

COTTON VARIETY FIBER CHARACTERISTICS AND YIELD COMPARISON

King Ranch Farms, Kleberg County, 1998

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MATERIALS/METHODS: Two tests were established to evaluate cotton varieties. One test consisted of 8 transgenic B.t. varieties and the other test consisted of 15 varieties; two transgenic B.t. cultivars (DPL 32B and PM 1215B) were included in both tests. Varieties were replicated 3 times in a RCB design in 36-row by 5,775 ft plots (15.1 acres). Rows were spaced on 38-inch centers. Three John Deere 7300 MaxEmerge 12-row air planters were used to plant 4.4 seed/row ft on 11 and 12 Mar in a field that had been in sorghum in 1997. Stand establishment rates were measured 9 and 16 days after planting.

Seventeen John Deere pickers including 4 and 6 row machines were used to harvest plots on 5-8 Aug. Seed cotton from each plot was stored in separate modules. A seed cotton sample was obtained from each corner of all modules to determine lint turnout percentage and fiber characteristics. These samples were processed on a 10-saw Eagle Laboratory machine and lint was sent to the International Textile Center, Lubbock, Texas for fiber analysis. Module weights were then used to determine lint yield based on percentage turn-out achieved in the laboratory gin but before yields were calculated, the lab gin turnout readings were uniformly adjusted to match achievement of the commercial gin. In addition, modules were weighed and ginned separately by variety so that fiber characteristics and quality factors could also be measured on all bales processed by commercial ginning (these samples were in addition to single samples from the modules). All data were analyzed by ANOVA and LSD.

RESULTS/DISCUSSION: Tables 1 and 2 provide data on seedling emergence measured 9 and 16 days after planting (DAP) using 45,000 plants per acre as the optimum population (the percentage of optimum stand achieved 9 DAP is listed). Although there were large differences, yield rankings did not necessarily follow the plant establishment rate. However, none of the low yielding varieties exceeded 25% optimum plant stand 9 DAP in the 15-entry variety test but the same trend did not occur in the transgenic B.t. test.

Table 3 lists data from the transgenic B.t. cotton variety comparison based on hand samples taken from each module. Except for lint yield differences (LSD=53.6 lb), few striking observations were obtained, even though there were statistical differences among varieties for all fiber characteristic parameters but strength. Lint values based on fiber characteristics from all bales from each of 3 modules (Table 4) best exhibit the true value of cotton production on an acre basis. Lint value differences ranged from a high of \$0.4918 to a low of \$0.4806 per pound in the B.t. cotton evaluation.

Fiber characteristics based on hand samples from modules and yield data for the 15-entry test containing 13 conventional and 2 transgenic B.t. cotton cultivars are provided in Table 5. Statistical differences were found for every parameter measured. The probability level and LSD (P=0.05) are given for each parameter. Noteworthy results included (1) three varieties with micronaire readings of 5.0 or more (SG125, PHM1560 and

STV474), (2) longest fiber in the test (numerically) for the FM 832 variety and (3) greater strength (numerically) for the FM 832 variety. Surprisingly, only 27.2 lb lint/acre was required to statistically separate lint yields (P=0.05). Major differences in lint value were detected in the 15-entry variety comparison based on data from all bales produced from each of the 3 plots (15.1 acres/plot). The difference in lint value among varieties was more than \$0.05/pound.

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Table 1. Plant emergence rates in the transgenic B.t. cotton variety test, King Ranch Farms, Kleberg County, TX 1998.

Variety	Plant emergence in 1000's/acre (days after planting)		% of optimum population 9 DAP ^a
	9	16	
DPL 35B	17.2	40.8	42.3
DPL 33B	17.0	45.2	37.6
DPL 32B	13.5	47.8	28.3
DPL 20B	8.4	43.3	19.4
PM 1560B	12.6	37.7	33.3
DPL 50B	24.0	41.2	58.2
PM 1215B	5.1	34.0	15.1
PM 1330B	22.7	41.3	55.1
Average	15.1	41.4	36.2

^a Optimum population is defined as 45,000 plants per acre and DAP=days after planting.

Included in this report since Tables 4 & 6 represent data not in the 1998 report.

Table 2. Plant emergence rates of cotton varieties, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Plant emergence in 1000's/acre (days after planting)		% of optimum population 9 DAP ^a
	9	16	
SG 125	5.8	32.6	12.9
PM H1560	11.0	43.6	24.3
DPL 5690	4.4	39.4	9.8
FM 989	18.2	45.9	40.4
STV 474	4.7	34.9	10.4
FM 832	23.8	39.1	52.8
DPL 5690RR	7.9	48.2	17.6
DPL 32B	22.1	41.9	49.2
DPL 5409	16.1	50.0	35.7
STV 373	4.7	30.1	10.4
DPL 50	10.7	35.6	23.8
PM 1215B	5.8	37.0	12.9
UAP 201	10.7	44.0	23.8
PM H1215	4.9	29.8	10.9
TX 300	2.8	36.1	6.2
Average	10.2	38.7	22.7

^a Optimum population is defined as 45,000 plants per acre and DAP=days after planting.

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Table 3. Transgenic B.t. cotton variety fiber characteristics (**hand samples from modules**) and lint yield, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Fiber characteristics ^a					Yield (lb lint/ac)
	Mic	Lgth	Ur	St	Elong	
DPL 35B	4.5	0.99	79.9	26.2	5.0	401
DPL 33B	4.4	0.99	80.8	25.1	5.8	392
DPL 32B	4.1	0.97	79.9	24.8	6.0	381
DPL 20B	4.1	0.99	81.4	25.2	6.0	370
PM 1560B	4.5	0.99	81.3	26.6	5.7	359
DPL 50B	4.0	1.02	81.6	25.9	5.9	340
PM 1215B	3.8	1.02	82.5	27.0	6.0	312
PM 1330B	4.0	1.00	80.1	25.2	5.5	273
LSD (P=0.05)	.419	.029	1.525	NS	.305	53.6
P>F	.0267	.0253	.0237	.1186	.0001	.0022

^a Mic = micronaire, Lgn = length, Ur = uniformity, St = fiber strength, Elong = Elongation

Table 4. Transgenic B.t. cotton lint characteristics and yield, average loan price, and lint value based on **all bales** produced in each of 3 replications, King Ranch Farms, Kleberg County, TX, 1998.^a

Variety	Mic	Lgth	Ur	St	Yield (lb lint/ac)	Loan price (¢/lb)	Lint value (\$/acre)
DPL 35B	4.17	0.97	79.7	25.7	401	48.54	194.65
DPL 33B	4.27	0.96	79.5	25.2	392	48.48	190.04
DPL 32B	4.25	0.95	80.0	24.8	381	48.06	183.11
DPL 20B	4.17	0.97	80.7	24.9	370	48.47	179.34
PM 1560B	4.46	0.96	80.7	26.1	359	48.72	174.90
DPL 50B	4.14	1.00	80.6	24.9	340	48.99	166.57
PM 1215B	4.15	0.99	80.4	26.1	312	49.18	153.44
PM 1330B	4.07	0.98	80.8	25.4	273	48.22	131.64
Average	4.21	0.97	80.3	25.4	354	48.6	171.71

^a Fiber quality data based on an average of 30.3 bales per variety ranging from 21-35 bales.

Table 5. Cotton variety fiber characteristics (**hand samples from modules**) and lint yield, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Fiber characteristics					Yield (lb lint/ac)
	Mic	Lqth	Ur	St	Elong	
SG 125	5.0	1.01	81.9	26.0	5.5	439
PM H1560	5.2	1.02	82.1	27.0	5.0	432
DPL 5690	4.8	0.97	80.8	26.8	4.9	425
FM 989	4.4	0.98	80.4	26.3	5.0	409
STV 474	5.0	0.97	81.4	26.1	5.5	409
FM 832	4.2	1.05	81.8	28.2	5.1	406
DPL 5690RR	4.7	0.98	80.4	26.1	5.5	405
DPL 32B	4.3	0.97	80.1	24.6	6.1	398
DPL 5409	4.6	0.99	80.3	25.1	5.8	383
STV 373	4.4	1.00	80.7	24.2	5.3	383
DPL 50	4.7	1.00	81.7	24.4	5.6	374
PM 1215B	4.1	1.04	81.6	26.0	5.8	341
UAP 201	4.3	0.99	80.1	24.7	5.6	338
PM H1215	4.3	1.01	81.4	26.9	5.4	333
TX 300	4.6	0.95	80.3	26.1	4.9	261
LSD (P=0.05)	.382	.048	1.436	1.507	.407	27.2
P>F	.0000	.0098	.0389	.0002	.0000	.0000

^a Mic = micronaire, Lgn = length, Ur = uniformity, St = fiber strength, Elong = Elongation

Included in this report since Tables 4 & 6 represent data not in the 1998 report.

Table 6. Cotton lint characteristics and yield, average loan price, and lint value based on **all bales** produced in each of 3 replications, King Ranch Farms, Kleberg County, TX, 1998.^a

Variety	Mic	Lgth	Ur	St	Yield (lb lint/ac)	Loan price (¢/lb)	Lint value (\$/acre)
SG 125	4.87	0.98	81.4	25.5	439	48.44	212.65
PM H1560	5.00	0.97	81.0	26.2	432	45.22	195.35
DPL 5690	4.55	0.95	79.7	26.6	425	47.72	202.81
FM 989	4.39	0.96	80.1	27.0	409	48.13	196.85
STV 474	4.90	0.98	81.1	25.8	409	47.63	194.81
FM 832	4.04	1.03	81.0	28.8	406	50.69	205.80
DPL 5690RR	4.46	0.95	79.6	27.0	405	47.21	191.20
DPL 32B	4.27	0.96	80.1	25.3	398	47.97	190.92
DPL 5409	4.43	0.96	80.0	25.1	383	48.35	185.18
STV 373	4.45	0.99	80.0	24.3	383	49.04	187.82
DPL 50	4.63	0.98	80.7	24.5	374	48.31	180.68
PM 1215B	4.19	1.00	81.0	26.4	341	49.21	167.81
UAP 201	4.34	0.97	80.0	24.5	338	48.47	163.83
PM H1215	4.49	1.00	81.9	26.8	333	49.02	163.24
TX 300	4.50	0.97	80.0	25.4	261	48.09	125.51
Average	4.50	0.98	80.5	25.9	382	48.2	184.30

^a Fiber quality data based on an average of 32.6 bales per variety ranging from 23-37 bales.

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