



Replicated Irrigated Transgenic Variety Demonstration

Cooperator: Tommy Asher, Stratford, TX - 2004

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Summary: Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 19.3% to 24.4% for All-Tex ExcessRR and PM 2145RR, respectively. Lint yields varied with a low of 218 lb/acre (FM 960RR) and a high of 505 lb/acre (PM 2145RR). Lint loan values ranged from a low of \$0.3647/lb (PM 2145RR) to a high of \$0.4368/lb (ST 2448R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$108.39 for FM 960RR to a high of \$280.96 for PM 2280BG/RR. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$194.00 (PM 2280BG/RR) to a low of \$48.59 (FM 960RR), a difference of \$145.41. 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 transgenic varieties under irrigated production systems.

Materials and Methods:

Varieties: AFD 3511R, All-Tex Excess RR, Beltwide Cotton Genetics 50R, FiberMax 960RR, Paymaster 2280BG/RR, Paymaster 2145RR, Stoneville 1553R, and Stoneville 2448R

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.7 seed per row-ft in 30-inch row spacing (John Deere 1720 stacked vacuum planter)

Plot size: 6 rows by variable length of field (1541-1950 ft long).

Planting date: May 17

Weed management: Treflan was applied preplant incorporated at 3 pt/acre on May 1. Roundup Original herbicide was applied over-the-top on June 11 at a rate of 26 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix). A post-direct application with a hooded sprayer was performed on August 28 at a rate of 28 oz/acre with ammonium sulfate (17lbs/100 gallons of spray mix).

Rainfall and Irrigation: 1.5 inches of preplant irrigation was applied and 7 inches of water was applied during the growing season for a total of 8.5 inches. Above normal rainfall was encountered at this site.

Insecticides: Orthene was applied at 4 oz/acre on May 27, June 11, and July 26. No other insecticides were applied at this site.

Fertilizer management: 52 lbs of nitrogen using 32-0-0 liquid fertilizer was applied in season via fertigation.

Plant growth regulator: Pentia was applied at 8 oz/acre on July 6 and July 26, and at 10 oz/acre on August 2.

Harvest aids: Finish 6 at 42 oz/acre + Aim at 1 oz/acre was applied on October 2.

Harvest: Plots were harvested on December 14 using a commercial John Deere 7455 with field cleaner bypassed. 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 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 USDA loan values were determined for each variety by plot.

Ginning costs and seed values: Ginning costs were based on \$2.25 per cwt. of bur cotton and seed value/acre was based on \$125/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology fees were determined by variety per acre using manufacturer's suggested retail price for seed and appropriate technology fee for Bollgard and/or Roundup Ready based on 3.7 seed per row-ft.

Results and Discussion:

Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 19.3% to 24.4% for All-Tex ExcessRR and PM 2145RR, respectively. Lint yields varied with a low of 218 lb/acre (FM 960RR) and a high of 505 lb/acre (PM 2145RR). Lint loan values ranged from a low of \$0.3647/lb (PM 2145RR) to a high of \$0.4368/lb (ST 2448R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$108.39 for FM 960RR to a high of \$280.96 for PM 2280BG/RR. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$194.00 (PM 2280BG/RR) to a low of \$48.59 (FM 960RR), a difference of \$145.41. Staple length averaged 33.8 across all varieties with a low of 31.3 and a high of 35.1. Significant differences were observed among varieties for strength, leaf grade and uniformity, however, no significant differences were observed for reflectance (Rd), yellowness (+b), elongation or micronaire. 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 some inclement weather was encountered with low intensity rainfall and low wind events at this location prior to harvest. Picker type varieties experienced minimum preharvest losses. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgments: Appreciation is expressed to Tommy Asher for the use of his land, equipment and labor for this project.

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Table 1. Harvest results from the irrigated replicated transgenic cotton variety demonstration, Tommy Asher Farm, Stratford, TX 2004.

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	
PM 2280BG/RR	24.0	51.0	2079	498	1061	0.4313	214.67	66.29	280.96	46.77	40.19	194.00	a
ST 2448R	23.5	46.4	1990	468	923	0.4368	204.32	57.72	262.03	44.77	31.64	185.63	ab
PM 2145RR	24.4	46.7	2070	505	967	0.3647	184.09	60.41	244.50	46.58	24.60	173.32	bc
ST 1553R	24.1	49.1	1872	451	919	0.4080	183.83	57.44	241.27	42.11	31.64	167.52	c
AFD 3511R	20.8	49.5	1542	322	763	0.4135	132.96	47.70	180.66	34.69	24.80	121.17	d
BCG 50R	20.6	47.8	1710	352	817	0.3913	137.63	51.05	188.68	38.48	29.47	120.73	d
All Tex ExcessRR	19.3	45.3	1602	309	726	0.3845	118.78	45.36	164.15	36.04	22.84	105.27	d
FM 960RR	20.5	43.2	1064	218	459	0.3653	79.67	28.72	108.39	23.95	35.85	48.59	e
Test average	22.2	47.4	1741	390	829	0.3994	156.99	51.84	208.83	39.17	30.13	139.53	
CV, %	7.6	6.1	3.9	3.6	3.7	5.3	5.7	3.7	4.7	3.9	--	6.5	
OSL	0.0089	0.0913	<0.0001	<0.0001	<0.0001	0.0049	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD 0.05	2.9	NS	118	25	54	0.0373	15.65	3.39	17.24	2.65	--	15.91	

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, NS - not significant.

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 from the irrigated replicated transgenic cotton variety demonstration, Tommy Asher Farm, Stratford, TX 2004.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
PM 2280BG/RR	2.2	35.1	79.3	26.3	7.0	3.3	75.5	8.8	3.0	1.0
ST 2448R	2.1	34.8	79.9	28.0	7.5	3.0	79.5	9.1	2.0	1.0
PM 2145RR	2.3	31.3	78.6	25.2	6.7	4.0	76.1	8.9	2.7	1.3
ST 1553R	2.1	33.9	77.4	24.6	7.4	2.3	77.5	10.3	1.3	1.3
AFD 3511R	2.2	33.9	79.4	27.1	7.3	3.0	76.2	8.9	3.0	1.3
BCG 50R	2.1	32.9	78.6	25.8	8.4	2.7	74.7	9.6	2.7	1.3
All Tex ExcessRR	2.1	34.6	80.1	27.3	6.9	5.0	73.3	8.4	4.0	1.0
FM 960RR	2.0	33.8	75.9	21.4	6.0	4.3	75.1	8.4	3.3	1.0
Test average	2.1	33.8	78.7	25.7	7.1	3.5	76.0	9.1	2.8	1.2
CV, %	5.1	2.8	0.9	5.1	12.8	16.5	3.3	9.7	--	--
OSL	0.1675	0.0049	<0.0001	0.0007	0.1900	0.0007	0.1876	0.2201	--	--
LSD 0.05	NS	1.7	1.3	2.3	NS	1.0	NS	NS	--	--

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level, NS - not significant.

Table 3. Seed and technology expenses* for the irrigated replicated transgenic cotton variety demonstration, Tommy Asher Farm, Stratford, TX 2004.

Variety	Seed/lb	Seed/bag	Acres planted /bag	Seed fee \$/bag	Tech fee \$/bag	Total seed and tech fee \$/bag	Seed and tech fee \$/acre
PM 2280BG/RR	4500	250,000	3.91	55.00	102.00	157.00	40.19
ST 2448R	4460	230,000	3.59	75.90	37.80	113.70	31.64
PM 2145RR	4400	250,000	3.91	55.00	41.10	96.10	24.60
ST 1553R	4370	230,000	3.59	75.90	37.80	113.70	31.64
AFD 3511R	4500	225,000	3.52	49.40	37.80	87.20	24.80
BCG 50R	4248	212,400	3.32	60.00	37.80	97.80	29.47
All Tex ExcessRR	4500	225,000	3.52	42.50	37.80	80.30	22.84
FM 960RR	4400	220,000	3.44	72.95	50.30	123.25	35.85

*Trial was planted at 64000 seed/acre in 30-inch rows (3.7 seed/row ft).