

'Fibre to Fabric Training'

Final Report to the CCC CRC

CCC CRC Project Number xxxx

4.04.05.

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October 2005.

Executive Summary

This report is the formal final report to the CCC CRC Project 'Fibre to Fabric Training' (CCC CRC Project Number xxxx). This project initiative which was started under the Australian Cotton CRC was to develop a training course to give people employed in the cotton production including the ginning and merchant sectors an intensive introduction to the operations of a modern cotton spinning, fabric formation and dyeing and finishing mill and how fibre quality impacts upon these operations in terms of end-product quality and processing efficiency.

A 2.5 day hands on course was developed and in August 2005 it was delivered on site at the CSIRO Textile and Fibre Technology to the first group of 29 participants. It heavily utilised the extensive commercial scale cotton textile spinning and processing equipment available at CSIRO in Geelong. Extensive course notes were prepared and distributed to participants. These are available as a separate document (on CD).

The course was very well received. Detailed feedback from course participants was collected and a review of this pilot course was undertaken. This has lead to some relatively minor potential improvements being identified.

// It is recommended that the course be offered twice in mid 2006.

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Significance of project

It is apparent that in order for Australian cotton to maintain its status as a quality fibre by overseas mills and continue to obtain a premium, a significant and sustained focus on improving fibre quality is required.

There are numerous ways of achieving this but understanding spinners' requirements will help the Australian cotton industry continue to deliver quality cotton and maintain a competitive position on international markets.

To this end a training initiative has been developed by CSIRO Textile and Fibre Technology (CTFT) targeted mainly at the cotton production chain i.e. growers, consultants, ginners and shippers.

The Course

Preliminary planning for the course was undertaken between January and June 2005 as a project in the Australian Cotton CRC. As part of the wind up of the Australian Cotton CRC, it assigned all IP (eg copyright of course material) developed during this planning phase to the new CCC CRC.

The current project 'Fibre to Fabric Training' in the CCC CRC covered finalization of the course preparation and material etc and delivery of the inaugural course.

The inaugural "Field to Fabric" Course which was conducted on 2 - 4 August 2005 at CTFT in Geelong. This 2.5 day course was presented by way of lectures and practical demonstrations using the extensive commercial scale cotton textile spinning and processing equipment available at CTFT. The course is aimed to give people employed in the cotton production i.e. ginning and merchant sectors an intensive introduction to the operations of a modern cotton spinning, fabric formation and dyeing and finishing mill and how fibre quality impacts upon these operations in terms of end-product quality and processing efficiency. The presenters delivering the various modules are all expert presenters with training skills and experience. The presenters are listed in Table 1 and the outline of the course can be found in Appendix 1.

Full course notes (power-point presentations) were prepared. Due to their size they are available as a separate document (either in hard copy or on CD).

Table 1 Presenters of Field to Fabric Course

Presenters	Organisations
Tony Geitz	ACSA
Mike Bange	CSIRO PI
Geoff Dunlop	NSW TAFE
Stuart Gordon	CSIRO TFT
Greg Parle	CCAA
Ian Russell	CSIRO TFT
René van der Sluijs	CSIRO TFT
Martin Prins	CSIRO TFT
Shaun Smith	CSIRO TFT

The course was attended by 29 participants originating mainly from the cotton production chain. Table 2 gives a breakdown of the participants.

Table 2 Participants of Field to Fabric Course

Sector	Number
Growers	5
Ginner/Shippers	14
Seed Companies	3
Extension/DPI	3
Other	4

Feedback Mark Hickman is detailed in Appendix 2 and from the participants in Appendix 2. Most comments were very positive.

A media release regarding the course was released by the CRDC and is listed in Appendix 3.

Course Review

A review meeting was held on 31/08/2005 at the CRDC attended by René van der Sluijs, Allan Williams, Dallas Gibb, Mark Hickman, Geoff Dunlop and Ben Stephens to discuss the course and feedback received from the participants. We agreed that the course was very successful and that the following points should be incorporated in the course to make the course even more effective:

- Participants will receive comprehensive notes.
- Maximum of 25 participants.
- Smaller groups for factory tours.
- Will look into feasibility of headsets.
- Three day course as opposed to 2.5 days
- Global perspective will highlight; fibre properties, uses, production, consumption, etc. of all fibres
- Market will touch on environmental issues as well.
- More examples.
- Costs of converting fibre to yarn to fabric to dyed and finished fabric.

At the review meeting we agreed on the outline for the 2006 course and have set the dates for next years courses which have been added to the cotton calendar. The course dates are as follows;

Course 1: 25th to 27th July 2006 (inclusive)

Course 2: 22nd to 24th August 2006 (inclusive)

Whilst the inaugural course was by invitation only, the courses in 2006 are open to anyone who is interested to learn more about the Textile Processing of cotton.

Appendix 1: Course Outline

Outline for Field to Fabric Cotton Course held in Geelong on 2, 3 and 4 August 2005.

Managing for quality through the production chain.

This course will consist of 9 modules which will cover the following subjects:

1. Market.

This module will cover the following;

- History of Cotton Trading.
 - Original use of cotton.
 - Emergence of consumption/production at a global level.
 - Formation of the LCA.
 - Development post WWII.
 - Development of the cotton industry in Australia.
- Trends in World Fibre Consumption.
 - Historical cotton market share trends.
 - Emergence of polyester.
- The Cotton Trade.
 - Recent trade trends.
 - Historical trade trends.
 - Merchants' role in facilitating trade.
- What are Cotton Merchants?
 - Service provision.
 - Buy at the highest price and sell at the lowest price.
 - Significant financing requirement.
 - Types of merchants; International merchant, regional merchants, local merchants.
- What is the added value that Cotton Merchants provide?
 - Mills want to buy low and growers want to sell high.
 - Benefits for the grower.
 - Benefits for the Mill.
 - Contract sanctity and performance.
- Information Gathering
 - Collection and dissemination of the various supply demand estimates.
 - Primary market influences supply/demand etc., secondary market influences world economies, quotas etc. and additional market influences political stability inflation/exchange rates etc.
 - Long term market influences; oil prices, market share influences etc.

- Pricing of Cotton
 - NYBOT & Cot A.
 - Exchange Rates.
 - Basis; origin and landed.
- Hedging & NYK Futures Market.
 - How the market functions.
 - Hedgers and speculators.
 - NYBOT reports eg. Spec/Hedge.
 - Historical changes in volatility.
 - Options.
- E-Trade
 - Telcot & The Seam.
- Positions
 - Merchant positions.
 - Basis positions.
 - Speculator positions.
- Summary
 - Merchants; link between the grower and Mill.
 - The importance of knowing your merchant.
 - Merchant contract performance regardless of how the AUD/USD and NYK moves

2. Environmental Issues.

This module will cover the following:

- Australian Cotton BMP program
- Consumer trends
- Environmental legislation
- Eco labels: clean fibre, clean processing, consumer recognition
- Linking farm and consumer

3. Fibre Properties.

This module will cover the following; Length Properties

- Transverse Properties
 - Micronaire
 - Maturity (Neps)
 - Fineness
- Tensile Properties
- Colour
- Impurities in Cotton
 - Trash
 - Neps
 - Stickiness
 - Contamination
- Moisture
- Compression Properties
- Wax Content
- Microbial Attack
- Indices of Fibre Quality
- Future Trends

4. Agronomy.

This module will cover the following;

- Fibre Growth in the field.
- Climatic Impacts on Fibre Development.
 - Temperature.
 - Radiation.
 - Water.
- Crop Management of Fibre Quality.
 - Varieties.
 - Irrigation.
 - Nutrition.
 - Fruit Load.

5. Picking & Ginning.

This module will cover the following;

- Harvesting.
 - Defoliation.
 - Picker set up and operation.
 - Module Building.
 - Human Resources.
- Ginning.
 - Tasks of the Gin.
 - Operational guidelines.
 - Modifications.
 - Technological change.
 - Quality measurements.
 - Conflicting aims.
 - Human Resources.
- Challenges.

6. Classing.

This module will cover the following;

- History of Classing.
- Classing in Australia
- How does one become a classer?
- How do we class our cotton?
- Requirements of BMP.
- Subjective classing:
 - USDA Classing Boxes and demonstration.
- Objective classing:
 - High Volume Instrument (HVI)
 - NEP tester.
 - Colour Charts RD, +b and CG.

7. Yarn Manufacture.

This module will cover the following:

- General

- General principles of yarn manufacture.
- Process flow of various spinning systems.
- Explanation of various count systems.

- Opening and Cleaning.
 - Basic operation of a blowroom.
 - Reasons for blending.
 - Opening.
 - Cleaning and dust extraction.
- Carding.
 - Tasks of the card.
 - Neps.
- Drawing.
 - Tasks of the drawframe.
 - Cornerstone of a spinning mill.
 - Blending.
 - Drafting.
- Combing.
 - Tasks of comber.
 - Advantages and disadvantages of combing.
 - Noil.
 - Combing preparation.
- Roving.
 - Tasks of the Roving frame.
 - Drafting.
 - Twist and twist factor.
- Ring Spinning.
 - Advantages and disadvantages of Ring Spinning.
 - Tasks of the Ringframe.
 - Drafting.
 - Twist and twist factor
 - Automation.
- Rotor Spinning.
 - Comparison of ring and rotor yarn.
 - Advantages and disadvantages of Rotor spinning.
 - Principle of operation.
 - Drafting.
 - Twist and twist factor.
 - Clearing.
 - Waxing.
 - Automation.
- Air jet/vortex.
 - Comparison to other spinning systems.
 - Advantages and disadvantages.
 - Principle of operation.
 - Drafting.
 - Twist and twist factor.
 - Clearing.
 - Waxing.
- Winding.

- Reason for winding.
- Joining.
- Waxing and friction.
- Clearing.
- Twisting.
 - Definition of twisting.
 - Benefits of twisting.
 - Twist and twist factor.

8. Fabric formation.

This module will cover the following:

- Knitting
 - Circular knitting
 - Flat-bed knitting
 - Weft knitting
 - Warp knitting
- Weaving
 - Fabric designs
 - Warping
 - Sizing
 - Principles of weaving
 - Weft insertion mechanisms
- Non-woven
 - Blending
 - Carding
 - Needle punch
 - Thermal bonding
 - Hydro-entanglement

9. Dyeing and Finishing.

This module will cover the following:

- Preparation
 - Singeing
 - De-sizing
 - Scouring
 - Bleaching
- Dyeing & dyeing machinery
 - Classes of dyes
 - Batch dyeing
 - Continuous dyeing
 - Printing
 - Environmental aspects
- Chemical finishing
 - Easy care
 - Durable press
 - Softeners

Appendix 2: Course Feedback from Mark Hickman

Field to Fabric Training Course: Managing for quality through the production chain.

Mark Hickman: Cotton Training Coordinator, DPI & F Toowoomba

Course: pilot course held at Geelong CSIRO Textile and Fibre Technology, between the 2nd and 4th August 2005.

The following notes are personal observations I have made regarding the Pilot course held at Geelong in August. In addition I have included the raw comments and quotations taken directly of the written surveys suggestions.

SECTION 1: Mark Hickman Personal comments

Supportive Comments

- Overall the pilot course was a success. The feeling from the participants I spoke to were very supportive and all felt there was a definite role for this course within the industry.
- The location certainly worked to the courses advantage. The ability to discuss the mechanics of how a fibre leaves the gin as a bale and then undergoes a series of processes to become yarn was reinforced with visits to the 'on site' spinning mill. Seeing the processes in action with commercial machinery provided a good learning tool to fully understand how fibre strength, length and uniformity are all key parameters. As well as observing how mills overcome poorer strength in cotton via twisting. Which in turn reduces the production efficiency of the plant?
- Ford factory visit achieved what was intended. To have a break from the course but also reinforce the aspects of why quality is important, how to handle the human element when striving for quality in a process chain and to illustrate how a non agricultural processing chain has the same dilemmas as we were outlining with the course.
- Mixture of participant's background worked well and discussion flowed once the comfort level was achieved within the group. Like all courses the first day is where everyone "finds the comfort zone", before they really open up in discussions.
- Classing display with 'hands on' activity for how grades are achieved was good, except it was not fully explored due to the time limitation of the sessions and the number of people wishing to look at the samples caused a limitation.
- Recaps in the morning (which were stimulated from the assessment sheets) worked well. It recapped the previous day's activities and generates good discussion. A good way to incorporate the assessments

Constructive thoughts

- The course needs a manual to accompany the course presentations. This could take the form of a short paper on the topic from each speaker as would be presented at a conference. These papers would need to ensure all technical detail is included.
- I felt the requirement for completing assessment tasks needs to be worked into the course better. While the assessments were done I think more group discussions after smaller group activities could be used. In saying, this we must maintain a large individual influence in the answers each question as this is required to satisfy the auditors of the competency assessment.
- The Ecolabel and Marketing sessions are important, although a little more on setting the scene as to why this course has any relevance to the industry and why we are asking people to change practices. Perhaps the 2 sessions could be combined? For example, it would answer questions like why is quality of a fibre so important. Why should the industry strive for this when P and D sheets mainly reward Base grade.
- I do have concerns over the comments to minimise some content based on the % make up of a certain target group. I believe if the group has lots of growers, assuming too much prior knowledge regarding fibre development and agronomic practices that impact on quality could be dangerous. Often people don't understand the full story only parts of the story. In essence we must cater to the average knowledge base in the group and answer the group questions to the higher technical level.
- While the location was excellent for access to the spinning machines, and I am very supportive of the location. I do believe some discussion / consideration should be given to the splitting of the course into an agronomic section where the class visit cotton fields or view modules from fields belonging to some of the participants are tracked through a gin with "modified settings". Then at a later time the 2nd half of the course happens in Geelong and that cotton is ginned. And the class "track the process". This would be a more expensive exercise and logistical problem. However, I believe it would be a very powerful learning tool. It should be noted, the class in the verbal course evaluation were not supportive of this concept. As stated at the start of this section, these are my person view
- Time was very limiting; there was an underestimation of how long the mill visits would take and the difficulties of hearing within the large group due to the OHS requirements.

Overall comment:

In general I rated the pilot workshop a great success and it certainly provides strong bases to build on for future courses. Rene and the Geelong team should be congratulated for their work.

Appendix 3: Course Feedback from Participants

SECTION 1: Notes recorded during the Feedback session on the last day of the pilot course

Suggestions for future courses

Improvements for the course

- Extend the last day to cover the topics better
- Change the program to include a visit to the Mill on Day 1 , as a way of breaking up the lectures
- Assume a little more knowledge with regards to the agronomics
- Include a commercial spinner in the program of presenters
- Course needs a manual of the presentations, not just the PowerPoint displays , include colour pictures on the PowerPoint to ensure fine details can be seen on the small hard copy slides
- Investigate the use of a head phone set for hearing protection and communication while walking through the mills. Very hard to hear with ear plugs
- Perhaps split groups into smaller sizes for mill visits
- Essential to allow formal participant introductions so the group can consolidate
- Pre the course date send out the manual and assessment tasks so people can have time to reflect before the course starts
- Program needs more on fibre competition, what this means for cotton in the market place, what are the trends in combination fibres-polycotton blends etc
- Lacking ginning information in the course
- The course is field to fabric, however what about extending this to the finished article. What are the losses, quality, market forces and process once it is in the yarn state
- Perhaps include an aspect on the shipping of cotton.

Units that should be Modified or Included

- EcoLabels - Keep the unit in however modify the presentation to a more cotton focus, encompass more on public opinion, Relevance to the cotton mills and market place
- Place a dollar value on each step of the processing chain. This will highlight where savings can be made or loss
- A little more clarity is required on the steps within the chain in relation to quality. Rather than the physical mechanics of each stage
- A little more agronomics for the non agronomist is required (Marks comment: This highlights the difficulties of a mixed audience given the

previous comment under "Negatives for the course, dot point 3. where they wished to have less "agronomics")

- A topic addressing the threat of synthetics replacing cotton in the market place. What is the financial buffer?
- New topics
 - Promotion of cotton marketing – to increase cotton use
 - Future breeding objectives and how these are matching the quality requirements of the mills and market

Positives on the Course from the Feedback session

- The course was an excellent overview
- It allowed a better understanding of spinning terminology such as Ring Vs Rotor spinning
- Excellent to physically see the spinning machines and grasp a really good impression of why quality is important
- Now appreciate the complexity of the machinery and the operations
- Good to show the linkage between the fibre and the end product
- Ford Visit – Was very good as it tied nicely into the course's messages regarding the production chain
- Good to talk to the staff and enter into dialogue
- Enjoyed the group activities such as a the recapping each morning
- Mills – access and location to the course
- Main Dinner worked well, did not need a main speaker

Overall Impressions that could limit the course from the feedback sessions

- Course fee : Too High (5), Adequate (17) and too low (3)
- Total cost to the Growers could be limiting (airfares, accommodations etc). the suggestion was to investigate subsidies for the training or encompass as a prize for local grower association awards
- The distance required for some participants in the future could be seen as impeding despite the positives of being at Geelong. This may not become evident until the participant attend the course at Geelong and sees why it is being held there
- Timing of this annual event- The years when the Cotton conference is on will cause issues with who can afford to attend the course. Thought needs to be given to this

Alternative Suggestions for the Course format

- The suggestion to split the course between a meeting at the production area to address agronomics and ginning then the follow up with a meeting in Geelong to cover the spinning was dismissed by the majority. Attendees felt a video on production of cotton could cover the farming practices.
- The course total number (30) can not become any bigger, If anything reduce the numbers slightly

SECTION 2 Written Response collected from surveys

Suggestions for future courses: Written response

- Need for more time allocated for the mill visits
- Ear plugs in the mill made it difficult to hear, perhaps investigate a headphone system like that at ford factory- mobile phone system.
- Diagrams (from ppt presentations) could be set-up above the various machines showing the process
- A number flow chart throughout the mill with the various processes outlined
- We could tidy up day 1 to provide a little more time for Renes etc section, Sections that could be reduced are marketing to 20mins and industry branding to 15min.
- Need to shorten, particularly the first day.
- Some PowerPoint need shorten
- Group is a little large
- Need an overview of competitive fibres – state of play and threat
- Need to change the course a little each year
- I'd like to have spent more time (much more) on the fibre quality measurements
- Thankyou for all involved in running this course. It was completely worthwhile; however, feel that it was a bit crammed. Maybe needs to run for 4-5 days, OR maybe shorten each day a fraction. The first day was to long in the classroom and should have been broken up into some practical as well. The next car plant to visit should be at TOYOTA not ford.
- Course requires refinement- adjustments for presentations and workbooks BUT information is all there. Suggest all presentations be available for a future workbook- to be used as a reference
- Day 1 was very slow. Too much lecturing, not enough hands on.
- Day 2 and 3 was more what I expected hands on and going through the actual processes. Very informative. I think you need to assume prior knowledge on a lot of the subjects on day 1 and get to the real value of day 2and 3.
- I found Stuarts talk a little above me. I have no understanding of the process previously. Therefore I felt he needed to explain or go more into the background in "layman's terms". He was extremely knowledgeable but needed to simplify his talk

Key Take Home Messages:

These comments were taken directly from written post feedback sheets

Growers:

1. Growers should consider the impact upon the final product.
2. It is a total commitment from all the stakeholders to produce a good quality product

There are a lot of perceptions about cotton grades from the growers, ginners to the spinners. There seems to be varying factors in what the final product is needed, eg colour Vs Trash content. Maybe the spinners can handle more trash instead of the ginners removing it, but the spinners want to see the nice white cotton. A good overview on the whole industry.

1. Spinning and yarn manufacturing is a complex procedure.
2. Quality and faults influence the whole chain
1. What I do throughout the whole year (mainly defoliation onwards) has a direct result on what the consumer buys. I thought the gin and mills 'fixed it all up'.

The importance of quality through the whole process

That apart from being a grower there are many people along the line that contribute to fibre quality. It allows you to see and understand that line and factors and processes affecting the raw product to the finished product.

The fibre quality has a huge impact on its spinnability.

Extremely interesting to see the processes which occur after the cotton leaves the farm.

Merchants

Cotton quality from the growing, picking, ginning and spinning etc all affects the final product. Having a good understanding and overview of the supply chain is important to a merchant handling both the growers and the mills

The greater control on variety selection, on farm management with defoliation, timing of picking, maintenance and education towards contamination all lead towards the steps in greater quality in Australian Cotton. Also that Australian Cotton needs to be continually pushed out into the world market as a quality product that's getting better

1. Quality is everything.
2. Labour is the only difference in spinning between nations

Ginners

Being able to follow cotton from field to fabric. Understanding the importance of quality ginning and growing practices and the impact that this has on the field practices and products produced at the spinning mills

How cotton fibre quality affects the following processes it goes through
I know now each step of the cotton process
Spinning; but mainly everything was very good to know. Dying was pretty interesting.

Classers and Spinners

Understanding of the entire process

To create a linkage between the fibre product and the textile industry

Extension People

1. Good communication between Australian Industry and the end user at the mills is vital. 2. Important to determine where trash is best removed in the sample (gin or mill), Spinner education is required.

Quality is paramount, poor quality means serious problems down the line

1. Impacts of fibre quality on cotton processing.

2. Complexity of cotton spinning

3. Losses and costs to spinners

1. How critical fibre quality is to the efficiency of producing yarn and producing high quality yarn.

2. Puts cotton fibres into perspective with other competing fibres in terms of manufacturing efficiency and pros and cons of the eventual material.

1. Greater understanding of processes post farm gate leading to fabric manufacturing.

2. Greater understanding and appreciation of difficulties in yarn production as a direct effect of agricultural practices

An increased awareness of the process involved after ginning. Spinning, dying etc

Quotes from the Course

The question asked was "Write down your respond to someone who asked by what you thought of the course you have just finished. Was there a benefit in doing it?"

Grower Quotes

"It is important for all stakeholders in the cotton industry to realise that we are in the retail fashion industry "

"The course gives an understanding of how important quality is all the way up the supply chain from planting to the final product."

"I'd tell people to do this course as it is a great way to explain the consequences of our actions in the field. "

"It creates an understanding of the correspondence that comes back from the mills - our customers."

"Overall the course has been a great benefit to my operation and general knowledge of how the other 1/2 does it. Very well presented with excellent speakers with knowledge of their respective fields"

"As a grower I want to (need to) see the raw product that you produce evolve to the finish product. This is what the course does. It gives you a realisation of the impact on quality at all stages throughout the processing line."

Merchants Quotes

"Refreshing and Challenging.

Refreshing since I was able to meet the people in the supply chain (growers, ginners, merchants, spinners. Also I was able to engage in dialogue with each person's view- Interesting. **Challenging**: Trainers encouraged participants to think further with respect to fibre properties and their relations to textile."

"Good course that gave a great overview of the end product and the issues that affect the end products. It really made it clear and backed up the grade specifications that we market with and why. It also outlined the areas that we as an industry need to take action on to make us gain a leading edge with textile and as a cotton producing country."

"Every grower should do the course. Covers every facet of the supply chain."

Ginners Quotes

"I would be happy to send our ginning staff to attend such a course in the future."

"In my opinion, the course was very well thought out and will assist the whole cotton industry in producing a better quality product more able to compete in the world market. I sincerely hope it continues into the future."

"It was good- Information from my part of view. Some when over my head , the spinning was very good and I really enjoyed the tour"

Classers and Spinners Quotes

"Understanding of the entire process and that quality characteristics (Neps, SFI and Uniformity) are all important for different spinning techniques."

Extension People and Industry Representatives Quotes

"The ability to inspect ALL aspects of the cotton textile industry, processes quality issues @ the CSIRO facility are absolutely 2nd to none. I thought the balance, content was excellent. Martin Prims was particularly efficient with his theory presentation."

"Course delivered a good understanding of cotton processing pathway and also highlighted the complexity of the spinning process. Including how fibre quality impacts on this."

"The course was good in the fact that it brought home to me that we are in the textile industry and we are all about producing good fabric and all the implications of that."

"As a pilot - great base to establish a worthwhile course for all participants in the cotton Industry. Well done"

"Good learning on the processes after ginning and the incredible technology that is involved in preparing, cleaning spinning weaving and dyeing the cotton. Really good course."

"Good bases of the value adding process.
Puts into context the pathway for cotton from field to fabric.
Puts into perspective the need for high quality cotton to compete in the fabric market."

Appendix 4: Media Release

Media Release
29 August 2005

Focus on Field to Fabric New Cotton Industry Training Program Developed

Have you ever wondered whether agricultural practices, storage, ginning and handling of cotton have an impact upon the quality of the end product? To help people from all aspects of the cotton industry understand the complexities of these issues, the CSIRO Textile and Fibre Technology (TFT) team have developed a new training program which focuses on cotton processing, from the farm gate to finished product.

The 2 ½ day course, which was piloted in Geelong earlier this month, looked at the potential impacts of growing, ginning, handling and manufacturing on cotton fibre. Personnel representing the entire length of the cotton value chain attended the course.

Cotton Training Coordinator (QDPI & F), Mark Hickman, said "Almost 30 people attended the pilot course, representing growers, extension officers, ginners, merchants, seed companies, classers and researchers."

Participants had the opportunity to interact with leading researchers and received presentations on all aspects of the cotton production pipeline from agronomy to fabric formation. A strong emphasis was placed on the impacts of fibre quality on textile processing. The workshop included numerous practical demonstrations and a visit to a spinning and fabric formations mills to fully understand yarn and fabric formation, as well as the opportunity to review the workings of a dyeing and finishing mill.

Mark Hickman added 'A real strength of the course is seeing the spinning machines in action. Given that these machines work at extremely high speeds, it soon becomes apparent that a linkage exists between low quality cotton at the field level (such as immature fibres) and the resultant yarn being of an inferior quality. Growers need to see these machines to really appreciate the connection.'

René van der Sluijs CSIRO TFT and Course Leader said "This Field to Fabric training course and the previously held Fibre to Fabric Road show is part of our Post Harvest Training initiative to make everyone in the cotton production pipeline aware of what their customers need and expect when they process Australian cotton. Our site at Geelong has a commercial scale cotton mill, fabric formation and dyehouse to demonstrate the effects of fibre quality on processing performance and yarn and fabric quality."

"An additional benefit of the program is that it has been aligned with several competencies from the national training package for vocational training and education. This allows participants to experience a short course and at the same time, gain a formal qualification." René added.

Feedback from the pilot program was excellent. Plans are already underway for CSIRO to host another course next year, cementing this course as an annual event in the cotton calendar.

CRDC's Research Program Manger, Dallas Gibb, who attended the course, said 'CRDC was a key investor in the development of this course, and it has certainly provided an excellent insight into how actions at field level can impact upon the quality of the yarn that is produced by spinning mills.'

"Maintaining and enhancing the industry's reputation for producing high quality fibre is critical in the face of increasing global competition. In addition to the training provided by the workshop, Best Management Practice's for fibre quality are being developed and trailed as part of the National Heritage Trust-funded 'EMS Pathways' project." Dallas added.

CSIRO TFT would like to acknowledge CRDC, the Australian Cotton CRC, International Fibre Centre, NSW Tafe, Australian Cotton Shippers Association, CSIRO PI, Cotton Classers Association of Australia, Queensland Department of Primary Industries and Fisheries and National Heritage Trust for their support in funding and developing the Field to Fibre training Course.

Anyone interested in attending future 'Field to Fabric' courses should contact René van der Sluijs at CSIRO TFT at 03 5246 4000 or rene.vandersluijs@csiro.au

Media Contacts

CRDC – Julie Burt (0429 916758)

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Appendix 5: Powerpoint Slides from Course

This appendix is the set of powerpoint slides as supplied to the course participants as the course notes (three powerpoint slides per page). It is available as a separate (hard copy) document.

Appendix 6: CD of Course Material

(See separate CD titled 'Cotton Field to Fabric Training Course 2005' produced by CSIRP Textile and Fibre Technology)

Field to Fabric Course

Managing for quality through the production chain.

René van der Sluijs

Following on from the successful presentation of the inaugural Field to Fabric training course in August 2005, which was attended by 30 people, two follow up courses were held in July and August 2006. The first course was held from 25 to 27 July 2006 and was attended by 23 participants. The second course was held from 22 to 24 August 2006 and was attended by 25 participants. (Attached please find lists of participants) Of these 48 participants 5 were international participants from Vietnam, Singapore and the US.

Due to demand from the industry a further course will be presented this year on 28 to 30 November, for which 20 participants have already registered. A further course is planned for 24 to 26 July 2007.

This Field to Fabric training course is part of the Post Harvest Training initiative to make everyone in the cotton production pipeline aware of what their customers need and expect when they process Australian cotton.

The 3 day course, which was presented in Geelong, gives participants an opportunity to interact with leading researchers and industry experts. (Attached please find lists of presenters, a CV of presenters can be found in front of course notes) on all aspects of the cotton production pipeline and includes modules on: global perspective, fibre properties, agronomy, picking, ginning, classing, marketing, yarn formation, fabric formation and dyeing and finishing. A strong emphasis is placed on the impacts of fibre quality on textile processing. Information is presented by way of lectures and practical demonstrations using the modern commercial cotton spinning and processing equipment available at CSIRO Textile and Fibre Technology (CTFT). All participants are issued with a course pack which incorporates;

- Course notes (106 pages) with copies of the PowerPoint slides used by the presenters and comprehensive course notes ,
- CDROM with above information
- Supplementary information

Besides the fact that all participants are presented with a certificate of attendance, an additional benefit of the program is that it has been aligned with several competencies from the national training package for vocational training and education. This allows participants to experience a short course and at the same time, gain a formal qualification

CTFT would like to acknowledge CRDC, the Australian Cotton Catchment and Community CRC, International Fibre Centre, NSW Tafe, Australian Cotton Shippers Association, CSIRO PI, Cotton Classers Association of Australia and National Heritage Trust for their funding and support in the development and presentation of these Field to Fibre training Courses.

Cotton Field to Fabric Training Course 25th – 27th July 06

List of Participants/Presenters

	<u>Presenters</u>	<u>Company</u>
	Dr Bill Humphries	CSIRO TFT
	Mr Joe Merola	IFC
	Mr Mark Hickman	QDPI & F
	Mr Cliff White	ACSA
	Mr Peter Bunce	CCAA
	Dr Mike Bange	CSIRO PI
	Mr Geoff Dunlop	NSW TAFE
	Dr Stuart Gordon	CSIRO TFT
	Mr René van der Sluijs	CSIRO TFT
	Mr Martin Prins	CSIRO TFT
	Dr David King	CSIRO TFT
	Participants	
1	Ben McClymans	Qld Cotton Corp
2	John Egan	Mr Harris Pastoral Co
3	Mitchell Anderson	Qld Cotton
4	Simon McInnes	ACIC
5	Andrew Jones	CSIRO TFT
6	David Green	Australian Classing Services
7	Van Bic Nguyen	Ecomtrading
8	Steve Tan Tjay Sing	Ecomtrading
9	Steve Dalton	Ecomtrading
10	David Brophy	Ecomtrading
11	Ross Harvie	Ecomtrading
12	Leong Zhi Yong	Ecomtrading
13	Tran Thuy Ha	Ecomtrading
14	Adrian Gallagher	Weil Brothers Cotton (Aust) P/L
15	Damion Irons	Brighann Ginning
16	Michael Sweeney	Brighann Ginning
17	Richard Egging	Brighann Ginning
18	Keven Dickson	Brighann Ginning
19	Ian Seery	Brighann Ginning
20	Dan Munk	Uni of California
21	Robert Long	CSIRO TFT
22	John Stanley	University of New England
23	Mr Peter Bunce	Australian Classing Services

Cotton Field to Fabric Training Course 22nd – 24th August 06

List of Participants/Presenters

	<u>Presenters</u>	<u>Company</u>
	Dr Geoff Naylor	CSIRO TFT
	Mr Barry White	IFC
	Phil Ryan	ACSA
	Ms Krista Page	CCAA
	Dr Mike Bange	CSIRO PI
	Dr Stuart Gordon	CSIRO TFT
	Mr Geoff Dunlop	NSW TAFE
	Mr René van der Sluijs	CSIRO TFT
	Mr Martin Prins	CSIRO TFT
	Dr David King	CSIRO TFT
	Participants	
1	Camilla Taylor	Qld Cotton
2	Lauren Wilson	Qld Cotton
3	Damien Erbacher	Dawson Ag Consulting
4	Jane Caton	CSIRO Plant Industry
5	Andrew Vanderstok	Namoi Cotton Co-op Ltd
6	Stephen Mallinson	Namoi Cotton Co-op Ltd
7	Ben Meyers	Weil Brothers Cotton (Aust) PL
8	Krista Page	Weil Brothers Cotton (Aust) PL
9	Darren Van-Dugteran	North West Ginning
10	Michael Robinson	North West Ginning
11	Shane Jett	North West Ginning
12	Mark Swan	North West Ginning
13	Wayne Clissold	North West Ginning
14	Tony Heckendorf	Qld Cotton
15	Steve Gardiner	Qld Cotton
16	Graeme Hollis	Auscott Ltd
17	Tom Galbraith	Independent Commodity Management
18	Anthony Walker	Qld Cotton
19	Steve McNallie	Qld Cotton
20	Ben Keft	Qld Cotton
21	Angus Crossan	University of Sydney
22	Peter Smith	Qld Cotton Corp
23	Andrew Gourlay	Deltapine Aust Pty Ltd
24	Nathan Eulenstein	Deltapine Aust Pty Ltd
25	Mark Freijah	CSIRO TFT

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Course Feedback

How would you rate the knowledge you have gained from this course

1 = No use

5= Of moderate use

10= Extremely useful

1	2	3	4	5	6	7	8	9	10
				9 %	5%	10 %	24 %	14%	38%

How would you rate the overall course content? *Please Circle one*

Excellent	Good	Average	Below expectation
57 %)	43 %		

How would you rate the delivery by presenters? *Please Circle one*

Excellent Good Average Below expectation

- **Excellent-** Well explained, good PowerPoint & slide use, felt the yellow exam was difficult to complete due to action packed program & having to think back to various talks
- **Excellent/ Good-** only issue taking Excel towards good was the leaving of technical explanation until next to the machines where I could not hear anything. Martin's video explanations of weaving- then see the machines was the best by far.
- **Good/ Average-** some presenters spoke for too long without a break. Encourage more interaction. Some presenters need to be more energetic, move around & increase tone of voice.
- **Good-** if possible the presenters should give speech a little bit slower so that foreign attendants (like me) can totally understand. Thank you.
- **Good-** some were excellent. Some could be more detailed like marketing and classing and made a bit easy to understand.
- **Excellent-** little less on history but only because of time limits.
- **Excellent-** after lunch is always hard- make it hands on.

How would you rate the course material supplied? *Please Circle one*

Excellent Good Average Below expectation

- **Excellent-** have not opened the CD-ROM
- **Excellent-** need samples to take home to be able to show others at home & spread the messages
- **Good-** HAND OUTS in colour as graphs don't talk well in black & white
- **Average-** the presentation copies given are too small to read some details.
- **Good-** I'm not sure if the given CD contains the videos or not. If yes, that's great.

- **Good**- the printed slides are very small, hard to read.
- **Excellent**- very in depth material that I will utilise all the time.

How would you rate the usefulness of the site tours? *Please Circle one*

Excellent Good Average Below expectation

- **Excellent**- found the whole tour fascinating. Very useful.
- **Good**- You need to ensure people can hear. The weaving/ knitting/ non-woven's was great because you could hear. Maybe show video of card/draft – then show the working mill.
- **Excellent**- this worked well as it reinforced the theory.
- **Excellent**- it would be even more excellent if we can see & have some time really work on the classing field.
- **Good**- particularly good for weaving spinning, non-weaver.
- **Excellent**- everything makes more sense when you can see it.
- **Excellent**- smaller groups- sometimes hard to hear.
- **Excellent**- very good to see process in action, this brings the notes and videos into perspective.
- **Excellent**- I couldn't imagine a more suitable site to hold a course like this.

Please provide a sentence on how would you describe the course to your colleagues.

- Do you know what the spinners think of your cotton? This course explains what is important to yarn spinners and fabric manufactures.
- Very informative as to the needs of spinning mills in regards to trash content on contamination
- Very good for learning about all those processing questions we often know nothing about.
- A useful amount of knowledge to create links throughout the industry
- A good overall description about the may faults of cotton production.
- Essential, if you want to intimately understand cotton and what our customers' needs are.
- Very comprehensive. Gives a holistic view of the entire cotton production process.
- Worthwhile
- The course is teaching very broad scope of textile industry, but the time was too short.
- Very informative.
- A very practical & highly informative introduction to the cotton processing chain, with a primary focus on quality issues.
- You get to see all the steps in the textile chart and realise that a lot happens in between ginning and garments manufacture.
- Worth going to Melbourne for the course.
- Very hands on and interesting.

- Very useful in that it gives you a great perspective on how seemingly small or insignificant things can present major problems further down the production line.
- Highly interesting and gives you a lot to think about the little things we do that cause big problems down the line.
- “fills in the gaps”
- Excellent base to the post harvest/ginning process shows visually use there is such importance on quality.
- A great overview of the whole cotton industry and good knowledge to benefit anyone in the industry.
- An unbelievable experience! It truly provides a holistic view of the chain of events from field to fabric, particularly yarn & fabric manufacturing.
- A good opportunity to gain knowledge in all aspects of the cotton chain- particularly the spinning side of things.

Has this course provided information that will change the way you conduct your work in the future?

Yes

No

If Yes, explain what you expect to implement or change in the future.

- **Yes-** Will recommend the course to southern growers, many of whom are new to the cotton industry.
- **Yes-** Try changing rate gin is run at so as too eliminate need too use 2 lint cleaners.
- **Yes-** a better perspective of this part of the industry is essential to co-ordinating the cotton course.
- **Yes-** provide me with knowledge to answer inquiries received regarding cotton.
- **Yes-** more educated about the industry
- **Yes-** have a better comprehension of quality requirements discuss this with more authority with customers. Develop more creative marketing options e.g. contract ginning
- **Yes-** allows me to recommend cotton that are useful for our client’s spinning mills.
- **Yes-** be able to relate this better when in talks with clients.
- **Yes-** in providing customer service to spinner.
- **Yes-** I will spend more time studying about cotton and will put more efforts in cotton trading.
- **Yes-** the course has confirmed many of my previous held views about quality- as a grower I am limited in what I can do except choose varieties for quality & manage & harvest the crop for quality. Concentrate on contamination at picking. At the gin we do not get paid to max quality.
- **Yes-** helpful to explain the whole process to others.
- **Yes-** to learn & implement better plant management practises.
- **Yes-** every action I take.

- **Yes-** better understanding
- **Yes-** give better information back to growers in the classing area.
- **Yes-** this will defiantly give me some ideas to put to my fellow works and discuss weather to implement them.
- **Yes-** I'll be more aware of how fibre quality effects the spinning process.
- **Yes-** as a classer I have learned how much emphasis is put on contamination & pepper trash so it has made me think about this when I am classing cotton next time.

EXTRA

Improvements-

The marketing section could focus less on “history” and more on the current position and about why mills like to buy Australian cotton & others don't.

Well done gentleman.... Great job!