Pima Cotton Regional Variety Trial, Safford Agricultural Center, 2000

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Abstract

Twenty five long staple varieties were tested in a replicated small plot trial on the Safford Agricultural Center in Graham county at an elevation of 2950 feet. The highest yielding variety in this study was Hazera 83-208 with a yield of 1180 pounds of lint p[1]er acre. This interspecific hybrid from Israel was the highest yielding cultivar in the 1999 test, also. The top five varieties consisted of two interspecific hybrids from Isreal, a variety developed by the University of Arizona and entries from Buttonwillow Research and California Planting Cotton Seed Distributors (CPCSD). The average yield in the trial was the same as last year, but the highest yield was slightly lower. Yield and other agronomic data as well as fiber quality data are contained in this paper.

Introduction

Continuing the trend seen the past few years, more breeders are active in the long staple area and higher yield potential is being exhibited as the competition increases. This trial contained entries from two California groups that had not been tested in the area before, but the newer materials from the Olvey group were not present. Our part in this process is to provide an unbiased testing program where new strains, varieties and hybrids can be evaluated in a high desert environment so cultivars can be selected that will be beneficial to the high desert cotton growers in Arizona, New Mexico and Texas. This is part of an Arizona Regional variety trial as well as a Beltwide Regional variety trial.

Materials and Methods

This trial was designed as a replicated small plot trial with four replications. The plots were planted with a cone-type planter which distributes a given weight of seed uniformly over the length of the plot. This year the seeds were planted planted dry and watered up. 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: 26 April 2000 Rate: 25 pound per acre
Herbicide: 1.5 pt/ac Treflan pre-plant, 3.2 pts/ac Prometryne at lay-by
Fertilizer: Side dressing of 100 lbs/ac of urea on 5/24 and 6/27
Insecticide: 2 applications to control pinkie, aphids and whitefly
Pix/Prep: None
Defoliation: Ginstar
Irrigation: Furrow, watered up + 8 irrigations (ca. 27.3 inches + 1.9 inches of rain)
Harvest dates: 1st pick: 30 November 2nd pick: not taken

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Heat units (86/55EF): to frost (1 Nov) - 3752
The plots were picked using a modified 2-row cotton picker. The production from each plot was caught in a sack and weighed on an electronic platform scale to determine seed cotton yields. Sub-samples were taken to determine lint quality. Fifty boll samples were collected prior to harvest to determine boll weights, these samples were then ginned to determine percent lint turnout.

Results and Discussion

Weather conditions were slightly above normal for cotton stand establishment in 2000. A paragraph on this subject is found in reference 1, which will be found elsewhere in this volume. Abnormal rainfall in June and then again for the month of October made the weather year somewhat unique.

Table 1 contains yield data, plant height, plant populations and boll weights. Yields varied greatly from 1180 to 378 pounds of lint per acre with an average of 787 pounds per acre. The extremes were lower than the previous year's study (2), but the average was about the same. Hazera 83-208, an interspecific hybrid from Israel, was the yield leader, the same as last year, with the nearest competitors about 100 pounds per acre less lint. The 25 boll samples collected by hand were ginned on a small research gin and the percent lint turnout was then adjusted down to more realistic values for field turnout. Olvey's HTO variety held good to it's name producing the highest lint turnout. Plant heights varied by variety with two Hazera varieties being the tallest and Pima S-7 the shortest. Plant populations also varied by variety with most varieties having plant populations in the acceptable range. The exception to this was three selections from ButtonWillow Research, which had low plant populations and yields also in the low range. Boll weights are in grams and a Hazera variety (83-58) and CPCSD variety (E 102) had the heaviest bolls.

Table 2 contains additional agronomical variables. There were significant differences in values for these variables by variety, but most of these comparisons will be left to the reader. The table below shows that plant height and plant population are the only agronomic variables with a direct statistical correlation to lint yield. The latter probably being influenced by the three CH varieties at the bottom of the table.

Correlations vs lint yield				
Variable	Probability		Variable	Probability
1st Fruiting Branch	NS		Plants per acre	0.0004 ***
Total Nodes	NS		% Lint turnout	NS
Plant Height	0.04 *		10 Boll Weight	NS
HNR	NS			

HVI values of the lint are included in Table 3. The average fiber length was slightly lower and the strength and uniformity was higher than those in 1999. The longest fiber was found three Hazera varieties (195-86, 1578 and83-58) but these varieties had strength lower than the average. CH L007 had the strongest fiber

References

1. Clark, L.J. and E.W. Carpenter. 2001. Acala cotton variety trial, Safford Agricultural Center, 2000. Cotton, A College of Agriculture and Life Science Report, The University of Arizona, Tucson, AZ. *In this publication.*

2. Clark, L.J. and E.W. Carpenter. 2000. Pima cotton regional variety trial, Safford Agricultural Center, 1999. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-121, pp.163-167.

Table 1. Yield and other agronomic variables for Regional Pima Variety trial grown on the Safford Agricultural Center, 2000.

Variety	Lint Yield (lba/ac)	% Lint	Plant Height (inches)	Plants per Acre	Boll Weight (grams)
HAZ 83-208	1180.6 a	33.5 cde	33.9 bc	44014 def	3.5 abc
HAZ 83-58	1073.4 ab	33.7 b-e	37.4 ab	35166 fg	3.6 a
UA 6	1073.0 a b	36.5 a-d	30.0 c	63071 ab	3.2 a-d
CH L007	1007.5 abc	36.6 a-e	31.3 c	58761a-e	3.2 a-d
E 103	979.3 a-d	36.0 a-e	30.1 c	62618abc	2.9 d
HAZ 195-86	968.5 a-d	32.1 e	40.0 a	51728 a-f	3.5 ab
PHY 57	895.0 b-e	35.8 a-e	33.8 bc	56946 a-e	3.4 abc
HAZ 7-66	884.6 b-e	37.9 a	31.6 c	48551 b-f	3.4 abc
OA 312	882.0 b-e	37.3 abc	30.1 c	52181 a-e	3.0 cd
E 102	845.7 b-f	37.9 a	32.1 c	65567 ab	3.6 a
UA 4	815.6 b-g	37.5 abc	31.0 c	56719 a-e	3.4 abc
OA HTO	800.9 b-g	39.2 a	30.0 c	61029 a-d	3.4 abc
HAZ 20-66	790.8 c-g	36.2 a-d	31.9 c	63071 ab	3.3 a-d
CH L001	786.6 c-g	35.4 a-e	32.6 bc	45148 c-f	3.1 bcd
CH L003	769.7 c-g	35.7 a-e	29.5 c	20873 gh	3.1 bcd
Pima S-6	755.3 c-g	37.7 ab	31.0 c	56946 a-e	3.4 abc
Pima S-7	727.6 c-g	36.4 abc	29.4 c	57626 a-e	3.2 a-d
E 104	721.6 d-g	38.6 a	30.3 c	67836 a	3.4 abc
HAZ 1578	703.2 d-g	35.9 a-e	31.3 c	55811 a-e	3.4 abc
CH L006	630.3 e-h	36.0 a-e	29.4 c	42199 ef	3.4 abc
E 101	598.4 fgh	35.4 a-e	29.8 c	56265 a-e	3.4 abc
HAZ 362	558.6 gh	35.6 a-e	33.1 bc	50139 a-f	3.3 a-d
CH L004	434.4 h	32.6 de	33.4 bc	15654 h	3.3 a-d
CH L005	407.7 h	35.2 a-e	32.5 bc	10890 h	3.3 a-d
CH L002	378.3 h	36.5 a-d	32.1 c	9756 h	3.4 abc
Average	786.7	36.1	31.9	48343	3.3
LSD(05)	234.6	3.33	4.41	14628	0.38
CV(%)	21.2	6.56	9.81	21.5	8.2

Table 2. Plant mapping and gin trash data for Regional Pima Variety trial grown on the Safford Agricultural Center, 2000.

Variety	1st Fruiting Branch	Total Nodes	HNR	% Trash
HAZ 83-208	6.6 b-f	28.5 ab	1. 19 cd	3.8 ab
HAZ 83-58	6.0 ef	28.1 abc	1. 33 a-d	3.2 ab
UA 6	7.4 a-e	25.3 a-g	1.19 cd	2.8 ab
CH L007	7.3 a-e	25.0 a-g	1.27 a-d	3.9 ab
E 103	7.9 ab	22.5 e-h	1.34 a-d	1.7 ab
HAZ 195-86	6.3 c-f	27.3 a-d	1. 48 ab	3.2 an
PHY 57	8.5 a	24.3 c-h	1.39 a-d	4.8 a
HAZ 7-66	7.5 a-d	26.0 abc	1.22 bcd	4.4 ab
OA 312	6.5 b-f	24.1 d-h	1. 25 a-d	2.6 ab
E 102	7.0 b-e	21.4 gh	1.51 a	2.8 ab
UA 4	7.0 b-e	21.8 fgh	1.43 abc	3.2 ab
OA HTO	7.5 a-d	23.1 e-h	1. 30 a-d	2.9 ab
HAZ 20-66	7.8 ab	22.8 e-h	1. 41 abc	2.2 ab
CH L001	7.5 a-d	26.0 a-e	1.26 a-d	3.3 ab
CH L003	7.0 a-e	25.5 a-f	1.17 cd	2.5 ab
Pima S-6	7.9 ab	23.9 d-h	1. 31 a-d	1.5 b
Pima S-7	7.1 a-e	21.5 fgh	1.38 a-d	3.7 ab
E 104	7.9 ab	22.5 e-h	1.34 a-d	2.1 ab
HAZ 1578	7.6 ab	24.4 c-h	1.31 a-d	3.5 ab
CH L006	6.1 def	23.5 d-h	1.25 a-d	3.3 ab
E 101	6.9 b-e	21.0 h	1.42 abc	4.2 ab
HAZ 362	6.9 b-e	24.6 b-h	1.36 a-d	2.2 ab
CH L004	6.0 ef	25.3 a-g	1.33 a-d	3.5 ab
CH L005	6.6 b-f	25.0 a-g	1.30 a-d	2.2 ab
CH L002	5.5 f	28.6 a	1.14 d	3.2 ab
Average	7.04	24.5	1.32	3.1
LSD(05)	1.22	3.29	0.21	2.6
CV(%)	12.3	9.54	11.5	59.6

Table 3. HVI data for Regional Pima Variety trial grown on the Safford Agricultural Center, 2000.

Variety	Grade	Mike	Length	Strength	Uniformity	Color	RD	+b

HAZ 83-208	4	4.3	1.35	33.5	86	3.0	71	88
HAZ 83-58	4	3.6	1.42	33.3	87	2.0	72	90
UA 6	3	4.2	1.40	39.7	88	2.0	69	117
CH L007	4	4.2	1.40	44.7	88	3.0	65	121
E 103	3	4.3	1.39	41.1	87	2.0	69	116
HAZ 195-86	4	3.4	1.44	31.9	88	2.0	71	98
PHY 57	4	4.0	1.37	41.7	88	2.0	70	110
HAZ 7-66	3	4.3	1.37	35.5	88	2.0	70	111
OA 312	3	4.3	1.40	43.8	87	3.0	68	109
E 102	3	4.6	1.32	37.0	86	2.0	69	118
UA 4	3	4.7	1.34	41.6	88	1.0	71	111
OA HTO	3	4.7	1.32	40.8	87	2.0	69	112
HAZ 20-66	3	4.0	1.40	37.5	88	2.0	70	109
CH L001	4	4.9	1.33	42.4	88	4.0	65	113
CH L003	3	4.2	1.37	38.2	86	3.0	66	118
Pima S-6	3	4.8	1.37	42.4	88	3.0	68	117
Pima S-7	4	4.7	1.36	43.2	87	3.0	68	106
E 104	4	4.1	1.35	38.7	85	2.0	70	111
HAZ 1578	3	3.9	1.43	37.6	88	2.0	73	93
CH L006	3	4.3	1.37	42.7	85	2.0	68	114
E 101	3	4.4	1.39	39.0	88	1.0	72	104
HAZ 362	3	4.5	1.33	40.4	86	2.0	70	108
CH L004	5	4.4	1.36	35.4	86	2.0	69	118
CH L005	3	4.2	1.40	41.2	88	2.0	70	116
CH L002	4	4.1	1.33	42.6	87	2.0	68	114
Average	--	4.3	1.37	39.4	87.1	2.2	69.2	109.7