



## Replicated Irrigated Transgenic Variety Demonstration

Cooperator: Keith Watson, Dumas, TX - 2004

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### Moore County

**Summary:** Significant differences were observed for all parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 21.9% to 30.2% for BCG 28R and ST 4892BR, respectively. Lint yields varied with a low of 531 lb/acre (DP 449BG/RR) and a high of 1090 lb/acre (ST 1553R). Lint loan values ranged from a low of \$0.3700/lb (BCG 28R) to a high of \$0.4973/lb (ST 2448R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$280.67 for DP 449BG/RR to a high of \$660.25 for ST 2448R. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$534.75 (ST 2448R) to a low of \$162.34 (DP 449BG/RR), a difference of \$372.41. 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, AFD 3602R, All-Tex Excess RR, Beltwide Cotton Genetics 28R, Deltapine 434RR, Deltapine 444BG/RR, Deltapine 449BG/RR, FiberMax 960RR, FiberMax 960BR, FiberMax 989RR, Paymaster 1199RR, Paymaster 2280BG/RR, Paymaster 2145RR, Stoneville 1553R, Stoneville 2448R, and Stoneville 4892BR

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.4 seed per row-ft in 30-inch row spacing (John Deere 7000)

MaxEmerge)

Plot size: 6 rows by variable length of field (778-1083 ft long).

Planting date: May 5

Weed management: Treflan was applied preplant incorporated at 3 pt/acre on March 15. Roundup Original Max herbicide was applied over-the-top on June 11 at a rate of 20 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix). A blanket cultivation was conducted on June 15. A post-directed application using a hooded sprayer at a rate of 20 oz/acre with ammonium sulfate (17lbs/100 gallons of spray mix) was performed on July 6.

Rainfall and Irrigation: 3 inches of preplant irrigation was applied, and 14 inches of irrigation was applied during the growing season for a total of 17 inches.

Insecticides: Temik was applied at planting at 4.0 lbs/acre. No other insecticides were applied at this site.

Fertilizer management: 90 lbs of nitrogen using 32-0-0 liquid fertilizer was applied in season via fertigation.

Mepiquat Chloride: Pix was applied at a rate of 32 oz/acre on August 10.

Harvest aids: Prep at 1 qt/acre was applied on October 11.

Harvest: Plots were harvested on December 20 using a commercial John Deere 7460 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 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 4.4 seed per row-ft.

## Results and

**Discussion:**

Significant differences were observed for all parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 21.9% to 30.2% for BCG 28R and ST 4892BR, respectively. Lint yields varied with a low of 531 lb/acre (DP 449BG/RR) and a high of 1090 lb/acre (ST 1553R). Lint loan values ranged from a low of \$0.3700/lb (BCG 28R) to a high of \$0.4973/lb (ST 2448R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$280.67 for DP 449BG/RR to a high of \$660.25 for ST 2448R. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$534.75 (ST 2448R) to a low of \$162.34 (DP 449BG/RR), a difference of \$372.41. Micronaire values ranged from a low of 2.2 for BCG 28R and DP 449BG/RR to a high of 3.1 for ST 2448R. Staple length averaged 33.7 across all varieties with a low of 31.8 and a high of 34.9. Significant differences were observed among varieties for strength, elongation, uniformity, leaf grade, reflectance (Rd) or yellowness (+b). 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 Keith Watson 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, Keith Watson Farm, Dumas, 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
ST 2448R	27.9	51.3	3894	1086	1999	0.4973	535.30	124.95	660.25	87.61	37.90	534.75 a
ST 1553R	27.2	51.8	4012	1090	2077	0.4708	513.24	129.82	643.05	90.27	37.90	514.88 a
PM 2145RR	25.5	51.0	4100	1046	2092	0.4122	429.67	130.73	560.41	92.25	29.47	438.68 b
PM 2280BG/RR	24.7	53.2	3878	958	2065	0.4068	388.97	129.08	518.05	87.26	48.15	382.64 c
AFD 3511R	24.9	54.7	3188	794	1743	0.4500	358.54	108.95	467.49	71.73	29.71	366.05 cd
PM 1199RR	26.8	49.6	3205	861	1589	0.4230	367.87	99.30	467.17	72.11	39.77	355.29 cde
AFD 3602R	27.2	51.5	3127	851	1608	0.4135	349.63	100.52	450.15	70.35	35.21	344.58 cde
All-Tex ExcessRR	23.4	50.4	3319	777	1673	0.4220	331.68	104.56	436.24	74.67	27.36	334.21 def
DP 444BG/RR	27.8	47.7	3328	926	1587	0.3965	367.22	99.16	466.38	74.89	67.13	324.36 def
FM 960RR	28.5	49.5	2907	828	1438	0.4047	336.01	89.87	425.88	65.41	42.95	317.52 fe
DP 434RR	28.0	47.3	2819	790	1334	0.4340	342.42	83.39	425.81	63.43	47.44	314.94 fe
ST 4892BR	30.2	48.8	2837	856	1384	0.3927	333.63	86.52	420.15	63.84	62.53	293.78 fg
FM 989RR	27.4	47.9	2729	746	1307	0.3853	287.18	81.68	368.85	61.40	41.09	266.36 g
FM 960BR	25.1	49.2	2836	713	1394	0.4043	287.72	87.13	374.85	63.82	62.64	248.39 g
BCG 28R	21.9	48.7	2588	567	1262	0.3700	210.41	78.84	289.25	58.23	35.02	196.01 h
DP 449BG/RR	23.3	49.1	2276	531	1118	0.3950	210.79	69.87	280.67	51.21	67.13	162.34 h
Test average	26.2	50.1	3190	839	1604	0.4174	353.14	100.27	453.42	71.78	44.46	337.17
CV, %	9.1	3.9	7.5	7.6	7.7	8.5	7.6	7.7	6.8	7.5	--	8.3
OSL	0.0139	0.0026	<0.0001	<0.0001	<0.0001	0.0153	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD 0.05	4.0	3.2	400	106	207	0.0594	44.87	12.94	51.77	9.01	--	46.79

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, Keith Watson Farm, Dumas, TX 2004.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 <sup>nds</sup> inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
ST 2448R	3.1	33.7	80.7	29.0	7.7	1.7	79.9	8.3	2.3	1.0
ST 1553R	2.6	34.9	80.2	27.6	7.1	1.7	76.5	8.9	2.7	1.0
PM 2145RR	2.7	31.8	78.3	26.3	8.4	2.7	72.6	9.2	3.3	1.3
PM 2280BG/RR	2.4	34.9	80.1	28.1	7.9	1.7	71.0	10.8	3.0	2.3
AFD 3511R	2.9	33.2	80.2	27.8	7.4	2.3	73.3	9.0	3.3	1.3
PM 1199RR	2.7	34.6	80.8	26.0	8.5	2.3	70.2	10.4	3.3	2.3
AFD 3602R	2.6	33.3	79.3	27.1	7.3	1.3	73.6	10.2	3.0	2.0
All-Tex ExcessRR	2.6	34.4	80.0	28.5	7.9	3.7	71.3	10.0	3.3	1.7
DP 444BG/RR	2.3	33.9	79.3	26.2	8.3	1.7	72.7	9.9	3.0	2.0
FM 960RR	2.3	34.0	78.8	27.3	6.8	1.7	72.9	10.7	2.7	2.3
DP 434RR	2.7	33.7	78.1	24.7	9.6	2.0	75.3	8.9	3.3	1.0
ST 4892BR	2.6	32.0	78.8	25.8	8.6	2.0	69.2	10.8	3.3	2.7
FM 989RR	2.4	33.1	78.6	26.7	7.9	1.3	71.8	10.8	3.0	2.3
FM 960BR	2.5	34.3	78.9	27.1	6.4	2.0	71.7	10.0	3.3	2.0
BCG 28R	2.2	34.1	76.9	24.0	7.2	2.0	70.4	11.4	3.0	3.0
DP 449BG/RR	2.2	33.7	78.4	26.4	7.3	1.7	74.4	10.9	2.0	2.0
Test average	2.5	33.7	79.2	26.8	7.8	2.0	72.9	10.0	3.0	1.9
CV, %	9.8	2.7	1.3	4.1	8.1	35.7	3.0	9.8	--	--
OSL	0.0051	0.0071	0.0036	0.0003	0.0001	0.0514	0.0002	0.0142	--	--
LSD 0.05	0.4	1.5	1.7	1.8	1.0	1.2	3.6	1.6	--	--

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, Keith Watson Farm, Dumas, 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
AFD 3511R	4500	225,000	2.93	49.40	37.80	87.20	29.71
AFD 3602R	4450	222,500	2.90	64.40	37.80	102.20	35.21
All-Tex ExcessRR	4500	225,000	2.93	42.50	37.80	80.30	27.36
BCG 28R	5605	280,250	3.66	68.50	59.50	128.00	35.02
DP 434RR	4720	250,000	3.26	97.50	57.20	154.70	47.44
DP 444BG/RR	4720	250,000	3.26	97.50	121.40	218.90	67.13
DP 449BG/RR	5200	250,000	3.26	97.50	121.40	218.90	67.13
FM 960BR	4400	220,000	2.87	72.95	106.80	179.75	62.64
FM 960RR	4400	220,000	2.87	72.95	50.30	123.25	42.95
FM 989RR	4730	236,500	3.08	72.95	53.80	126.75	41.09
PM 1199RR	4700	250,000	3.26	72.50	57.20	129.70	39.77
PM 2145RR	4400	250,000	3.26	55.00	41.10	96.10	29.47
PM 2280BG/RR	4500	250,000	3.26	55.00	102.00	157.00	48.15
ST 1553R	4370	230,000	3.00	75.90	37.80	113.70	37.90
ST 2448R	4545	230,000	3.00	75.90	37.80	113.70	37.90
ST 4892BR	4600	230,000	3.00	75.90	111.70	187.60	62.53

\*Trial was planted at 76,665 seed/acre in 30-inch rows.