

## BREEDING FOR SHORT SEASON ENVIRONMENTS

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There are increasing areas of cotton grown in regions which are prone to cool seasons, eg. the Darling Downs, the upper Namoi and upper Macquarie valleys. Farmers even further south in the Lachlan valley are also now showing interest in cotton production and, given good management and suitable varieties, there appears no reason why they should not be successful. In all these more marginal areas an early maturing crop is highly desirable.

Of course there are a number of management tools available to increase earliness, including water and nitrogen management and growth regulators. However, varieties better adapted to cool season conditions would constitute a significant addition to a short season management package. At present in Australia there are no very early varieties grown, although the CSIRO-bred variety, Siokra, is earlier than DP90 and has performed well in cooler areas. With our short season breeding effort we are concentrating on developing lines especially adapted to the cooler growing regions. When breeding for earliness there is an inevitable trade-off between earliness and yield - we aim to achieve the optimum balance to maximise production in the short season areas. As a secondary aim we hope these early lines may provide farmers in longer season areas with greater management flexibility, eg. to enable earlier harvest of a portion of their crop or for very late plantings.

As in all our breeding efforts at Narrabri we are striving to improve fibre quality as much as possible. With early maturing cottons there have traditionally been problems with short staple lengths so this aspect, as well as the important strength character, has received a lot of attention. Of course we also aim to develop lines which show consistent premium range micronaire under the

unfavourable conditions often encountered in the target environments. Bacterial Blight resistance is being incorporated in all our early lines.

## PROGRESS

In recent seasons our best early lines have been tested at Breeza in the upper Namoi valley and near Brookstead on the Darling Downs. For a number of lines we now have three seasons of yield results at these short season environments (Table 1). The results demonstrate the improved production possible with short season lines such as 82041-32, 81042-19 and 82041-6 which all outyielded Siokra on average over the three seasons. These early types (which all have normal leaf shapes) were markedly superior to Siokra in the 1986/87 and 1987/88 seasons. As well as their better yield the early lines all had at least slightly better strength than Siokra. Despite their earliness these short season lines have good staple lengths. Another plus for the early lines is that they have shown higher micronaire values in these trials - Siokra and Deltapine 90 produced mikes well below 3.5 at Breeza and Brookstead in 1986/87 while the early lines maintained acceptable levels. Given the penalties for low mike cotton, this is an important consideration. Thus the use of early cultivars in these cool environments offers the potential to stabilize returns by lessening the effects of poor seasons on both yield and quality.

The first of these short season lines to undergo preliminary seed increase and testing by Cotton Seed Distributors (CSD) is 82041-6. It was evaluated in a large scale trial at Breeza in 1987/88 and gave a very encouraging result, being the top yielder and outyielding Siokra 1-1 by 20%.

We have obtained promising results from new lines which were tested at Breeza and Brookstead this last season (Table 2). Of course one year's results should be treated with caution, but both the yield and quality (particularly strength) performance of 83055-33 is certainly encouraging. We also evaluated

our early material at Trangie in 1987/88 but unfortunately at the time of writing the "great wet" had prevented us from harvesting the trial.

### **CONCLUSIONS**

With high yielding, good quality early lines from our short season breeding program now proceeding to seed increase and evaluation by CSD, farmers in the short season growing areas should soon have varieties available which are specially suited to their needs. These varieties offer the potential to increase and stabilize yield and quality in the expanding cooler growing areas and should provide farmers in warmer areas with greater management flexibility.

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Table 1. Mean yield results over 3 seasons and mean fibre quality results over 2 seasons at Brookstead and Breeza.

	Yield as % of Deltapine 90	Length (ins)	Strength (g/tex)	Micronaire
82041-32	129	1.17	26.6	3.9
81042-19	124	1.14	26.2	3.6
82041-6	122	1.15	27.3	3.8
Siokra 1-1	118	1.16	26.0	3.4
Deltapine 90	100	1.16	28.7	3.6

Table 2. Mean yield results for the 1987/88 season at Breeza and Brookstead and fibre quality results from Narrabri Research Station.

	Yield as % of Siokra 1-1	Length (ins)	Strength (g/tex)	Micronaire
83055-33	130	1.18	28.4	4.1
83055-95	129	1.12	26.3	4.4
82041-32	126	1.19	26.5	4.5
Sicala 3-1	109	1.18	27.5	4.0
Siokra 1-1	100	1.21	26.0	3.9