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COMPARISON OF FIBER PROPERTIES OF CURRENT AND OBSOLETE COTTON VARIETIES

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Abstract

In 1991, high volume instrumentation (HVI) was adopted to provide cotton producers and textile manufacturers information on the length, length uniformity, elongation, strength, and micronaire of fiber within every bale of cotton. Studies were conducted in 2002 at the LSU AgCenter, Red River Research Station, Bossier City to evaluate current and obsolete cotton varieties for fiber quality by comparing fiber test results from HVI and less modern fiber testing instruments. Cotton seed of obsolete varieties were obtained from the National Collection of Gossypium Germplasm at College Station, Texas, and seed of newer varieties were obtained from commercial seed companies. Fibers from more modern varieties are longer and stronger than from less recent varieties. Modern varieties also have a higher micronaire than older varieties.

Materials and Methods

Varieties were planted in a randomized complete block design with four replications. The soil type at this location is a Caplis very fine sandy loam. Experimental plots were one row, 22 feet long, and spaced 3.3 feet apart. Planting and harvest dates were May 15 and November 5, 2002, respectively. Standard crop production management practices were used throughout the growing season. Fiber quality analysis was performed by the LSU AgCenter Cotton Fiber Testing Laboratory, Dept. of Agronomy, Baton Rouge, Louisiana. Fiber analysis was performed on each variety using modern High Volume Instrumentation (Zellweger/Uster HVI Model 900 SA) technology and older measuring devices (Stelometer, Pressley strength tester, and Fibronaire instruments). Varieties used in this test and the approximate year they were released are listed in Table 1.

Results

Fiber measurements on each variety using both modern HVI and the older fiber testing instruments are shown in Tables 2-6. With respect to fiber properties, current and obsolete varieties are much the same except for the following differences:

1) Modern varieties have slightly longer fiber than less recent ones.
2) Modern varieties have stronger fiber than less recent ones.
3) With the exception of Deltapine 491, modern varieties have a higher micronarie than less recent varieties when measured with either the HVI or Fibronaire instruments.

Table 1. Varieties used and release dates.

Newer Varieties	Release Dates
Deltapine 555 BR	2001
Deltapine 491	2001
Deltapine DeltaPEARL	2000
Stoneville 4892 BR	2000
PhytoGen PSC 355	1998
SureGrow 747	1998
Deltapine 33B	1996
Stoneville 474	1994
Stoneville LA 887	1991

Older Varieties	Release Dates
Deltapine 50	1984
Stoneville 825	1979
Deltapine 41	1979
Deltapine 16	1967
Deltapine 15A	1966
Stoneville 7A	1962
Stoneville 213	1962
Deltapine 15	1947

Table 2. Micronaire measurements using HVI and fibronaire measuring equipment.

Variety	HVI	Rank	Conventional	Rank
Stoneville 4892 BR	5.38	1	5.46	2
Stoneville 474	5.37	2	5.53	1
Stoneville 825	5.25	3	5.37	3
Sure Grow 747	5.20	4	5.32	4
Phytogen 355	5.18	5	5.30	6
Deltapine 33B	5.13	6	5.32	5
Deltapine 50	5.10	7	5.17	9
Stoneville LA 887	5.10	8	5.28	8
Stoneville 7A	5.10	9	5.28	7
Deltapine Delta Pearl	5.00	10	5.01	11
Deltapine 16	4.95	11	5.06	10
Deltapine 41	4.90	12	4.93	13
Deltapine 555 BR	4.90	13	4.89	15
Deltapine 15	4.87	14	4.91	14
Stoneville 213	4.85	15	4.98	12
Deltapine 15 A	4.82	16	4.85	16
Deltapine 491	4.77	17	4.76	17
LSD (0.05)	0.16		0.21	

Table 3. Strength measurements using HVI, pressley, and stelometer measuring equipment.

Variety	HVI	Rank	Pressley	Rank	Stelometer	Rank
Stoneville LA 887	33.3	1	26.6	3	21.9	3
Phytogen 355	32.2	2	26.6	4	20.1	8
Deltapine 491	31.7	3	28.5	1	22.2	2
Deltapine Delta Pearl	31.7	4	28.1	2	22.3	1
Deltapine 33 B	31.0	5	25.4	9	20.5	6
Stoneville 474	31.0	6	25.0	11	19.5	13
Stoneville 4892 BR	30.8	7	25.6	8	19.9	9
Stoneville 16	30.3	8	24.7	15	19.9	10
Stoneville 555 BR	30.3	9	25.6	7	20.7	5
Stoneville 41	30.1	10	25.8	6	20.9	4
Stoneville 213	29.9	11	25.9	5	20.3	17
Stoneville 15	29.9	12	24.9	14	19.4	15
Sure Grow 747	29.6	13	24.9	13	19.0	7
Stoneville 7A	29.5	14	25.3	10	19.5	12
Deltapine 50	29.0	15	24.6	16	19.1	16
Stoneville 825	28.8	16	25.0	12	19.4	14
Deltapine 15A	28.6	17	24.5	17	19.8	11
LSD (0.05)	0.9		1.11		1.2	

Table 4. Elongation measurements using HVI and stelometer measuring equipment.

Variety	HVI	Rank	Stelometer	Rank
Sure Grow 747	9.5	1	6.8	3
Phytogen 355	9.2	2	7.0	1
Deltapine 15A	8.7	3	6.4	9
Deltapine 16	8.7	4	6.9	2
Deltapine 50	8.6	5	6.7	5
Deltapine 15	8.4	6	6.7	4
Stoneville 474	8.3	7	6.6	6
Stoneville 4892 BR	8.0	8	6.4	8
Stoneville LA 887	7.9	9	6.5	7
Deltapine 33B	7.9	10	6.3	10
Deltapine 41	7.4	11	6.1	12
Stoneville 213	7.3	12	6.2	11
Stoneville 825	6.9	13	5.7	14
Stoneville 7A	6.8	14	6.0	13
Deltapine 491	6.5	15	5.7	15
Deltapine 555 BR	6.5	16	5.5	17
Deltapine DeltaPearl	6.4	17	5.6	16
LSD (0.05)	0.5		0.4	

Table 5. Uniformity measurements using HVI equipment.

Variety	HVI	Rank
Sure Grow 747	86.2	1
Stoneville LA 887	85.6	2
Stoneville 7A	85.2	3
Deltapine 16	85.1	4
PhytoGen 355	85.1	5
Stoneville 474	85.1	6
Stoneville 4892 BR	85.0	7
Stoneville 825	85.0	8
Deltapine 50	84.9	9
Deltapine 33B	84.8	10
Stoneville 213	84.6	11
Deltapine 15	84.5	12
Deltapine 41	84.2	13
Deltapine DeltaPearl	84.2	14
Deltapine 491	83.7	15
Deltapine 555 BR	83.6	16
Deltapine15A	83.6	17
LSD (0.05)	0.5	

Table 6. Length measurements using HVI equipment.

Variety	HVI	Rank
Deltapine 491	1.20	1
Deltapine DeltaPearl	1.19	2
Stoneville LA 887	1.18	3
Deltapine 16	1.16	4
Stoneville 7A	1.16	5
Deltapine 33B	1.15	6
Deltapine 50	1.15	7
Deltapine 15	1.14	8
Sure Grow 747	1.14	9
Deltapine 555 BR	1.13	10
PhytoGen 355	1.13	11
Stoneville 213	1.13	12
Stoneville 825	1.12	13
Deltapine 41	1.12	14
Sure Grow 474	1.12	15
Stoneville 4892 BR	1.10	16
Deltapine 15A	1.09	17
LSD (0.05)	0.04	