2019 TEXAS UPPER GULF COAST REPLICATED AGRONOMIC COTTON EVALUATION (RACE) - TRIAL SUMMARY

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Abstract

Texas A&M AgriLife Extension Service conducts over 20 large-plot replicated cotton variety trials across the southern, eastern and central portions of Texas each year. The objective of these trials is to compare yield and lint quality of multi-gene cotton cultivars from the major seed suppliers, grown in large plot, replicated trials on producer-cooperator fields across this region. Because of the various environmental conditions and site locations that these trials are conducted annually, these trials produce a wealth of data on variety performance. These variety results are made available to local producers throughout these regions of the state. Due to limited space and adverse impact of weather on late harvested trials, a summary of 4 county cotton variety trials conducted in 2019 across the Upper Coastal Bend Region of Texas will be summarized. All the trial sites are replicated multiple times per location, with plot sizes exceeding 0.25 acres. These trials are managed by the producer/cooperator and thus represent true, on-farm management practices.

Introduction

Cultivar selection is the most important decision made by the cotton (*Gossypium hirsutum* L.) grower; however, with the proliferation of transgenic technology, new seed treatments for both early season insects and disease management, and new genetics, cultivar selection has become even more critical, and one of the most expensive inputs of the production enterprise. Unlike herbicide or insecticide decisions that can be changed during the season to address specific conditions and pests, cultivar selection is made only once and that selection dictates field management for the entire season.

Because of the ever rapidly increasing rate in introduction of new cultivars/technologies into the marketplace, growers and practitioners are forced to make cultivar selection decisions with even less information than ever. In most cases, decisions are based upon single-year information from academic/public sources, and sometimes the only information available is derived from seed company reports. Due to the rapid turnover of cultivars (three to four-year life-cycle), multiple-year testing has virtually become a “thing-of-the-past.”

Consequently, these on-farm, large-plot cultivar testing program have been implemented by Texas A&M AgriLife Extension cotton agronomists with the goal of providing growers and practitioners with information necessary in making cultivar decisions. Agronomic management of weed, insect and plant growth regulator use and harvest operations will not be reflective of the commercial.

According to the USDA, NASS Cotton Planted acres, June 2019, Texas producers planted 7.2 million acres in 2019 compared to 7.5 million acres in 2019 According to the USDA-Agricultural Marketing Service “Cotton Varieties Planted 2019 Crop” survey for Texas, the percent market of each of these varieties were as follows: DP 1646 B2XF – 10.6%, PHY 480 W3FE – 2.4 NG 5711 B3XF – 1.2%, ST 4848 GLT – 0.5% and DG 3421 B3XF, DP 1948 B3XF, FM 2398 GLT, NG 4936 B3XF and ST 5471 GLTP each accounted for no more than 0.3% share of the Texas market.

Materials and Methods

Ten cultivars were planted at each location and cultivar selections were determined with input from grower cooperators/committees, Extension faculty, and seed industry representatives. Only the ten varieties, that were common in each of the five locations, were used for the analysis of this poster. Variety entries consisted of Bollgard 3 XtendFlex, WideStrike 3/Enlist, or Glytol TwinLink/TwinLink Plus varieties. The Fort Bend county location received one flood irrigation.

Plot size was as big as 1.4 acres in size, depending upon the location. Studies were arranged in a randomized complete block design with three replications (Table 1). All trials were machine harvested with commercial pickers. Plot weights were determined using a weighing boll buggy equipped with electronic scales or platform scale, depending on type of picker. Sub-samples from each plot were ginned on a Continental 20 saw gin with no lint cleaner (which produces a higher lint turnout percent than a commercial gin). Consequently, higher turnouts equate to lint yields which were generally higher than area-wide commercial yields. Lint quality was quantified by high volume instrument (HVI) at the Fiber and Biopolymer Research Institute at Lubbock, Texas. Additionally, all data were standardized to a color grade and leaf of 41 – 4. Lint value per pound was calculated using Cotton Incorporated's 2019 Cotton Loan Calculator. Statistical analysis of data was conducted using ARM, using LSD (P=0.10).

Table 1. Trial location, cooperator, planting date, harvest date, row spacing, plot dimensions and area of 2019 Texas A&M AgriLife Extension Service RACE Trials.

County	Cooperator	Planting Date	Harvest Date	Row Spacing (inches)	Plot Dimensions	Irrigated or Dryland	A/plot
Jackson	Chris Hajovosky	12-Apr	5-Sep	38	6 rows x 3163 ft	Dryland	1.4
Matagorda	Hansen Farms	16-Apr	12-Sep	40	6 rows x 1378 ft	Dryland	0.7
Wharton	Michael Beard	12-Apr	3-Sep	40	6 rows x 1930 ft	Dryland	0.5
Fort Bend	Alan Stansney	26-Apr	15-Sep	36	6 rows x 1550 ft	Irrigated	0.7
Colorado	Mahalitc Farms	15-Apr	6-Sep	40	6 rows x 1600 ft	Dryland	0.7

Results and Discussion

Mean variety yield across all locations ranged from 1578 to 1281 lbs/ac for PHY 480 W3FE and NG 4777 B2XF, respectively (Table 2). Overall mean yield of all varieties across all five locations was 1449 lbs/ac. Mean turnout for each variety across all locations ranged from 41.0 to 45.7 for NG 4777 B2XF and PHY 330 W3FE, respectively. Loan value ranged from 51.66 to 54.64 cents/lb for FM 2498 GLT and DP 1845 B3XF, respectively. Mean lint value for each variety across all locations ranged from $861 to $692 per ac for PHY 480 W3FE and NG 4777 B2XF, respectively. Mean location yields ranged from 1591 to 1228 lbs/ac for the Wharton-2 and Calhoun Co RACE trials, respectively (Tables 3-7).

Table 2. Multi-county summary of mean yields, percent lint turnout, loan value and lint value of RACE Trials, for Calhoun, Jackson, Matagorda- Hansen, Matagorda-Reed, Wharton-1 and Wharton-2, 2019.

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
PHY 400 W3FE	1245	43.9	53.98	672
DG 3421 B3XF	1192	42.6	54.01	644
NG 4936 B3XF	1187	41.5	53.88	642
DP 1646 B2XF	1184	43.3	53.76	639
FM 2398 GLTP	1201	43.8	53.03	635
PHY 480 W3FE	1172	43.1	52.73	618
ST 5471 GLTP	1111	41.7	53.89	598
ST 4848 GLT	1103	43.2	53.44	587
DP 1948 B3XF	1063	42.5	53.33	569
NG 5711 B3XF	1035	41.1	54.24	561
Mean	1149	42.7	53.62	616

Table 3. Mean lint yields, percent lint turnout, loan value and lint value from Jackson County RACE Trial, 2019.

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
DP 1646 B2XF	856	42.1	54.18	464
NG 4936 B3XF	840	40.3	54.18	455
DG 3421 B3XF	803	40.7	53.75	431
PHY 400 W3FE	793	43.2	53.95	428
FM 2398 GLTP	781	41.8	53.38	417
NG 5711 B3XF	686	38.4	54.23	372
ST 5471 GLTP	690	40.0	53.4	369
ST 4848 GLT	678	42.4	53.5	363
PHY 480 W3FE	686	42.7	52.73	362
DP 1948 B3XF	684	40.7	52.53	360
Mean	749	41.2	53.58	402

Table 4. Mean lint yields, percent lint turnout, loan value and lint value from Matagorda County RACE Trial, 2019

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
PHY 400 W3FE	1289	45.7	54.28	700
ST 4848 GLT	1304	44.5	53.45	696
DG 3421 B3XF	1278	44.3	54	690
PHY 480 W3FE	1274	45.2	53.95	688
DP 1646 B2XF	1228	45.1	53.37	655
DP 1948 B3XF	1200	45.5	54.37	652
NG 4936 B3XF	1219	41.9	53.4	651
FM 2398 GLTP	1240	46.1	50.9	631
ST 5471 GLTP	1169	42.9	53.82	629
NG 5711 B3XF	1158	44.7	54.25	628
Mean	1236	44.6	53.58	662

Table 5. Mean lint yields, percent lint turnout, loan value and lint value from Wharton County RACE Trial, 2019

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
PHY 480 W3FE	1360	44.7	53.92	734
FM 2398 GLTP	1407	44.6	51.85	729
PHY 400 W3FE	1344	43.6	54.2	729
NG 4936 B3XF	1339	44.7	54.22	726
DG 3421 B3XF	1286	44.9	53.93	694
DP 1646 B2XF	1258	44.4	54.18	681
ST 5471 GLTP	1218	43.7	53.72	654
DP 1948 B3XF	1199	44.2	54.33	652
ST 4848 GLT	1160	44.8	53.17	616
NG 5711 B3XF	1102	44.1	54.15	597
Mean	1267	44.4	53.77	681

Table 6. Mean lint yields, percent lint turnout, loan value and lint value from Fort Bend County RACE Trial, 2019.

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
PHY 400 W3FE	1326	43.3	54.3	720
DP 1646 B2XF	1306	42.4	53.83	703
DG 3421 B3XF	1294	41.4	54.05	700
FM 2398 GLTP	1266	43.3	54	684
NG 4936 B3XF	1264	39.7	54.03	683
ST 5471 GLTP	1230	41.1	53.93	663
NG 5711 B3XF	1188	40.0	54.15	644
ST 4848 GLT	1188	42.4	53.6	637
PHY 480 W3FE	1211	41.0	52.3	635
DP 1948 B3XF	1162	41.6	54.33	632
Mean	1243	41.6	53.85	670

Table 7. Mean lint yields, percent lint turnout, loan value and lint value from Colorado County RACE Trial, 2019.

Variety	Yield (lbs/acre)	Turnout %	Loan Value (¢/lbs)	Lint Value ($/Ac)
PHY 400 W3FE	1475	43.8	53.15	783
FM 2398 GLTP	1313	43.3	54.27	713
DG 3421 B3XF	1298	41.7	54.2	703
NG 4936 B3XF	1274	40.9	54.42	693
DP 1646 B2XF	1274	42.8	54.33	692
ST 5471 GLTP	1250	40.6	54.1	676
PHY 480 W3FE	1327	41.9	50.65	672
ST 4848 GLT	1183	41.9	52.52	622
NG 5711 B3XF	1040	38.4	54.25	564
DP 1948 B3XF	1070	40.5	51.38	550
Mean	1250	41.6	53.31	666

Summary

Mean variety yield across all locations ranged from 1245 to 1035 lbs/ac for PHY 400 W3FE and NG 5711 B3XF, respectively (Table 2). Overall mean yield of all varieties across all five locations was 1149 lbs/ac. Mean turnout for each variety across all locations ranged from 41.1 to 43.9 for NG 5711 B3XF and PHY 400 W3FE, respectively. Loan value ranged from 52.73 to 54.01 cents/lb for PHY 480 W3FE and DG 3421 B3XF, respectively. Mean lint value for each variety across all locations ranged from $672 to $557 per ac for PHY 400 W3FE and NG 5711 B3XF, respectively. Mean location yields ranged from 1267 to 749 lbs/ac for the Wharton and Jackson Co RACE trials, respectively (Tables 3-7).

The information in this poster represents only 5 of the over 20 different Replicated Agronomic Cotton Evaluations (RACE) trials that were planted in South and East-Central Texas in 2019 by Texas A&M AgriLife Extension Service.

In general, mean yields of these five trials were comparable in 2019 when compared to the previous year in the Upper Gulf Coast considering the extreme weather conditions that the crop experienced. An excessively wet fall, winter and spring leading up to planting resulted in reduced field and seed bed preparation and also resulted in later planted crop and in some situations, caused producers to take preventive planting where conditions where the most extreme. Then when the weather conditions changed and the rainy conditions ended, the weather turned extremely hot and dry for the duration of the summer and through most of the fall. This limited yield potential compared to years when a normal rainfall pattern general occurs through the spring and summer. The data generated from these RACE trials and other similar trials throughout the state, provide growers with updated information on many of the most marketed cotton varieties and technologies commercially available to them for 2020 and beyond.

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