THE AUSTRALIAN COTTON CULTIVAR TRIAL RESULTS FOR THE LAST TWO SEASONS

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The performance of CSIRO varieties and new lines are evaluated each year in a series of regional trials, known as the Australian Cotton Cultivar Trial (ACCT). CSIRO and the QDPI have been running these trials since the 1974/75 season. Currently the ACCT comprises twelve sites representing all the major cotton growing areas. This wide testing provides a good estimate of overall performance while also enabling assessment of whether particular genotypes perform relatively better at some environments than others.

Again, as for previous conferences, we are providing an update of the ACCT results over the last two seasons. In both seasons 30 entries were tested at each of 12 sites (Warren, Breeza, Narrabri, Merah North, Bourke, Moree, Boggabilla, St George, Cecil Plains, Theodore, Biloela and Emerald) but in the 88/89 season the Biloela yield results were discarded because of 2,4-D damage.

Fifteen varieties were common to both seasons and overall means for the two seasons and all sites are given in Table 1. For yield the 15 varieties could roughly be assigned into four groups. Most (8 of 15) were in the highest yielding group with a yield ranging from 103% to 106% of the overall mean. This group included the three commercial Siokras (1-4, L22 and S324). All three had similar high overall mean yields but Siokra S324 showed a greater season to season variability yielding relatively better in the cooler 1988/89 season. Compared to Siokra 1-4, Siokra L22 has slightly longer, finer and appreciably stronger fibre while Siokra S324 is shorter and coarser. Another member of the high yielding group, the newly available CS 189 has displayed some tolerance of Verticillium wilt, although not so pronounced as the tolerance exhibited by another member of the group, Sicala V1, a variety that will be commercially available in the 1991/92 season (see P. Reid's and N. Thomson's article in these proceedings). Sicala V1 has done especially well at the cool and Verticillium infected Darling Downs and Breeza sites and has also performed well at Warren. It is a large bolled type and has a good quality fibre that

exceeds Sicala 33 in strength. Sicala V1, however, with a heavy crop, tends to lodge and generally has not done so well under hotter, higher yielding conditions. By contrast 83203-156 and 83203-183 perform better in hotter areas but their commercial prospects are clouded by shorter than desirable staple length with 83203-156 and lower than desirable strength for 83203-183.

Another line of interest is the normal leaf, big bolled 82268-263. Like CS 189 and Sicala V1, it also shows some Verticillium tolerance and although not an early maturer has consistently done well at the cool Darling Downs and Breeza sites. However, by the same token, it has also yielded well in both seasons at the hot Bourke and St George sites. It generally stands well even under high fertility conditions. It has an acceptable, though not high, quality with a strength intermediate between Siokra and Sicala.

The two high quality varieties DP90 and Sicala 33 with a yield of around 100% of the overall mean constitute the next group. It should be mentioned that this season in our trials DP90 showed poor seedling vigour and despite "patch-up" over-sowing, the yields recorded were probably less than its true potential. No particular pattern of adaptation was evident for Sicala 33 with it being middle ranking for yield at most sites. Some observers thought that it appeared more affected by thrips during early seedling growth than were other varieties.

Siokra 1-1 (the orginal commercial Siokra), Sicala 3-2 and the glabrous okra leaf 84023-74 were the third yield group with an average 96% to 97% of the overall mean yield. All three appeared to be especially disadvantaged by this last season when their yield was only 94% to 95% of the seasonal mean.

The two members (DP16 and Namcala) of the lowest yielding group (range 87-89%) show how much yields have improved since these varieties were grown commercially in the 1970's, although it must be conceded none of the new varieties yet equals the strength of Namcala.

A number of new lines tested this season for the first time in the ACCT performed well with three Sicala 33 selections having the highest overall mean yields (Table 2). Another Sicala 33 selection (457) not only slightly outyielded Sicala 33 but also has appreciably (circa 2 gms/tex) greater strength. However the highest quality new line among the entries was (84530-48). Its yield, length and strength are

greater than Namcala's, but probably its yield is still too low for this line to be a commercial prospect at present prices.

The ACCT, by covering all the main growing areas, provides an excellent means of evaluating the worth of the new lines we are producing by our breeding program. The results for the last two seasons are certainly encouraging and indicate that we are continuing to progress in yield, quality and disease resistance.

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Table 1. Mean results for the fifteen varieties common to both the 1988/89 and 1989/90 ACCT.

	Lint Yield % of Mean for			Lint %	Boll Weight (g)	Staple Length (in)	Strength (g/tex)	Micronaire Value
	88/89	89/90	Overall					
82268-263	107	105	106	40.4	5.5	1.14	27.7	4.2
Siokra 1-4	106	104	105	41.0	4.6	1.19	26.6	4.0
Siokra L22	105	105	105	41.2	5.0	1.20	27.7	3.9
Siokra S324	108	102	105	41.2	4.5	1.14	26.2	4.2
Sicala V1	108	102	105	39.8	5.4	1.16	29.1	4.1
83203-183	107	103	105	41.6	4.5	1.15	26.6	4.2
83203-156	107	102	104	41.3	5.0	1.10	28.0	4.5
CS 189	104	102	103	40.6	4.6	1.16	27.0	4.1
Sicala 33	102	100	101	39.2	4.5	1.21	28.4	4.1
DP 90	101	97	99	39.5	4.8	1.15	28.1	4.2
Siokra 1-1	99	95	97	41.3	4.3	1.16	25.6	4.0
84023-74	99	94	97	38.6	5.4	1.18	28.0	4.1
Sicala 3-2	98	94	96	38.5	5.5	1.18	27.9	4.0
DP 16	90	88	89	38.1	5.3	1.16	24.1	4.1
Namcala	89	86	88	37.0	5.6	1.16	31.5	3.8

Table 2. Results of some new ACCT entries. Yields expressed as a % of the overall mean yield for all sites.

	Yield %	Lint %	Boll Weight † (g)	Staple Length ** (in)	Strength ** (g/tex)	Micronaire ** Value
Sicala 33 - Selection 391	107	41.8	3.85	1.18	27.9	4.3
Sicala 33 - Selection 53	106	41.1	4.28	1.20	28.7	4.4
Sicala 33 - Selection 288	106	40.4	3.93	1.20	29.5	4.4
86001 - 130	105	39.3	4.40	1.18	28.3	4.3
Sicala 33 - Selection 457	102	39.3	3.85	1.21	30.9	4.3
84530 - 483	90	37.2	6.15	1.24	32.8	4.2
Checks						
Siokra 1-4	104	41.0	4.34	1.20	26.6	4.0
Sicala 33	100	39.0	4.26	1.22	28.5	4.2
Namcala	86	36.7	5.18	1.18	31.6	3.9

† Boll weight assessment affected by late hail damage

** Means of six sites