, with all the participants indicating that the course met their expectations/requirements.

3) *Cotton Field to Fabric course in Geelong*

The three day Cotton Field to Fabric course provided an in-depth overview of the practices and processes that transform the fibre into a textile, with a view on fibre quality effects in each process. This course was presented at CSIRO in Geelong and incorporated discussions and lectures by industry experts and practical demonstrations in the modern and commercial scale textile processing mill and testing facilities. Over the years the course has evolved and changed to keep abreast with new technologies and incorporating useful and realistic feedback from participants. Since 2005, this course has now been presented fifteen times to 410 participants, mainly from Australia but also from other countries such as the USA, South America, South Africa, Singapore, Thailand and Indonesia.

Four formal 'Cotton Field to Fabric' courses were presented from 2012 to 2014. The courses presented in 2012 and 2013 were presented at the CSIRO facilities in Belmont, with the two courses in 2014 presented at the new facilities situated at Deakin University in Waurn Ponds. The course in 2012 was presented from 4 to 6 September, which was later than normal due to the large crop in that year, and the course for 2013 was presented from 17 to 19 June 2013, which was earlier than normal due to relocation to Deakin. There were two courses presented in 2014, with the first course presented from 25 to 27 August and the second course presented from 22 to 24 September.

Over the years the course has evolved and changed to keep abreast with new technologies and incorporating useful and realistic feedback from participants. As a result a Variety Selection module, which is presented by Cotton Seed Distributors, was added in 2011. In 2012 the Quality Assurance module was removed, although the laboratory tours were continued which provided the participants with enough insight in the quality aspects encountered and monitored during textile processing. In 2013 a module on Risk Management presented by John Williams from the Food and Fibre Supply Chain Institute was added.

All participants were provided with a course pack which included the following:

- e) Booklet with presentations and notes
- f) CD ROM with PDF copies of presentations
- g) Cotton CRC – 'FIBREpak' manual
- h) Cotton CRC – 'Contamination and its significance to the Australian Cotton Industry' booklet
- i) Cotton Incorporated – 'The Classification of Cotton' booklet
- j) Sample packs – which included fibre (seed cotton and cotton lint as well as polyester and polyester pellets), products from the various processes in the spinning mill (i.e. sliver, roving, noil, and yarn) and fabric samples.

Since 2013 the course consisted of 13 modules which have been presented by a number of presenters. Table 5 provides details of the various modules and presenters for the courses in 2012 to 2014.

Table 5 Details of the various Modules and Presenters from 2012 to 2014

Module	2012	2013	2014 (A)	2014 (S)
Global Perspective	René van der Sluijs	René van der Sluijs	René van der Sluijs	René van der Sluijs
Fibre Properties	Geoff Naylor	Geoff Naylor	Geoff Naylor	Robert Long
Agronomy	Mike Bange	Mike Bange	Mike Bange	Mike Bange
Variety Selection	Robert Eveleigh	John Marshall	Bob Ford	Jorian Milliyard
Harvesting	Geoff Dunlop	Geoff Dunlop	Geoff Dunlop	Geoff Dunlop
Ginning	Geoff Dunlop	Geoff Dunlop	Geoff Dunlop	Geoff Dunlop
Classing	Greg Parle	René van der Sluijs	Greg Parle	Greg Parle
Marketing	Phil Ryan	Phil Ryan	Ashley Power	Gordon Cherry
Risk Management	*	John Williams	John Williams	John Williams
Yarn Formation	René van der Sluijs	René van der Sluijs	René van der Sluijs	René van der Sluijs
Fabric Formation	Laurie Staynes Andrew Jones	Laurie Staynes Andrew Jones	Peter Herwig Andrew Jones	Andrew Jones
Dyeing Finishing and Printing	Frank Dean	Frank Dean	Jackie Cai	Jackie Cai
Environmental Issues	Ian Russell	Ian Russell	René van der Sluijs Geoff Dunlop	Luke Grundy

* Module not presented

Feedback from the participants for the 4 courses showed that 65% rated the delivery of the presenters as excellent with the remaining 35% rating the delivery as good. The ratings of the presenters was consistent over the 4 courses, where some presenters, although acknowledged as being knowledgeable, were not good presenters and struggled to get their message across. Over the years we have endeavoured to minimise this situation, but it remains a challenge as in a number of instances a representative is elected by an industry group, association to do the presentation.

A total of 110 participants attended the 4 courses, with 22 participants attending the 2012 course, 29 participants attending the 2013 course with 30 participants attending the August 2014 course and 29 participants attending the September 2014 course. A breakdown by occupation is given in Figure 1.

As can be seen there were essentially eight major occupations which attended the course. At 25%, the largest group of participants over the four courses were growers, followed by 23% marketers (including logistics and traders), 15% extension officers (including Cotton Australia), 12% ginners, 10% researchers, 8% agronomists, 5% teachers (all from Queensland) and 2% students.

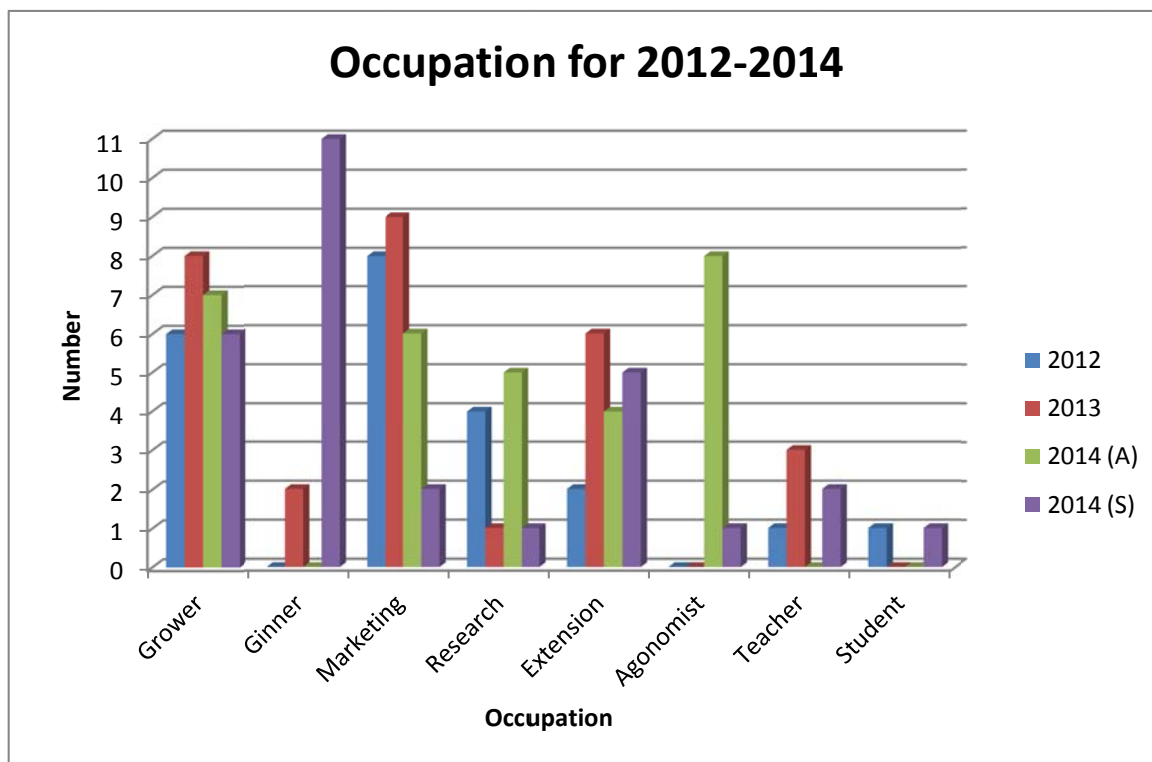


Figure 1 Breakdown by occupation for 2012 to 2014

A further breakdown of the participants by age showed that the participants were from a wide age category - see Figure 2.

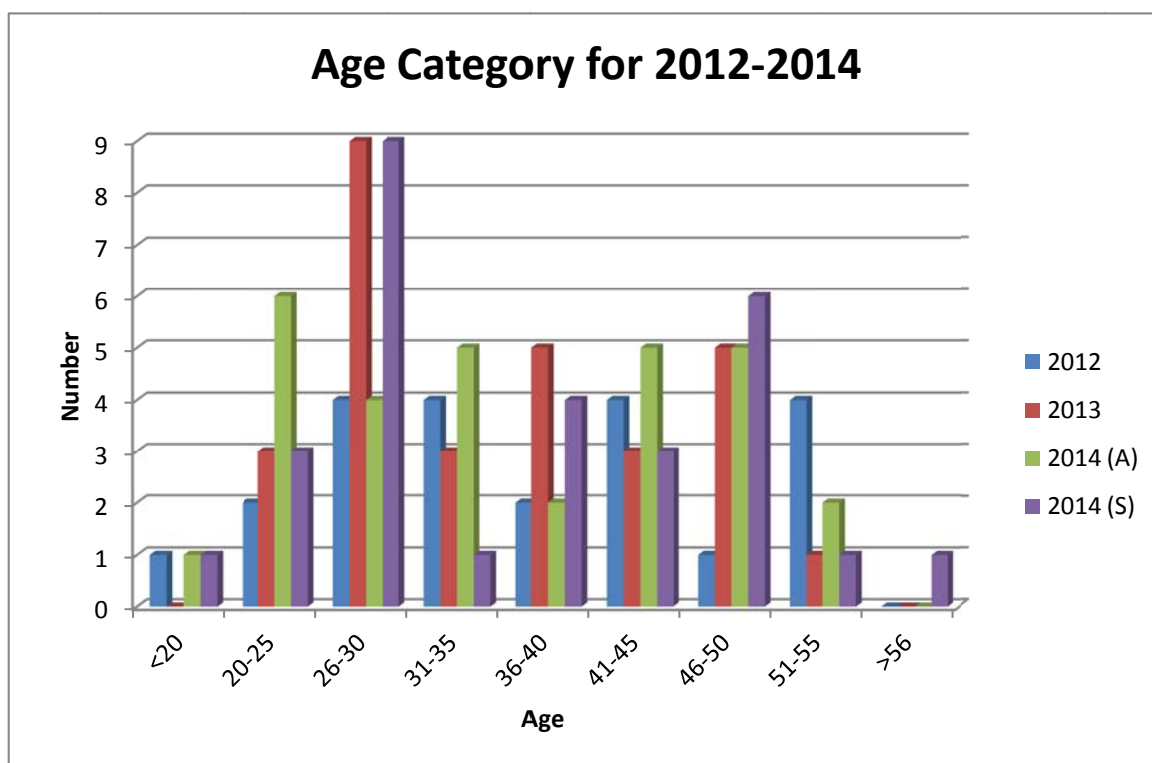


Figure 2 Breakdown by age for 2012 to 2014

At 24%, the largest group of participants over the four courses were in the 26 to 30 age group, followed by 15% in the 46 to 50 age group, 14% in the 41 to 45 age group, 13% in the 20 to 25 age group and 12% in the 31 to 35 and 36 to 40 age groups and 7% in the 50 to 51 age group with a small number in the <20 and >56 age groups.

Figure 3 gives the breakdown by gender. At 61%, the largest group of participants over the four courses were male, with 39% female.

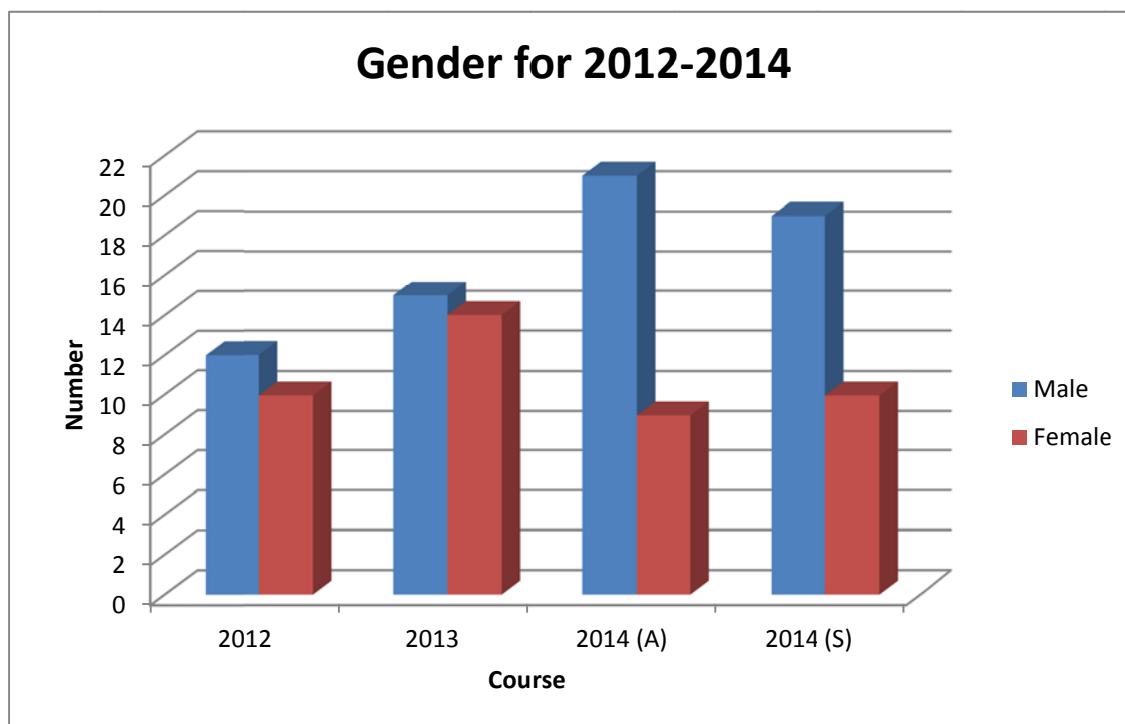


Figure 3 Breakdown by gender for 2012 to 2014

Feedback from the participants for the 4 courses showed that 83% rated the course as excellent with the remaining 17% rating the course as good. Eighty two percent of the participants found the course support materials very useful, with the remaining 18% rating the support materials as useful. All the participants indicated that the course met their expectations/requirements.

Participants were requested to provide information on what they regarded as the weaknesses and strengths of the course. Some general comments are provided below;

Weaknesses

- Some presenters, although knowledgeable, were not good presenters and struggled to get their message across. At times too much reliant on the presentation (death by PowerPoint) which results in long drawn out presentations.
- Some presentations were not updated and provided out of date information.
- Some presenters not staying within their allocated time, resulting in subsequent presentations being rushed.
- Course too short, should be longer to allow for more in-depth discussions and presentations.
- Mobile Phones are a distraction.
- More practical demonstrations
- A mini gin to explain the concept of ginning

Strengths

- Well organised and managed course.
- Knowledge and enthusiasm of presenters.
- Informative and interactive.
- Interaction with presenters and other participants.

- To obtain an overview of the entire cotton production pipeline.
- The factory tours

General comments from the participants showed that they have gained a wealth of information from this course. They are now more aware of the requirements and needs of the textile manufacturers and how they can influence fibre quality. A number of the participants have stated that they will amend their practices to ensure that resources are better utilised and that fibre quality is not compromised.

Acknowledgements

With the current Cotton Field to Fabric Training program coming to an end I would like to acknowledge the various organisations that have provided financial support; most notably the Cotton Cooperative Research Centre, The Cotton Catchment Communities CRC, Cotton Research and Development Corporation, International Fibre Centre and CSIRO. Also the in-kind contributions from The Cotton Classers Association of Australia, The Cotton Shippers Association of Australia and Cotton Seed Distributors are also gratefully acknowledged. The encouragement, advice and input of Mark Hickman and Geoff Dunlop in formulating my idea for this program is greatly appreciated and the input and contribution by Trudy Staines to the Schools program and the assistance of the extension officers in arranging the Roadshows is also gratefully acknowledged

Outcomes

5. Describe how the project's outputs will contribute to the planned outcomes identified in the project application. Describe the planned outcomes achieved to date.

The main aim of the Cotton Field to Fabric Program was to provide people in the cotton production pipeline with the opportunity to gain valuable and current information and to understand the extent of the cotton production pipeline from field to fabric. The program in 2012 to 2014 entailed three initiatives. The Cotton Field to Fabric course in Geelong was presented four times during this period to 110 participants. The fact that the majority of the courses were fully booked, has been presented fifteen times in the last nine years and feedback from participants was overwhelmingly positive suggests that the course continues to be well received by the industry. Moreover, a number of the larger organisations/companies have made attendance to this course a priority for existing and new staff as part of their development program. Requests were received from secondary school teachers of subjects such as science, agriculture and textiles to provide information on cotton production, has led to the initiation of the Cotton Field to Fabric to schools course. This course was presented seven times during this period to 110 participants. The course also provided teachers and students with an overview on the range of careers available in the broader cotton industry.

6. Please describe any:-

- a) technical advances achieved (eg commercially significant developments, patents applied for or granted licenses, etc.);**
- b) other information developed from research (eg discoveries in methodology, equipment design, etc.); and**
- c) required changes to the Intellectual Property register.**

N/A

Conclusion

- 7. Provide an assessment of the likely impact of the results and conclusions of the research project for the cotton industry. What are the take home messages?**

The Cotton Field to Fabric Courses in Geelong and the Roadshows have provided people in the cotton production pipeline with the opportunity to gain valuable and current information and to understand the extent of the cotton production pipeline from field to fabric. The Cotton Field to Fabric course in Geelong has been presented 15 times in the last nine years to a total of 410 people from all sectors of the industry. This indicates that the industry finds this initiative beneficial to their operations. Moreover, a number of large organisations and companies have made attendance to the course a priority for existing and new staff as part of their development program. The Field to Fabric to Schools course was presented to 160 secondary school teachers and students enrolled in science, agriculture and textiles, providing them with an overview of the cotton production and processing pipeline. The course showed secondary school students the range careers available in the broader cotton industry.

Extension Opportunities

- 8. 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.**
 - (c) for future research.**

N/A

- 9. A. List the publications arising from the research project and/or a publication plan.
(NB: Where possible, please provide a copy of any publication/s)**
- B. Have you developed any online resources and what is the website address?**

N/A

Part 4 – Final Report Executive Summary

Provide a one page Summary of your research that is not commercial in confidence, and that can be published on the World Wide Web. Explain the main outcomes of the research and provide contact details for more information. It is important that the Executive Summary highlights concisely the key outputs from the project and, when they are adopted, what this will mean to the cotton industry.

The Cotton Field to Fabric Training program was initiated in 2005 with the main aim of educating and providing information to the various production sectors in the Australian cotton industry on the needs and requirements of both domestic and international spinning companies. Understanding spinners' requirements is of utmost importance in assisting the Australian cotton industry in continuing to deliver quality cotton and maintaining a competitive position in the international market. This program currently has three initiatives which provided people in the cotton production pipeline the opportunity to gain valuable and current information and understanding of the entire cotton production pipeline; from the field to the manufacturing of fabric. The three initiatives are the: 1) Cotton Field to Fabric Course held in Geelong, 2) Cotton Field to Fabric Roadshow and 3) Field to Fabric in Schools course.

The three day Cotton Field to Fabric Course provides an in-depth overview of the practices and processes that transform the fibre into a textile, with a view on fibre quality effects at each stage. This course is presented at CSIRO in Geelong and incorporates discussions and lectures by industry experts and practical demonstrations in the modern and commercial scale textile processing mill and testing facilities. Over the years the course has evolved and changed to keep abreast with new technologies and incorporating useful and realistic feedback from participants. A total of 110 participants attended the four courses in 2012 to 2014.

The Cotton Field to Fabric Roadshows which entail visiting local cotton growing areas with leading researchers and sector experts making short presentations on subjects including fibre quality, ginning, agronomy, marketing and classing. A total of 233 participants attended the Roadshows presented in 2013 and 2014.

The Field to Fabric to Schools Course provides an overview of the cotton production pipeline to secondary school teachers and students enrolled in science, agriculture and textiles. This course is presented at the ACRI or at the school and during over three hours by industry experts give talks and practical demonstrations on how to grow and process the fibre. A total of 110 participants attended the seven courses in 2013 and 2014.

The success of this project and its initiatives is very much dependant on the support from the cotton industry. The three initiatives used each had a different focus but were aligned with essentially the same message. All participants obtained a clearer understanding of the entire cotton production and textile processing pipeline. In the past this has led to, and hopefully will continue to, a number of growers and commercial operations changing their practices to ensure that resources are better utilised and fibre quality is not compromised to ensure that yarn and fabric manufacturers' needs are met. This project, together with other initiatives such as Best Management Practices and research in other areas, has contributed to the sustainability and growth of the industry.