

**2011 COTTON VARIETY PERFORMANCE IN THE TEXAS HIGH PLAINS****M.S. Kelley****C.W. Ashbrook****J.E. Woodward****Texas AgriLife Extension Service****Lubbock, TX****Abstract**

On farm large plot variety testing provides valuable information to cotton producers in the Texas High Plains on performance of commercially available cotton cultivars. The objectives of this project was to compare the performance of several commercial cotton varieties under varying production systems across the Texas High Plains. Three large plot trials were initiated in 2011, of which two were taken to harvest. Parameters measured and reported here include lint turnout and yield, lint loan value and value per acre, and selected HVI fiber quality measurements. The harsh growing conditions experienced resulted in below average cotton yields under the irrigated production systems utilized at the trial locations and across the Texas High Plains. Significant differences were observed among varieties for most parameters reported. Results from the trials indicate that differences in overall performance among commercially available cotton cultivars can be observed under identical production environments and management practices. This information can provide assistance to producers in selecting cotton varieties for planting. However, the results from several trials across multiple locations and, if possible, multiple years should be referred to prior to variety selections.

**Introduction**

On farm large plot variety testing provides valuable information to cotton producers in the Texas High Plains on performance of commercially available cotton cultivars across variable environments and crop management practices. The harsh growing conditions experienced in the Texas High Plains in 2011 resulted in below average cotton yields under irrigated production systems. Three large plot replicated variety demonstrations were initiated at Plains, Farwell and Mount Blanco to compare performance of several commercially available cotton varieties. Parameters measured included plant stand establishment, days to cutout, various plant mapping parameters, lint and seed yield, and fiber quality. Significant differences were observed among varieties at surviving locations for most parameters measured.

**Materials and Methods**

For scientific validity, three replications of each variety were included at the Plains and Farwell locations, with four replications included at Mount Blanco. Plots at Plains and Mount Blanco were of sufficient size to enable the combination of all replications of each individual variety into a single module at harvest. Each individual variety had at least three acres total (approximately one acre per experimental unit with three replications equals three acres total). A randomized complete block design was used at all three locations. Unfortunately, the Plains location was abandoned due to poor stand establishment resulting from the harsh drought and windy conditions experienced shortly after planting. At the remaining locations, all weed and insect control measures, if needed, and harvest aid applications were performed commercially or by cooperating producers. Plots were harvested with commercial harvesters by producers with assistance provided by program personnel. Individual location information was as follows:

**Location 1: Farwell, TX – Parmer County**

At the Farwell location, fourteen varieties were planted to 30" straight rows on the flat on May 10 with a seeding rate of approximately 60,000 seed per acre. This location was under a Low Elevation Spray Application (LESA) center pivot irrigation system with a terminated wheat cover crop. Plot size was 8 rows by variable length due to center pivot. Plots were harvested on November 10 and grab samples were taken by plot and ginned at the Texas AgriLife Research and Extension Center at Lubbock. Resulting lint samples were submitted to the Texas Tech University – Fiber and Biopolymer Research Institute for HVI fiber analysis.

**Location 2: Mt Blanco, TX – Crosby County**

Fourteen varieties were planted to 40" raised bed rows on May 6 with an approximate seeding rate of 42,000 seed per acre. The rows were circular due to center pivot LEPA irrigation system (sprinklers utilized for stand establishment). Plot sizes were 8 rows wide by variable length due to circular rows. Harvest occurred on October 25 and 26 using the producer/cooperator harvesting equipment. Harvest material was transferred to the Lee Weigh Wagon for plot weight determination. Replications were combined by variety into individual modules and followed through the commercial ginning process for lint and seed turnout and HVI fiber quality.

**Results and Discussion**

At the Farwell location, lint turnouts of field-cleaned bur cotton averaged 34.5% (Table 1). Lint yields ranged from 1040 lb/acre for FiberMax 2011GT to 640 lb/acre for Croplan Genetics 3006B2RF, and seed yields averaged 1276 lb/acre. Loan values derived from grab samples ranged from \$0.5705 for FiberMax 2484B2F to \$0.5275 for FiberMax 1740B2F. After applying loan values to lint yields, the test average lint value was \$485.25/acre.

Table 1. Harvest results from the irrigated large plot replicated systems variety demonstration, Mark and Ryan Williams Farm, Farwell, TX, 2011.

Entry	Lint turnout	Lint yield	Seed yield	Lint loan value	Lint value
	%	-----lb/acre----- ---		\$/lb	\$/acre
FiberMax 2011GT	38.1	1040	1291	0.5533	575.30
FiberMax 2484B2F	36.0	996	1339	0.5705	568.49
FiberMax 9250GL	34.8	938	1345	0.5618	527.13
Deltapine 10R011B2RF	34.3	921	1280	0.5663	521.87
NexGen 4111RF	34.0	915	1369	0.5670	518.95
All-Tex Edge B2RF	34.7	904	1319	0.5587	504.83
FiberMax 1740B2F	35.3	930	1290	0.5275	490.51
Deltapine 1032B2RF	36.7	879	1176	0.5495	483.07
Stoneville 4288B2F	34.7	876	1300	0.5477	479.59
PhytoGen 367WRF	34.1	875	1278	0.5428	475.18
Dyna-Gro 2450B2RF	33.6	869	1336	0.5415	470.64
NexGen 2051B2RF	33.1	838	1329	0.5350	448.30
All-Tex Rapid B2RF	31.6	713	1163	0.5322	379.46
Croplan Genetics 3006B2RF	32.0	640	1046	0.5468	350.20
Test average	34.5	881	1276	0.5500	485.25
CV, %	5.5	5.2	5.2	1.8	5.1
OSL	0.0252	<0.0001	0.0001	<0.0001	<0.0001
LSD	3.2	76	111	0.0167	41.89

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level.

Note: some columns may not add up due to rounding error.

Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Classing data from grab samples are reported in Table 2. Micronaire ranged from 4.7 for Croplan Genetics 3006B2RF to 3.9 for Deltapine 10R011B2RF. Staple was highest for FiberMax 2484B2F (35.4) and lowest for All-Tex Rapid B2RF (33.7). The highest uniformity (82.2%) was observed in All-Tex Edge B2RF and NexGen 2051B2RF had the lowest with 79.1%. Fiber strength values ranged from a high of 32.2 g/tex for NexGen 4111RF and All-Tex Edge B2RF to a low of 27.4 g/tex for NexGen 2051B2RF.

Table 2. HVI fiber property results from the irrigated large plot replicated systems variety demonstration, Mark and Ryan Williams Farm, Farwell, TX, 2011.

Entry	Micronaire	Staple	Uniformity	Strength
	units	32 <sup>nds</sup> inch	%	g/tex
FiberMax 2011GT	4.1	34.8	80.4	30.0
FiberMax 2484B2F	4.1	35.4	80.6	30.7
FiberMax 9250GL	4.4	34.9	80.0	29.3
Deltapine 10R011B2RF	3.9	34.8	80.5	30.6
NexGen 4111RF	4.1	34.9	81.8	32.2
All-Tex Edge B2RF	4.6	34.8	82.2	32.2
FiberMax 1740B2F	4.1	34.0	79.3	28.7
Deltapine 1032B2RF	4.2	34.3	80.8	29.5
Stoneville 4288B2F	4.5	34.2	80.1	28.9
PhytoGen 367WRF	4.2	34.0	80.6	29.4
Dyna-Gro 2450B2RF	4.3	34.0	80.7	27.5
NexGen 2051B2RF	4.4	33.8	79.1	27.4
All-Tex Rapid B2RF	4.5	33.7	79.8	28.9
Croplan Genetics 3006B2RF	4.7	34.7	81.6	28.5
Test average	4.3	34.5	80.5	29.6
CV, %	6.5	1.8	0.6	2.3
OSL	0.0485	0.0594 <sup>†</sup>	<0.0001	<0.0001
LSD	0.5	0.9	0.8	1.2

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level, <sup>†</sup>indicates significance at the 0.10 level.

At the Mount Blanco location, lint turnouts of field-cleaned bur cotton ranged from a high of 34.8% for Deltapine 1032B2RF to a low of 29.7 for Stoneville 4288B2F (Table 3). Lint yields averaged 441 lb/acre. FiberMax 2011GT had the highest lint yield with 481 lb/acre. Seed yields averaged 580 lb/acre. Loan values derived from commercially ginned bales ranged from \$0.5367 for FiberMax 9180B2F to \$0.4895 for Deltapine 1032B2RF. Lint values ranged from \$248.49/acre for FiberMax 2011GT to \$196.08/acre for Deltapine 1032B2RF.

Table 3. Harvest results from the irrigated large plot replicated systems variety demonstration, Mark and David Appling Farm, Mount Blanco, TX, 2011.

Entry	Lint turnout	Lint yield	Seed yield	Lint loan value	Lint value
	%	-----lb/acre----- ---		\$/lb	\$/acre
FiberMax 2011GT	34.1	481	577	0.5170	248.49
FiberMax 9180B2F	31.5	458	651	0.5367	245.80
Deltapine 1044B2RF	32.0	473	624	0.5030	237.74
FiberMax 9170B2F	32.5	446	602	0.5192	231.43
Deltapine 10R011B2RF	33.7	448	568	0.5151	230.66
All-Tex Dinero B2RF	30.5	438	595	0.5176	226.47
FiberMax 9103GT	32.0	455	636	0.4949	225.16
NexGen 4111RF	31.5	434	555	0.5135	222.76
PhytoGen 367WRF	30.7	441	569	0.5030	221.76
NexGen 4010B2RF	30.6	430	470	0.5103	219.37
Stoneville 4288B2F	29.7	444	626	0.4929	218.89
NexGen 4012B2RF	31.3	427	571	0.5071	216.22
FiberMax 2484B2F	32.8	399	559	0.5137	204.99
Deltapine 1032B2RF	34.8	400	517	0.4895	196.08
Test average	32.0	441	580	0.5095	224.70
CV, %	--	7.8	7.8	--	7.9
OSL	--	0.0798 <sup>†</sup>	0.0001	--	0.0109
LSD	--	41	65	--	25.23

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level, <sup>†</sup>indicates significance at the 0.10 level.

Note: some columns may not add up due to rounding error.

Value for lint based on CCC loan value from commercially classed bales.

Classing data derived from bales are reported in Table 4. Micronaire averaged 4.3 across all varieties. Staple averaged 32.7 and was highest for FiberMax 9180B2F (33.8) and lowest for Deltapine 1032B2RF (31.9). The highest uniformity (80.4%) was observed in NexGen 4111RF. Strength values ranged from a high of 30.4 g/tex for NexGen 4111RF to a low of 26.0 g/tex for Stoneville 4288B2F.

Table 4. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems variety demonstration, Mark and David Appling Farm, Mount Blanco, TX, 2011.

Variety	Micronaire	Staple	Uniformity	Strength
	units	32nds	%	g/tex
FiberMax 2011GT	4.2	32.7	79.8	28.3
FiberMax 9180B2F	4.2	33.8	80.1	29.1
Deltapine 1044B2RF	4.6	32.1	79.3	28.3
FiberMax 9170B2F	4.1	33.1	78.5	28.3
Deltapine 10R011B2RF	4.4	32.9	79.2	27.7
All-Tex Dinero B2RF	4.4	33.4	79.7	26.7
FiberMax 9103GT	3.9	32.7	78.4	27.1
NexGen 4111RF	4.4	32.4	80.4	30.4
PhytoGen 367WRF	4.3	32.4	79.4	26.9
NexGen 4010B2RF	4.3	33.0	79.8	30.0
Stoneville 4288B2F	4.5	32.1	79.1	26.0
NexGen 4012B2RF	4.2	32.3	79.2	27.0
FiberMax 2484B2F	4.4	32.8	79.1	26.1
Deltapine 1032B2RF	4.4	31.9	78.1	26.3
Test average	4.3	32.7	79.3	27.7

Reflects average HVI values from bales classed for each variety.

### **Summary**

Results from these studies, and others, indicate significant differences exist among varieties in terms of lint and seed yield, lint loan value, and fiber quality under varying environmental conditions and management practices. When selecting varieties for planting, producers should compare results from as many locations across as many years as possible. Variety testing results can be obtained from various sources including, but not limited to, university and company trials.