

# Better ginning for Australian cotton

By Dr Geoff Naylor, Cotton Textile Research Unit, CSIRO Textile and Fibre Technology

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With the current world price at or near historic lows, the Australian cotton industry faces increased competition for markets from major rivals like the United States, which for the first time, will be growing more cotton for export than for its local spinners.

Sponsored by the CRDC, researchers from the Cotton Textile Research Unit at CSIRO Textile and Fibre Technology are tackling this issue head on in a new two-year study that specifically addresses the competitiveness of Australian cotton in the export market. In particular, the study will investigate ways to reduce the nepping and breakage of Australian cotton fibre that can occur during lint cleaning in the ginning of cotton.

Anecdotal evidence from customers of Australian cotton suggests that while local cotton is very good with respect to its cleanliness (grade), length (staple length) and strength (bundle), it also can be high in nep and short fibre content (SFC). Research has shown that most fibre damage occurs during lint cleaning.

As indicated in previous articles, minimising the amount of short fibre is becoming even more critical as the textile processing industry is taking up modern spinning technologies like the Murata Vortex system.

Ironically, ginning technology in Australia is generally imported from the United States where the main issue with respect to ginning for fibre quality is fibre cleanliness (grade). In contrast, in Australia, where over 80 per cent of the cotton is a Middling grade or better with a trash content of less than two per cent, the largest issue with respect to lint cleaning is minimising the damage to the fibre in terms of nep and SFC. So it is not at all clear that US gin technology and settings



Dr. Geoff Naylor



Dr. Stuart Gordon with Auscott engineers undertaking preliminary measurements at the Auscott Narrabri gin.

are optimal for preserving the quality of Australian cotton.

While a good deal of research has already been done on the effects of moisture and heat application, microbial degradation and the number of seed-cotton and lint cleaners on ginned fibre quality — little work has focused on the gin machinery itself.

Initially, the project will review current lint cleaner settings and determine experimentally if they are appropriate for Australian cotton. The effects of the number and combination of grid bars and feed bar and grid bar (toe and heel) settings will be surveyed in an attempt to find where the damage to fibres occurs in the lint cleaner.

The interaction between the fibre batt and the leading edge profiles of the grid bars and saw tooth wire will also be examined with a view to deriving new or adapting current profiles that would reduce fibre damage. On assessment of this data, the design of new settings and cleaning elements will be investigated in order to improve the quality of the ginned cotton. Of particular interest is the reduction of neps and fibre breakage.

The project draws on a long and successful history at CSIRO Textile and Fibre Technology. Our understanding of the fundamentals of fibre cleaning and blending processes has led to significant new developments — particularly in developing wire profiles and settings for the cleaning cylinders in wool processing.

For example CSIRO recently developed a new radical patented design for card wire that is currently undergoing commercialisation with a leading international company. This new design offers a substantial reduction in fibre recycling in carding and significantly reduces fibre breakage. Another application of this technology is nonwoven carding.

This invaluable background has given the project a real 'head start' as evidenced by the ideas and possibilities that were generated in recent discussions with the ginning industry.

The study will investigate ways to reduce the nepping and breakage of Australian cotton fibre during ginning.



Even though the study is still in its early days, team members are hopeful of not only identifying problem areas in the lint cleaning processes of local cotton, but providing dramatic improvements which ultimately result in reducing the amount of nepping and fibre damage to Australian cotton crops.

For more information on this and other research taking place at CSIRO Textile and Fibre Technology, go to: [www.tft.csiro.au](http://www.tft.csiro.au) or contact Dr Geoff Naylor on 03 5246 4000.