



## Replicated Dryland Systems Variety Demonstration

Cooperator: Greg White, Littlefield, TX - 2003

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### Lamb County

**Summary:** Significant differences were noted for most characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 29.2% (AFD Raider 271) to a high of 33.2% (FM 958). Lint yields varied from a low of 103 lb/acre (AFD Raider 271) to a high of 213 lb/acre (PM 2266RR). Lint loan values varied from a low of \$0.4865/lb (PM HS26) to a high of \$0.5558/lb (FM 958). Lint loan values were high for all varieties with the exception Paymaster HS26 which received discounts for high micronaire in some replications (average 4.9). Micronaire ranged from a low of 4.4 units (All-Tex Atlas RR) to a high of 4.9 units (PM HS26). After adding lint and seed value, total value/acre for varieties ranged from a low of \$69.15 (PM HS26) to a high of \$138.45 (PM 2266RR). When subtracting ginning and systems costs, the net value/acre among varieties ranged from a high of \$89.04 (PM 2266RR) to a low of \$22.17 (PM HS26), a difference of \$66.87. 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, FiberMax 958, Paymaster 2266RR, Paymaster 2326RR, Paymaster HS26, and Stoneville 2454R

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.3 seed per row-ft in 40-inch row spacing in 2x1 skip row planting pattern (John Deere Max Emerge vacuum planter)

Plot size: 4 rows by length of field (1730 ft long).

Planting date: May 28

Weed management: Treflan was applied preplant incorporated at 1 pt/acre across all varieties on March 1. At planting, Direx was applied to a band at 2.13 oz/acre across all varieties. Roundup WeatherMax herbicide was applied at 22 oz/acre with ammonium sulfate at 17 lbs/100 gallons of solution on Roundup Ready varieties on July 2. Roundup Ready and conventional varieties were hoed once at costs of \$5.82 and \$21.85/acre respectively. Roundup Ready varieties were cultivated 1 time and conventional varieties were cultivated 2 times.

Rainfall:

June:	3.70"	July:	0.00"
August:	0.50"	September:	0.75"

Total moisture: 4.95"

Insecticides: Temik was applied at planting at 2.5 lbs/acre. No other 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: No fertilizers were applied at this site.

Harvest aids: No harvest aids were used at this site as plots were left until a hard freeze occurred on November 23.

Harvest: Plots were harvested on December 3 using a commercial John Deere 7445 with field cleaner. 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 3.3 seeds per row-ft.

**Results and Discussion:**

It should be noted that this site had significant weed pressure with morningglory, palmer amaranth (pigweed), and silverleaf nightshade being the predominant weeds. Significant differences were noted for most characteristics measured (Tables 1 and 2). Lint turnout ranged from a low of 29.2% (AFD Raider 271) to a high of 33.2% (FM 958). Lint yields varied from a low of 103 lb/acre (AFD Raider 271) to a high of 213 lb/acre (PM 2266RR). Lint loan values varied from a low of \$0.4865/lb (PM HS26) to a high of \$0.5558/lb (FM 958). Lint loan values were generally very high for all varieties with the exception of Paymaster HS26 which received discounts for high micronaire in some replications (average 4.9). Micronaire ranged from a low of 4.4 units (All-Tex Atlas RR) to a high of 4.9 units (PM HS26). After adding lint and seed value, total value/acre for varieties ranged from a low of \$69.15 (PM HS26) to a high of \$138.45 (PM 2266RR). When subtracting ginning and systems costs, the net value/acre among varieties ranged from a high of \$89.04 (PM 2266RR) to a low of \$22.17 (PM HS26), a difference of \$66.87. 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 the Roundup Ready varieties had a less severe weed problem overall when compared to the conventional varieties due primarily to the application of Roundup WeatherMax. It should be noted that some inclement weather was encountered at this location after planting, however, no substantial stand losses were encountered. None of the varieties experience any preharvest losses. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of dryland environments.

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Table 1. Harvest results from the dryland replicated cotton systems variety demonstration, Littlefield, TX 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	
PM 2266RR	30.0	52.8	711	213	375	0.5386	114.97	23.48	138.45	16.00	33.40	89.04	a
AFD 3511R	30.4	53.4	692	210	369	0.5301	111.59	23.10	134.70	15.58	33.73	85.39	a
All-Tex Atlas RR	30.8	53.6	689	212	369	0.5191	110.24	23.09	133.34	15.51	32.87	84.96	a
ST 2454R	32.7	53.1	629	206	334	0.5066	104.32	20.88	125.31	14.16	33.49	77.56	a
PM 2326RR	31.2	54.0	604	189	326	0.5175	97.98	20.39	118.37	13.59	33.19	71.59	a
AFD 2485	32.2	49.5	442	143	219	0.5550	79.15	13.69	92.84	9.96	36.67	46.21	b
FM 958	33.2	50.0	380	126	190	0.5558	70.25	11.89	82.14	8.56	39.37	34.21	bc
AFD Raider 271	29.2	56.8	354	103	201	0.5538	57.36	12.56	69.92	7.97	36.42	25.54	bc
PM HS26	30.8	52.2	380	117	198	0.4865	56.75	12.40	69.15	8.55	38.43	22.17	c
Test average	31.2	52.8	542	169	287	0.5292	89.18	17.94	107.14	12.21	35.29	59.63	
CV, %	3.3	2.6	11.5	11.8	10.9	2.6	12.8	10.9	12.4	11.5	--	20.1	
OSL	0.0038	0.0005	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD 0.05	1.8	2.5	108	35	54	0.0246	19.79	3.40	23.10	2.44	--	20.72	

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 replicated cotton systems variety demonstration, Littlefield, TX 2003.

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
AFD 2485	4.6	35.3	81.4	29.7	4.0	1.0	77.7	8.2	3.0	1.0
AFD 3511R	4.8	33.6	81.7	30.5	5.3	1.0	77.1	8.8	3.0	1.0
All-Tex Atlas RR	4.4	33.3	82.1	29.9	6.0	1.0	77.4	8.8	2.6	1.0
FM 958	4.6	35.5	81.7	30.6	3.7	1.0	76.8	8.4	3.0	1.0
PM HS26	4.9	32.6	82.0	30.1	7.0	1.0	76.5	8.6	3.0	1.0
PM 2266RR	4.7	33.6	82.0	30.0	6.7	1.0	77.1	8.9	2.6	1.0
PM 2326RR	4.8	33.4	82.5	29.7	6.2	1.0	76.7	8.9	3.0	1.0
AFD Raider 271	4.5	36.3	81.7	31.7	5.2	1.0	76.1	8.6	3.3	1.0
ST 2454R	4.7	32.8	82.4	28.4	6.4	1.0	78.7	8.5	2.3	1.0
Test average	4.7	34.0	81.9	30.1	5.6	1.0	77.1	8.6	2.9	1.0
CV, %	2.8	1.5	0.8	1.6	3.1	--	0.9	4.3	13.5	--
OSL	0.0101	<0.0001	0.5856	0.0001	<0.0001	--	0.0104	0.4335	0.1911	--
LSD 0.05	0.2	0.9	NS	0.9	0.3	--	1.1	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 cost from the dryland replicated cotton systems variety demonstration, Littlefield, TX 2003.

Variety	Solid planting basis				Skip row basis	
	Seed/lb	Seed/50lb bag	Ac/bag	Seed and tech fee/bag	seed and tech fee/ac	Seed and tech fee/ac
AFD 3511R	4450	222500	5.15	71.90	13.96	9.31
All-Tex Atlas RR	4600	230000	5.32	67.45	12.67	8.45
ST 2454R	4800	240000	5.56	75.60	13.61	9.07
PM 2266RR	4700	235000	5.44	73.25	13.47	8.98
PM 2326RR	4700	235000	5.44	71.55	13.15	8.77
AFD 2485	4600	230000	5.32	38.50	7.23	4.82
PM HS26	4200	210000	4.86	47.95	9.86	6.58
FM 958	4900	245000	5.67	63.95	11.28	7.52
AFD Raider 271	4600	230000	5.32	36.50	6.86	4.57
Seed drop rate 3.3 seed/row-ft 40 inch rows =43200 seed/acre						Seed drop on 2x1 skip is 28,800 (0.6666 factor)

**Table 4. Expenses incurred for the dryland replicated cotton systems variety demonstration, Littlefield, 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	Cultivation	Hoe cost/ac	Systems cost/ac
1	PM 2326RR	43.95	27.60	71.55	8.77	1	3.50	10.10	5.00	5.82	33.19
2	PM 2266RR	47.95	28.80	76.75	8.98	1	3.50	10.10	5.00	5.82	33.40
3	AFD 3511RR	43.50	28.40	71.90	9.31	1	3.50	10.10	5.00	5.82	33.73
4	All-Tex AtlasRR	40.45	27.00	67.45	8.45	1	3.50	10.10	5.00	5.82	32.87
5	ST 2454R	48.00	27.60	75.60	9.07	1	3.50	10.10	5.00	5.82	33.49
6	FM 958	63.95	0.00	63.95	7.52	0	0.00	0.00	10.00	21.85	39.37
7	PM HS 26	47.95	0.00	47.95	6.58	0	0.00	0.00	10.00	21.85	38.43
8	AFD 2485	38.50	0.00	38.50	4.82	0	0.00	0.00	10.00	21.85	36.67
9	AFD Raider 271	36.50	0.00	36.50	4.57	0	0.00	0.00	10.00	21.85	36.42
					2x1 skip row 40" rows 3.3 seed per row-ft		3.50/ac	57.00/gal includes AMS at 0.31/ac	5.00/acre once on RR two times on conv	5.15/hr Time spent hoeing 1.13 hr/ac on RR	
								Roundup WeatherMax rate at 22 oz/ac		4.24 hrs/ac on conv total approx hrs hoeing = 36	
<b>Base weed control program</b>				<b>chem cost</b>	<b>app cost</b>	<b>total cost</b>					
	Pre- and At-planting										
1-Mar	1 pt/acre Treflan			3.44	3.50	6.94					
28-May	2.13 oz/acre Direx at plant on 13' band			0.36		0.36					
Total blanket weed control program						10.80					
Insecticide program											
28-May	2.5 lb/acre Temik at plant			8.30		8.30					
Harvest aid program											
	Left till freeze										
Total blanket input cost (\$/acre)						19.10					