



Replicated Dryland Systems Variety Demonstration

Cooperator: Ricky Bearden - 2003

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Summary: Significant differences were noted for some characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 22.8% (FM 989RR) to a high of 27.1% (BCG 28R). Lint yields varied from a low of 136 lb/acre (FM 989RR) to a high of 210 lb/acre (DP 5415RR). Lint loan values varied from a low of \$0.4845/lb (All-Tex AtlasRR) to a high of \$0.5566/lb (AFD Raider 271). Micronaire values ranged from a low of 3.9 units (AFD Raider 271) to a high of 4.8 units (PM 2379 RR and ST 5303R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$87.06 (FM 989RR) to a high of \$133.91 (FM 832). When subtracting ginning and systems costs, the net value/acre among varieties ranged from a high of \$89.04 (FM 832) to a low of \$32.19, (FM 989RR) a difference of \$56.85. 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 conventional and transgenic varieties in under dryland production systems.

Materials and Methods:

Varieties: AFD 2485, AFD Raider 271, AFD 3511RR, All-Tex Atlas RR, Beltwide Cotton Genetics 24R, Beltwide Cotton Genetics 28R, Delta and Pine Land 5415RR, FiberMax 989RR, FiberMax 832, FiberMax 958, FiberMax 966, Paymaster 2326RR, Paymaster 2266RR, Paymaster 2379RR, Paymaster HS26, and Stoneville 5303R

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.36 seed per row-ft in 40-inch row spacings (John Deere Max Emerge vacuum planter)

Plot size:	6 rows by 1320 ft long
Planting date:	June 3
Weed management:	Treflan was applied preplant incorporated at 1 pt/acre across all varieties on March 15. A banded application of Direx at 4 oz/acre and Caparol at 8 oz/acre was made at planting. Roundup WeatherMax herbicide was applied broadcast to Roundup Ready varieties on July 2 at 22 oz/acre. Conventional varieties were spot sprayed with Fusion at a cost of \$7.50/acre, and hoed at a cost of \$4.50/acre. All varieties were cultivated on July 20.
Rainfall:	Less than 2 inches of rainfall was obtained at this location, according to personal correspondence with cooperator. A trace amount was received during the month of June with no other rainfall until September.
Insecticides:	No insecticides were applied at this site. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer management:	10-34-0 was applied pre-plant at 60 lbs/acre on March 15.
Harvest aids:	A harvested aid tank mix consisting of Aim at 1 oz/acre and Gramoxne Max at 5.12 oz/acre was applied on October 17.
Harvest:	Plots were harvested on November 24 using two commercial John Deere Strippers (7445 and 7450). 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 Center at Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the International Textile Center (ITC) 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 are based on \$2.25 per cwt. of bur cotton and seed values are based on \$125/ton. Ginning costs do not include checkoff.
Systems costs:	Systems cost was determined by variety per acre using manufacturer's suggested retail price for seed and appropriate technology fee for Roundup Ready based on 4.36 seed per row-ft.

Results and Discussion:

Significant differences were noted for most characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 22.8% (FM 989RR) to a high of 27.1% (BCG 28R). Lint yields varied from a low of 136 lb/acre (FM 989RR) to a high of 210 lb/acre (DP 5415RR). Lint loan values varied from a low of \$0.4845/lb (All-Tex AtlasRR) to a high of \$0.5566/lb (AFD Raider 271). Micronaire ranged from a low of 3.9 units (AFD Raider 271) to a high of 4.8 units (PM 2379 RR and ST 5303R). After adding lint and seed value, total value/acre for varieties ranged from a low of \$87.06 (FM 989RR) to a high of \$133.91 (FM 832). When subtracting ginning and systems costs, the net value/acre among varieties ranged from a high of \$89.04 (FM 832) to a low of \$32.19, (FM 989RR) a difference of \$56.85. 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 and therefore, no stand or pre-harvest lint losses were observed. 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 Ricky Bearden for the use of his land, equipment and labor for this project.

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Table 1. Results from the dryland replicated cotton systems variety demonstration, Tokio, 2003.

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Systems cost	Net value	
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	
FM 832	25.6	39.9	812	208	324	0.5445	113.67	20.24	133.91	18.28	26.59	89.04	a
FM 966	26.9	38.2	765	206	292	0.5448	112.46	18.29	130.76	17.21	29.99	83.55	ab
FM 958	26.7	37.0	745	199	277	0.5431	108.91	17.33	126.24	16.84	27.18	82.22	ab
AFD 2485	25.6	40.5	754	193	305	0.5165	100.61	19.10	119.72	16.96	21.84	80.91	abc
DP 5415RR	26.5	39.0	790	210	308	0.5305	111.49	19.28	130.77	17.78	38.73	74.26	abcd
AFD Raider 271	23.3	41.0	681	158	279	0.5566	88.44	17.47	105.92	15.33	21.35	69.24	abcde
BCG 28R	27.1	39.0	745	202	291	0.5101	103.00	18.19	121.20	16.77	37.63	66.80	bcde
PM 2379RR	26.0	41.7	737	192	308	0.4876	93.25	19.25	112.51	16.58	31.40	64.52	bcde
BCG 24R	24.7	39.6	776	191	307	0.5003	95.87	19.20	115.08	17.46	37.63	59.98	cde
ST 5303R	27.0	40.8	723	195	295	0.5086	99.01	18.44	117.45	16.27	42.16	59.02	de
PM 2326RR	24.7	41.8	678	168	283	0.5116	85.85	17.74	103.59	15.26	30.95	57.38	de
All-Tex Atlas RR	24.8	40.9	678	168	278	0.4845	81.79	17.38	99.17	15.27	30.32	53.58	def
AFD 3511R	23.4	41.7	678	158	283	0.5128	81.45	17.69	99.14	15.26	32.02	51.85	ef
PM 2266RR	23.9	39.9	669	160	267	0.5083	81.34	16.69	98.04	15.05	31.37	51.62	ef
PM HS26	23.7	39.5	637	151	251	0.4916	74.53	15.74	90.27	14.32	25.32	50.63	ef
FM 989RR	22.8	41.2	595	136	345	0.5291	71.72	15.33	87.06	13.38	41.49	32.19	f
Test average	25.2	40.1	716	181	293	0.5175	93.96	17.96	111.93	16.13	31.62	64.17	
CV, %	5.2	6.0	11.3	11.4	11.2	3.0	13.7	11.2	13.2	11.3	--	20.3	
OSL	0.0012	0.5524	0.1318	0.0008	0.2608	<0.0001	0.0020	0.2708	0.0051	0.1311	--	0.0005	
LSD 0.05	2.2	NS	NS	35	NS	0.0264	21.48	NS	24.74	NS	--	21.76	

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.

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 dryland replicated cotton systems variety demonstration, Tokio, 2003.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 2485	4.3	33.2	80.6	29.0	4.8	1.0	77.0	8.0	3.0	1.0
AFD 3511R	4.4	33.1	81.5	30.7	6.1	1.0	75.9	8.4	3.0	1.0
AFD Raider 271	3.9	34.7	81.1	30.7	5.6	1.0	77.8	7.7	3.0	1.0
All-Tex Atlas RR	4.4	31.6	81.0	29.1	6.6	1.3	76.4	8.2	3.0	1.0
BCG 24R	4.4	32.7	80.8	27.8	7.8	1.0	78.9	8.0	2.6	1.0
BCG 28R	4.7	33.4	80.2	25.8	6.2	1.0	77.6	8.4	3.0	1.0
DP 5415RR	4.6	34.1	81.7	27.9	7.8	1.0	78.7	7.8	3.0	1.0
FM 832	4.2	34.7	81.4	29.5	6.4	1.0	77.9	7.9	3.0	1.0
FM 958	4.4	34.3	81.6	30.3	4.6	1.0	78.3	7.7	3.0	1.0
FM 966	4.3	34.2	81.3	31.5	4.1	1.0	78.5	7.7	3.0	1.0
FM 989RR	4.1	33.8	82.4	31.4	5.3	1.3	76.2	7.9	3.3	1.0
PM 2266RR	4.4	32.9	81.7	29.9	7.3	1.3	76.0	8.2	3.3	1.0
PM 2326RR	4.7	32.7	82.2	29.9	7.0	1.0	76.2	8.2	3.0	1.0
PM 2379RR	4.8	32.7	81.6	29.4	8.4	1.0	76.3	8.4	3.0	1.0
PM HS26	4.7	32.3	82.0	30.1	7.7	1.6	76.2	8.0	3.6	1.0
ST 5303R	4.8	32.5	82.0	30.3	6.6	1.0	76.7	8.5	3.0	1.0
Test average	4.4	33.3	81.4	29.6	6.4	1.1	77.2	8.1	3.1	1.0
CV, %	2.9	2.2	0.9	3.1	6.2	26.1	1.0	4.4	9.5	--
OSL	<0.0001	0.0002	0.0581	<0.0001	<0.0001	0.1878	<0.0001	0.0715	0.1082	--
LSD 0.05	0.2	1.2	NS	1.5	0.7	NS	1.3	NS	NS	--

CV - coefficient of variation.

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

LSD - least significant difference.

Table 3. Seed and tech fees costs for dryland replicated cotton systems variety demonstration, Tokio, 2003.

Variety	Seed/lb	Seed/50lb bag	Ac/bag	Seed and tech fee/bag	Total seed and tech cost/acre
1 PM 2326RR	4700	235000	4.12	71.55	17.35
2 PM 2266RR	4700	235000	4.12	73.25	17.77
3 DP 5415RR	5500	275000	4.82	121.25	25.13
4 PM HS26	4200	210000	3.68	47.95	13.02
5 PM 2379RR	4545	227250	3.99	70.95	17.80
6 FM 832	5100	255000	4.47	63.95	14.29
7 FM 958	4900	245000	4.30	63.95	14.88
8 FM 966	4120	206000	3.61	63.95	17.69
9 FM 989RR	4580	229000	4.02	112.05	27.89
10 BCG 24R	5300	265000	4.65	111.70	24.03
11 BCG 28R	5300	265000	4.65	111.70	24.03
12 ST 5303R	4450	222500	3.90	111.50	28.56
13 All-Tex Atlas RR	4600	230000	4.04	67.45	16.72
14 AFD 2485	4600	230000	4.04	38.50	9.54
15 AFD 3511R	4450	222500	3.90	71.90	18.42
16 AFD Raider 271	4600	230000	4.04	36.50	9.05

Seed drop rate 4.36 seed/row-ft 40 inch rows
=57000 seed/acre

Table 4. Expenses incurred for the Yoakum County Dryland test, Tokio, TX 2003.

	Variety	Seed cost/bag	Tech fees/bag	Total cost/bag	Seed & tech fee/ac	Herb apps	Herb app cost/ac	Roundup WeatherMax cost/ac	Fusion spot spray cost/ac	Hoe cost/ac	Systems cost/ac
1	PM 2326RR	43.95	27.60	71.55	17.35	1	3.50	10.10	0.00	0.00	30.95
2	PM 2266RR	47.95	25.30	73.25	17.77	1	3.50	10.10	0.00	0.00	31.37
3	DP 5415RR	70.95	50.30	121.25	25.13	1	3.50	10.10	0.00	0.00	38.73
4	PM 2379RR	43.95	27.00	70.95	17.80	1	3.50	10.10	0.00	0.00	31.40
5	FM 989RR	68.95	43.10	112.05	27.89	1	3.50	10.10	0.00	0.00	41.49
6	BCG 24R	65.00	46.70	111.70	24.03	1	3.50	10.10	0.00	0.00	37.63
7	BCG 28R	65.00	46.70	111.70	24.03	1	3.50	10.10	0.00	0.00	37.63
8	ST 5303R	39.50	72.00	111.50	28.56	1	3.50	10.10	0.00	0.00	42.16
9	All-Tex Atlas RR	40.45	27.00	67.45	16.72	1	3.50	10.10	0.00	0.00	30.32
10	AFD 3511R	43.50	28.40	71.90	18.42	1	3.50	10.10	0.00	0.00	32.02
11	AFD Raider 271	36.50	0.00	36.50	9.05	0	0.00	0.00	7.50	4.80	21.35
12	AFD 2485	38.50	0.00	38.50	9.54	0	0.00	0.00	7.50	4.80	21.84
13	PM HS26	47.95	0.00	47.95	13.02	0	0.00	0.00	7.50	4.80	25.32
14	FM 832	63.95	0.00	63.95	14.29	0	0.00	0.00	7.50	4.80	26.59
15	FM 958	63.95	0.00	63.95	14.88	0	0.00	0.00	7.50	4.80	27.18
16	FM 966	63.95	0.00	63.95	17.69	0	0.00	0.00	7.50	4.80	29.99
					40" rows		3.50/acre	57.00/gal	Includes 1.50/acre	6.00/hr	
					4.36 seed				chem cost +		
					per row-ft			includes AMS	6.00/ac application	Time spent hoeing	
								at 0.31/ac		0.80 hrs/ac on conv	
										total approx hrs	
										hoeing = 13.5	
	Base weed control program			chem cost	app cost	total cost		Roundup WeatherMax			
								rate at 22 oz/ac			
	Pre- and At-planting										
15-Mar	1 pt/acre Trellan			3.43	3.50	6.93					
3-Jun	4 oz/acre Trellan plus			0.86		0.86					
	8 oz/acre Caparol			1.83		1.83					
	on 10" band at plant										
20-Jul	Blanket cultivation				5.00	5.00					
	Total blanket weed control program					14.62					
	Insecticide program										
	No insecticide applied										
	Harvest aid program										
17-Oct	1 oz/acre Aim			5.70	3.50	9.20					
17-Oct	5.12 oz Gramoxone Max			1.50		1.50					
	Total blanket input cost (\$/acre)					25.32					