DRYLAND CULTIVAR EVALUATION

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The renewed interest in non-irrigated cotton production in recent years led us to undertake co-operative cultivar trials, commencing in 1981/82. There were considerable differences in opinion on the types of cultivars required with much media speculation about the desirability of Texan short season types. Yet, as reported at the Goondiwindi and Toowoomba grower conferences, our preliminary results suggested full season varieties did better under Australian conditions.

In an attempt to more fully evaluate cultivar response under rain grown conditions we have expanded our testing by evaluating the same 30 entries at four sites in both the 1984/85 and 1985/86 seasons. These 30 entries include a wide range of USA and local cultivars chosen to not only select the best ones for commercial use but also to provide information on the reaction of different types to different environmental conditions. The environments chosen have been at Narrabri (solid planting), north of Moree (skip row), and a skip row and a solid planting at Biloela. The two trials at Biloela provide a direct comparison of skip and solid planting and it was hoped that it might show if cultivars reacted in different ways to the two planting configurations.

Results

The rankings for lint yield for the trials are shown in Tables 1 and 2. Table 2 also includes the overall mean yield rankings and overall yields as a percentage of Deltapine 90. The entry numbers 1 to 15 are USA cultivars (except the Namcala selection which was selected at Narrabri) while entries 16 to 30 are all from the Narrabri irrigated breeding programs.

Both the 1984/85 and 1985/86 seasons were dry at all sites and this is reflected in the fairly low mean yields. The already low yields caused by severe drought at the 1984/85 Moree site were further worsened by a violent storm just before picking which caused perhaps 40% of the crop to be lost on the ground.

The best overall mean yield was achieved by McNair 235, a cultivar from Mississippi. However, its performance was inconsistent, yielding only moderately in 1984/85 whereas it had very high yields at Biloela in 1985/86. The related line, McNair 220, behaved in a similar fashion. Other good yield performances came from Deltapine 90, Deltapine 70, Siokra, Sicot 2 and Sicot 2-436. These were generally more consistent than McNair 235. Sicot 2 and its selection are glabrous (ultra-smooth) and are slightly later maturing so it is certainly interesting that they perform so well under dryland conditions (Sicot 2 also gave high yields in our preliminary trials). Siokra yielded only fractionally less than Deltapine 90 on average with a better performance in 1984/85 than in 1985/86. The reasons for the different relative performances of some cultivars from site to site and season to season are not immediately clear but a closer study of weather data and further trials may give us some

insights. Yet, in general, relative varietal performance across the wide geographic and climatic spread of environments was quite consistent given the inherently variable nature of dryland farming. Thus there is no real evidence that different cultivars are required in central Queensland and northern N.S.W.

The USA short season types such as the Tamcots and Paymaster 145 performed poorly as they have done consistently in all our dryland trials. One factor which disadvantages some of the American dryland cultivars is their greater storm resistance which is more suited to stripper harvesting. All our trials were spindle picked. A preliminary look at the amount of cotton left behind after spindle picking suggests that stripping may slightly improve the relative performance of the storm resistant early types, but not enough to bring them up to the level of the best full season types.

A comparison of the overall mean yield of the skip row and solid plantings at Biloela is interesting with both producing similar yields in 1984/85 and the solid planting doing best in 1985/86. It is surprising that the skip row system did not do better in the dry seasonal conditions and certainly questions whether it is the best planting configuration. There were some cultivars which performed differently in the skip and solid plantings but these differences generally did not repeat themselves in both seasons. For example Deltapine 41 was 22nd and 3rd under skip and solid respectively in 1984/85 but was 10th and 11th in 1985/86. While there is a suggestion that Deltapine 90 performed relatively better in the skip row in both seasons, overall, there is little consistent difference in varietal

response to the two planting configurations.

In terms of quality at the N.S.W. sites (Table 3) there are obvious problems with dryland production in exceptionally dry seasons. The staple lengths are generally very low and the strengths are also less than those obtained in most of our irrigated trials. McNair 235 which yielded so well at some sites in 1985/86 is unfortunately deficient in length and strength and thus unsatisfactory from a marketing point of view. Some cultivars have maintained quality better than others with the best being Namcala, Deltapine 90 and N74 720. Short staple length (often less than one inch) is certainly a problem with the short season types such as the Tamcots and Paymaster 145. For such lengths penalties in excess of $25 per bale are imposed compared with 1 1/16 inch cotton. Thus, in addition to lower yield, the likely quality penalty is another factor confirming that the Texan cottons are not attractive for our situation.

Conclusions

We are gradually building up a clearer picture of the cultivar requirements of the dryland situation but we plan to gather more data in future trials and hopefully identify new higher yielding, high quality lines. From our present knowledge we can say the dominant irrigated cultivars Deltapine 90 and Siokra are the best available at present with Deltapine 90 having the edge in fibre strength. The better pest tolerance of Siokra may allow some savings in pesticide use. There appears to be no evidence that short season types are likely to be beneficial under dryland conditions unless a low input growing system can be

devised to counteract their lower yields and quality. With the current poor prices, dryland production faces an uncertain future but if the market improves we are fortunate that our commercially available cultivars are also the ones best suited to dryland farming.

Table 1. Lint yield rankings for 1984/85 season.

Cultivar	Narrabri	Moree	Biloela skip	Biloela solid	Mean
1 DPL 30	9	10	15	24	14
2 DPL 41	1	9	22	3	6
3 DPL 61	5	13	13	5	8
4 DPL 70	8	12	6	7	7
5 DPL 90	7	1	4	14	3
6 DPL SR5	26	20	29	27	28
7 Namcala	24	25	25	29	27
8 Namcala Sel	23	21	24	9	20
9 Tamcot CAMD-E	27	27	20	25	26
10 Tamcot SP37H	29	29	26	23	29
11 Coker 383	30	30	30	30	30
12 Coker 5110	12	7	21	18	16
13 McNair 220	16	23	12	11	10
14 McNair 235	19	24	19	15	18
15 Paymaster 145	17	22	27	28	25
16 N95 A1	13	26	9	13	13
17 N70 28/3	11	5	28	26	22
18 N74 250	20	15	14	20	17
19 N74 355	25	14	10	10	15
20 Siokra	2	4	7	1	2
21 N74 666-108	28	16	23	4	24
22 N74 720	22	18	17	16	19
23 N74 873	10	7	5	6	9
24 N74 873 NLN	21	11	16	21	21
25 N74 956	15	17	8	17	12
26 Sicot 1	6	6	3	12	5
27 Sicot 2	3	2	1	2	1
28 Sicot 2-436	4	3	11	8	4
29 81002-10	18	19	2	19	11
30 81023-7	14	28	18	22	23
Mean yield (kg/ha)	483	170	599	596	462

Table 2. Lint yield rankings for 1985/86 season; rankings of mean over two seasons; and overall mean as a % of DPL 90.

Cultivar	Narrabri	Moree	Biloela skip	Biloela solid	Mean	Overall Mean	Overall as % of DPL 90
1	20	26	8	5	16	15	93
2	1	11	10	11	6	8	99
3	9	18	9	18	17	13	96
4	6	16	4	6	3	3	100
5	2	20	6	12	8	2	100
6	19	21	30	27	26	27	81
7	27	29	15	28	28	28	81
8	29	22	19	23	25	24	86
9	23	27	18	25	24	26	83
10	28	28	13	30	29	29	78
11	17	30	28	26	30	30	70
12	14	15	17	15	18	17	92
13	3	25	3	3	2	7	99
14	4	13	1	1	1	1	103
15	21	17	22	22	21	23	86
16	25	7	29	24	23	21	88
17	24	6	20	7	14	18	91
18	11	14	5	16	11	16	93
19	26	2	2	14	4	12	96
20	15	9	12	13	12	6	99
21	30	3	26	29	27	25	84
22	18	12	27	8	19	19	91
23	8	19	16	2	7	9	98
24	12	10	14	4	10	14	93
25	16	1	11	10	5	11	96
26	10	5	24	9	13	10	97
27	7	4	21	19	15	4	99
28	5	8	7	17	9	5	99
29	22	23	23	21	22	20	89
30	13	24	25	20	20	22	87
Mean yield (kg/ha)	373	533	478	589	493	478	DPL 90 Mean = 522kg/ha

Table 3. Mean fibre quality of the two NSW sites over two seasons.

Cultivar	Length (ins)	Uniformity Ratio	Strength (g/tex)	Mike
1 DPL 30	1.00	45.3	22.8	4.8
2 DPL 41	1.03	45.4	23.1	4.9
3 DPL 61	1.04	45.5	23.5	5.2
4 DPL 70	1.01	46.0	22.9	4.7
5 DPL 90	1.04	46.5	26.9	4.7
6 DPL SR5	0.99	45.4	24.0	4.3
7 Namcala	1.05	43.8	28.1	4.2
8 Namcala Sel	1.03	44.6	26.9	4.2
9 Tamcot CAMD-E	0.98	44.8	20.9	4.1
10 Tamcot SP37H	0.99	46.5	22.2	4.6
11 Coker 383	0.96	47.4	22.7	4.7
12 Coker 5110	1.04	44.2	23.4	4.5
13 McNair 220	1.01	45.9	22.6	4.7
14 McNair 235	0.99	46.1	21.4	4.7
15 Paymaster 145	0.96	47.7	22.4	5.0
16 N95 A1	1.03	46.2	24.2	5.2
17 N70 28/3	1.02	45.0	22.1	4.7
18 N74 250	1.02	45.2	22.3	4.7
19 N74 355	0.99	47.2	23.8	5.0
20 Siokra	1.04	45.5	23.0	4.7
21 N74 666-108	1.04	44.3	23.5	4.1
22 N74 720	1.06	45.2	26.7	4.7
23 N74 873	1.03	44.7	23.9	4.4
24 N74 873 NLN	1.04	44.7	24.6	4.3
25 N74 956	1.01	43.6	22.8	4.8
26 Sicot 1	1.04	44.4	22.7	4.7
27 Sicot 2	1.04	44.9	22.6	4.9
28 Sicot 2-436	1.02	45.9	22.3	5.0
29 81002-10	0.98	47.2	23.3	4.3
30 81023-7	1.00	47.3	21.6	4.5