

Short Staple Cotton Advanced Strains Trial, Safford Agricultural Center, 1996

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Abstract

Thirty five short staple advanced strains/varieties were grown in a replicated field on the Safford Agricultural Center in 1996. These included entries from Delta Pine, Olvey and Associates, Australia McDaniels, Sure-Grow, Germains, Georga, NMSU, and Terra. Delta Pine Experimental 1075 and Olvey and Associates 63 lead the trial with yields over 3.5 bales. Twelve 'varieties' exceeded 3 bales per acre, including 6 varieties from Australia (eg. IF 1003). Much agronomic information is included in the paper as well as HVI values for each variety.

Introduction

Over the years, the short staple variety trial on the Safford Agricultural Center has grown from a dozen varieties to more than fifty. In 1995 the advanced strain portion of the trial was separated from the registered varieties. That trial contained 15 advanced strains and DP 90 as a standard, this year the trial has grown to 34 advanced strains and DP 90 as a standard. The main objective of this trial is to screen advanced strains so the strongest can be selected and developed as registered varieties. By cooperating with and encouraging breeders to work at this elevation, we hope to strengthen the varieties available for the southeastern part of Arizona, and parts of New Mexico and Texas with similar climates.

Materials and Methods

This trial was designed as a replicated small plot trial with five replications. The plots were planted with a cone-type planter which distributes a given weight of seed uniformly over the length of the plot. The following crop history provides the information on how the crop was managed:

Crop History:

Previous crop: Cotton

Soil type: Pima clay loam variant

Planting date: 18 April 1996

Rate: 25 pounds per acre

Herbicide: 1.5 pts/ac Triflurilin pre-plant, Cotton Pro at lay-by

Fertilizer: 200 lbs/ac NH_4SO_4 4 June, 100 lbs/ac Urea 16 July

Insecticide: three applications for pinkie, aphid and whitefly

Pix/Prep: None

Defoliation: Ginstar

Irrigation: Furrow, planted to moisture + 8 irrigations (ca. 35.4 inches + 3.5 inches of rain)

Harvest dates: 1st pick: 4 November

2nd pick: 26 November

Heat units per growing season: 3839 (86/55)

In early October 25 boll samples were taken to determine boll weights. These hand picked samples were also used to determine percent lint turnout. This produced values that are 10 to 15 percent higher than lint turnout values taken from grab samples. Plots were picked with an IH 782 picker modified for small plot use. Plots were picked individually, weighed and grab samples taken for fiber analysis.

Results and Discussion

Yield and agronomic data for the study are included in Tables 1 and 2. The varieties in all the tables are placed in order of lint yield shown in the fourth column of Table 1. Comparing the values in Table 1 with those of the previous year (1), the 1996 values were higher; lint yields were about 100 pounds higher, percent first pick was 10 percent higher and the plant populations were about 13,000 plants per acre higher. These increases were probably due to the weather conditions, which is partially described by the heat units found in the Crop Histories (3839 vs 3703 for 1996 and 1995, respectively). Figures 1 and 2 of reference 2 show more of the weather situation during the year. Only 3 varieties are comparable from one year to the next, DP 90, DPX 9050 and MAC 95. These varieties stayed in the same yield order both years but with yields 200 to 300 pounds of lint greater in 1996. A killing frost occurred on October 22 which explains the high percent first pick and the little variability between these values from variety to variety. Never-the-less some differences are seen between maturities of varieties as shown by the percent first pick. Not much more can be said about yield comparisons without getting into too much detail for this report. The values are there for the reader to use as they see fit.

Of equal interest to the yields are the fiber values of the advances strains. The HVI values are reported in Table 3. The average HVI values were essentially the same as seen in 1995. The material with the best fiber qualities was LC94-4231, it was the longest, most uniform and the finest (from Micronaire values). Whether this advances strain will be successful depends on the premium paid for these qualities. From our yield data, using a base fiber value of 78¢ per pound, it would need a 31¢ premium to compete with DP 90. A few other tibbits: four of the Australian varieties had fiber length \geq 1.20 inches, Germains 9306 had the strongest fiber with a value of 35 g/tex, OA 64 had the shortest fiber. Again, the reader is encouraged to make personal comparisons between selected varieties.

References

1. Clark, L.J., E.W. Carpenter, G.L. Hart and J.M. Nelson. 1996. Short staple cotton advanced strains trial, Safford Agricultural Center, 1995. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-103, pp. 156-160.
2. Clark, L.J., E.W. Carpenter, G.L. Hart and J.M. Nelson. 1997. Short staple regional variety trial, Safford Agricultural Center, 1996. In this publication.

Acknowledgments

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Table 1. Yield and other agronomic data from the upland cotton advanced strains trial grown on the Safford Agricultural Center, 1996.

Variety	SC Yield	% Lint	Lint Yield	% 1st Pick	Pl/ac
DPX 1075	4165 a	40.7 a-e	1695 a	92.7 a-d	48276 ab
OA 63	4157 ab	40.7 a-f	1690 a	87.5 cd	39386 c
DP 90	4144 abc	40.2 a-e	1666 a	92.7 a-d	50911 a
IF 1003	4049 a-d	40.7 a-e	1650 a	91.0 a-d	44105 abc
DPX 9057	4024 a-e	40.5 a-g	1632 a	95.8 a	46464 abc
IF 1007	3817 a-g	42.3 abc	1613 ab	92.4 a-d	44105 abc
IF 1001	3875 a-f ¹	41.2 a-e	1595 abc	93.4 abc	45375 abc
IF 1002	3730 b-h	42.7 ab	1591 abc	89.8 bcd	48098 ab
IF 1004	3659 d-i	43.0 a	1575 a-d	93.2 abc	44286 abc
DPX 9050	3717 c-h	42.2 a-d	1575 a-d	90.5 a-d	46827 abc
IF 1000	3742 a-h	40.9 a-e	1530 a-e	91.0 a-d	42290 bc
MAC 95	3879 a-f	38.0 c-i	1473 a-f	90.8 a-d	44831 abc
SGX 2079	3356 f-k	40.7 a-f	1406 b-g	92.6 a-d	44649 abc
SGX 96	3518 f-k	40.0 a-g	1406 b-g	89.7 bcd	45375 abc
IF 1005	3510 f-k	39.8 a-h	1397 b-g	92.4 a-d	48824 ab
GCMS3	3659 d-i	38.1 c-i	1393 b-g	91.3 a-d	46827 abc
OA 60	3597 e-j	38.3 b-i	1380 c-h	89.2 bcd	47553 ab
IF 1006	3456 f-k	39.4 a-h	1362 d-i	90.8 a-d	46464 abc
OA 61	3526 f-k	37.7 e-i	1328 e-j	92.3 a-d	46646 abc
OA 64	3439 f-k	38.1 c-i	1310 e-k	91.4 a-d	44286 abc
G92-161	3252 i-n	39.5 a-h	1287 f-l	91.1 a-d	47916 ab
G91-227	3340 h-m	38.3 b-i	1279 f-l	90.3 a-d	43016 abc
LC94-4086	3365 h-m	37.0 e-i	1245 g-m	89.3 bcd	42290 bc
DPX 9069	3136 k-o	39.4 a-f	1238 g-m	91.5 a-d	45920 abc
GC9306	3199 j-n	38.6 b-i	1234 g-m	91.6 a-d	47190 abc
W5250	3352 h-m	36.3 ghi	1214 g-m	90.6 a-d	43379 abc
B 5008	3311 h-m	36.3 f-i	1199 g-m	93.6 ab	46101 abc
G90-89	3103 k-o	38.7 b-i	1199 g-m	87.2 d	46101 abc
LC94-4231	3460 f-k	34.4 ij	1192 g-m	93.4 abc	49187 ab
TERRA101-1	3248 i-n	35.5 hi	1154 h-m	88.8 bcd	46827 abc
TERRA306-96	2958 m-o	38.6 b-i	1141 i-m	88.5 bcd	44649 abc
B 5617	2987 l-o	37.8 d-i	1131 j-m	88.4 bcd	44105 abc
SGX 821	3406 g-l	31.3 j	1086 klm	91.6 a-d	44831 abc
GC 9422	2842 no	37.4 e-i	1065 lm	90.4 a-d	43923 abc
G89-224	2734 o	37.7 e-i	1032 m	92.6 a-d	42653 bc
Average	3508.9	38.9	1370.6	91.1	45533.2
LSD(05)	365.8	3.54	188.3	4.75	6385.4
CV(%)	8.33	7.29	11.0	4.2	11.2

1. Values followed by the same letter within a column are not significantly different at the 5% level of probability.

Table 2. Continuation of Table 1, other agronomic data from the upland cotton advanced strains trial grown on the Safford Agricultural Center, 1996.

Variety	Pl Ht (in)	1st Fruiting Node	Boll Weight (g)
DPX 1075	39.2 a-f	5.5 abc	4.8 d-j
OA 63	37.4 b-j	5.7 ab	4.7 e-l
DP 90	39.9 a-e	5.7 ab	4.9 d-i
IF 1003	37.7 b-i	5.8 ab	5.2 bcd
DPX 9057	35.1 f-j	5.6 abc	4.5 h-l
IF 1007	41.3 ab	5.2 bc	4.6 g-l
IF 1001	35.5 e-j	5.3 abc	4.5 h-l
IF 1002	40.4 a-d	5.6 abc	4.6 f-l
IF 1004	36.8 c-j	5.2 bc	4.4 jkl
DPX 9050	38.8 a-g	5.7 ab	4.0 m
IF 1000	39.2 a-f	5.3 abc	4.7 f-l
MAC 95	41.3 ab	5.1 bc	4.6 g-l
SGX 2079	33.3 ij	5.2 bc	4.6 g-l
SGX 96	33.9 hij	5.4 abc	4.2 lm
IF 1005	38.2 a-h	5.2 bc	4.3 klm
GCMS3	35.7 e-j	4.9 c	4.7 e-l
OA 60	38.5 a-g	5.3 abc	4.5 j-l
IF 1006	40.6 abc	5.3 abc	5.4 bc
OA 61	40.2 a-d	5.4 abc	4.7 f-l
OA 64	38.8 a-g	6.0 a	4.6 f-l
G92-161	36.6 c-j	5.1 bc	5.1 b-e
G91-227	36.6 c-j	5.2 bc	4.6 f-l
LC94-4086	36.9 b-j	5.3 abc	5.0 c-h
DPX 9069	34.9 f-j	5.2 bc	4.4 jkl
GC9306	37.1 b-j	5.4 abc	4.9 d-i
W5250	37.3 b-j	5.5 abc	5.0 c-g
B 5008	38.9 a-f	5.3 abc	5.1 b-e
G90-89	42.2 a	5.5 abc	4.3 klm
LC94-4231	36.0 d-j	5.1 bc	5.1 c-f
TERRA101-1	34.4 g-j	5.5 abc	4.7 e-k
TERRA306-96	33.9 hij	5.4 abc	4.5 i-l
B 5617	40.3 a-d	5.5 abc	5.5 b
SGX 821	33.1 j	5.2 bc	4.6 f-l
GC 9422	37.5 b-j	5.4 abc	6.3 a
G89-224	33.6 ij	5.5 abc	5.2 bcd
Average	37.5	5.39	4.77
LSD(05)	3.59	0.58	0.38
CV(%)	7.7	8.5	6.3

1. Values followed by the same letter within a column are not significantly different at the 5% level of probability.

Table 3. HVI data from the upland cotton advanced strains trial grown on the Safford Agricultural Center, 1995.

Variety	Length	Uniformity	Strength	Elongation	Micronair	C Grade	L Grade
DPX 1075	1.17 d-h ¹	83.6 b-f	31.1 c-i	10.0 b	4.2 bc	31/32	2.0 abc
OA 63	1.16 e-h	81.7 f	29.9 g-j	9.2 g-k	4.2 abc	31	3.0 abc
DP 90	1.17 d-h	82.5 def	31.6 b-h	9.8 b-e	4.4 ab	32	1.0 c
IF 1003	1.17 d-h	82.5 def	31.2 c-i	9.3 f-k	4.3 abc	31/32	3.0 abc
DPX 9057	1.16 d-h	81.9 ef	29.3 h-k	9.7 b-f	4.7 a	31	3.0 abc
IF 1007	1.17 c-h	83.5 b-f	29.7 hij	10.0 bc	4.4 ab	31	1.0 c
IF 1001	1.12 h	82.8 c-f	29.2 ijk	9.5 d-j	4.4 ab	31	2.5 abc
IF 1002	1.20 b-f	83.1 c-f	32.5 b-e	10.0 bc	4.3 abc	31/32	3.0 abc
IF 1004	1.17 c-h	81.8 f	29.8 hij	9.6 b-i	4.2 abc	21/31	4.0 a
DPX 9050	1.18 c-g	82.8 def	29.8 hij	9.0 k	4.2 abc	31/41	3.5 ab
IF 1000	1.20 b-f	83.6 b-f	30.8 d-i	9.8 b-e	4.2 bc	31	3.0 abc
MAC 95	1.17 c-h	82.5 def	30.0 g-j	9.6 b-h	4.2 bc	31/32	2.5 abc
SGX 2079	1.15 fgh	82.6 def	30.1 f-j	9.8 b-e	4.6 ab	31	3.5 ab
SGX 96	1.20 b-f	83.5 b-f	29.6 hij	9.9 bcd	4.4 ab	11/21	2.5 abc
IF 1005	1.21 b-e	84.1 a-f	29.7 hij	8.9 k	4.2 abc	21/31	2.0 c
GCMS3	1.18 c-g	84.0 a-f	28.6 jk	9.5 c-i	4.3 abc	31/41	3.5 ab
OA 60	1.16 e-h	82.7 def	29.1 ijk	9.8 b-e	4.4 ab	31/32	2.5 abc
IF 1006	1.23 bc	84.4 a-d	30.4 e-j	9.4 e-k	4.2 abc	31	2.0 abc
OA 61	1.16 e-h	84.3 a-d	27.3 kl	9.9 bcd	4.4 ab	31	3.5 ab
OA 64	1.03 i	82.1 def	29.8 hij	10.0 bc	4.5 ab	32/42	1.5 bc
G92-161	1.23 bc	84.1 a-f	32.0 b-g	9.7 b-f	4.3 abc	31/32	2.5 abc
G91-227	1.24 b	84.2 a-e	32.6 bcd	9.9 bcd	3.8 cd	21/31	3.0 abc
LC94-4086	1.25 b	84.5 a-d	32.0 b-g	9.1 ijk	4.1 bc	31	4.0 a
DPX 9069	1.16 e-h	82.1 def	32.2 b-f	9.7 b-g	4.2 abc	22/32	1.0 c
GC9306	1.17 d-h	85.2 abc	35.1 a	10.0 b	4.3 abc	31/42	2.5 abc
W5250	1.21 b-e	84.1 a-f	33.2 abc	9.4 e-k	4.4 ab	21/22	2.0 c
B 5008	1.12 gh	83.2 c-f	29.7 hij	9.1 jk	4.3 abc	21/31	4.0 a
G90-89	1.21 b-e	83.1 c-f	31.5 b-h	9.2 h-k	4.4 ab	31/41	2.5 abc
LC94-4231	1.30 a	86.2 a	32.2 b-f	9.9 bcd	3.7 d	21/31	1.0 c
Terra101-1	1.16 d-h	83.8 b-f	25.3 m	10.0 b	4.5 ab	21/31	3.0 abc
Terra306-96	1.12 h	82.8 def	26.2 lm	9.3 f-k	4.5 ab	31	4.0 a
B 5617	1.22 bcd	84.0 a-f	33.5 ab	9.5 d-j	4.7 a	41	3.5 ab
SGX 821	1.14 gh	83.4 b-f	28.5 jk	10.5 a	4.3 abc	21/32	1.0 c
GC 9422	1.18 c-g	85.6 ab	32.2 b-f	9.7 b-f	4.4 ab	21/31	2.0 abc
G89-224	1.16 d-h	82.5 def	30.7 d-j	9.1 ijk	4.2 bc	31/41	3.0 abc
Average	1.18	83.4	30.4	9.6	4.3	--	2.63
LSD(05)	0.05	1.99	1.86	0.41	0.42	--	1.91
CV(%)	1.93	1.17	3	2.1	4.8	--	35.7

1. Values followed by the same letter within a column are not significantly different at the 5% level of probability.