CSIRO ADVANCED LINE TRIALS FOR 2000/01 AND 2001/02

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The CSIRO Advanced Lines Trial (ALT) has been run cooperatively by CSIRO and DPIQ for 28 years and is used as the last stage in our breeding line evaluation. Early generation testing following single plant selection involves unreplicated progeny rows at the Australian Cotton Research Institute, further progeny row tests and multiple row replicated trials at a limited number of farm sites. At each stage, lines with poor seedling vigour, disease susceptibility, poor fibre quality or low yield are removed from further testing. The ALT now involves 14 irrigated sites in all major cotton growing regions in Australia from Emerald to Hillston. Management is normal commercial practice including full insect control.

Entries in the ALT include promising breeding lines, commercial standards and long term controls. Some Ingard varieties are included in the ALT even though the trials are conventionally sprayed. This is a test of Ingard yield potential and also gives an indication of insect pressure. Plots consist of three or four rows from 10 to 14 metres long and four replications are used. The centre rows of all plots are harvested with a modified picker, the seed cotton weighed and a subsample is taken for ginning at Biloela or Narrabri and fibre quality analysis at Narrabri. The most promising lines are retained in the scheme and also seed increased. In this way, by the time good performance is confirmed, sufficient seed is available for large scale testing and final seed increase for commercial use.

Results and Discussion

There were some similarities between the last two seasons in growing conditions and in the pattern of varietal performance. Both seasons had some very hot periods following a cooler than average start, especially in 2001/02. Insect pressure was generally below average and verticillium wilt and fusarium wilt were widespread.

To aid in interpretation the trial sites have been grouped into regions: cool (Hillston, Breeza and Brookstead), central (Warren, Narrabri, Merah North, Collarenebri, Moree and Boggabilla), west (Bourke and St George) and north (Theodore, Biloela and Emerald).

The overall highest yielder over the past two seasons (Table 1) was the new full season, normal leaf variety, Sicot 71. It showed very broad adaptation, yielding well in all regions. Importantly, it appears to have similar Fusarium resistance to Sicot 189. Sicot 71 will be available commercially for 2002 planting. Other good overall performers were a new medium maturing, okra leaf line 510, Sicot 70 (a full season relative of Sicot 71) and a new full season, normal leaf line 709.

In the cool regions two new okra leaf lines, Line 510 and Line 1189 (early to medium maturing) yielded very well, as did Sicot 71 and the other new medium maturing release from CSIRO, Sicala 43. Thus there is a very good range of new high yielding types emerging for the cooler growing areas.

In the central growing regions Sicot 71, Sicot 70, Sicot 72, Line 510, Sicot 80 and Sicala 43 all showed high yields. This group covers a wide range of types from the medium maturing Sicala 43 and Line 510 to the full season Sicot 70, 71, 72 and 80.

The highest yields in the long season, western growing areas were produced by the full season types, Sicot 72 and Sicot 71. Another full season type, Line 709, also did well but the early to medium maturing okra leaf 1189 also yielded surprisingly well.

In the central Queensland trials Sicot 71 continued its outstanding performance with other good yields shown by Line 709, Line 510, Sicot 70 and Sicot 80. Thus the range of high yielding varieties available for this region is also expanding.

It is of interest to note the progress in breeding by comparing with the Deltapine 16 variety, grown up to 1980. Yield progress with Sicot 71 is 29% overall.

Table 1. Mean yields of important varieties and new breeding lines over the 2000/01 and 2001/02 seasons as a percentage of overall or regional means.

Variety	Mean	Cool	Central	West	North
Sicot 71	107	107	107	106	106
Sicot 70	105	105	106	103	103
Line 709	104	102	104	104	104
Sicot 72	103	98	105	107	99
Sicot 80	103	103	104	102	102
Sicot 189	97	92	98	100	97
Sicala 43	104	107	104	103	101
Sicala 40	100	99	100	99	98
Sicala V-2	95	96	96	92	93
Line 510 okra	105	111	105	102	104
Line 1189 okra	103	112	101	105	101
Siokra V-16	100	101	100	97	101
Siokra V-17	100	106	98	103	98
Siokra 1-4	94	95	92	91	100
Deltapine 16	78	72	76	79	86

Conclusions

The yield results from the last two seasons of the ALT demonstrate that good yield progress is still being made in the CSIRO breeding program. The two new varieties for 2002 planting, Sicot 71 and Sicala 43, show considerable promise. Sicot 71 is very broadly adapted and yields well in most areas. However care should be taken in shorter season environments, as it is a full season variety. Sicala 43 is well adapted to the southern and central growing areas

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