

Short Staple Variety Demonstrations, Graham County, 1994

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Abstract

Two on-farm, replicated short staple variety demonstrations were established in 1994. Fifteen varieties were evaluated on the Layton farm in Thatcher and eighteen varieties were evaluated on the Colvin farm in Eden. Several new varieties were planted in both studies. Stoneville 324 and HS 46 were the highest yielding varieties with yields of 1060 and 975 pounds of lint per acre at the Thatcher and Eden locations, respectively.

Introduction

This cotton variety demonstration, similar to the previous year's demonstration, is part of state-wide variety evaluation done in conjunction with Dr. Jeff Silvertooth and seven seed companies. But, even more important, is part of the on-going variety trials conducted in the county for the benefit of local cotton growers. In addition to the state-wide variety selection, one additional variety was added to the Thatcher location and four varieties were added to the Eden study.

Materials and Methods

The demonstrations were grown with the cooperation of Dennis Layton in Thatcher, at an elevation of 2900 feet, and Colvin Farms in Eden, at an elevation of 2800 feet, using their equipment and normal cultural practices. The two sites differ in elevation by about 100 feet with the Layton field being higher and generally warmer. The varieties were planted in two row plots in four replications. Plots were mechanically picked using the cooperators' machines, with each plot being weighed separately using electronic weigh scales under cotton trailers. Sub-samples were taken to determine lint turnout and fiber quality.

Crop History - Layton farm

Previous crop: Cotton

Soil type: Grabe clay loam with inclusions of Anthony loam

Planting date: 19 April 1994 Rate: 26 pounds per acre

Fertilizer: 300 lbs/ac NH_4SO_4 side-dressed, water run NH_3 2 times (40 lbs of N each time)

Herbicide: Banded Caparol and MSMA at layby

Insecticide: Two applications to control lygus bugs, one application for aphid

Irrigation: Furrow, approximately 4.5 acre feet

PIX/PREP: None

Defoliation: Sodium chlorate

Harvest dates: 1st Pick: 13 October

Heat units (86/55) to 1st pick: 3794

Crop History - Colvin farm

Previous crop: Cotton

Soil type: Grabe clay loam
Planting date: 18 April 1993 Rate: 20 pounds per acre
Fertilizer: 40 n in water
Herbicide: Treflan and caparol incorporated pre-plant
Insecticide: None
Pix/Prep: None
Defoliation: Sodium chlorate
Irrigation: Furrow
Harvest dates: 1st Pick: 7 November 2nd Pick: 29 November
Heat units (86/55) to 1st pick (recorded at Safford Ag Center): 4024

Results and Discussion

Weather is always a factor in crop production so a discussion of weather in the county is included in reference 1.

Tables 1a and 2a show the yields and other agronomic data on the Layton and Colvin farms, respectively. Stoneville 324 had the highest seedcotton yields in both locations this year. This is interesting because from the standpoint of heat units alone, 1994 would have been considered a year when the longer seasoned varieties like DP 90, KC311 and SG 1001 would have dominated the yield trial. The three cold fronts that moved through in April and early May apparently slowed crop development and made the plants appear to have been planted later. The record breaking highs in June also worked to reduce yields so the average yield on the Layton field was more than 300 pounds lighter than in 1993 (2). On Table 2a, it can be seen that Stoneville 324 came in 7th place in lint yield due to its low lint turnout. Its lint turnout was a bit low in the Layton study also, but its outstanding seedcotton yield kept it in the number 1 position. The Mycogen varieties were interesting to compare in the two tests. They tended to be near the top or near the bottom in both tests, but switched positions between the two tests. From data at the Safford Agricultural Center(3), Mycogen 1185 seems to have a fiber quality very close to the New Mexico acalas. Germains GC 702, an acala cotton, had good fiber quality in the SAC trial, but the yields in these two sites was not comparable to the other varieties. Plant populations seemed to be adequate for all varieties in both tests.

Table 1b and 2b show plant growth parameters in the two tests. All of the measurements were taken at harvest. Plants tended to be taller and have more nodes on the Colvin farm, but have lower Height to Node Ratios (HNR). The HNR's on the Layton site were in the upper half of acceptable HNR's for full season upland varieties according to Silvertooth, et.al. (4), whereas the HNR's on the Colvin site tended to be in the middle of the acceptable range. HNR's are affected by growing conditions and also by genetics. The cultivars with the largest HNR' tended to be the same in both sites.

HVI data for these sites are found in Tables 3a and 3b.

References

1. Clark, L.J. and E.W. Carpenter. 1995. Short staple regional cotton variety trial, Safford Agricultural Center, 1994. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. In this issue.
2. Clark, L.J. and R.E. Cluff. 1994. Short staple variety demonstrations, Graham county, 1993. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-96, pp. 169-172.
3. Clark, L.J., E.W. Carpenter, G.L. Hart and J.M. Nelson. 1995. Short staple regional cotton variety trial. Safford Agricultural Center, 1994. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. In this issue.
4. Silvertooth, J.C., P.W. Brown and J.E. Malcuit. 1993. The development and delivery of a crop monitoring program for upland and Pima cotton in Arizona. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-94, pp. 17-26.

Table 1a. Yields and other agronomic data from the upland cotton variety trial grown on the Layton farm in Graham county, 1994.

Variety	Seedcotton	Percent Lint	Lint Yield	Plant/acre
STV 324	3164.6 a*	33.5 bcd	1060.1	38128 cd
DP 5690	2678.8 bc	34.7 ab	929.5	36838 cd
CB 407	2581.9 bcd	36.0 a	929.5	39418 bcd
KC 311	2681.6 bc	34.5 abc	925.2	44730 a
DP 90	2624.2 bcd	35.2 ab	923.7	40149 bc
Myco 1185	2636.5 bcd	32.5 cd	856.9	40149 bc
GC 9033	2624.2 bcd	34.9 ab	915.8	40429 bc
HS 46	2494.6 de	34.8 ab	868.1	37848 cd
SG 1001	2490.5 de	34.6 abc	861.7	42579 ab
SG 404	2707.5 b	31.8 d	861.0	40859 bc
HS SAL 10	2565.6 bcde	33.5 bcd	859.5	37698 cd
HS 44	2516.4 cde	34.0 bc	855.6	38278 cd
CB 1233	2456.4 de	34.3 abc	842.5	42579 ab
Myco 2006	2401.8 e	33.8 bc	811.8	45741 a
GC 702	2225.8 f	34.7 ab	772.3	37848 cd
Average	2590.0	34.2	888.92	40064.8
LSD(05)	157.37	1.64		3525.16
CV(%)	4.26	3.35		6.17

* Values followed by the same letter, within columns, are not statistically different at the 5% level of probability.

Table 1b. Other agronomic variables measured or calculated from the cotton variety study on the Layton farm in Graham county, 1994.

Variety	Plant Height	Nodes	Height to Node Ratio
STV 324	34.8 f*	23.0 abcd	1.51 d
DP 5690	42.2 abc	22.5 abcd	1.88 ab
CB 407	41.5 abcd	22.8 abcd	1.82 ab
KC 311	41.3 bcd	24.2 a	1.71 bc
DP 90	43.0 ab	23.2 abc	1.86 ab
Myco 1185	37.8 e	21.7 bcd	1.75 abc
GC 9033	43.0 ab	22.5 abcd	1.91 a
HS 46	44.7 a	23.5 ab	1.90 ab
SG 1001	42.8 ab	24.5 a	1.75 abc
SG 404	31.8 g	21.2 d	1.511 d
HS SAL 10	38.7 de	22.5 abcd	1.72 abc
HS 44	38.0 e	23.7 a	1.61 cd
CB 1233	42.7 ab	23.3 abc	1.83 ab
Myco 2006	39.2 cde	21.5 cd	1.82 ab
GC 702	39.0 de	22.5 abcd	1.74 abc
Average	40.03	22.84	1.76
LSD9050	2.84	1.69	0.16
CV(%)	4.97	5.20	6.64

* Values followed by the same letter, within columns, are not statistically different at the 5% level of probability.

Table 2a. Yields and other agronomic data from the upland cotton variety trial grown on the Colvin farm in Graham county, 1994.

Variety	Seedcotton Yield	Percent Lint	Lint Yield	Percent 1st Pick	Plants/acre
STV 324	2844.4 a*	32.8 d	933.0	91.6 ghi	42199 a
Myco 2006	2723.5 ab	34.6 abcd	942.3	93.9 bcde	38569 abc
DP 90	2663.5 ab	35.0 abcd	932.1	95.0 ab	37208 abc
C-40	2642.9 abc	35.6 abc	940.9	89.4 j	39930 ab
HS 46	2634.9 abc	37.0 a	974.9	94.3 bc	29948 bc
LA 887	2634.9 abc	35.5 abc	935.4	93.1 cdef	44921 a
SG 501	2622.8 abcd	36.0 abc	944.2	92.7 efgh	30855 bc
DP 5690	2606.7 abcd	36.6 ab	954.1	94.2 bcd	30855 bc
HS SAL 10	2590.6 abcd	34.9 abcd	904.1	90.7 i	30401 bc
CB 1210	2514.0 abcd	35.4 abc	890.0	95.0 ab	29494 bc
CB 1233	2489.8 abcd	34.8 abcd	866.5	91.4 hi	29494 bc
GC 9033	2457.6 abcd	35.0 abcd	860.2	95.4 ab	42199 a
SG 1001	2429.4 abcd	33.7 cd	818.7	92.8 defgh	38569 abc
KC 311	2377.0 bcd	35.5 abc	843.8	96.2 a	35846 abc
HY 39	2348.8 bcde	33.6 cd	789.2	93.0 cdefg	35846 abc
Myco 1185	2215.9 cde	34.1 bcd	755.6	93.2 cde	38115 abc
CB 407	2187.7 de	35.2 abcd	770.1	91.2 i	28133 c
GC 702	1958.0 e	34.5 abcd	675.5	91.7 fghi	34031 abc
Average	2496.78	35.0	873.9	93.04	35367.3
LSD(05)	371.95	2.19		1.32	9411.13
CV(%)	10.49	4.34		0.99	18.74

* Values followed by the same letter, within columns, are not statistically different at the 5% level of probability.

Table 2b. Other agronomic variables measured or calculated from the cotton variety study on the Colvin farm in Graham county, 1994.

Variety	Plant Height	Nodes	Height to Node Ratio
STV 324	40.8 e*	28.3 abcd	1.46 de
Myco 2006	47.3 abc	28.3 abcd	1.68 abcde
DP 90	50.8 a	30.5 ab	1.67 abcde
C-40	43.5 cde	28.0 abcd	1.56 bcde
HS 46	50.5 ab	30.8 a	1.65 abcde
LA 887	42.8 cde	30.5 ab	1.40 e
SG 501	43.3 cde	27.3 abcd	1.60 abcde
DP 5690	49.3 ab	27.3 abcd	1.82 ab
HS SAL 10	45.3 bcde	30.0 abc	1.51 cde
CB 1210	50.5 ab	28.8 abcd	1.77 abc
CB 1233	50.0 ab	26.8 bcd	1.88 a
GC 9033	49.5 ab	27.0 abcd	1.84 ab
SG 1001	43.3 cde	29.5 abcd	1.47 de
KC 311	46.3 abcd	26.0 d	1.79 abc
HY 39	49.0 ab	28.3 abcd	1.73 abcd
Myco 1185	47.5 abc	30.8 a	1.56 bcde
CB 407	41.0 de	27.5 abcd	1.52 cde
GC 702	41.0 de	26.3 cd	1.58 bcde
Average	46.18	28.42	1.64
LSD(05)	4.54	3.29	0.25
CV(%)	6.93	8.15	10.55

* Values followed by the same letter, within columns, are not statistically different at the 5% level of probability.

Table 3a. HVI data from the upland cotton variety trial grown on the Layton farm in Graham county, 1994.

Variety	Length	Uniformity	Strength	Elongation	Micronaire	Grade
STV 324	1.17	85.3	30.7	5.9	3.7	21
DP 5690	1.13	84.4	31.3	5.5	3.4	21
CB 407	1.16	84.8	31.9	5.8	3.5	21
KC 311	1.17	85.2	32.5	6	3.3	21
DP 90	1.14	84.8	32	5.9	3.4	21
Myco 1185	1.2	86	33.4	6	3.8	11/21
GC 9033	1.14	85.1	32.8	6	3.3	11/21
HS 46	1.15	85	31.9	6.1	3.1	21
SG 1001	1.15	85	32.3	5.9	3.3	21/31
SG 404	1.13	84	30	5.9	4.2	21
HS SAL 10	1.16	85	31.9	6.2	3.4	21
HS 44	1.16	84.9	31.8	5.8	3.9	21
CB 1233	1.13	84.3	32.3	5.8	3.4	21
Myco 2006	1.15	84.9	31.3	5.6	3.5	31
GC 702	1.19	85.4	35	6.4	3.8	21/31
Average	1.155	84.94	32.07	5.92	3.53	21
Std Dev	0.021	0.478	1.16	0.22	0.29	--

Table 3b. HVI data from the upland cotton variety trial grown on the Colvin farm in Graham county, 1994.

Variety	Length	Uniformity	Strength	Elongation	Micronaire	Grade
STV 324	1.13	84.6	30.5	5.3	4.2	41
Myco 2006	1.15	85	29.9	6	4.7	31
DP 90	1.13	84.3	32.9	6.1	4.8	41
C-40	1.12	84	29.1	6.3	4.7	31
HS 46	1.14	84.6	33.6	6.1	4.5	31
LA 887	1.15	84.4	32.4	6.2	4.7	31/41
SG 501	1.11	83.6	31.4	6.2	4.7	31/41
DP 5690	1.11	83.7	32	5.8	4.9	31/41
HS SAL 10	1.12	83.9	33.3	6.4	4.5	31/41
CB 1210	1.12	84.4	32.1	6	4.9	41
CB 1233	1.12	84.1	31.2	5.7	4.8	31/41
GC 9033	1.11	84.2	31.9	6	4.8	31
SG 1001	1.13	84.3	33.7	5.9	4.9	31/41
KC 311	1.13	84.3	32.8	6.2	5	31
HY 39	1.17	84.3	34	5.7	4.5	31/41
Myco 1185	1.17	85.2	34.2	6	4.4	41
CB 407	1.13	84.1	31.8	6.1	4.9	31/41
GC 702	1.15	84.9	33.9	6.2	4.2	31/41
Average	1.133	84.33	32.26	6.01	4.67	31/41
Std Dev	0.019	0.423	1.457	0.261	0.239	--