2019 COTTON VARIETY EVALUATION IN NORTHEAST TEXAS

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Introduction and Abstract

Cotton variety selection is an important decision in growing a cotton crop and affects many other management decisions throughout the production and marketing of a crop. Twenty (20) cotton varieties were evaluated for yield in a replicated small plot trial in Greenville, Texas at the Texas A&M University System Greenville Research, Extension, and Teaching Farm. Entries included eighteen commercially available upland varieties from major companies, an acala type (PHY 764) and a hybrid pima X upland type (HA 1432). Varieties were evaluated for agronomic traits, yield, and fiber quality. The highest yielding variety was PHY 300 W3FE at 551.8 pounds (lbs) of lint per acre with 13 of the 20 varieties not statistically significantly different from the top variety for lint yield. The trial mean was 418.5 lbs of lint per acre and slightly lower than average for the area. The lower yield is attributed to a wet spring, late planting, and a dry season at full bloom. Bollworm pressure was low not giving an advantage to the varieties with insect resistance traits. The acala and hybrid pima were in the second statistical grouping for yield at 361.9 and 376.9 lbs of lint per acre, respectively. All varieties were saw ginned with the top fiber quality varieties as determined by HVI being HA 1432, DP 1948, and PHY 764. The hybrid pima with lower to average yield would still have similar gross returns to the higher yielding uplands based on higher lint value if it could be roller ginned. Variety selection should be based on multiple year information with similar location and production practices.

Materials and Methods

Plots were seeded on June 3, 2019 as 2 row plots, 40 ft in length, on 30 inch row spacing, at 95,000 plants per acre with a two-row cone planter in a randomized complete block design with 4 replications. Plots received a pre-emergent application of glyphosate and Caparol and were hand weeded as needed. After emergence seedlings were rated for vigor/size on a 1-10 scale with 10 being the largest. Plots were side-dressed on July 8, 2019 with 99 units of N as ammonium nitrate (34-0-0). Single rows of 17’ 5” in length; were harvested by removing bolls by hand beginning in October. Final populations were determined by counting the number of plants harvested and multiplying by 1000. Lint was deburred by hand. Samples were ginned to determine lint yield and lint turnout. Yield analysis was done with ANOVA for yield differences between the populations of each treatment. Replications 1 and 2 were assessed by Texas Tech Fiber Lab for quality determination by HVI.

Results and Discussion

The highest yielding variety was PHY 300 W3FE at 551.8 pounds (lbs) of lint per acre with 13 of the 20 varieties not statistically significantly different from the top variety for lint yield. The trial mean was 418.5 lbs of lint per acre and lower than average for the area. Lower yields are attributed to a wet spring, late planting, and a dry season at full bloom. Bollworm pressure was low not giving an advantage to the varieties with insect resistance traits or requiring an insecticide treatment on conventional varieties. Earlier maturing varieties may have been favored because of the late planting although September set a record for lack of rainfall and heat which is atypical of this environment and some of the later maturing varieties matured more bolls. The hybrid pima was the most indeterminate entry.

The acala and hybrid pima were in the second statistical grouping for yield at 361.9 and 376.9 lbs of lint per acre, respectively. All varieties were saw ginned with the top fiber quality varieties as determined by HVI being HA 1432, DP 1948, and PHY 764. The hybrid pima’s lower yield has similar gross returns to the higher yielding uplands based

on higher lint value if it could be roller ginned. Samples have been sent for roller ginning and classing to confirm the improved quality. Despite the lack of stacked traits in the hybrid pima there is still a higher seed cost because of the increased cost of hybrid seed production. Currently transportation to a roller gin would be a large cost. This information should be helpful to determine the potential for growing higher quality fibers and construction of a roller gin in other cotton growing regions. Variety selection should be based on multiple year information with similar location and production practices.

Table 1. Dryland cotton variety evaluation at Greenville, TX in 2019. Twenty varieties are ranked by lint yield and also evaluated by population, seedling vigor rating, (10 = best), lint and seed size, based on 100 fuzzy seed. Values in a column followed by the same letter are not statistically different.

Variety/Hybrid	**Lint Yield lbs/acre**		**Plant Population plants/acre**	**Seedling Vigor Rating**		**Seed Size 100 seed Weight in grams**	
PHY 300 W3FE	551.8	a	93202	4.8	abc	7.7	ef
PHY 330 W3FE	514.0	ab	63270	4.5	bc	7.95	ef
PHY 480 W3FE	511.7	ab	71948	5	ab	9.2	cde
PHY 430 W3FE	499.8	ab	76700	5	ab	8.75	ef
NG 4936 B3XF	465.1	abc	59804	4.5	bc	8.15	ef
PHY 350 W3FE	461.1	abc	60985	3.8	c	8.85	def
ST 5711 B3XF	455.9	abc	61416	4.5	bc	7.7	ef
PHY 333 WRF	437.7	a-d	69016	5.8	a	8.25	ef
PHY 340 W3FE	429.7	a-d	70018	4.5	bc	8.35	ef
DP 1948 B3XF	417.3	a-d	62920	3.8	c	7.8	ef
DP 1646 B2XF	417.2	a-d	74455	4.8	abc	7.4	f
PHY 400 W3FE	409.3	a-d	77603	5.5	ab	9.1	cde
ST 5707 B2XF	398.7	a-d	68527	5	ab	11	b
HA 1432	376.9	bcd	48750	5.8	a	11.9	a
ST 4848 GLT	364.1	bcd	79220	5.5	ab	8.275	ef
PHY 764 WRF	361.9	bcd	65857	5.3	ab	10.25	bc
FM 2398 GLTP	349.5	bcd	72513	4.5	bc	8.95	def
DG 3421 B3XF	341.9	bcd	89482	5	ab	8.55	ef
ST 4480 B3XF	323.4	cd	80114	4.5	bc	8	ef
ST 5471 GLTP	283.3	d	65097	5	ab	10.1	bcd
Average	418.5		70545	4.84		8.81	
P > F	0.0001		.0124	.0001		.0001	
LSD $_{(0.05)}$	97.9		19826	0.65		0.878	
CV	16.4		19.8	9.53		4.76	

Table 2. Dryland cotton variety evaluation at Greenville, TX in 2019. Lint was assessed by Texas Tech Fiber Lab for quality evaluation by HVI using 2 replicates.

Variety/Hybrid	Mic	Length	Uniformity	Strength	Loan Value
HA 1432	3.87	1.32	85.50	39.95	76.05
DP 1948 B3XF	4.44	1.18	84.70	36.35	56.78
PHY 764 WRF	4.11	1.15	83.75	34.40	55.95
NG 4936 B3XF	4.56	1.12	81.90	29.25	55.78
DP 1646 B2XF	4.31	1.13	80.75	29.00	55.78
ST 5711B3XF	4.49	1.11	81.75	30.20	55.30
DG 3421 B3XF	4.72	1.10	83.15	32.70	55.18
PHY 480 W3FE	4.35	1.13	85.10	31.75	54.90
PHY 350 W3FE	4.32	1.11	82.95	30.25	54.80
PHY 400 W3FE	4.30	1.10	82.85	31.20	54.78
PHY 330 W3FE	4.31	1.10	82.95	29.45	54.65
PHY 333 WRF	4.42	1.09	82.60	28.15	54.38
PHY 300 W3FE	4.12	1.08	82.20	30.00	53.98
PHY 430 W3FE	4.74	1.07	82.75	30.45	53.95
ST 5471GLTP	4.37	1.07	81.55	30.75	53.85
ST 4480 B3XF	4.07	1.07	79.55	27.40	53.33
ST 4848 GLT	4.67	1.06	82.75	29.80	53.13
ST 5707 B2XF	5.04	1.15	83.35	37.00	53.03
PHY 340 W3FE	4.24	1.11	82.55	29.90	52.98
FM 2398 GLTP	4.97	1.08	81.50	29.65	52.55
Average	3.85	1.11	82.71	31.38	54.45
P > F	0.0001	0.0001	0.0004	0.0001	0.0268
$LSD_{(0.05)}$	0.356	0.043	1.85	2.58	2.14
CV	3.85	1.83	1.07	3.93	1.88

Conclusions

- Several excellent yielding varieties are available for producer selection that include choices in herbicide and insect tolerant traits.
- Delayed planting and early season high soil moisture hampered plant growth followed by late season drought reduced yields.
- Boll worm pressure was low and did not favor varieties with insect protection traits.
- Earlier maturing varieties may have been favored because of the late planting although September set a record for lack of rainfall and heat which is atypical of this environment and some of the later maturing varieties matured more bolls.
- The Hybrid Pima exhibited slightly lower yield but has a similar gross profit based on higher lint value, however transportation to a roller ginning needs to be considered.
- Hybrid seed has a higher seed cost than other conventional varieties.

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