Replicated Irrigated Cotton Variety Demonstration,
Brownfield, TX - 2006

Cooperator: Geoff Cooper

Chris Bishop, Scott Russell, Randy Boman, Aaron Alexander, and Mark Kelley;
CEA-AG/NR Terry County, EA-IPM Terry/Yoakum Counties,
Extension Agronomist-Cotton, Graduate Student Assistant,
and Extension Program Specialist-Cotton

Terry County

Summary: Significant differences were noted for most characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 30.6% (PhytoGen 125 RF) to a high of 36.8% (Deltapine 147 RF). Lint yields averaged 1483 lb/acre with a low of 1177 lb/acre (PhytoGen 125RF) and a high of 1656 lb/acre (Stoneville 4554B2RF). Lint loan values varied from a low of $0.5300/lb (Deltapine 113B2RF) to a high of $0.5760/lb (FiberMax 9060F). After adding lint and seed value, total value/acre ranged from a low of $770.30 (PhytoGen 125RF) to a high of $1072.78 (FiberMax 989B2R). When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of $910.40 (FiberMax 989B2R) to a low of $631.50 (PhytoGen 125RF), a difference of $278.90. Significant differences were observed among varieties for all fiber quality parameters measured. 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 yield, gin turnout, and fiber quality of transgenic cotton varieties.

Materials and Methods:

Variety:	All-Tex Summit B2RF, Americot 1532B2RF, Deltapine 113B2RF, Deltapine 147RF, Dyna-Gro 2100B2RF, FiberMax 9060F, FiberMax 989B2R, PhytoGen 125RF, PhytoGen 485WRF, Stoneville 4554B2RF, and Stoneville NexGen 3550RF.
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	4.0 seed per row-ft in 40-inch row spacings (John Deere Max Emerge vacuum planter)
Plot size:	8 rows by variable length due to circular pivot (770-1470 feet long)

Planting date:	8-May
Weed management:	Trifluralin was applied preplant incorporated at 1 on 15-March. A banded application of trifluralin at 8.0 oz/acre, Caparol at 3.3 oz/acre, and 0.2 oz/acre of Staple was made at planting. One over-the-top application of Roundup Original Max (26 oz/acre) with ammonium sulfate (17 lbs/100 gallons spray solution) was made prior to 4th true leaf stage. A post-directed application of 26 oz/a Roundup Original Max with ammonium sulfate at 17 lb/100 gallons spray solution was made on 26-June. Also, 2.0 pt/acre LayBy Pro was applied post-direct in late July.
Rainfall and Irrigation:	According to personal communication with cooperator, 9.55 inches of rainfall accumulated during the summer and 9.20 inches of irrigation were applied during the growing season for a total of 18.75 inches.
Insecticides:	Temik was applied at planting at 2 lbs/acre. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer management:	150 lb/acre 8-24-4 liquid fertilizer (12 lb N, 32 lb P_2O_5, and 6 lb K_2O/acre) was applied pre-plant and 100 lb/acre 20-0-0-5 was applied via fertigation during the growing season.
Harvest aids:	Prep at 1 qt/acre plus ET at 1.5 oz/acre with 1 pt/acre crop oil concentrate was applied on 4-October. On 18-October, a sequential application of 1 pt/acre Gramoxone Inteon with a non-ionic surfactant was made.
Harvest:	Plots were harvested on 24-October using a commercial John Deere 7455 stripper with field cleaner. Harvested material was dumped into a weigh wagon with integral digital 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 characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 30.6% (PhytoGen 125 RF) to a high of 36.8% (Deltapine 147 RF). Lint yields averaged 1483 lb/acre with a low of 1177 lb/acre (PhytoGen 125RF) and a high of 1656 lb/acre (Stoneville 4554B2RF). Lint loan values varied from a low of $0.5300/lb (Deltapine 113B2RF) to a high of $0.5760/lb (FiberMax 9060F). After adding lint and seed value, total value/acre ranged from a low of $770.30 (PhytoGen 125RF) to a high of $1072.78 (FiberMax 989B2R). When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of $910.40 (FiberMax 989B2R) to a low of $631.50 (PhytoGen 125RF), a difference of $278.90. Six of the ten varieties produced statistically similar net values/acre. Of the six, one contained Bollgard II/Roundup Ready technology, two were Bollgard II/Roundup Ready Flex types, one was Widestrike/Roundup Ready Flex and two were Roundup Ready Flex only types. Micronaire values ranged from a low of 3.8 for Deltapine 113B2RF to a high of 4.5 for Stoneville 4554B2RF. Staple averaged 36.7 across all varieties with a low of 35.1 for PhytoGen 125RF and a high of 38.5 for FiberMax 9060F. Uniformity was highest for PhytoGen 485WRF (84.1%) and lowest for Stoneville NexGen 3550RF (81.6%). A test average strength of 28.5 g/tex was observed with a high of 32.1 g/tex (FiberMax 989B2R) and a low of 26.0 g/tex (Americot 1532B2RF). Percent elongation values ranged from a high of 8.6 to a low of 5.4 for PhytoGen 485WRF and FiberMax 9060F, respectively. The highest average leaf grade (5.0) was observed for Deltapine 113B2RF and the lowest (3.0) for FiberMax 9060F. Test averages for reflectance (Rd) and yellowness (+b) were 78.9 and 7.2, respectively. Color grades were mostly 31's at this location. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. No inclement weather was encountered at this location to cause significant preharvest lint losses from looser picker type varieties. Additional multi-site and multi-year applied research is needed to evaluate varieties and technologies across a series of dryland environments.

Acknowledgments:

Appreciation is expressed to Geoff Cooper for the use of his land, equipment and labor for 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:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the irrigated replicated transgenic cotton variety demonstration, Geoff Cooper Farm, Brownfield, 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 989B2R	33.4	52.8	4760	1594	2515	0.5738	915.61	157.17	1072.78	116.62	45.76	910.40	a
FiberMax 9060F	35.5	49.6	4441	1575	2204	0.5760	907.14	137.74	1044.87	108.81	42.18	893.88	a
Stoneville 4554B2RF	34.5	49.3	4800	1656	2365	0.5487	908.65	147.83	1056.48	117.61	55.68	883.20	a
Deltapine 147RF	36.8	50.4	4373	1607	2203	0.5442	874.72	137.67	1012.38	107.14	47.68	857.56	ab
Americot 1532B2RF	33.7	50.4	4587	1547	2313	0.5632	871.50	144.54	1016.04	112.39	52.42	851.23	abc
PhytoGen 485WRF	33.7	52.0	4672	1576	2428	0.5428	855.68	151.78	1007.46	114.48	54.09	838.90	abc
All-Tex Summit B2RF	33.4	52.4	4336	1450	2270	0.5668	821.64	141.88	963.53	106.23	56.96	800.34	bc
Dyna-Gro 2100B2RF	33.4	51.5	4289	1432	2207	0.5623	805.26	137.89	943.15	105.08	56.09	781.98	c
Stoneville NexGen 3550RF	33.7	52.4	4225	1424	2214	0.5490	781.58	138.34	919.93	103.52	39.95	776.46	c
Deltapine 113B2RF	33.7	50.2	3801	1280	1909	0.5300	678.25	119.30	797.55	93.10	57.13	647.32	d
PhytoGen 125RF	30.6	54.3	3849	1177	2087	0.5438	639.84	130.46	770.30	94.29	44.50	631.50	d
Test average	33.9	51.4	4376	1483	2247	0.5546	823.62	140.42	964.04	107.21	50.22	806.61	
CV, %	3.0	1.6	3.8	3.9	3.5	1.9	5.1	3.5	4.8	3.8	--	5.5	
OSL	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD	1.8	1.4	281	100	134	0.0181	72.42	8.35	79.00	6.87	--	75.22	

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.
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.

Table 2. HVI fiber property results from the irrigated replicated transgenic cotton variety demonstration, Geoff Cooper Farm, Brownfield, TX, 2006.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
FiberMax 989B2R	4.1	37.9	83.5	32.1	5.7	3.3	79.8	7.2	3	1
FiberMax 9060F	4.2	38.5	82.6	29.8	5.4	3.0	80.8	6.9	3	1
Stoneville 4554B2RF	4.5	36.4	82.6	28.0	8.4	4.0	78.0	7.8	3	1
Deltapine 147RF	4.1	38.0	82.3	29.0	5.9	4.3	78.7	7.0	3	1
Americot 1532B2RF	4.3	37.6	82.7	26.0	6.9	3.3	80.5	7.5	3	1
PhytoGen 485WRF	4.4	36.5	84.1	28.8	8.6	4.3	76.6	7.3	3	1
All-Tex Summit B2RF	4.1	35.8	83.5	26.2	7.4	3.3	80.6	7.5	3	1
Dyna-Gro 2100B2RF	4.3	35.6	82.8	26.1	7.4	3.3	79.9	7.4	3	1
Stoneville NexGen 3550RF	4.2	35.7	81.6	27.8	7.3	4.0	79.1	7.0	3	1
Deltapine 113B2RF	3.8	36.5	82.2	31.0	6.0	5.0	76.9	7.1	3	1
PhytoGen 125RF	4.3	35.1	82.4	29.2	7.4	4.0	77.3	6.9	3	1
Test average	4.2	36.7	82.7	28.5	6.9	3.8	78.9	7.2	3.0	1.0
CV, %	2.5	0.8	0.5	3.1	4.0	11.4	0.9	2.7	--	--
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	--	--
LSD	0.2	0.5	0.7	1.5	0.5	0.7	1.2	0.3	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level.