

PRELIMINARY COTTON VARIETY TRIAL, 2004

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Introduction

Tennessee cotton producers need more ample and timely data from field trials to properly assess the potential of new cultivars. Objectives of this research are to evaluate the yield potential and fiber quality of newly introduced transgenic varieties and experimental strains, relative to several popular cultivars currently grown in Tennessee.

Methods

Thirty cotton varieties and experimental strains from six seed companies were tested at the West Tennessee Experiment Station in 2004, including seven popular cultivars as checks (Table 1). The site was a conventionally tilled Calloway silt loam that had been planted to corn in 2003. Entries were planted in 2-row plots arranged in a RCB design with four replications on May 5, 2004. Conventional UT-recommended weed- and pest-control measures were uniformly applied to all plots. Application of mepiquat chloride was delayed relative to UT and product label recommendations to allow varieties to express their growth habits. Defoliants were applied per UT recommendations at 138 days after planting (DAP). No boll opening material was applied, in order to let varieties express earliness as the percent of total yield picked at first harvest. Each plot was picked twice (at 145 and 170 DAP) with a spindle picker. Gin turnout of each entry was determined using a 20-saw gin equipped with a stick machine, two incline cleaners and two lint cleaners. A subsample of lint of each entry was analyzed by HVI procedures at the USDA-AMS Cotton Classing Office in Memphis TN.

Results and Discussion

Total lint yields ranged from 1222 to 1676 lb lint/acre in 2004 (Table 1). The highest yielding entry was the popular cultivar, DP 444 BG/RR, but the top five yielding entries did not differ significantly in total yield. This top-yielding group included the highest yielding RR-only entry, PHY 310 R. Six early maturing entries produced more than 85% of their yield by first harvest, including DP 444 BG/RR, DP 455 BG/RR, PHY 310 R, ST 4575BR, and a BCG entry. Three varieties in this early-maturing group were also among the top yielding entries. The most widely planted cultivar in Tennessee in 2004, PM 1218 BG/RR, ranked 11th in total yield. The seven entries containing Bollgard II genes ranked from 18th to 30th in total lint yield.

Table 2 shows the HVI fiber properties for these entries. Most varieties had highly satisfactory fiber profiles, unlikely to incur price discounts. Micronaire values of all entries were in the base or premium range. Fiber length exceeded 1.13 in. for ten entries, and UHM lengths of all entries were above the short-staple discount threshold (<1.05 in.). Fiber strength exceeded 30.5 g/tex for four entries, and strength of only two entries (ST 3636B2R and ST 4686R) were below the low-strength discount threshold of 26.5 g/tex. Color grades ranged from 21 to 31, thanks to dry conditions at first harvest. Trash content of only one entry (ST 3636B2R) was greater than 1%.

Results show that several new varieties and experimental strains may have markedly improved fiber quality profiles, together with high yield potential in Tennessee.

Table 1. Lint yield, earliness, and gin turnout of 30 cotton varieties in the 2004 PVT Early Evaluation study at Jackson TN, listed by yield rank.

Yield Rank	Variety	Check	Lint	Lint	First	Gin
			Yield, Total lb/A	Yield, 1st Hvst. lb/A	Harvest %	Turnout %
1	Deltapine DP 444 BG/RR	✓	1676	1489	89.0	38.5
2	FiberMax FM 960BR	✓	1673	1349	80.6	38.0
3	Deltapine DP 455 BG/RR †		1662	1420	85.4	40.3
4	Deltapine DP 488 BG/RR		1616	1185	73.3	36.9
5	Phytogen PHY 310 R		1602	1375	85.9	39.9
6	BCSI E0222-5LL		1560	1332	85.5	37.2
7	FiberMax FM 960RR		1555	1207	77.6	37.2
8	Stoneville ST 4575BR		1550	1325	85.5	37.8
9	Deltapine DP 555 BG/RR	✓	1544	992	64.3	38.6
10	Syngenta DX 25105N		1535	1269	82.7	39.1
11	Paymaster PM 1218 BG/RR	✓	1523	1274	83.7	37.6
12	Deltapine DP 432 RR	✓	1521	1235	81.1	35.9
13	FiberMax FM 966LL		1515	1245	82.2	36.6
14	Stoneville ST 4686R		1503	1206	80.4	36.5
15	Syngenta DX 99197		1492	1249	83.8	36.7
16	Stoneville ST 5599BR	✓	1471	986	67.0	36.6
17	Syngenta DX 24119		1467	1145	78.0	38.7
18	FiberMax FM 960B2R		1461	1106	75.9	35.8
19	Syngenta DX 241203		1457	1153	79.3	37.5
20	Syngenta DX 24706		1451	1216	83.8	37.2
21	BCG P0304 BII/R		1434	1254	87.4	37.9
22	Deltapine DP 445 BG/RR ‡		1413	1177	83.3	38.6
23	Deltapine DPLX 02T57R		1409	1160	82.3	35.0
24	Deltapine DP 393 §		1405	1102	78.4	36.2
25	Stoneville ST 3636B2R		1398	1117	80.1	33.3
26	Stoneville ST 4793R	✓	1383	1114	80.5	36.6
27	Stoneville ST 5454B2R		1339	1032	77.0	34.6
28	Deltapine DP 543 BGII/RR ¶		1322	902	67.9	35.1
29	BCG P0204 BII/R		1286	1040	80.8	35.0
30	BCG P0104 BII/R		1222	805	66.0	33.3
	Mean:		1481	1182	79.6	36.9
	CV (%)		4.2	7.3	5.0	
	LSD (0.05)		87.4	120.7	5.6	

Planted 5 May 2004. Defoliant applied 20 Sept 2004. Harvested 27 Sept and 22 Oct 2004.

Irrigated, conventionally tilled Calloway Silt Loam. Trial Managers: Carl Michaud & Clint Sharp.

†tested as DPLX 02X39 BR. ‡tested as DPLX 01W93BR. §tested as DPLX 00W12. ¶tested as DPLX 03Q301DR.

Tennessee Agricultural Experiment Station data collected by C.O. Gwathmey.

Table 2. HVI fiber properties of 30 cotton varieties tested in the 2004 PVT Early Evaluation study at Jackson TN, listed alphabetically.

Variety	Check	Micro- naire	Fiber Length in.	Fiber Strength g/tex	Uni- formity %	HVI Trash %	HVI Color	Color Rd	Color +b
BCG P0104 BII/R		42	1.11	29.2	83	0.5	31-1	80	7.7
BCG P0204 BII/R		42	1.12	29.1	82	0.2	21-1	82	7.8
BCG P0304 BII/R		37	1.10	27.5	81	0.5	21-2	81	7.6
BCSI E0222-5LL		40	1.16	31.3	84	0.5	31-1	82	7.1
Deltapine DP 393 §		45	1.16	29.8	82	0.5	31-1	79	8.3
Deltapine DP 432 RR	✓	42	1.12	26.8	83	0.9	31-1	79	7.7
Deltapine DP 444 BG/RR	✓	38	1.13	28.9	83	0.8	31-1	80	7.4
Deltapine DP 445 BG/RR ‡		42	1.14	28.7	83	0.7	31-1	81	7.5
Deltapine DP 455 BG/RR †		41	1.13	29.8	81	0.4	21-2	80	8.4
Deltapine DP 488 BG/RR		46	1.19	30.1	83	0.6	31-1	79	7.9
Deltapine DP 543 BGII/RR ¶		47	1.11	29.1	81	0.4	21-2	82	7.5
Deltapine DP 555 BG/RR	✓	46	1.13	30.3	81	0.4	21-1	82	7.6
Deltapine DPLX 02T57R		40	1.12	27.5	82	0.8	31-1	80	7.2
FiberMax FM 960 B2R		45	1.16	31.2	81	0.8	31-1	81	7.2
FiberMax FM 960 BR	✓	44	1.11	30.8	82	0.6	31-1	80	7.6
FiberMax FM 960 RR		40	1.16	30.5	83	0.6	31-1	81	7.3
FiberMax FM 966 LL		43	1.12	31.8	82	0.8	31-1	80	7.2
Paymaster PM 1218 BG/RR	✓	47	1.09	27.8	82	0.5	21-1	80	8.6
Phytogen PHY 310 R		45	1.08	28.7	82	0.6	31-1	80	7.8
Stoneville ST 3636B2R		43	1.13	26.3	83	1.6	31-2	78	7.5
Stoneville ST 4575BR		44	1.12	28.6	83	0.8	31-1	79	7.9
Stoneville ST 4686R		42	1.13	25.9	82	0.4	21-1	81	8.3
Stoneville ST 4793R	✓	44	1.08	28.0	82	1.0	31-1	78	7.9
Stoneville ST 5454B2R		44	1.12	28.7	82	0.4	21-2	80	8.1
Stoneville ST 5599BR	✓	44	1.13	29.8	82	1.0	31-2	78	7.8
Syngenta DX 24119		40	1.15	27.2	81	0.7	31-1	78	8.1
Syngenta DX 241203		44	1.15	28.4	83	0.7	31-1	81	7.5
Syngenta DX 24706		44	1.12	28.4	83	0.4	21-2	80	8.2
Syngenta DX 25105N		44	1.15	27.7	82	1.0	31-1	78	7.9
Syngenta DX 99197		45	1.14	29.5	82	0.6	31-1	80	7.1
Mean:		43	1.13	28.9	82	0.7	31-1	80	7.7

HVI data from the USDA Cotton Classing Office in Memphis TN, based on lint samples from the WTES gin.

§tested as DPLX 00W12. ‡tested as DPLX 01W93BR. †tested as DPLX 02X39 BR. ¶tested as DPLX 03Q301DR.

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