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

Cooperator: Kerry Cartrite

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Summary: Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 25.9% to 31.4% for AFD 3511R and Paymaster 2167RR, respectively. Lint yields varied with a low of 1249 lb/acre (Paymaster 2280BG/RR) and a high of 1461 lb/acre (Paymaster 2326RR). Lint loan values ranged from a low of $0.4620/lb (Paymaster 2145RR) to a high of $0.5437/lb (Paymaster 2326RR). After adding lint and seed value, total value/acre for varieties ranged from a low of $749.33 for Paymaster 2280BG/RR to a high of $917.81 for Paymaster 2326RR. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $755.96 (Paymaster 2326RR) to a low of $582.03 (Paymaster 2280BG/RR), a difference of $173.93. Micronaire values ranged from a low of 2.9 for Stoneville NexGen 2448R and Paymaster 2280BG/RR to a high of 4.0 for Paymaster 2326RR. Staple length averaged 34.0 across all varieties with a low of 32.2 for Paymaster 2167RR and a high of 35.1 for Stoneville NexGen 2448R and Paymaster 2280BG/RR. Significant differences were observed among varieties for strength, elongation, uniformity, leaf grade, and reflectance (Rd). 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 3511RR, Paymaster 2145RR, Paymaster 2326RR, Paymaster 2167RR, Paymaster 2280BG/RR, Stoneville NexGen 2448R

Experimental design: Randomized complete block with 3 replications

Seeding rate:	4.6 seed per row-ft in 30-inch row spacing
Plot size:	8 rows by variable length of field (~800 ft long).
Planting date:	14-May
Weed management:	Prowl was applied preplant incorporated at 3.6 pt/acre. Glyphosate herbicide was applied over-the-top on 1-June and 18-June at a rate of 32 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix). Dual Magnum at a rate of 1.3 pts/acre was applied with the glyphostate application on 18-June. Assure at a rate of 10 oz/acre was applied on 18-July.
Rainfall and Irrigation:	According to personal correspondence with cooperator, 1.5 inches of rainfall fell during the summer and 10 inches of irrigation were applied during the growing season for a total of 11.5 inches.
Insecticides:	Temik was applied at in-furrow at planting at 4.0 lb/acre. Orthene was applied at a rate of 6 oz/acre on 18-June with glyphosate and Dual Magnum application. A second application of Orthene at a rate of 6oz/acre was applied on 1-July.
Fertilizer management:	100 lb/acre of 11-52-0 dry fertilizer were applied pre-plant on 3-April.
Plant growth regulators:	Pix was applied at a rate of 4 oz/acre on 1-July with the Orthene application and again at a rate of 8 oz/acre on 18-July with the Assure application.
Harvest aids:	Ethephon 6 at 1.5 qt/acre with Def 6 at 1.25 pt/acre were applied on 10-October.
Harvest:	Plots were harvested on 17-November using a commercial John Deere 7460 stripper harvester 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 and/or Roundup Ready based on 4.6 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 25.9% to 31.4% for AFD 3511R and Paymaster 2167RR, respectively. Lint yields varied with a low of 1249 lb/acre (Paymaster 2280BG/RR) and a high of 1461 lb/acre (Paymaster 2326RR). Lint loan values ranged from a low of $0.4620/lb (Paymaster 2145RR) to a high of $0.5437/lb (Paymaster 2326RR). After adding lint and seed value, total value/acre for varieties ranged from a low of $749.33 for Paymaster 2280BG/RR to a high of $917.81 for Paymaster 2326RR. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $755.96 (Paymaster 2326RR) to a low of $582.03 (Paymaster 2280BG/RR), a difference of $173.93. Micronaire values ranged from a low of 2.9 for Stoneville NexGen 2448R and Paymaster 2280BG/RR to a high of 4.0 for Paymaster 2326RR. Staple length averaged 34.0 across all varieties with a low of 32.2 for Paymaster 2167RR and a high of 35.1 for Stoneville NexGen 2448R and Paymaster 2280BG/RR. Significant differences were observed among varieties for strength, elongation, uniformity, leaf grade, or and reflectance (Rd). 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 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 Kerry Cartrite for the use of his land, equipment and labor for this project.

Table 1. Harvest results from the irrigated replicated transgenic cotton variety demonstration, Kerry Cartrite Farm, Sunray, 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	
Paymaster 2326RR	29.6	50.2	4929	1461	2474	0.5437	794.09	123.72	917.81	120.76	41.10	755.96	a
Stoneville NexGen 2448R	29.8	50.0	4827	1437	2413	0.5115	735.14	120.65	855.78	118.25	45.29	692.24	b
AFD 3511R	25.9	50.4	4999	1293	2520	0.5368	694.53	126.02	820.54	122.47	41.02	657.04	b
Paymaster 2167RR	31.4	49.7	4568	1437	2270	0.4828	693.98	113.47	807.45	111.93	41.10	654.42	b
Paymaster 2145RR	30.7	51.1	4548	1395	2323	0.4620	644.44	116.15	760.60	111.43	41.10	608.06	c
Paymaster 2280BG/RR	28.1	51.8	4452	1249	2307	0.5072	633.97	115.35	749.33	109.08	58.22	582.03	c
Test average	29.3	50.5	4721	1379	2384	0.5073	699.36	119.23	818.59	115.65	44.64	658.29	
CV, %	3.6	2.5	2.1	2.0	2.1	2.3	3.2	2.1	3.0	2.1	---	3.4	
OSL	0.0009	0.4067	0.0002	<0.0001	0.0006	<0.0001	<0.0001	0.0006	<0.0001	0.0002	---	<0.0001	
LSD 0.05	1.9	NS	181	50	92	0.0208	41.00	4.60	44.47	4.43	---	41.14	

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, Kerry Cartrite Farm, Sunray, 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
Paymaster 2326RR	4.0	34.0	82.5	29.2	7.0	2.7	76.5	7.9	3.0	1.0
Stoneville NexGen 2448R	2.9	35.1	82.4	30.4	6.1	2.0	79.3	7.9	2.7	1.0
AFD 3511R	3.3	34.8	81.3	29.6	6.3	2.0	78.1	7.9	3.0	1.0
Paymaster 2167RR	3.5	32.2	80.5	27.9	7.1	2.3	77.1	7.9	3.0	1.0
Paymaster 2145RR	3.0	32.7	80.6	28.6	7.4	3.7	75.1	7.3	4.0	1.0
Paymaster 2280BG/RR	2.9	35.1	80.7	30.1	6.4	1.7	78.7	7.9	3.0	1.0
Test average	3.3	34.0	81.3	29.3	6.7	2.4	77.5	7.8	3.1	1.0
CV, %	6.2	0.8	0.8	2.9	4.4	19.7	1.5	3.8	--	--
OSL	0.0004	<0.0001	0.0119	0.0448	0.0020	0.0051	0.0144	0.1135	--	--
LSD 0.05	0.4	0.5	1.2	1.6	0.5	0.9	2.2	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, Kerry Cartrite Farm, Sunray, TX, 2005.

Variety	Seed/lb	Seed/bag	Acres planted /bag	Seed fee $/bag	Tech fee $/bag	Total seed and tech fee $/bag	Total fee $/acre
AFD 3511R	4,434	221,724	2.77	49.40	64.30	113.70	41.02
Stoneville NexGen 2448R	--	230,000	2.88	64.40	65.80	130.20	45.29
Paymaster 2145RR	--	250,000	3.13	56.95	71.50	128.45	41.10
Paymaster 2167RR	--	250,000	3.13	56.95	71.50	128.45	41.10
Paymaster 2280BG/RR	--	250,000	3.13	56.95	125.00	181.95	58.22
Paymaster 2326RR	--	250,000	3.13	56.95	71.50	128.45	41.10

*Trial was planted at 80,000 seed/acre in 30-inch rows.