



**Replicated Transgenic Cotton Variety Demonstration
Under LEPA Irrigation, AG-CARES, Lamesa, TX - 2006**

**Cooperators: Lamesa Cotton Growers/Texas Agricultural
Experiment Station/Texas Cooperative Extension**

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Summary: Significant differences were noted for most parameters measured (Tables 1 and 2). Lint turnout ranged from 32.8% for PhytoGen 485WRF, to 35.9% for FiberMax 9058F. Lint yields varied from a low of 1048 lb/acre (Beltwide Cotton Genetics 4630B2F) to a high of 1249 lb/acre (Stoneville 4554B2RF). Lint loan values ranged from a low of \$0.5058/lb to a high of \$0.5703/lb for PhytoGen 485WRF and FiberMax 9068F, respectively. Net value ranged from a high of \$648.24 (FiberMax 9058F) to a low of \$500.92 (Deltapine 117B2RF), a difference of \$147.32. Micronaire ranged from a low of 4.3 for Deltapine 147RF to a high of 5.1 for Stoneville 4554B2RF. Staple length averaged 34.9 across all varieties with a low of 33.5, for Stoneville 4554B2RF and All-Tex Summit B2RF, and a high of 36.3 for FiberMax 9063B2F. Percent uniformity ranged from a low of 80.3 (Deltapine 143B2RF) to a high of 82.8 (PhytoGen 485WRF). A test average strength of 28.0 g/tex was observed with All-Tex Summit B2RF producing the lowest value (25.7), and FiberMax 9063B2F producing the highest (30.5). These data indicate that substantial differences can be obtained in terms of gross value/acre due to variety and technology selection.

Objective: The objective of this project was to compare yield, gin turnout, and fiber quality of transgenic Roundup Ready Flex, and Widestrike or Bollgard II/Roundup Ready Flex “stacked” gene varieties under LEPA irrigation.

Materials and Methods:

Varieties: All-Tex Summit B2RF, All-Tex Apex B2RF, Deltapine 117B2RF, Deltapine 143B2RF, Stoneville 4554B2RF, FiberMax 9058F, FiberMax 9068F, Beltwide Cotton Genetics 3255B2RF, FiberMax 9063B2F, Deltapine 147RF, Stoneville 4700B2RF, Beltwide Cotton Genetics 4630B2F, and PhytoGen 485WRF.

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.0 seeds/row-ft in 40-inch row spacing (John Deere Max Emerge vacuum planter)

Plot size: 4 rows by variable length due to circular pivot rows (357-872 ft long).

Planting date: 3-May

Weed management: Trifluralin was applied preplant incorporated at 1.25 pt/acre across all varieties on 7-April. A preemergence application of glyphosate was made on 11-May at 48 oz/acre to control volunteer peanuts. Two over-the-top applications of Roundup Original Max at 32 oz/acre with ammonium sulfate (17lb/100 gallons of spray mix) were applied on 3-June and 12-July.

Irrigation: LEPA irrigation

April: 2.25"	May: 1.10"	June: 4.50"
July: 4.50"	Aug: 3.60"	Sept: 0.00"
Total irrigation:	15.95"	

Rainfall:

April: 0.60"	May: 0.50"	June: 0.50"
July: 0.30"	Aug: 3.50"	Sept: 3.75"
Total rainfall:	9.15"	
<u>Total moisture:</u>	<u>25.10"</u>	

Insecticides: Temik was applied in-furrow at planting at 3.5 lb/acre. No other insecticides were applied at this site. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: Preplant fertilizer consisting of 10-34-0 was applied at a rate of 100 lb/acre on 12-April. An additional 120 lb N/acre using 32-0-0 was fertigated in four 30 lb N/acre increments during the growing season.

Harvest aids: An application of 1.5 pt/a Boll'd (6-lb ethephon/gal) plus 6.0 oz/a Ginstar EC was applied via ground rig at 70 percent open bolls on 29-September. A follow-up application of Gramoxone Max at 16 oz/acre plus 1.5 oz/acre ET with 1% crop oil was aerially applied on 13-October.

Harvest: Plots were stripper harvested on 6-November using a commercial John Deere 7445 with field cleaner. Harvested material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin turnout:	Grab samples were taken by plot and ginned at the Texas A&M University Agricultural Research and Extension Center at Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the International Textile Center at Texas Tech University for HVI analysis, and Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.
Ginning cost and seed values:	Ginning costs were based on \$2.45 per cwt. of bur cotton and seed value/acre was based on \$125/ton of seed. Ginning costs did not include checkoff.
Seed and technology cost:	Seed and technology costs were calculated using the appropriate seeding rate (seed/row-ft) for the row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet with Monsanto Cap Cost Thresholds. available at: http://www.plainscotton.org/Seed/seedindex.html

Results and Discussion:

Significant differences were noted for most parameters measured at this location (Tables 1 and 2). Lint turnout ranged from a low of 32.8% for PhytoGen 485WRF to a high of 35.9% for FiberMax 9058F. Lint yields varied from a low of 1048 lb/acre for Beltwide Cotton Genetics (BCG) 4630B2F to a high of 1249 lb/acre for Stoneville 4554B2RF. Lint loan values ranged from a low of \$0.5058/lb to a high of \$0.5703/lb for PhytoGen 485WRF and FiberMax 9068F, respectively. FiberMax 9058F had the highest lint value of \$672.40/acre and the lowest value of \$538.88 was observed for PhytoGen 485WRF. When adding lint and seed values, total values ranged from a high of \$771.63/acre for FiberMax 9058F to a low of \$633.83/acre for Deltapine 117B2RF. After subtracting ginning cost (based on \$2.45/cwt bur cotton) and seed/technology cost, net value per acre ranged from a high of \$648.24 (FiberMax 9058F) to a low of \$500.92 (Deltapine 117B2RF), a difference of \$147.32. Two Roundup Ready Flex varieties and two Bollgard II/Roundup Ready Flex "stacked" gene varieties were in the statistical upper-tier. Micronaire values ranged from a low of 4.3 for Deltapine 147RF to a high of 5.1 for Stoneville 4554B2RF. Staple length averaged 34.9 across all varieties with a low of 33.5, for Stoneville 4554B2RF and All-Tex Summit B2RF, and a high of 36.3 for FiberMax 9063B2F. Percent uniformity ranged from a low of 80.3 (Deltapine 143B2RF) to a high of 82.8 (PhytoGen 485WRF). A test average strength of 28.0 g/tex was observed with All-Tex Summit B2RF producing the lowest value (25.7), and FiberMax 9063B2F producing the highest (30.5). Elongation averaged 6.8% with a high of 8.3% (Stoneville 4554B2RF) and a low of 5.5% (FiberMax 9058F). Leaf grades were lowest for FiberMax 9058F and 9068F, All-Tex Apex B2RF, and BCG 3255B2F (3.0) and highest for PhytoGen 485WRF (5.0). These data indicate that substantial differences can be obtained in terms of gross value/acre due to variety and technology selection. It should be noted that no inclement weather was encountered at this location prior to harvest. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Acknowledgments:

Appreciation is expressed to Danny Carmichael, Research Associate - AG-CARES, Lamesa; and John Everitt, Research Associate - Texas Agricultural Experiment Station (TAES), Lubbock, for their assistance with this project. Further assistance with this project was provided by Dr. John Gannaway - TAES, Lubbock, and Dr. Eric Hequet - Associate Director, International Textile Center, Texas Tech University.

Disclaimer Clause:

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Table 1. Harvest results from the irrigated replicated transgenic cotton variety demonstration, AG-CARES, Lamesa, TX, 2006.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
FiberMax 9058F	35.9	47.9	3315	1190	1588	0.5648	672.40	99.23	771.63	81.21	42.18	648.24 a
Deltapine 143B2RF	34.8	49.5	3484	1213	1726	0.5450	661.03	107.86	768.89	85.37	57.13	626.39 ab
FiberMax 9068F	35.1	49.0	3174	1115	1555	0.5703	635.96	97.19	733.15	77.76	44.31	611.08 abc
Stoneville 4554B2RF	35.3	47.6	3541	1249	1687	0.5072	633.65	105.44	739.09	86.76	55.68	596.65 abcd
Beltwide Cotton Genetics 3255B2F	33.1	48.6	3436	1136	1671	0.5365	609.54	104.45	713.99	84.17	54.90	574.91 bcde
All-Tex Apex B2RF	33.8	47.2	3234	1093	1527	0.5595	610.92	95.43	706.36	79.24	55.91	571.20 bcdef
FiberMax 9063B2F	34.0	48.9	3207	1091	1566	0.5500	599.88	97.88	697.76	78.56	51.80	567.40 bcdef
Deltapine 147RF	35.0	48.6	3065	1071	1489	0.5457	584.84	93.07	677.90	75.10	47.68	555.12 bcdef
Stoneville 4700B2RF	32.9	48.5	3273	1076	1589	0.5427	584.07	99.27	683.34	80.17	55.68	547.49 cdef
Beltwide Cotton Genetics 4630B2F	34.0	48.7	3084	1048	1499	0.5492	575.27	93.72	668.99	75.56	54.90	538.54 cdef
All-Tex Summit B2RF	34.1	49.9	3236	1103	1612	0.5170	571.01	100.76	671.77	79.28	56.96	535.52 def
PhytoGen 485WRF	32.8	49.0	3249	1066	1593	0.5058	538.88	99.55	638.42	79.59	54.09	504.74 ef
Deltapine 117B2RF	34.3	46.5	3093	1061	1439	0.5122	543.89	89.94	633.83	75.78	57.13	500.92 f
Test average	34.2	48.5	3261	1116	1580	0.5389	601.64	98.75	700.39	79.89	52.95	567.55
CV, %	1.9	1.5	6.1	6.3	6.3	1.6	6.9	6.3	6.8	6.1	--	7.6
OSL	<0.0001	0.0005	0.1216	0.0325	0.0680	<0.0001	0.0123	0.0680	0.0238	0.1213	--	0.0079
LSD	1.1	1.2	NS	119	139 [†]	0.0147	70.43	8.71 [†]	80.51	NS	--	72.81

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.

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

LSD - least significant difference at the 0.05 level, [†] denotes LSD at the 0.10 level, NS - nonsignificant.

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

Assumes:

\$2.45/cwt ginning cost.

\$125/ton for seed.

Value for lint based on CCC loan value from grab samples and ITC HVI results. Color grades set at 31.

Table 2. HVI fiber property results from the irrigated replicated transgenic cotton variety demonstration, AG-CARES, Lamesa, TX, 2006.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf
	units	32 ^{nds} inches	%	g/tex	%	grade
FiberMax 9058F	4.6	35.4	80.8	28.0	5.5	3.0
Deltapine 143B2RF	4.5	35.7	80.3	27.9	6.7	4.0
FiberMax 9068F	4.6	36.1	81.8	29.9	6.0	3.0
Stoneville 4554B2RF	5.1	33.5	81.9	29.1	8.3	3.7
Beltwide Cotton Genetics 3255B2F	4.6	34.0	82.4	25.8	7.3	3.0
All-Tex Apex B2RF	4.7	35.1	82.2	26.9	6.8	3.0
FiberMax 9063B2F	4.6	36.3	81.6	30.5	6.1	4.0
Deltapine 147RF	4.3	35.5	80.9	27.6	5.8	4.0
Stoneville 4700B2RF	4.6	35.1	82.7	26.7	7.2	4.0
Beltwide Cotton Genetics 4630B2F	4.7	35.5	82.1	26.3	7.0	3.7
All-Tex Summit B2RF	4.8	33.5	82.3	25.7	7.1	3.3
PhytoGen 485WRF	4.9	34.1	82.8	29.2	8.2	5.0
Deltapine 117B2RF	4.6	33.9	81.3	29.9	6.5	4.7
Test average	4.6	34.9	81.8	28.0	6.8	3.7
CV, %	1.7	1.5	0.8	3.2	3.7	8.6
OSL	<0.0001	<0.0001	0.0029	<0.0001	<0.0001	<0.0001
LSD	0.1	0.9	1.2	1.5	0.4	0.5

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level.