



Replicated Dryland Systems Variety Demonstration

Cooperators: Mark and David Appling - 2004

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Summary: Significant differences were noted for all parameters measured (Tables 1 and 2). Lint turnout ranged from 23.3% to 28.2% for AFD Raider 271 and Deltapine 494RR respectively. Lint yields varied from a low of 724 lb/acre (AFD Raider 271) to a high of 975 lb/acre (FiberMax 960RR). Lint loan values varied from a low of \$0.4682/lb (FiberMax 960RR) to a high of \$0.5404/lb (AFD 2485). After adding lint and seed value, total value for varieties ranged from a low of \$465.45 for AFD 3511R, to a high of \$610.09 for AFD 2485. When subtracting ginning, and systems costs, net value/acre among varieties ranged from a low of \$362.29 to high of \$520.46 (AFD 3511R and AFD 2485 respectively), a difference of \$158.17. 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 3511R, AFD 3602R, All-Tex Atlas RR, AFD 2485, AFD Raider 271, All-Tex Excess RR, All-Tex 40802RR, All-Tex Toppick, Beltwide Cotton Genetics 24R, Beltwide Cotton Genetics 30R, Deltapine 434RR, Deltapine 432RR, Deltapine 494RR, FiberMax 960RR, FiberMax 989RR, FiberMax 958LL, FiberMax 966LL, Stoneville 1553R, and Stoneville 2448R

Experimental design: Randomized complete block with 3 replications

Seeding rate: Solid planted at 4.0 seed per row-ft in 40-inch row spacing (Case International 900 planter)

Plot size: 4 rows by 1700 feet long

Planting date: May 11

Weed management: Treflan at 1qt/acre was broadcast applied preplant and incorporated with a disk-bedder on March 10. At planting, Direx was applied to a band at 1.5 pt/acre across all varieties. Roundup WeatherMax was applied over-the-top on Roundup Ready varieties on June 4 at a rate of 22 oz/acre + ammonium sulfate (17 lb/100 gallons of spray mix) in 15 gallons/acre (GPA) total volume. Ignite was applied over-the-top of Liberty Link varieties on June 9 at a rate of 32 oz/acre in 25 GPA total volume.

Rainfall: Above normal rainfall was encountered at this site.

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: No fertilizers were applied at this site.

Harvest aids: GramoxoneMax was aerially applied at 24 oz/acre with 0.5% non-ionic surfactant on October 1.

Harvest: Plots were harvested on October 19 using a commercial Case International 1800. stripper. Harvested material was transferred into a weigh wagon with integral digital scales to determine individual plot weights. Plots 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 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 per ton. Ginning costs do 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, appropriate technology fees for Liberty Link and/or Roundup Ready based on 4.0 seed per row-ft.

Results and Discussion:

Significant differences were noted for all parameters measured (Tables 1 and 2). Lint turnout ranged from 23.3% to 28.2% for AFD Raider 271 and Deltapine 494RR respectively. Lint yields varied from a low of 724 lb/acre (AFD Raider 271) to a high of 975 lb/acre (FiberMax 960RR). Lint loan values varied from a low of \$0.4682/lb (FiberMax 960RR) to a high of \$0.5404/lb (AFD 2485). After adding lint and seed value, total value for varieties ranged from a low of \$465.45 for AFD 3511R, to a high of \$610.09 for AFD 2485. When subtracting ginning,

seed and technology fees the net value/acre among varieties ranged from a low of \$362.29 to high of \$520.46 (AFD 3511R and AFD 2485 respectively), a difference of \$158.17. 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. Picker type varieties experienced some preharvest losses due to these weather conditions. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Acknowledgments: Appreciation is expressed to Mark and David Appling for the use of their land, equipment and labor for this project.

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Table 1. Harvest results from the replicated dryland systems variety demonstration, Appling Farms, Blanco, 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	26.5	41.2	3608	957	1486	0.5405	517.25	92.85	610.09	81.19	8.44	520.46 a
Beltwide Cotton Genetics 24R	27.1	41.7	3474	941	1448	0.5273	496.08	90.52	586.60	78.17	40.63	467.80 b
FiberMax 989RR	28.1	41.9	3430	963	1436	0.5038	485.83	89.75	575.58	77.16	41.61	456.81 bc
Deltapine 432RR	26.7	42.4	3606	962	1529	0.5067	487.98	95.57	583.55	81.13	45.95	456.46 bc
Deltapine 434RR	28.1	40.8	3320	935	1356	0.5223	488.75	84.75	573.50	74.71	45.95	452.84 bc
Stoneville 2448R	26.2	44.4	3321	869	1476	0.5397	469.08	92.23	561.31	74.71	39.44	447.16 bcd
FiberMax 966LL	26.4	42.2	3468	915	1465	0.5117	468.63	91.54	560.16	78.03	42.79	439.34 bcde
FiberMax 958LL	26.8	41.8	3462	928	1446	0.5023	466.21	90.40	556.61	77.88	41.70	437.02 bcde
All Tex Toppick	24.7	43.4	3218	796	1395	0.5330	424.46	87.21	511.67	72.40	7.68	431.58 bcdef
FiberMax 960RR	27.9	42.6	3493	975	1488	0.4682	456.65	92.98	549.63	78.60	42.88	428.15 bcdef
AFD 3602R	26.4	43.3	3304	870	1430	0.5168	449.88	89.39	539.28	74.35	37.61	427.32 bcdef
Deltapine 494RR	28.2	40.9	3250	901	1327	0.5108	460.69	82.97	543.65	73.13	45.95	424.58 bcdef
Beltwide Cotton Genetics 30R	26.1	44.7	3333	871	1490	0.5058	440.66	93.15	533.81	74.99	40.11	418.71 cdefg
All Tex Excess RR	24.7	45.3	3385	835	1534	0.5018	418.92	95.89	514.80	76.15	32.26	406.39 defgh
Stoneville 1553R	25.7	46.2	3157	812	1459	0.5177	420.21	91.18	511.39	71.04	39.44	400.92 efgh
All Tex Atlas RR	24.6	46.3	3167	780	1466	0.5165	402.75	91.63	494.38	71.25	31.85	391.28 fgh
AFD Raider 271	23.3	45.0	3103	724	1396	0.5243	379.51	87.27	466.78	69.83	8.19	388.76 fgh
All Tex 40802RR	25.6	44.1	3203	819	1414	0.4863	398.07	88.37	486.44	72.07	39.15	375.22 gh
AFD 3511R	24.5	46.1	3080	756	1419	0.4987	376.79	88.66	465.45	69.30	33.86	362.29 h
Test average	26.2	43.4	3336	874	1445	0.5123	447.81	90.33	538.14	75.06	35.03	428.06
CV, %	2.7	3.1	2.8	2.8	2.8	4.3	5.9	2.7	5.2	2.7	--	6.2
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0463	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD 0.05	1.2	2.2	152	41	66	0.0367	43.90	4.10	46.70	3.42	--	44.33

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 fiber property results from the replicated dryland systems variety demonstration, Appling Farms, Blanco, 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	3.5	36.4	81.8	32.2	3.8	3.7	72.7	7.3	4.0	1.0
Beltwide Cotton Genetics 24R	3.4	34.7	82.4	28.5	6.6	2.7	76.4	8.2	3.3	1.0
FiberMax 989RR	3.3	35.6	82.6	31.0	4.5	4.0	74.7	7.1	4.0	1.0
Deltapine 432RR	3.7	35.1	83.1	28.3	7.1	4.7	71.1	7.9	4.3	1.0
Deltapine 434RR	3.4	36.8	81.7	27.6	6.2	3.7	75.1	7.9	4.0	1.0
Stoneville 2448R	3.6	34.8	83.4	31.7	6.2	2.3	74.2	8.7	3.7	1.0
FiberMax 966LL	3.4	35.7	82.8	32.8	3.9	4.0	73.4	7.1	4.0	1.0
FiberMax 958LL	3.3	36.5	81.4	31.9	3.3	4.3	73.3	7.4	4.0	1.0
All Tex Toppick	3.5	36.6	82.6	29.5	5.9	3.3	74.1	7.9	4.0	1.0
FiberMax 960RR	3.0	35.8	81.3	31.3	3.7	4.7	74.3	7.3	4.0	1.0
AFD 3602R	3.4	35.0	81.8	30.3	4.7	3.3	74.0	8.0	4.0	1.0
Deltapine 494RR	3.5	36.0	82.0	30.8	5.3	4.3	73.4	8.1	4.0	1.0
Beltwide Cotton Genetics 30R	3.3	36.5	81.1	28.5	4.9	3.7	72.8	7.7	4.0	1.0
All Tex Excess RR	3.6	35.3	82.9	30.4	5.7	4.7	71.8	7.4	4.3	1.0
Stoneville 1553R	3.3	37.8	83.9	29.4	6.1	3.0	74.8	7.3	4.0	1.0
All Tex Atlas RR	3.7	34.1	82.5	29.6	6.3	3.7	71.0	7.9	4.3	1.0
AFD Raider 271	3.3	36.5	82.3	32.2	4.8	3.0	74.5	8.3	3.7	1.0
All Tex 40802RR	3.3	36.4	81.3	28.5	4.9	4.7	72.3	7.8	4.0	1.0
AFD 3511R	3.7	35.0	83.1	30.1	5.4	5.0	70.3	8.0	4.3	1.0
Test average	3.4	35.8	82.3	30.2	5.2	3.8	73.4	7.7	4.0	1.0
CV, %	3.8	1.3	0.5	2.2	3.9	19.1	1.3	2.1	--	--
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0014	<0.0001	<0.0001	--	--
LSD 0.05	0.2	0.8	0.8	1.1	0.3	1.2	1.6	0.3	--	--

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, Appling Farms, Blanco, TX 2004.

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 3511R	4500	225,000	4.30	49.40	37.80	87.20	20.26
AFD 3602R	4450	222,500	4.26	64.40	37.80	102.20	24.01
All Tex AtlasRR	4600	230,000	4.40	42.50	37.80	80.30	18.25
All Tex ExcessRR	4500	225,000	4.30	42.50	37.80	80.30	18.66
All Tex 40802RR	5000	250,000	4.78	65.00	57.20	122.20	25.55
BCG 24R	5128	256,400	4.91	68.50	64.10	132.60	27.03
BCG 30R	5000	250,000	4.78	68.50	58.30	126.80	26.51
DP 434RR	4720	250,000	4.78	97.50	57.20	154.70	32.35
DP 432RR	5200	250,000	4.78	97.50	57.20	154.70	32.35
DP 494RR	5275	250,000	4.78	97.50	57.20	154.70	32.35
FM 960RR	4400	220,000	4.21	72.95	50.30	123.25	29.28
FM 989RR	4730	236,500	4.52	72.95	53.80	126.75	28.01
ST 1553R	4370	230,000	4.40	75.90	37.80	113.70	25.84
ST 2448R	4545	230,000	4.40	75.90	37.80	113.70	25.84
FM 958LL	4460	223,000	4.27	.	.	125.00	29.30
FM 966LL	4300	215,000	4.11	.	.	125.00	30.39
AFD 2485	4560	228,000	4.36	36.80	.	36.80	8.44
AFD Raider 271	4700	235,000	4.50	36.80	.	36.80	8.19
All Tex Toppick	4900	245,000	4.69	36.00	.	36.00	7.68

*Trial was planted at 52,272 seed/acre in 40-inch rows.

Table 4. Expenses incurred for the replicated dryland systems variety demonstration, Appling Farms, Blanco, TX 2004.

	Variety	Seed cost/bag	Tech fees/bag	Total cost/bag	Seed & tech fee/ac	Herb apps	Herb app cost/ac	Ingnite cost/ac	Roundup WeatherMax cost/ac	Systems cost/ac
1	AFD 3511R	49.40	37.80	87.20	20.26	1	3.50	0.00	10.10	33.86
2	AFD 3602R	64.40	37.80	102.20	24.01	1	3.50	0.00	10.10	37.61
3	All Tex AtlasRR	42.50	37.80	80.30	18.25	1	3.50	0.00	10.10	31.85
4	All Tex ExcessRR	42.50	37.80	80.30	18.66	1	3.50	0.00	10.10	32.26
5	All Tex 40802RR	65.00	57.20	122.20	25.55	1	3.50	0.00	10.10	39.15
6	BCG 24R	68.50	64.10	132.60	27.03	1	3.50	0.00	10.10	40.63
7	BCG 30R	68.50	58.30	126.80	26.51	1	3.50	0.00	10.10	40.11
8	DP 434RR	97.50	57.20	154.70	32.35	1	3.50	0.00	10.10	45.95
9	DP 432RR	97.50	57.20	154.70	32.35	1	3.50	0.00	10.10	45.95
10	DP 494RR	97.50	57.20	154.70	32.35	1	3.50	0.00	10.10	45.95
11	FM 960RR	72.95	50.30	123.25	29.28	1	3.50	0.00	10.10	42.88
12	FM 989RR	72.95	53.80	126.75	28.01	1	3.50	0.00	10.10	41.61
13	ST 1553R	75.90	37.80	113.70	25.84	1	3.50	0.00	10.10	39.44
14	ST 2448R	75.90	37.80	113.70	25.84	1	3.50	0.00	10.10	39.44
15	FM 958LL	125.00		125.00	29.30	1	3.50	8.90	0.00	41.70
16	FM 966LL	125.00		125.00	30.39	1	3.50	8.90	0.00	42.79
17	AFD 2485	36.80	0.00	36.80	8.44	0	0.00	0.00	0.00	8.44
18	AFD Raider 271	36.80	0.00	36.80	8.19	0	0.00	0.00	0.00	8.19
19	All Tex Toppick	36.00	0.00	36.00	7.68	0	0.00	0.00	0.00	7.68
					40" inch rows			June 9 over-the-top	June 4 over-the-top of all	
					13,068 row-ft/ac			of Liberty Link varieties	Roundup Ready varieties	
					4.0 seed/row-ft			35.60/gal	57.00/gal	
					52,272 seed/ac			rate at 1 qt/ac	Roundup WeatherMax	
									rate at 22 oz/ac	
									includes AMS at 0.31/ac	
	Base weed control program	chem cost	app cost	total cost						
	Pre- and At-planting									
	10-Mar 1 qt/acre Treflan ppi	6.87	3.50	10.37						
	11-May 1.5 pt/acre Direx at planting	2.00		2.00						
	5-Jul Blanket Cultivation		5.00	5.00						
	Total blanket weed control program			17.37						
	Insecticide program									
	no insecticides applied									
	Harvest aid program									
	1-Oct 24 oz/acre Gramoxone Max with 0.5% COC	7.44	3.50	10.94						
	Total blanket input cost (\$/acre)			28.31						