



Replicated Dryland Systems Variety Demonstration

Cooperator: Greg White, Littlefield, TX - 2004

Kent Lewis, Emilio Nino,
Randy Boman, Mark Kelley, and Mark Stelter
County Extension Agent-Agriculture, Lamb County,
Extension Agent-IPM, Castro/Lamb Counties,
Extension Agronomist-Cotton, Extension Program Specialist-Cotton,
and Extension Assistant-Cotton

Lamb County

Summary: Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from 28.7% to 35.4% for AFD 3511R and FM 958, respectively. Lint yields (on a field acre basis) varied with a low of 712 lb/acre (AFD Raider 271) and a high of 875 lb/acre (PM 2266RR). Lint loan values ranged from a low of \$0.5045/lb (ST 2454R) to a high of \$0.5570/lb (AFD 2485). After adding lint and seed value, total value/field acre for varieties ranged from a low of \$473.83 for ST 2454R to a high of \$568.59 for PM 2266RR. When subtracting ginning and systems costs, the net value/field acre among varieties ranged from a high of \$494.19 (AFD 2485) to a low of \$396.41 (ST 2454R), a difference of \$97.78. 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 variety and technology selection under dryland production systems.

Materials and Methods:

Varieties: AFD 2485, AFD Raider 271, AFD 3511R, 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 MaxEmerge vacuum planter)

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

Planting date: May 18

Weed management: Treflan was applied preplant incorporated at 1 pt/acre across all varieties on March 1. At planting, Caparol was applied to a band at 10.4 oz/acre with Prowl at 5.2 oz/acre across all varieties. Roundup WeatherMax was applied over-the-top to Roundup Ready varieties on June 14 at a rate of 22 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix) in 15 gallons/acre (GPA) total volume. Blanket cultivations were conducted on June 4 and July 28.

Rainfall: May: 0.50" August: 2.20"
June: 2.70" September: 5.70"
July: 4.50"

Total moisture: 15.60"

Insecticides: Temik was applied in-furrow at 3.0 lbs/acre. No other insecticides were applied at this site. This location is in an active boll weevil eradication zone, however, no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: No fertilizers were applied at this site.

Plant growth regulator: Pentia was aerially applied at 10 oz/acre on August 9.

Harvest aids: Finish 6 at 21 oz/acre + Def 6 at 8 oz/acre + LI 700 was applied aerially on October 21.

Harvest: Plots were harvested on December 15 using a commercial John Deere 7445 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 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 are based on \$2.25 per cwt. of bur cotton and seed value/acre was based on \$125/ton. Ginning costs do not include checkoff.

Seed and technology fees: Seed and technology fees were determined by variety per acre using the manufacturer's suggested retail price for seed and appropriate technology fee for Roundup Ready based on 3.3 seed per row-ft (down planted row).

Results and Discussion:

It should be noted that this site had noticeable weed pressure, with morningglory, palmer amaranth (pigweed), and silverleaf nightshade being the predominant weeds. Significant differences were noted for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 28.7% to 35.4% for AFD 3511R and FM 958 respectively. Lint yields (on a field acre basis) varied from with a low of 712

lb/acre (AFD Raider 271) and a high of 875 lb/acre (PM 2266RR). Lint loan values ranged from a low of \$0.5045/lb (ST 2454R) to a high of \$0.5570/lb (AFD 2485). After adding lint and seed value, total value/field acre for varieties ranged from a low of \$473.83 for ST 2454R to a high of \$568.59 for PM 2266RR. When subtracting ginning and systems costs, the net value/field acre among varieties ranged from a high of \$494.19 (AFD 2485) to a low of \$396.41 (ST 2454R), a difference of \$97.78. Micronaire values ranged from a low of 3.4 for AFD Raider 271 to a high of 4.2 for Paymaster HS26. Staple length averaged 34.2 across all varieties with a low of 32.8 and a high of 35.1. Significant differences were observed among varieties for strength and elongation, however, no differences existed for 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. Notable preharvest loss was observed for some of the varieties. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of dryland environments.

Acknowledgments: Appreciation is expressed to Greg White for the use of his land, equipment and labor for this project.

Disclaimer Clause: Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the replicated dryland systems variety demonstration, Greg White Farm, Littlefield, 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	Systems cost	Net value
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
AFD 2485	34.8	52.4	2443	850	1280	0.5570	473.79	79.99	553.78	54.95	4.64	494.19 a
FM 958	35.4	52.8	2447	867	1291	0.5452	472.78	80.73	553.51	55.06	8.72	489.73 a
PM 2266RR	30.4	56.3	2877	875	1619	0.5342	467.42	101.17	568.59	64.73	24.65	479.21 a
PM 2326RR	30.5	56.0	2748	839	1539	0.5145	431.85	96.17	528.02	61.83	24.65	441.55 b
All-Tex AtlasRR	31.0	55.7	2738	849	1524	0.5072	430.52	95.28	525.79	61.61	23.64	440.54 b
AFD 3511R	28.7	56.6	2776	797	1571	0.5218	415.92	98.21	514.13	62.46	24.74	426.93 b
PM HS26	31.2	56.1	2438	762	1367	0.5288	402.63	85.43	488.06	54.86	7.53	425.67 b
AFD Raider 271	29.1	59.7	2447	712	1461	0.5405	384.12	91.33	475.45	55.05	4.50	415.90 bc
ST 2454R	33.5	54.5	2332	782	1270	0.5045	394.45	79.37	473.83	52.47	24.94	396.41 c
Test average	31.6	55.6	2583	815	1436	0.5282	430.39	89.74	520.13	58.11	16.45	445.57
CV, %	2.6	1.9	1.8	1.7	1.8	3.4	3.5	1.8	3.0	1.8	--	3.4
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0296	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD 0.05	1.4	1.8	79	24	46	0.0309	26.08	2.86	27.06	1.78	--	26.37

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 results from the replicated dryland systems variety demonstration, Greg White Farm, Littlefield, TX 2004.

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	3.8	35.0	80.7	28.8	5.1	1.0	77.1	8.1	3.0	1.0
FM 958	3.7	35.1	80.8	29.1	5.0	1.3	75.3	8.2	3.3	1.0
PM 2266RR	3.9	34.6	82.0	27.6	6.8	1.7	75.2	7.7	4.0	1.0
PM 2326RR	4.1	33.4	81.5	28.7	6.9	1.3	76.2	7.6	3.7	1.0
All-Tex AtlasRR	3.7	33.0	80.3	28.4	7.0	1.3	75.6	8.2	3.7	1.0
AFD 3511R	3.6	34.0	80.9	28.4	6.4	1.7	76.4	7.8	3.7	1.0
PM HS26	4.2	33.9	81.8	28.6	7.8	1.3	75.6	8.4	3.3	1.0
AFD Raider 271	3.4	35.8	81.0	30.8	5.6	1.0	76.3	8.0	3.0	1.0
ST 2454R	3.8	32.8	80.9	26.0	8.0	1.3	76.3	7.6	4.0	1.0
Test average	3.8	34.2	81.1	28.5	6.5	1.3	76.0	8.0	3.5	1.0
CV, %	3.6	2.0	0.8	2.6	8.3	39.5	2.6	6.2	--	--
OSL	0.0002	0.0007	0.0980	0.0001	<0.0001	0.7647	0.9492	0.4452	--	--
LSD 0.05	0.2	1.2	NS	1.3	0.9	NS	NS	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 replicated dryland systems variety demonstration, Greg White Farm, Littlefield, TX 2004.

Variety	Seed/lb	Seed/bag	----- Solid planting basis -----				Skip row basis	
			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	5.22	49.40	37.80	87.20	16.71	11.14
All-Tex AtlasRR	4600	230,000	5.33	42.50	37.80	80.30	15.06	10.04
ST 2454R	4700	230,000	5.33	52.90	37.80	90.70	17.01	11.34
PM 2266RR	4300	250,000	5.80	55.00	41.10	96.10	16.58	11.05
PM 2326RR	4600	250,000	5.80	55.00	41.10	96.10	16.58	11.05
AFD 2485	4560	228,000	5.29	36.80	0.00	36.80	6.96	4.64
PM HS26	4200	210,000	4.87	55.00	0.00	55.00	11.29	7.53
FM 958	4472	223,600	5.19	67.85	0.00	67.85	13.09	8.72
AFD Raider 271	4700	235,000	5.45	36.80	0.00	36.80	6.75	4.50
Seed drop rate 3.3 seed/row-ft 40 inch rows =43,124 seed/acre							Seed drop on 2x1 skip is 28,749 (0.6666 factor)	

Table 4. Expenses incurred for the replicated dryland systems variety demonstration, Greg White Farm, Littlefield, TX 2004.									
	Variety	Seed cost/bag	Tech fees/bag	Total cost/bag	Seed & tech fee/field ac	Herb apps	Herb app cost/field ac	Roundup WeatherMax cost/field ac	Systems cost/field ac
1	PM 2326RR	55.00	41.10	96.10	11.05	1	3.50	10.10	24.65
2	PM 2266RR	55.00	41.10	96.10	11.05	1	3.50	10.10	24.65
3	AFD 3511R	49.40	37.80	87.20	11.14	1	3.50	10.10	24.74
4	All-Tex AtlasRR	42.50	37.80	80.30	10.04	1	3.50	10.10	23.64
5	ST 2454R	52.90	37.80	90.70	11.34	1	3.50	10.10	24.94
6	FM 958	67.85	0.00	67.85	8.72	0	0.00	0.00	8.72
7	PM HS 26	55.00	0.00	55.00	7.53	0	0.00	0.00	7.53
8	AFD 2485	36.80	0.00	36.80	4.64	0	0.00	0.00	4.64
9	AFD Raider 271	36.80	0.00	36.80	4.50	0	0.00	0.00	4.50
					2x1 skip row 40" rows 3.3 seed per row-ft 28749 seed/ac		3.50/ac	14-Jun Roundup WeatherMax rate at 22 oz/ac 57.00/gal includes AMS at 0.31/ac	
Base weed control program				chem cost	app cost	total cost			
	Pre- and at-planting								
1-Mar	1 pt/acre Treflan			3.43	3.50	6.93			
18-May	10.4 oz/acre Caparol at plant			2.43		2.43			
	5.2 oz/acre Prowl at plant on 13' band			0.84		0.84			
	Cultivation								
4-Jun	Blanket cultivation				5.00	5.00			
28-Jul	Blanket cultivation				5.00	5.00			
Total blanket weed control program						20.20			
Insecticide program									
28-May	3.0 lb/acre Temik at plant			10.50		10.50			
PGR program									
9-Aug	10 oz/acre Pentia by airplane			7.14	3.50	10.64			
Harvest aid program									
21-Oct	21 oz/acre Finish 6			11.55	3.50	15.05			
	8 oz/acre Def 6 with LI 700 by airplane			3.12		3.12			
Total blanket input cost (\$/acre)						59.51			