

# Pima Cotton Regional Variety Trial, Safford Agricultural Center, 2001

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## **Abstract**

*Twenty 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 HAZ 195 with a yield of 1408 pounds of lint per acre. This interspecific hybrid possessing a "fuzzy" seed and was tested with the Acala varieties in 2000, but was included in the Pima study this year because of its fiber characteristics. OA 345 was the highest yielding non-hybrid variety in the study, it yielded nearly 800 pounds of lint per acre. Yield and other agronomic data as well as fiber quality data are contained in this paper along with estimated values of the lint.*

## **Introduction**

This trial is a continuation of our search for the best variety of long staple cotton to grow in the Upper Gila Valley. Cultivars planted in this study include interspecific hybrids from the Hazera group in Israel, entries from Olvey's group, Phytogen, CPCSD, Moser's work, ButtonWillow Research and some old time standards. This is part of the Beltwide Regional variety study.

## **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 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 2001

Rate: 25 pound per acre

Herbicide: 1.5 pt/ac Treflan pre-plant, 3.2 pts/ac Caparol at lay-by

Fertilizer: Side dressing of 100 lbs/ac of urea on 5/30 and 7/5

Insecticide: 1 application to control pink bollworm

Pix/Prep: None

Defoliation: Ginstar

Irrigation: Furrow, watered up + 7 irrigations (ca. 27.4 inches + 2.3 inches of rain)

Harvest dates: 1st pick: 22 October      2nd pick: not taken

Heat units (86/55EF) from planting to harvest (179 days): - 3613

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. Twenty-five boll samples were collected prior to harvest to determine boll weights. These samples were then ginned on a small roller gin to determine percent lint turnout and samples were submitted to the Cotton Classing Office for HVI analysis.

## Results and Discussion

The weather conditions were slightly below normal for cotton stand establishment in 2001. A summary of the weather conditions during the growing season are included in the Acala Variety study (reference 1).

Table 1 contains yield data, percent lint turnout, plant height, and plant populations. Yields varied greatly from 1408 to 415 pounds of lint per acre with an average of 737 pounds per acre. The top two varieties are interspecific hybrids with fuzzy seeds. Since lint yield is only one part of the value component, lint values were estimated from USDA AMS American Pima quotes for the Desert Southwest, then discounting an additional 10¢ per pound for lengths less than 1.37" (44 staple) and an additional 8¢ per pound for strength between 37 and 35 g/tex and 2¢ per pound for strength less than 35 g/tex. These values were then multiplied by the lint yield to calculate gross values per acre. Even with the value per pound of lint reduced, the top two Hazera varieties produced more income per acre than the more traditional Pima lines. Lint turnout percentages varied greatly from 38.5% to 31.1%. Interestingly, the high value was from a fuzzy-seeded Hazera variety and the lowest value from a smooth-seeded Hazera variety. HTO, a variety touted for its high turnout values, was three from the top - the fuzzy-seeded Hazera variety and a sister Olvey line, OA 340, exceeding its value. From the table below, it is seen that plant heights and population were not statistically related to lint yield.

Table 2 contains additional agronomic 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 1<sup>st</sup> fruiting branch is the only agronomic variable from this table with a direct statistical correlation to lint yield.

Correlations vs lint yield			
Variable	Probability	Variable	Probability
1st Fruiting Branch	0.02 *	Plants per acre	NS
Total Nodes	NS	% Lint turnout	NS
Plant Height	NS	Boll Weight	NS
HNR	NS		

HVI values of the lint are included in Table 3. All of the varieties in this test were ginned on a small roller gin and sent to the classing office as Pima varieties. The average micronaire was higher than in 2000, length was the same and strength and uniformity slightly less than the previous season (2). Hazera 83-58 (smooth-seeded) had the longest fiber but the lowest strength. It is noted that this variety also had RD and +b values considerably different from the other varieties. Pima S7, HTO and OA 312 had the shortest fiber and these three varieties had among the strongest fibers of those tested. Using the calculated values for lint quality, E103 (CPCSD), CH 007 (ButtonWillow Research) and DP 744 had the highest quality fiber.

## References

1. Clark, L.J. and E.W. Carpenter. 2002. Acala cotton variety trial, Safford Agricultural Center, 2001. *Published elsewhere in this report.*
2. Clark, L.J. and E.W. Carpenter. 2001. Pima cotton regional variety trial, Safford Agricultural Center, 2000. Cotton, A College of Agriculture and Life Sciences Report, The University of Arizona, Tucson, AZ. Series P-125, pp. 111-115.

**Table 1. Yield and other agronomic variables for Regional Pima Variety trial grown on the Safford Agricultural Center, 2001.**

Variety	Lint Yield <sup>1</sup> (lbs/ac)	Value <sup>2</sup> (\$/acre)	% Lint	Plant Height (inches)	Plants per Acre
HAZ 195	1407.9 a	\$841.22	38.5 a	37.3 a	30401 b-e
HAZ 14-08	1055.7 b	\$651.89	33.7 def	33.8 abc	33124 abc
OA 345	799.3 cd	\$637.44	35.4 bcd	31.0 bcd	36300 ab
PHY 76	768.1 cde	\$612.56	34.3 def	34.8 abc	32670 a-d
HAZ 83-208	852.9 c	\$603.43	33.0 efg	33.5 abc	29948 b-f
OA EX22	777.6 cd	\$581.26	34.5 de	36.3 ab	22234 def
OA 340	711.0 c-f	\$574.13	36.9 ab	34.8 abc	31309 b-e
HAZ 83-58	782.8 cd	\$572.46	31.1 g	29.8 cd	25864 b-f
E103	698.9 c-f	\$571.35	34.7 de	34.3 abc	26318 b-f
PIMA S6	695.8 c-f	\$561.86	35.3 bcd	30.3 bcd	30855 b-e
UA 6	666.3 def	\$538.04	34.8 cde	31.8 a-d	32670 a-d
HAZ 34-08	735.0 c-f	\$534.71	32.4 fg	33.0 a-d	21780 ef
PIMA S7	721.1 c-f	\$510.18	35.1 bcd	33.5 abc	42199 a
OA 322	720.9 c-f	\$510.04	34.8 cde	35.3 abc	28586 b-f
CH 007	606.9 efg	\$496.14	33.8 def	27.3 d	29948 b-f
HTO	643.2 d-g	\$456.67	36.7 abc	34.0 abc	25410 c-f
PSC 57	608.6 efg	\$432.11	34.5 de	29.5 cd	19511 f
OA 312	583.7 fg	\$412.97	34.7 cde	31.5 a-d	27679 b-f
UA 17	479.7 gh	\$387.36	34.2 def	31.8 a-d	36300 ab
DP 744	414.8 h	\$339.10	35.6 bcd	34.5 abc	32670 a-d
Average	736.5	\$541.25	34.7	32.9	29789
LSD(05)	168.2	--	2.0	6.0	10506
CV(%)	10.9	--	2.8	8.8	16.9

1. Values followed by the same letter are not significantly different at the 95% level of confidence using standard statistical procedures.

2. Values in dollars per acre using the lint values per pound shown in Table 3.

**Table 2. Plant mapping and boll weight data for Regional Pima Variety trial grown on the Safford Agricultural Center, 2001.**

Variety	1st Fruiting Branch <sup>1</sup>	Total Nodes	HNR	Boll Weight (grams)
HAZ 195	7.3 a	22.5 a	1.69 b	4.20 ab
HAZ 14-08	5.8 ab	21.3 ab	1.59 b	4.14 ab
OA 345	6.5 ab	18.5 abc	1.68 b	3.22 cde
PHY 76	7.0 a	20.3 abc	1.72 b	3.52 cde
HAZ 83-208	5.5 ab	21.0 abc	1.59 b	4.28 a
OA EX22	5.5 ab	17.0 c	2.14 a	3.20 cde
OA 340	7.0 a	20.5 abc	1.70 b	3.32 cde
HAZ 83-58	6.0 ab	19.3 abc	1.55 b	4.48 a
E103	6.8 a	21.3 ab	1.61 b	3.14 de
PIMA S6	6.5 ab	19.5 abc	1.55 b	3.52 cde
UA 6	6.0 ab	20.5 abc	1.55 b	3.12 e
HAZ 34-08	6.8 a	20.0 abc	1.67 b	4.50 a
PIMA S7	6.5 ab	20.5 abc	1.64 b	3.34 cde
OA 322	3.3 b	20.5 abc	1.72 b	3.12 e
CH 007	5.8 ab	17.5 bc	1.56 b	3.12 e
HTO	4.3 ab	19.3 abc	1.77 b	3.38 cde
PSC 57	4.5 ab	17.3 bc	1.71 b	3.30 cde
OA 312	5.0 ab	18.0 bc	1.77 b	3.52 cde
UA 17	7.3 a	20.8 abc	1.54 b	3.68 bcd
DP 744	6.5 ab	20.5 abc	1.68 b	3.72 bc
Average	6.0	19.8	1.67	3.6
LSD(05)	3.3	4.0	0.25	0.5
CV(%)	26.3	9.7	7.0	7.2

1. Values followed by the same letter are not significantly different at the 95% level of confidence using standard statistical procedures.

**Table 3. HVI data for Regional Pima Variety trial grown on the Safford Agricultural Center, 2001.**

Variety	Grade	Mike	Length	Strength	Uniformity	Color	RD	+b	Value <sup>1</sup>
HAZ 195	2	5.3	1.33	30.4	85	2	69	112	59.75
HAZ 14-08	2	4.3	1.34	34.3	85	2	72	103	61.75
OA 345	2	4.7	1.39	36.6	86	2	69	119	79.75
PHY 76	1	4.5	1.37	37.4	86	2	69	124	79.75
HAZ 83-208	2	4.0	1.36	31.9	86	1	74	100	70.75
OA EX22	2	4.6	1.43	35.7	86	1	70	123	74.75
OA 340	2	4.4	1.37	38.8	86	1	71	118	80.75
HAZ 83-58	2	3.9	1.46	30.2	87	1	77	88	73.13
E103	2	4.7	1.39	37.1	86	1	71	121	81.75
PIMA S6	2	4.8	1.38	38.8	87	1	70	120	80.75
UA 6	2	4.6	1.37	37.0	85	1	70	123	80.75
HAZ 34-08	2	4.2	1.36	34.2	86	1	73	101	72.75
PIMA S7	2	4.4	1.32	39.3	87	1	70	119	70.75
OA 322	2	4.2	1.35	38.6	87	1	72	112	70.75
CH 007	2	4.4	1.43	38.6	88	2	67	133	81.75
HTO	1	4.7	1.32	40.2	85	1	71	117	71.00
PSC 57	1	4.1	1.34	37.9	86	1	72	115	71.00
OA 312	2	4.3	1.32	38.3	85	1	73	110	70.75
UA 17	2	5.1	1.37	38.2	87	1	70	118	80.75
DP 744	2	4.5	1.41	37.9	88	1	72	115	81.75
Averages	--	4.485	1.37	36.6	86.2	--	71.1	115	74.74

1. Estimated lint value per pound using USDA AMS American Pima quotes for the Desert Southwest, then discounting an additional 10¢ per pound for lengths less than 1.37" (44 staple) and an additional 8¢ per pound for strength less between 37 and 35 g/tex and 2¢ per pound for strength less than 35 g/tex.