



Replicated Transgenic Cotton Variety Demonstration Under LEPA Irrigation

**Cooperator: Helms Farm/Texas Agricultural Experiment Station and
Texas Cooperative Extension, Halfway, TX - 2003**

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Hale County

Summary: Significant differences were noted for most parameters measured (Tables 1 and 2). Lint turnout ranged from 23.0% to 29.0%. Lint yields varied from a low of 947 lb/acre to a high of 1363 lb/acre. Lint loan values were generally high all across the varieties. After adding lint and seed value, total value/acre for varieties ranged from a low of \$585.26 to a high of \$880.38. When subtracting ginning and seed and technology fees, the net value/acre for varieties ranged from a low of \$464.78 to high of \$722.17, a difference of \$257.39. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection.

Objective: The objective of this project was to compare yields, gin turnout, fiber quality and economics of variety and technology selection.

Materials and Methods:

Varieties: AFD 3511R, Beltwide Cotton Genetics 28R, Deltapine 5414RR, Deltapine X03X177R, FiberMax 960BR, FiberMax 819RR, Stoneville 5303R, Stoneville 4892BR, and Paymaster 2326RR

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.2 seed per row-ft in 30-inch row spacing (John Deere Max Emerge II vacuum planter)

Plot size: 8 rows by variable length due to circular pivot (827-1345 feet long)

Planting date: May 7

Weed management: Prowl at 1qt/acre was applied preplant and incorporated with a rolling cultivator on April 3. Roundup WeatherMax was applied over-the-top on May 26 and on June 10 and at a rate of 22 oz/acre with ammonium sulfate (17 lb/100 gallons of spray solution). Roundup WeatherMax was also applied on July 17 at 22 oz/acre as a post-directed spray with ammonium sulfate. Plots were cultivated twice during the growing season with furrow dikes being added.

LEPA irrigation:

April - May:	3.42"
July - August:	8.04"

Rainfall:

April:	0.46"	August:	2.34"
May:	0.38"	September:	0.67"
June:	6.55"		
July:	0.00"		

Total moisture: 21.86"

Insecticides:

Temik was applied in-furrow at 3 lb/acre at planting on all varieties except for Deltapine X030X177R which was Cruiser treated. Orthene was applied at 3.2 oz/acre with the June 10 over-the-top application of Roundup WeatherMax. No additional insecticides were required (lepidopterous larvae populations did not exceed thresholds). This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer

management:

Using a fertilizer-knife rig, 22 lb N/acre and 74 lb P₂O₅/acre using 10-34-0 was applied preplant on January 9. After planting, 40 lbs N/acre (32-0-0) with 10 lbs S/acre (12-0-0-26) were applied using the fertilizer-knife rig. An additional 35 lb N/acre using liquid nitrogen fertilizer (32-0-0) was applied during the growing season via fertigation.

Harvest aids:

Prep at 21 oz/acre and Ginstar at 6 oz/acre were applied on October 22 followed by Gramoxone Max at 16 oz/acre on November 4.

Harvest:

Plots were harvested on December 3 using a commercial John Deere 7445 with field cleaner bypassed. Harvested material was dumped into a weigh wagon with integral digital scales to determine individual plot weights. Plots yields were adjusted to lb/acre.

Gin turnout:

Grab samples were taken by plot and ginned at the Texas A&M Center at Lubbock to determine gin turnouts.

Fiber analysis:

Lint samples were submitted to the International Textile Center (ITC) at Texas Tech University for HVI analysis, and USDA loan values were determined for each variety by plot.

Ginning costs
and seed values:

Ginning costs are based on \$2.25 per cwt. of bur cotton and seed values are based on \$125 per ton. Ginning costs do not include checkoff.

Seed and tech fees:

Systems cost was determined by variety per acre using manufacturer's suggested retail price for seed and appropriate technology fee(s) for Bollgard and/or Roundup Ready based on 3.2 seed per row-ft.

Results and

Discussion: Significant differences were noted for most parameters measured (Tables 1 and 2). Lint turnout ranged from 23.0% to 29.0%. Lint yields varied from a low of 947 lb/acre to a high of 1363 lb/acre. Lint loan values were generally high all across the varieties. After adding lint and seed value, total value/acre for varieties ranged from a low of \$585.26 to a high of \$880.38. When subtracting ginning and seed and technology fees, the net value/acre for varieties ranged from a low of \$464.78 to high of \$722.17, a difference of \$257.39. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. It should be noted that inclement weather was encountered with high intensity rainfall and high wind events in this trial during the growing season and prior to harvest. Picker type varieties did experience some preharvest losses due to these weather conditions. Skips were also observed in some varieties. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Acknowledgments: Appreciation is expressed to Doug Nesmith, Farm Research Manager - Texas A&M Research Center, Halfway, TX; Danny Carmichael, Research Associate - AG-CARES, Lamesa, TX; Jim Bordovsky, Research Agricultural Engineer-Irrigation, Texas A&M Research Center, Halfway, TX; John Everitt, Research Assistant, and Dr. John Gannaway, Texas Agricultural Experiment Station, Lubbock, TX, for their assistance.

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Table 1. Harvest results from the LEPA irrigated replicated cotton variety demonstration, Helms Farm, Halfway, TX 2003.

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/tech fee	Net value
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
ST 4892BR	27.6	40.4	5254	1363	2107	0.5488	748.69	131.69	880.38	118.22	39.98	722.17 a
ST 5303R	28.7	42.0	4914	1321	2037	0.5530	730.98	127.33	858.32	110.57	28.06	719.68 a
BCG 28R	27.2	43.0	4681	1224	2082	0.5415	663.00	130.12	793.12	105.33	23.60	664.19 ab
FM 960BR	29.0	41.7	4826	1240	1919	0.5576	691.50	119.97	811.47	108.59	43.12	659.75 ab
PM 2326RR	25.5	43.2	4604	1216	1893	0.5423	660.30	118.30	778.61	103.60	17.05	657.95 ab
DP 5415RR	24.3	39.9	4644	1195	2006	0.5460	653.23	125.41	778.65	104.49	24.69	649.47 ab
FM 819RR	27.2	39.4	4431	1109	1768	0.5598	620.93	110.51	731.44	99.69	24.73	607.02 b
AFD 3511R	23.8	45.2	4465	1065	1967	0.5573	594.03	122.92	716.95	100.47	18.10	598.38 b
DPX03X177R (491RP)	23.0	38.4	4257	947	1608	0.5115	484.73	100.53	585.26	95.79	24.69	464.78 c
Test average	26.3	41.5	4675	1187	1932	0.5464	649.71	120.75	770.47	105.19	27.11	638.15
CV, %	5.6	4.4	6.4	6.4	6.4	2.2	7.5	6.4	7.3	6.4	--	7.8
OSL	0.0007	0.0090	0.0321	0.0002	0.0031	0.0055	0.0003	0.0031	0.0005	0.0322	--	0.0004
LSD 0.05	2.6	3.2	518	133	215	0.021	84.90	13.41	97.85	11.66	--	86.60

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation, LSD - least significant difference.

OSL - observed significance level, or probability of a greater F value.

Note: some columns may not add up due to rounding error.

Assumes:

\$2.25/cwt ginning cost.

\$125/ton for seed.

Value for lint based on CCC loan value from grab samples and ITC HVI results.

Table 2. HVI fiber property results results from the LEPA irrigated replicated cotton variety demonstration, Helms Farm, Halfway, TX 2003.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 3511R	4.0	35.2	82.2	30.0	6.0	1.0	78.3	7.8	3.0	1.0
BCG 28R	3.6	34.9	80.9	27.9	5.5	1.0	79.4	7.8	2.6	1.0
DPX03X177R (491RP)	3.1	36.0	81.7	30.7	6.0	1.3	78.8	8.0	2.6	1.0
DP 5415RR	3.6	35.5	81.4	28.8	7.0	1.0	81.2	7.4	2.0	1.0
FM 819RR	3.8	36.0	82.8	29.5	5.9	1.0	80.4	6.6	3.0	1.0
FM 960BR	4.2	34.8	82.9	32.2	4.5	1.0	79.3	6.9	3.0	1.0
PM 2326RR	4.3	34.1	83.6	29.9	6.9	1.0	78.0	7.4	3.3	1.0
ST 4892BR	4.1	34.4	82.6	28.4	6.2	1.0	78.1	8.2	2.6	1.0
ST 5303R	4.2	34.3	82.8	30.3	5.6	1.0	79.6	7.7	2.6	1.0
Test average	3.9	35.0	82.3	29.7	6.0	1.0	79.2	7.5	2.7	1.0
CV, %	5.2	1.6	0.8	2.5	3.1	18.5	0.7	3.3	15.8	--
OSL	<0.0001	0.0048	0.0027	0.0001	<0.0001	0.4726	<0.0001	<0.0001	0.0926	--
LSD 0.05	0.4	1.0	1.1	1.3	0.3	NS	1.0	0.4	NS	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference.