



Replicated Irrigated Roundup Ready Cotton Variety Demonstration, Dumas, TX - 2005

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Summary: Significant differences were observed for most parameters measured. Lint turnout ranged from a low of 26.8% to 29.9% for Paymaster 2280BG/RR and Stoneville NexGen 1553R, respectively. Lint yields varied with a low of 722 lb/acre (Deltapine 434RR) and a high of 1047 lb/acre (Stoneville NexGen 2448R). Lint loan values ranged from a low of \$0.4248/lb (Deltapine 434RR) to a high of \$0.5222/lb (Paymaster 2326RR). After adding lint and seed value, total value/acre for varieties ranged from a low of \$360.26 for Deltapine 434RR to a high of \$597.11 for Stoneville NexGen 2448R. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$472.88 (Stoneville NexGen 2448R) to a low of \$252.92 (Deltapine 434RR), a difference of \$219.96. Micronaire values ranged from a low of 2.6 for Stoneville NexGen 3969R to a high of 3.4 for Paymaster 2326RR. Staple length averaged 34.8 across all varieties with a low of 34.0 for Paymaster 2326RR and a high of 35.6 for Stoneville NexGen 1553R. Significant differences were observed among varieties for strength, elongation, uniformity, reflectance (Rd) and yellowness (+b). 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, Deltapine 434RR, Paymaster 2266RR, Paymaster 2326RR, Paymaster 2280BG/RR, Stoneville NexGen 1553R, Stoneville NexGen 2448R, and Stoneville NexGen 3969R

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.7 seed per row-ft in 30-inch row spacing (John Deere 7200 Max Emerge)
Plot size:	6 rows by variable length of circular pivot (~1000 ft long)
Planting date:	5-May
Weed management:	At planting, Diuron plus Caparol herbicides were applied in a band. Roundup Original Max was applied over-the-top on 1-July at a rate of 22 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix).
Rainfall and Irrigation:	9.2 inches of irrigation were applied during the growing season. Two hail events occurred on 22-May and 6-June which slightly damaged the project.
Insecticides:	Temik was applied in-furrow at planting at 4.0 lbs/acre. Mustang Max (plus crop oil) was applied on 1-September for bollworms at the recommend rate.
Fertilizer management:	90 lb nitrogen/acre using 32-0-0 liquid fertilizer were applied in increments during the season via fertigation.
Plant growth regulators:	Pix was applied at a rate of 12 oz/acre on 7-July, and another application of 24 oz/acre was made on 30-July.
Harvest aids:	Prep at 1 qt/acre was applied on 10-October.
Harvest:	Plots were harvested on 18-November using a commercial John Deere 7460 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 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 \$2.45 per cwt. of bur cotton and seed value/acre was based on \$100/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, Bollgard II and 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 26.8% to 29.9% for Paymaster 2280BG/RR and Stoneville NexGen 1553R, respectively. Lint yields varied with a low of 722 lb/acre (Deltapine 434RR) and a high of 1047 lb/acre (Stoneville NexGen 2448R). Lint loan values ranged from a low of \$0.4248/lb (Deltapine 434RR) to a high of \$0.5222/lb (Paymaster 2326RR). After adding lint and seed value, total value/acre for varieties ranged from a low of \$360.26 for Deltapine 434RR to a high of \$597.11 for Stoneville NexGen 2448R. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$472.88 (Stoneville NexGen 2448R) to a low of \$252.92 (Deltapine 434RR), a difference of \$219.96. Micronaire values ranged from a low of 2.6 for Stoneville NexGen 3969R to a high of 3.4 for Paymaster 2326RR. Staple length averaged 34.8 across all varieties with a low of 34.0 for Paymaster 2326RR and a high of 35.6 for Stoneville NexGen 1553R. Significant differences were observed among varieties for strength, elongation, uniformity, reflectance (Rd) and 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 no inclement weather was encountered at this location prior to harvest. 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, 2005.

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 cost	Net value
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
Stoneville NexGen 2448R	29.3	47.5	3569	1047	1694	0.4895	512.41	84.70	597.11	87.43	36.80	472.88 a
Stoneville NexGen 1553R	29.9	52.6	2922	874	1537	0.4945	432.50	76.86	509.36	71.59	36.80	400.97 b
Paymaster 2266RR	28.5	50.3	2983	852	1500	0.4683	398.66	75.01	473.67	73.09	33.40	367.18 bc
Paymaster 2326RR	28.1	50.0	2694	756	1348	0.5222	394.39	67.38	461.77	66.02	33.40	362.36 bc
Paymaster 2280BG/RR	26.8	50.0	2956	791	1477	0.5028	397.38	73.84	471.23	72.42	47.31	351.49 bc
AFD 3511RR	26.9	51.8	2794	751	1448	0.5032	377.21	72.41	449.63	68.45	33.33	347.85 c
Stoneville NexGen 3969R	28.5	48.6	2549	727	1238	0.4382	318.27	61.93	380.19	62.44	36.80	280.95 d
Deltapine 434RR	29.8	44.2	2420	722	1071	0.4248	306.73	53.53	360.26	59.28	48.06	252.92 d
Test average	28.5	49.4	2861	815	1414	0.4804	392.19	70.71	462.90	70.09	38.24	354.58
CV, %	6.9	5.3	8.4	8.1	8.5	4.0	7.5	8.5	7.5	8.4	--	8.3
OSL	0.4126	0.0346	0.0017	0.0005	0.0006	0.0002	<0.0001	0.0007	<0.0001	0.0016	--	<0.0001
LSD 0.05	NS	4.6	419	116	210	0.0334	51.39	10.52	60.75	10.26		51.64

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:

\$2.45/cwt ginning cost.

\$100/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, 2005.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Stoneville NexGen 2448R	2.8	34.6	81.8	30.4	6.0	1.7	76.9	9.6	2.3	1.3
Stoneville NexGen 1553R	2.7	35.6	80.6	29.6	6.5	1.0	77.4	9.8	1.7	1.3
Paymaster 2266RR	3.0	34.1	81.2	28.5	6.8	2.3	71.3	10.0	3.7	1.7
Paymaster 2326RR	3.4	34.0	82.3	30.3	6.3	2.0	75.4	9.8	2.3	1.3
Paymaster 2280BG/RR	2.8	35.2	81.4	30.0	5.9	2.0	75.5	9.6	2.7	1.0
AFD 3511RR	3.1	34.7	80.8	29.5	5.9	2.0	74.2	10.7	2.0	2.0
Stoneville NexGen 3969R	2.6	34.7	79.7	30.2	6.6	1.3	74.8	11.0	1.7	2.3
Deltapine 434RR	2.8	35.2	79.0	27.4	6.9	1.7	72.2	12.3	1.7	3.0
Test average	2.9	34.8	80.9	29.5	6.4	1.8	74.7	10.3	2.3	1.7
CV, %	3.3	1.0	0.7	3.4	5.2	29.2	1.9	5.5	--	--
OSL	<0.0001	0.0007	<0.0001	0.0290	0.0069	0.1138	0.0014	0.0006	--	--
LSD 0.05	0.2	0.6	1.0	1.7	0.6	NS	2.5	1.0	--	--

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, 2005.

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 3511RR	4,434	221,724	3.41	49.40	64.30	113.70	33.33
Deltapine 434RR	--	250,000	3.85	99.95	84.90	184.85	48.06
Paymaster 2266RR	--	250,000	3.85	56.95	71.50	128.45	33.40
PM 2280BG/RR	--	250,000	3.85	56.95	125.00	181.95	47.31
Paymaster 2326RR	--	250,000	3.85	56.95	71.50	128.45	33.40
Stoneville NexGen 1553R	--	230,000	3.54	64.40	65.80	130.20	36.80
Stoneville NexGen 2448R	--	230,000	3.54	64.40	65.80	130.20	36.80
Stoneville NexGen 3969R	--	230,000	3.54	64.40	65.80	130.20	36.80

*Trial was planted at 65,000 seed/acre in 30-inch rows.