# 2021 TEXAS UPPER GULF COAST – REPLICATED AGRONOMIC COTTON EVAULATION (RACE) – TRIAL SUMMARY

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## SUMMARY

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 to compare yield and lint quality of stacked-gene Glytol®, TwinLink®, Widestrike®, Roundup Ready Flex®, Extend Flex®, and Enlist® cultivars 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, a summary of 3-4 county cotton variety trials conducted in 2021 across the Upper Coastal Bend Region of Texas will be summarized. The core group of varieties in these trials includes FM 2398 GLTP, ST 5091 B3XF, PHY 332 W3FE, PHY 400 W3FE, DP 2012 B3XF, DP 2020 B3XF, NG 4936 B3XF, NG 5150 B3XF, DG 3402 B3XF, and H 959 B3XF. All the trial sites have three replicates, 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-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 program 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.

## 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.

Plot size was as big as 1.0 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 2021 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 2021 Texas A&M AgriLife Extension Service RACE Trials.

| County | Cooperator | Planting Date | Harvest Date | Row Spacing (in) | Plot Dimensions | Irrigated or Dryland | Area harvested per plot |
|---|---|---|---|---|---|---|---|
| Calhoun | Danny May | Mar 26 | Sept 10 | 38 | 2 rows x 30 ft | Dryland | 0.17 |
| Jackson | Chris Hajovosky | Apr 2 | Sept 24 | 38 | 6 rows x 1378 ft | Dryland | 0.65 |
| Wharton | Michael Beard | Mar 26 | Sept 21 | 40 | 6 rows x 2175 ft | Dryland | 1.0 |
| Colorado | Mahalitc Farms | Apr 5 | Oct 10 | 40 | 6 rows x 1600 ft | Dryland | 0.65 |

## RESULTS AND DISCUSSION

Mean variety yield across all locations ranged from 1363 to 1130 lbs/ac for DP 2020 B3XF and DG H959 B3XF, respectively (Table 2). Overall mean yield of all varieties across the five locations was 1282 lbs/ac. Mean turnout for each variety across all locations ranged from 40.6 to 45.4 for DG H959 B3XF and PHY 400 W3FE, respectively. Loan value ranged from 51.32 to 54.13 cents/lb for FM 2398 GLTP and DP 2020 B3XF, respectively. Mean lint value for each variety across all locations ranged from $738 to $605 per ac for DP 2020 B3XF and DG H959 B3XF, respectively. Mean location yields ranged from 1611 to 1087 lbs/ac for the Colorado and Jackson Co RACE trials, respectively (Tables 3-7).

Table 2. Multi-county summary of mean yield, percent lint turnout, loan value and lint value of RACE Trials, for Calhoun, Jackson, Wharton, and Colorado Counties, TX, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|
| DP 2020 B3XF | 1363 | 42.1 | 54.13 | 738 |
| PHY 400 W3FE | 1364 | 45.4 | 53.77 | 735 |
| DP 2012 B3XF | 1356 | 42.5 | 53.66 | 729 |
| NG 5150 B3XF | 1327 | 43.7 | 52.53 | 699 |
| NG 4936 B3XF | 1272 | 40.8 | 54.01 | 687 |
| ST 5091 B3XF | 1280 | 43.6 | 53.41 | 685 |
| DG 3402 B3XF | 1251 | 43.7 | 53.89 | 675 |
| FM 2398 GLTP | 1275 | 45.2 | 51.32 | 655 |
| PHY 332 W3FE | 1207 | 42.2 | 53.87 | 651 |
| DG H959 B3XF | 1130 | 40.6 | 53.41 | 605 |
| Mean | 1282 | 43.0 | 53.40 | 686 |

Table 3. Mean lint yields, percent lint turnout, fiber grades, loan value and lint value from Calhoun County RACE Trial, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Mic | Length | Strength | Unif | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|---|---|---|---|
| PHY 400 W3FE | 1384 | 45.1 | 4.5 | 1.19 | 32.5 | 83.4 | 54.37 | 752 |
| DP 2020 B3XF | 1371 | 40.6 | 4.6 | 1.22 | 31.6 | 83.7 | 54.35 | 745 |
| ST 5091 B3XF | 1340 | 42.6 | 4.5 | 1.14 | 29.2 | 81.7 | 53.68 | 719 |
| NG 5150 B3XF | 1342 | 42.8 | 4.8 | 1.12 | 29.4 | 82.3 | 53.42 | 717 |
| DP 2012 B3XF | 1308 | 42.0 | 4.8 | 1.19 | 31.5 | 83.4 | 54.15 | 708 |
| FM 2398 GLTP | 1271 | 44.3 | 5.2 | 1.15 | 31.0 | 83.2 | 52.02 | 661 |
| NG 4936 B3XF | 1221 | 40.4 | 4.5 | 1.18 | 29.6 | 84.3 | 54.07 | 660 |
| PHY 332 W3FE | 1203 | 42.0 | 4.2 | 1.2 | 33.3 | 83.5 | 54.45 | 655 |
| DG H959 B3XF | 1088 | 39.5 | 4.7 | 1.19 | 32.5 | 82.6 | 54.33 | 591 |
| PHY 400 W3FE | 1384 | 45.1 | 4.5 | 1.19 | 32.5 | 83.4 | 54.37 | 752 |
| Mean | 1281 | 42.1 | 4.6 | 1.18 | 31.2 | 83.1 | 53.87 | 689 |

Table 4. Mean lint yields, percent lint turnout, fiber grades, loan value and lint value from Jackson County RACE Trial, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Mic | Length | Strength | Unif | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|---|---|---|---|
| DP 2012 B3XF | 1178 | 44.3 | 5.0 | 1.17 | 29.4 | 83.3 | 52.35 | 617 |
| PHY 400 W3FE | 1161 | 47.1 | 5.1 | 1.15 | 30.7 | 84.1 | 52.42 | 609 |
| NG 4936 B3XF | 1128 | 42.5 | 4.9 | 1.16 | 29.4 | 84.0 | 53.93 | 609 |
| NG 5150 B3XF | 1223 | 46.5 | 5.4 | 1.12 | 28.2 | 82.2 | 49.40 | 604 |
| DP 2020 B3XF | 1112 | 42.9 | 4.8 | 1.20 | 30.8 | 83.4 | 54.22 | 603 |
| ST 5091 B3XF | 1047 | 46.8 | 5.0 | 1.13 | 27.5 | 82.1 | 52.12 | 546 |
| DG 3402 B3XF | 998 | 44.6 | 5.0 | 1.19 | 31.1 | 83.8 | 53.42 | 533 |
| FM 2398 GLTP | 1053 | 47.5 | 5.5 | 1.14 | 29.5 | 84.2 | 50.45 | 531 |
| PHY 332 W3FE | 997 | 44.5 | 5.0 | 1.18 | 31.8 | 83.3 | 52.70 | 526 |
| DG H959 B3XF | 968 | 43.1 | 5.1 | 1.19 | 31.3 | 83.9 | 51.87 | 502 |
| Mean | 1087 | 45.0 | 5.1 | 1.16 | 30.0 | 83.5 | 52.29 | 568 |

Table 5. Mean lint yields, percent lint turnout, fiber grades, loan value and lint value from Wharton County RACE Trial, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Mic | Length | Strength | Unif | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|---|---|---|---|
| DP 2020 B3XF | 1299 | 45.5 | 4.6 | 1.18 | 28.1 | 82.8 | 53.88 | 700 |
| NG 4936 B3XF | 1199 | 41.5 | 4.7 | 1.17 | 28.3 | 82.9 | 53.83 | 646 |
| PHY 400 W3FE | 1194 | 47.1 | 4.6 | 1.14 | 29.6 | 82.2 | 53.83 | 643 |
| DP 2012 B3XF | 1189 | 43.6 | 4.7 | 1.19 | 29.2 | 83.3 | 53.95 | 641 |
| DG 3402 B3XF | 1171 | 47.0 | 4.8 | 1.16 | 28.5 | 82.1 | 53.80 | 630 |
| NG 5150 B3XF | 1168 | 44.7 | 4.9 | 1.16 | 28.3 | 82.3 | 53.03 | 619 |
| ST 5091 B3XF | 1103 | 44.6 | 4.6 | 1.16 | 27.5 | 81.5 | 53.77 | 593 |
| FM 2398 GLTP | 1154 | 45.7 | 5.2 | 1.13 | 27.5 | 81.7 | 50.73 | 586 |
| PHY 332 W3FE | 1078 | 43.6 | 4.5 | 1.18 | 29.2 | 82.0 | 53.88 | 581 |
| H 959 B3XF | 984 | 42.3 | 5.0 | 1.16 | 28.8 | 82.0 | 53.02 | 522 |
| Mean | 1154 | 44.6 | 4.8 | 1.16 | 28.5 | 82.3 | 53.37 | 616 |

Table 6. Mean lint yields, percent lint turnout, fiber grades, loan value and lint value from Wharton County RACE Trial, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Mic | Length | Strength | Unif | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|---|---|---|---|
| DP 2020 B3XF | 1299 | 45.5 | 4.6 | 1.18 | 28.1 | 82.8 | 53.88 | 700 |
| NG 4936 B3XF | 1199 | 41.5 | 4.7 | 1.17 | 28.3 | 82.9 | 53.83 | 646 |
| PHY 400 W3FE | 1194 | 47.1 | 4.6 | 1.14 | 29.6 | 82.2 | 53.83 | 643 |
| DP 2012 B3XF | 1189 | 43.6 | 4.7 | 1.19 | 29.2 | 83.3 | 53.95 | 641 |
| DG 3402 B3XF | 1171 | 47.0 | 4.8 | 1.16 | 28.5 | 82.1 | 53.80 | 630 |
| NG 5150 B3XF | 1168 | 44.7 | 4.9 | 1.16 | 28.3 | 82.3 | 53.03 | 619 |
| ST 5091 B3XF | 1103 | 44.6 | 4.6 | 1.16 | 27.5 | 81.5 | 53.77 | 593 |
| FM 2398 GLTP | 1154 | 45.7 | 5.2 | 1.13 | 27.5 | 81.7 | 50.73 | 586 |
| PHY 332 W3FE | 1078 | 43.6 | 4.5 | 1.18 | 29.2 | 82.0 | 53.88 | 581 |
| DG H959 B3XF | 984 | 42.3 | 5.0 | 1.16 | 28.8 | 82.0 | 53.02 | 522 |
| Mean | 1154 | 44.6 | 4.8 | 1.16 | 28.5 | 82.3 | 53.37 | 616 |

Table 7. Mean lint yields, percent lint turnout, fiber grades, loan value and lint value from Colorado County RACE Tria1, 2021.

| Variety | Yield (lbs/acre) | Turnout % | Mic | Length | Strength | Unif | Loan Value (¢/lbs) | Lint Value ($/Ac) |
|---|---|---|---|---|---|---|---|---|
| DP 2012 B3XF | 1750 | 40.2 | 4.6 | 1.23 | 30.4 | 84.5 | 54.20 | 949 |
| PHY 400 W3FE | 1717 | 42.1 | 4.3 | 1.21 | 32.7 | 84.7 | 54.45 | 935 |
| DP 2020 B3XF | 1672 | 39.4 | 4.5 | 1.22 | 29.7 | 83.9 | 54.05 | 903 |
| ST 5091 B3XF | 1632 | 40.3 | 4.1 | 1.17 | 29.1 | 81.8 | 54.08 | 882 |
| DG 3402 B3XF | 1583 | 39.5 | 4.4 | 1.22 | 32.0 | 84.2 | 54.45 | 862 |
| NG 5150 B3XF | 1574 | 40.8 | 4.6 | 1.22 | 30.8 | 83.9 | 54.25 | 854 |
| FM 2398 GLTP | 1620 | 43.4 | 5.3 | 1.19 | 30.4 | 84.5 | 52.08 | 843 |
| PHY 332 W3FE | 1549 | 38.8 | 3.7 | 1.22 | 33.3 | 83.6 | 54.43 | 843 |
| NG 4936 B3XF | 1539 | 38.6 | 4.3 | 1.23 | 30.6 | 84.4 | 54.2 | 834 |
| DG H959 B3XF | 1478 | 37.4 | 4.7 | 1.26 | 32.2 | 84.7 | 54.42 | 804 |
| Mean | 1611 | 40.1 | 4.5 | 1.22 | 31.1 | 84.0 | 54.06 | 871 |

## SUMMARY

The information in this poster represents only five of the over twenty different Replicated Agronomic Cotton Evaluations (RACE) trials that were planted in the Texas Upper Gulf Coast in 2021 in cooperation with Texas A&M AgriLife Extension Service.

In general, mean yields of these five trials were comparable in 2021 when compared to the previous year in the Upper Gulf Coast considering the extreme weather conditions that the crop experienced. A relatively dry fall and winter, followed by an extremely wet spring and early summer. Then when the weather conditions changed and the rainy conditions ended, the weather turned extremely hot and dry for the duration of the summer until hurricane Nicholas made landfall in mid-September which produced as much as 20 plus inches of rainfall in some areas. 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 2022 and beyond.

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