

**2020 TEXAS UPPER COAST REPLICATED AGRONOMIC COTTON EVALUATION (RACE) SUMMARY****Dale A. Mott****Texas A&M AgriLife Extension Service****College Station, TX****Benjamin. McKnight****Josh. McGinty****Texas A&M AgriLife Extension Service****Corpus Christi, TX****Stephen Biles****Texas A&M AgriLife Extension Service****Port Lavaca, TX****Michael Hiller****Texas A&M AgriLife Extension Service****Edna, TX****Aaron Sumrall****Texas A&M AgriLife Extension Service****Bay City, TX****Corrie Bowen****Kate Crumley****Texas A&M AgriLife Extension Service****Wharton, TX****Laramie Kettler****Texas A&M AgriLife Extension Service****Eagle Lake, TX****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 rapid 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 programs have been developed 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 2020, Texas producers planted 7.05 million acres in 2020 compared to 7.2 million acres in 2019. According to the USDA-Agricultural Marketing Service “Cotton Varieties Planted 2020 Crop” survey for Texas, the percent market of each of these varieties were as follows: PHY 480 W3FE – 2.4, PHY 400 W3FE – 5.8, DP 1646 B2XF – 11.5%, NG 4936 B3XF – 2.6%, NG 4098 B3XF – 1.6%, DG 3421 B3XF - 0.4%, DP 2012 B3XF - %, ST 4990 B2XF – 0.10%, ST 4550 B2XF – 0.10%, DP 2020 B3XF 0.4%, and ST 5610 B3XF <0.1%.

**Objective**

The objective of this project is to compare yield and lint quality of stacked-gene cultivars grown in large plot replicated trials on producer-cooperator fields in the Upper Coastal Bend region of Texas.

### **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 Bollgard3 XtendFlex®, WideStrike3/Enlist®, or Glytol TwinLink/TwinLink Plus® varieties. The Colorado county locations was irrigated.

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 2020 Cotton Loan Calculator. Statistical analysis of data were conducted using ARM, using LSD (P=0.10).

Table 1. Trial location, cooperator, planting date, harvest date, row spacing, plot dimensions and area of 2020 Texas A&M AgriLife Extension Service RACE Trials.

| County    | Cooperator       | Planting Date | Harvest Date | Row Spacing (inches) | Plot Dimensions  | Irrigated or Dryland | Area harvested /plot |
|-----------|------------------|---------------|--------------|----------------------|------------------|----------------------|----------------------|
| Calhoun   | Danny May        | Apr 19        | Sept 2       | 38                   | 2 rows x 30 ft   | Dryland              | 0.004                |
| Jackson   | Brent Batchelder | Mar 25        | Aug 20       | 38                   | 6 rows x 2275 ft | Dryland              | 0.7                  |
| Matagorda | Hansen Farms     | Apr 7         | Aug 27       | 40                   | 6 rows x 1378 ft | Dryland              | 0.65                 |
| Wharton   | Michael Beard    | Mar 18        | Aug 13       | 40                   | 6 rows x 2175 ft | Dryland              | 1.0                  |
| Fort Bend | Alan Stasney     | Apr 26        | Sept 5       | 36                   | 6 rows x 1700 ft | Irrigated            | 0.7                  |
| Colorado  | Mahalitc Farms   | Apr 14        | Sept 6       | 40                   | 6 rows x 1550 ft | Irrigated            | 1.2                  |

### **Results and Discussion**

Mean variety yield across all locations ranged from 1462 to 1161 lbs/ac for PHY 480 W3FE and ST 5610 B3XF, respectively (Table 2). Overall mean yield of all varieties across all five locations was 1347 lbs/ac. Mean turnout for each variety across all locations ranged from 45.3 to 41.9 for ST 4550 GLTP and NG 4098 B3XF, respectively. Loan value ranged from 54.15 to 52.51 cents/lb for ST 4990 B3XF and DP 2020 B3XF, respectively. Mean lint value for each variety across all locations ranged from \$787 to \$625 per ac for PHY 480 W3FE and ST 5610 B3XF, respectively. Mean location yields ranged from 1580 to 1109 lbs/ac for the Colorado and Fort Bend Co RACE trials, respectively (Tables 3-8).

Table 2. Multi-county summary of mean yield, percent lint turnout, loan value and lint value of RACE Trials, for Calhoun, Jackson, Matagorda, Wharton, Fort Bend and Colorado Counties, TX, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| PHY 480 W3FE | 1462             | 44.3      | 53.83              | 787                |
| PHY 400 W3FE | 1437             | 44.1      | 54.07              | 777                |
| DP 1646 B2XF | 1398             | 44.7      | 53.27              | 744                |
| NG 4936 B3XF | 1375             | 43.2      | 53.82              | 740                |
| NG 4098 B3XF | 1361             | 41.9      | 54.11              | 737                |
| DG 3421 B3XF | 1369             | 44.4      | 53.66              | 734                |
| DP 2012 B3XF | 1344             | 42.4      | 53.74              | 723                |
| ST 4990 B3XF | 1325             | 42.2      | 54.15              | 718                |
| ST 4550 GLTP | 1289             | 45.3      | 53.71              | 693                |
| DP 2020 B3XF | 1299             | 42.0      | 52.51              | 685                |
| ST 5610 B3XF | 1161             | 45.6      | 53.72              | 625                |
| Mean         | 1347             | 43.6      | 53.69              | 724                |

Table 3. Mean lint yields, percent lint turnout, loan value and lint value from Calhoun County RACE Trial, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| PHY 400 W3FE | 1391             | 43.9      | 54.37              | 756                |
| PHY 480 W3FE | 1376             | 43.2      | 53.28              | 733                |
| NG 4936 B3XF | 1300             | 42.3      | 53.97              | 702                |
| DP 1646 B2XF | 1198             | 44.3      | 53.55              | 642                |
| ST 4550 B3XF | 1163             | 45.2      | 53.18              | 619                |
| ST 4990 B3XF | 1079             | 40.5      | 54.28              | 586                |
| NG 4098 B3XF | 970              | 41.0      | 53.62              | 520                |
| Mean         | 1211             | 42.9      | 53.75              | 651                |

Table 4. Mean lint yields, percent lint turnout, loan value and lint value from Jackson County RACE Trial, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| ST 4990 B3XF | 1666             | 42.2      | 54.63              | 910                |
| DG 3421 B3XF | 1645             | 46.8      | 53.53              | 881                |
| NG 4098 B3XF | 1576             | 43.3      | 54.03              | 851                |
| PHY 480 W3FE | 1581             | 45.9      | 53.77              | 849                |
| ST 5610 B3XF | 1513             | 45.4      | 54.47              | 824                |
| PHY 400 W3FE | 1528             | 42.8      | 53.82              | 822                |
| ST 4550 GLTP | 1459             | 44.3      | 54.28              | 792                |
| DP 1646 B2XF | 1476             | 43.1      | 53.10              | 783                |
| NG 4936 B3XF | 1347             | 47.5      | 53.23              | 717                |
| Mean         | 1532             | 44.6      | 53.87              | 826                |

Table 5. Mean lint yields, percent lint turnout, loan value and lint value from Matagorda County RACE Trial, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| PHY 480 W3FE | 1323             | 45.3      | 54.02              | 715                |
| NG 4098 B3XF | 1287             | 41.1      | 54.32              | 699                |
| PHY 400 W3FE | 1248             | 45.4      | 54.02              | 674                |
| DG 3421 B3XF | 1252             | 45.0      | 53.57              | 670                |
| DP 2012 B3XF | 1218             | 42.5      | 53.37              | 650                |
| NG 4936 B3XF | 1181             | 42.3      | 53.73              | 635                |
| ST 4990 B3XF | 1101             | 43.2      | 53.97              | 594                |
| DP 2020 B3XF | 1078             | 45.1      | 52.77              | 568                |
| ST 4550 GLTP | 1003             | 45.1      | 53.23              | 535                |
| ST 5610 B3XF | 740              | 45.9      | 53.08              | 393                |
| Mean         | 1143             | 44.1      | 53.61              | 613                |

Table 6. Mean lint yields, percent lint turnout, loan value and lint value from Wharton County RACE Trial, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| NG 4936 B3XF | 1655             | 43.8      | 53.93              | 893                |
| NG 4098 B3XF | 1591             | 44.0      | 54.25              | 863                |
| PHY 480 W3FE | 1565             | 45.7      | 53.73              | 841                |
| PHY 400 W3FE | 1556             | 45.0      | 53.98              | 840                |
| ST 4990 B3XF | 1542             | 43.3      | 53.87              | 831                |
| DP 1646 B2XF | 1521             | 46.8      | 53.17              | 807                |
| ST 4550 GLTP | 1476             | 47.0      | 53.48              | 789                |
| DG 3421 B3XF | 1445             | 44.6      | 53.55              | 773                |
| ST 5610 B3XF | 1330             | 47.2      | 53.95              | 718                |
| Mean         | 1520             | 45.3      | 53.77              | 817                |

Table 7. Mean lint yields, percent lint turnout, loan value and lint value from Fort Bend County RACE Trial, 2020.

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| PHY 480 W3FE | 1264             | 44.2      | 53.95              | 682                |
| PHY 400 W3FE | 1245             | 44.9      | 54.02              | 673                |
| DP 2012 B3XF | 1138             | 42.0      | 53.68              | 610                |
| NG 4936 B3XF | 1093             | 41.9      | 54.02              | 590                |
| ST 4550 GLTP | 1094             | 45.2      | 53.82              | 589                |
| DP 2020 B3XF | 1167             | 40.4      | 50.45              | 589                |
| ST 4990 B3XF | 1079             | 43.0      | 54.05              | 583                |
| NG 4098 B3XF | 1012             | 40.5      | 54.22              | 549                |
| ST 5610 B3XF | 1005             | 45.1      | 52.85              | 532                |
| DG 3421 B3XF | 990              | 43.0      | 53.52              | 530                |
| Mean         | 1109             | 43.0      | 53.46              | 593                |

Table 8. Mean lint yields, percent lint turnout, loan value and lint value from Colorado County RACE Trial, 2020

| Variety      | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value (\$/Ac) |
|--------------|------------------|-----------|--------------------|--------------------|
| NG 4098 B3XF | 1729             | 41.4      | 54.23              | 938                |
| DP 2012 B3XF | 1677             | 42.5      | 54.18              | 909                |
| NG 4936 B3XF | 1674             | 41.3      | 54.05              | 905                |
| PHY 480 W3FE | 1664             | 41.6      | 54.25              | 903                |
| DP 2020 B3XF | 1652             | 40.6      | 54.30              | 897                |
| PHY 400 W3FE | 1652             | 42.9      | 54.23              | 896                |
| ST 4550 GLTP | 1538             | 45.0      | 54.23              | 834                |
| DG 3421 B3XF | 1512             | 42.6      | 54.15              | 818                |
| ST 4990 B3XF | 1482             | 40.9      | 54.10              | 802                |
| ST 5610 B3XF | 1216             | 44.3      | 54.23              | 660                |
| Mean         | 1580             | 42.3      | 54.20              | 856                |

### Conclusions

The information in this poster represents only 6 of the over 20 different Replicated Agronomic Cotton Evaluations (RACE) trials that were planted in South and East-Central Texas in 2020 by Texas A&M AgriLife Extension Service. In general, mean yields of these six trials were comparable in 2020 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 were 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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