Short Staple Cotton Variety Trial, Safford Agricultural Center, 1993

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Abstract

Fifty three short staple varieties were grown in a replicated field trial on the Safford Agricultural Center. HS SAL 10, a long season variety, was the highest yielding variety in the trial with a lint yield of 1772 pounds per acre. Average yields in this trial were lower than in 1992, even though there were more heat units during the growing season. HVI data for the varieties in the trial are included in this report.

Introduction

When a cotton producer is looking to increase his yields, the first and most effective measure that he can take is to change varieties. Because of this, new varieties are constantly being screened to see if they might fit our location. This year, fifty-three short staple varieties are being evaluated in this trial, which is also a part of the Beltwide regional variety trial.

Materials and Methods

This replicated small plot variety trial is designed to screen a large number of cotton varieties to decide which ones should be tested further in the on-farm testing program. The plots were planted with a cone-type planter which distributes a given volume of seed uniformly over the length of the plot. After planting, the plots were irrigated to produce uniform germination and emergence. The following crop history provides the information on how the crop was managed:

Crop History:

Previous crop: Wheat
Soil type: Pima silty clay loam
Planting date: 21 April 1993 Rate: 25 pounds per acre
Herbicide: Triflurilin preplant incorporated
Fertilizer: 50 pounds of N per acre, side dressed on 8 June
Insecticide: 3 applications to control pinkie and aphid
Pix/Prep: None
Defoliation: None
Irrigation: Furrow, watered up + 6 irrigations (ca. 17 inches + 6 inches of rain)
Harvest dates: 1st pick: 2 November 2nd pick: 24 November
Heat units per growing season: 3745 (86/55)

The plots were picked using a modified 2-row cotton picker. The production from each plot was caught in

a sack and weighed on a hanging scale to determine seed cotton yields. Sub-samples were taken to determine percent lint turnout and lint quality.

Results and Discussion

The weather is always an important factor in determining why a particular variety performed well or not in a particular year. For this reason, a short analysis of the weather is given in this paper. The year started off very wet with 6.72 inches of rain falling from December through February, average rainfall for those 3 months is 2.34 inches. This wet condition made proper ground preparation difficult and some seedbeds were less than ideal going into planting. Figure 1 shows heat units (86/55°F) from the first of April to the end of October. It can be seen from Figure 1 that the heat units dropped to 5 or below twice in the first two weeks in April. Those two dips in heat units were caused by cold fronts that passed through lowering the air temperature to 32° and 33°F and soil temperatures at 2 inches as low as 49° and 50°F. These values are too low for cotton development according to Hake and Carter (1989) and Johnson and Kerby (1989). This plus extremely windy conditions made it difficult to establish a stand. After stands were established, however, things improved greatly. Figure 2 shows the departures from average of bi-monthly heat units. This indicates that the growing season was warmer than average for all but a short period in early June, at the end of July and at the end of October. This made possible better yields than normal where good stands had been established earlier in the season.

Table 1 shows lint yields and other agronomic values for this trial. Percent lint turnout values came from hand picked samples that were taken from the plots to determine boll weights and are therefore higher than would be found in a normal harvest situation. Even though these values are high and they increased the lint yields, it is felt that the relative values of the varieties are still in the right order. Compared with the previous year (reference 3) yields were lower in 1993, this being a result of spotty stands and a slow start and to a lesser extent the selection of varieties tested. The box below shows average yields and heat units accumulations over the past two years.

Year	Average Lint Yield	Heat Units (85/55°F)
1992	1445.5	3488
1993	1244.4	3745

The yields are not correlated to the heat units, but it is interesting to note that last year, with fewer heat units, a short season variety was the highest yielding variety and this year with more heat units, a longer season variety was the highest yielder. The top variety, HS SAL 10, has done very well in our tests over the past four years placing, #1, #9, #2 and #2 in the trials from 1993 back to 1990. Preliminary HVI data indicate that it has a length around 1.14 inches, strength around 29 grams/tex, uniformity around 82.5 and a micronaire around 4.5. Why isn't someone promoting this variety more? HS 46, which produced well in the Layton trial in Graham county and in the Curry trial in Cochise county in 1990 came in #2 in this trial. Plant heights were two inches shorter than those of last year and plant populations were about 15000 plants per acre less that last year. Lastly, it is interesting to note that Pima S-6 yielded higher than almost half of the short staple varieties in the trial.

HVI data for the varieties in the trial are included in Table 2. The reader is encouraged to study this data together with the yield data to select varieties that have the qualities of interest in their operation.

References

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Acknowledgements

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Table 1. Short staple yields and other agronomic values for a variety trial grown on the Safford Agricultural Center, 1993.

Variety	Lint Yield (lbs/ac)	Percent Lint	Percent 1st Pick	Boll Wt (gms)	Plant Ht (in)	Plant Population
HS Sal 10	1771.6	38.7	91.1	4.00	34.5	36981
HS 46	1712.7	40.3	91.7	4.71	37.0	40384
STV KC311	1616.0	38.1	94.2	4.19	34.0	34031
CB 1233	1551.5	39.3	92.4	4.71	36.5	29040
SG 1001	1532.6	38.6	95.8	4.55	33.5	24503
DPL 90	**1526.0**	**38.7**	**91.6**	**4.47**	**37.5**	**35393**
DPX 87232-860	1525.0	40.2	94.1	4.36	33.5	29267
CB 1210	1479.7	39.1	93.9	4.82	34.8	26771
OA 7	1476.2	40.4	92.9	4.48	34.3	29494
HY 39	1458.9	38.6	93.9	4.25	33.0	35619
DPL 5690	1455.4	39.6	93.7	4.62	31.5	24956
DPX 549	1451.1	40.5	91.4	4.41	32.8	26988
AZ B247SL	1429.2	39.7	93.7	4.65	35.0	28586
HS 44	1420.0	37.9	92.3	4.44	31.0	31309
GC 9033	1417.5	39.3	94.7	4.33	31.3	36073
CB 407	1399.4	39.7	92.9	4.42	37.3	31989
ALL TXMX 9	1392.4	38.8	94.0	4.75	31.5	27225
STX 9573	1379.3	41.5	91.7	4.52	35.0	34485
SG 039	1344.3	40.6	92.2	4.86	33.0	31309
DPL 6100	1337.9	38.6	94.6	4.50	35.8	31989
AZ B379SL	1331.6	39.1	94.6	5.00	35.8	29040
OA 6	1328.4	38.4	94.8	4.65	35.8	28586
STV LA887	1315.7	42.0	92.4	5.47	35.3	29948
CB 333	1312.9	38.7	92.0	4.83	35.3	34031
STV 324	1304.0	39.1	93.1	4.39	36.3	32216
SG 034	1304.0	40.8	92.6	4.66	33.0	29721
CB 1135	1293.4	37.9	92.7	4.97	36.3	31763
Pima S-6	**1235.8**	**38.0**	**87.1**	**3.03**	**36.8**	**30401**
CB 305	1226.8	38.8	90.7	5.61	34.8	36981
SG 501	1205.9	39.9	94.1	4.51	31.3	29721
PHY B638	1194.7	37.5	89.3	6.03	36.8	31536
DPL 50	1176.0	36.7	91.9	4.81	29.3	30855
HB 93172	1171.0	38.7	90.9	4.81	30.5	29721
CB 232	1166.2	36.4	87.0	4.74	34.5	31763
PHY B749	1120.8	36.1	93.4	5.60	32.8	26318
ROYALE	1118.5	40.6	90.6	5.06	31.3	32897
1517-88	1097.5	38.0	89.0	4.85	39.5	33124
1517-91	1092.0	39.1	88.8	5.46	35.0	33124
CB 7	1071.6	37.9	85.5	5.16	40.8	31309
SG 404	1046.2	37.3	90.6	4.68	33.5	31309
DPL 2056	1038.7	38.8	89.5	5.19	33.8	29267
HS 26	1034.4	36.4	84.6	5.06	34.0	31082
AGC 2008	1025.0	37.2	90.4	5.12	37.8	25183
AGC 3029	1022.8	36.5	90.7	5.14	38.3	30401
NAZAS 87	1005.7	38.2	90.9	4.37	32.3	24049
PREMA	1002.7	38.1	87.0	6.11	35.5	31989
AGC 3016	971.6	37.6	86.9	5.29	31.5	25183
MAXXA	957.0	42.0	85.9	5.06	35.5	24049
1517-SR3	942.5	37.2	88.5	5.00	36.5	24956
ACALA B4442	899.6	36.6	90.5	5.33	37.0	26998
PHY B399	889.0	37.9	84.0	5.99	35.3	31898
1517-E2	887.7	36.6	88.3	5.26	40.0	26544
NM 734X	867.5	31.8	89.1	4.02	37.0	28586
NM 56X	861.2	33.3	86.8	4.29	34.8	29948
Average	1244.4	38.47	91.05	4.807	34.7	30388.6
LSD(05)	257.7	1.28	5.35	0.47	6.00	9592.2
CV(%)	23.6	5.2	5.1	--	14.1	26.6

Table 2. HVI values for short staple varieties grown on the Safford Agricultural Center, 1993.

Variety	Fiber length	Uniformity	Strength	Elongation	Micronaire	Grade
HS Sal 10	1.14	82.5	28.95	10.0	4.45	41
HS 46	1.13	81.4	31.15	10.5	4.75	31
STV KC311	1.17	82.9	32.25	10.0	4.45	31/41
CB 1233	1.12	81.3	29.85	10.0	4.80	31
SG 1001	1.13	82.9	31.10	10.0	4.85	31/41
DPL 90	**1.12**	**82.0**	**33.35**	**10.0**	**5.00**	**31/41**
DPX 87232-860	1.12	81.5	26.15	9.4	4.35	31
CB 1210	1.12	82.0	30.80	9.9	4.65	31
OA 7	1.09	81.7	30.55	9.9	4.65	31/41
HY 39	1.13	82.1	32.05	10.0	4.85	31/41
DPL 5690	1.13	81.4	33.45	10.5	4.95	31/41
DPX 549	--	--	--	--	--	--
AZ B247SL	1.12	83.2	30.35	10.0	4.65	31
HS 44	1.13	81.5	28.45	9.8	5.10	31
GC 9033	1.10	81.5	31.65	10.0	4.65	31
CB 407	1.14	83.3	31.40	10.0	4.50	31
ALL TXMX 9	1.13	81.6	31.55	10.0	4.80	31
STX 9573	1.06	83.0	27.10	10.0	5.35	41
SG 039	1.08	82.7	27.55	11.0	4.90	31
DPL 6100	1.17	83.5	33.10	10.0	4.65	31
AZ B379SL	1.17	80.5	25.75	9.1	4.00	21
OA 6	1.11	81.6	31.75	10.0	4.65	31
STV LA887	1.11	82.3	30.05	11.0	5.05	31
CB 333	1.09	81.2	27.95	9.9	4.60	31/41
STV 324	1.13	82.0	29.40	10.0	4.60	31
SG 034	1.08	83.7	28.25	10.0	5.30	31
CB 1135	1.14	82.3	28.55	9.7	4.35	31
CB 305	1.14	83.2	33.40	10.0	4.65	31
SG 501	1.09	83.3	32.45	11.0	4.95	31/41
PHY B638	1.15	83.1	34.20	10.5	4.55	31/41
DPL 50	1.10	82.6	27.55	11.0	5.15	31
HB 93172	1.11	81.9	26.45	9.9	4.45	31
CB 232	1.10	82.5	26.45	10.0	4.30	31/41
PHY B749	1.15	83.7	33.80	10.0	4.85	31/41
ROYALE	1.12	83.0	33.00	10.0	4.55	31
1517-88	1.14	82.9	33.85	10.0	4.80	31/41
1517-91	1.15	83.0	34.50	10.0	4.75	31
CB 7	1.10	81.0	31.45	9.9	4.80	31
SG 404	1.10	82.9	28.15	10.0	5.40	31/41
DPL 2056	0.99	80.5	29.40	10.0	4.90	41
HS 26	1.08	82.1	30.70	11.0	4.80	31/41
AGC 2008	1.11	83.2	36.10	11.0	4.60	41
AGC 3029	1.15	83.1	32.15	10.0	4.55	31/41
NAZAS 87	1.09	79.8	26.15	9.4	4.35	31
PREMA	1.15	83.5	34.75	10.0	4.50	31/41
AGC 3016	1.10	83.2	32.35	10.0	4.75	41
MAXXA	1.12	84.3	32.95	10.0	4.35	31/41
1517-SR3	1.17	83.3	33.30	9.9	4.50	31
ACALA B4442	1.13	81.9	31.55	9.9	4.80	31/41
PHY B399	1.12	83.2	34.35	10.0	4.80	31
1517-E2	1.19	83.8	32.2	10.0	4.35	31
NM 734X	--	--	--	--	--	--
NM 56X	1.22	83.8	34.65	9.9	4.40	51
Average	1.119	82.43	30.82	10.07	4.72	--
LSD(05)	0.04	1.72	2.05	0.38	--	--
CV(%)	3.39	1.38	8.97	4.10	--	--

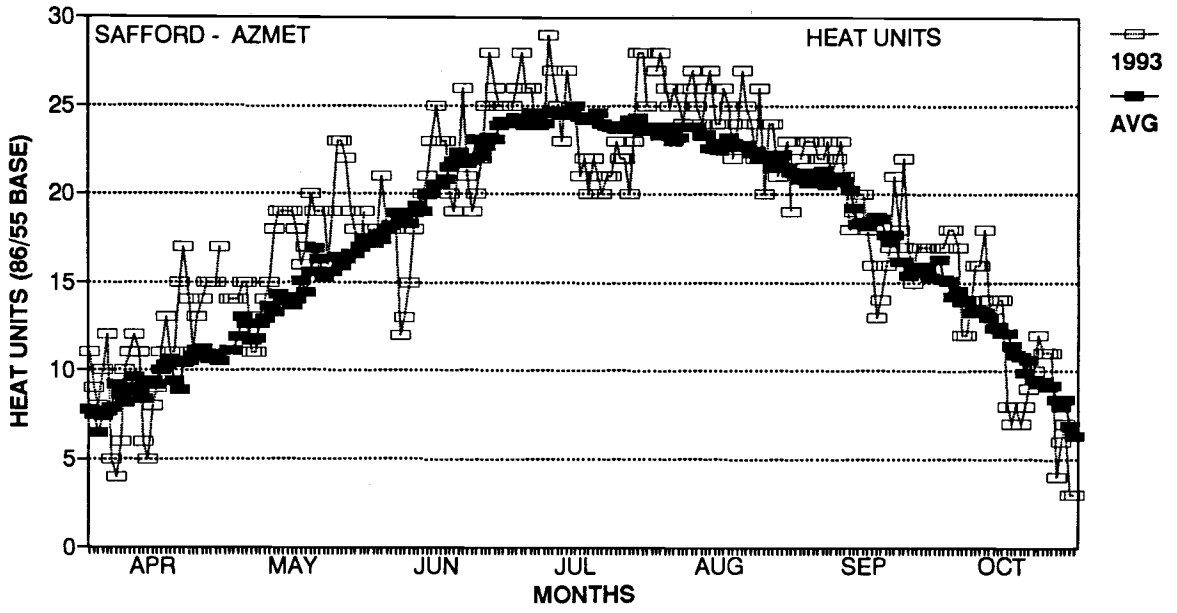

Figure 1. Daily heat units for 1993 and the average, plotted across the growing season.

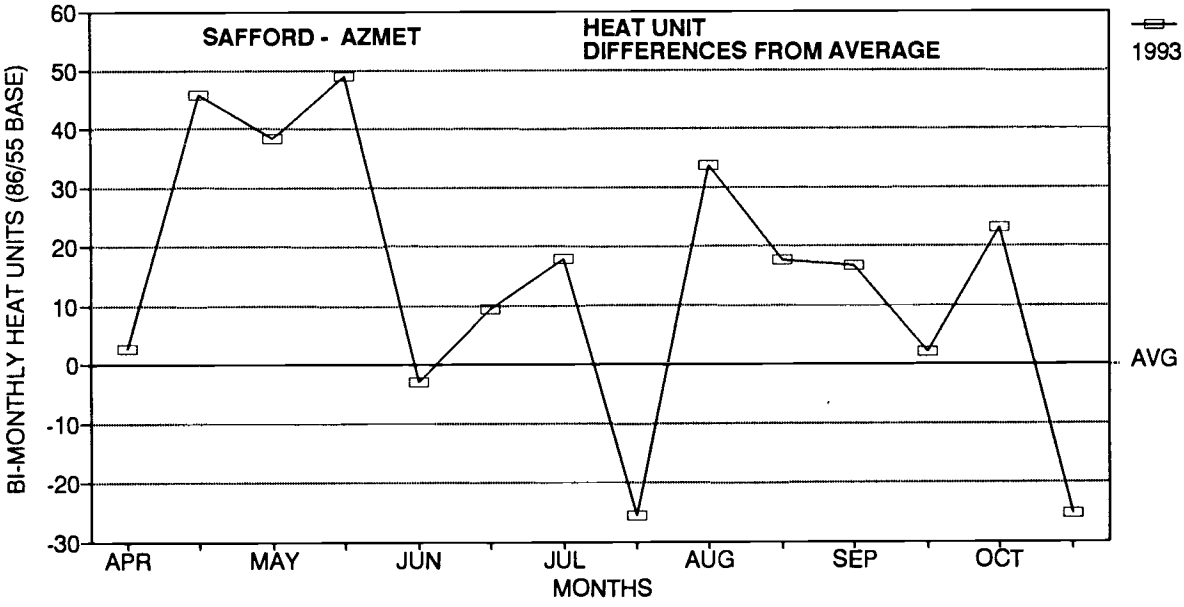

Figure 2. Heat unit differences from the average for 1993, plotted across the growing season.