

# **WEST CENTRAL TEXAS REPLICATED AGRONOMIC COTTON EVALUATION (RACE) TRIALS | 2019**



TEXAS A&M  
**AGRILIFE**  
EXTENSION

**Department of  
Soil and Crop Sciences  
Texas A&M AgriLife  
Extension Service**



# WEST CENTRAL TEXAS RACE TRIALS | 2019

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## ACKNOWLEDGEMENTS

We extend our appreciation to **the producer cooperators** (Table 2) who provided their land, equipment, and time for preparation, planting, management, and harvesting of these trials. We also appreciate the support of Cotton Incorporated through the Texas State Support Committee, Americot, Inc. (NexGen), BASF (FiberMax & Stoneville), Bayer Crop Science (DeltaPine), and Corteva Agriscience (Phytogen) for partial funding of these trials.

## 2019 REVIEW

The region received greater-than-normal rainfall through the spring of 2019 (Figure 1). This posed some challenges to planting on time, and some fields were washed out and required replanting. Overall, cotton across the region started the season with excellent soil moisture and good early growth. Late-season rainfall through August, September, and October was severely lacking, resulting in reduced production relative to earlier yield potential.

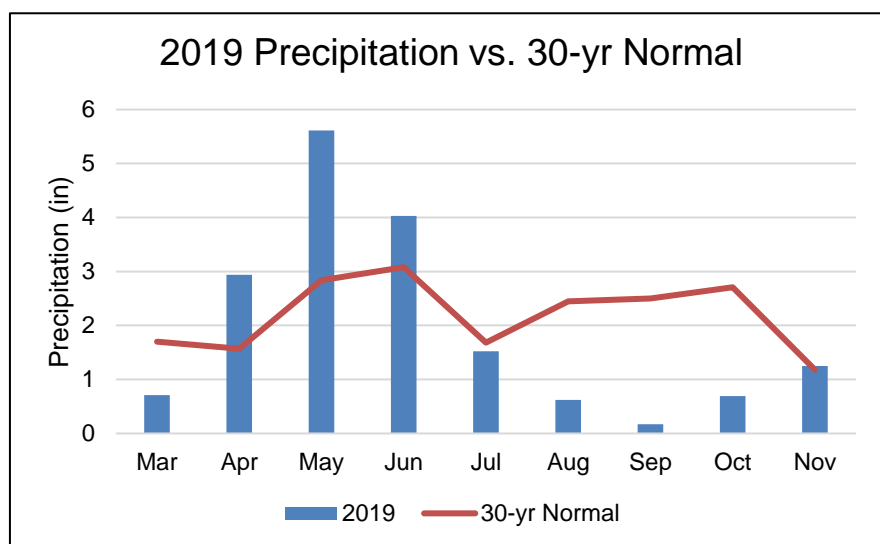
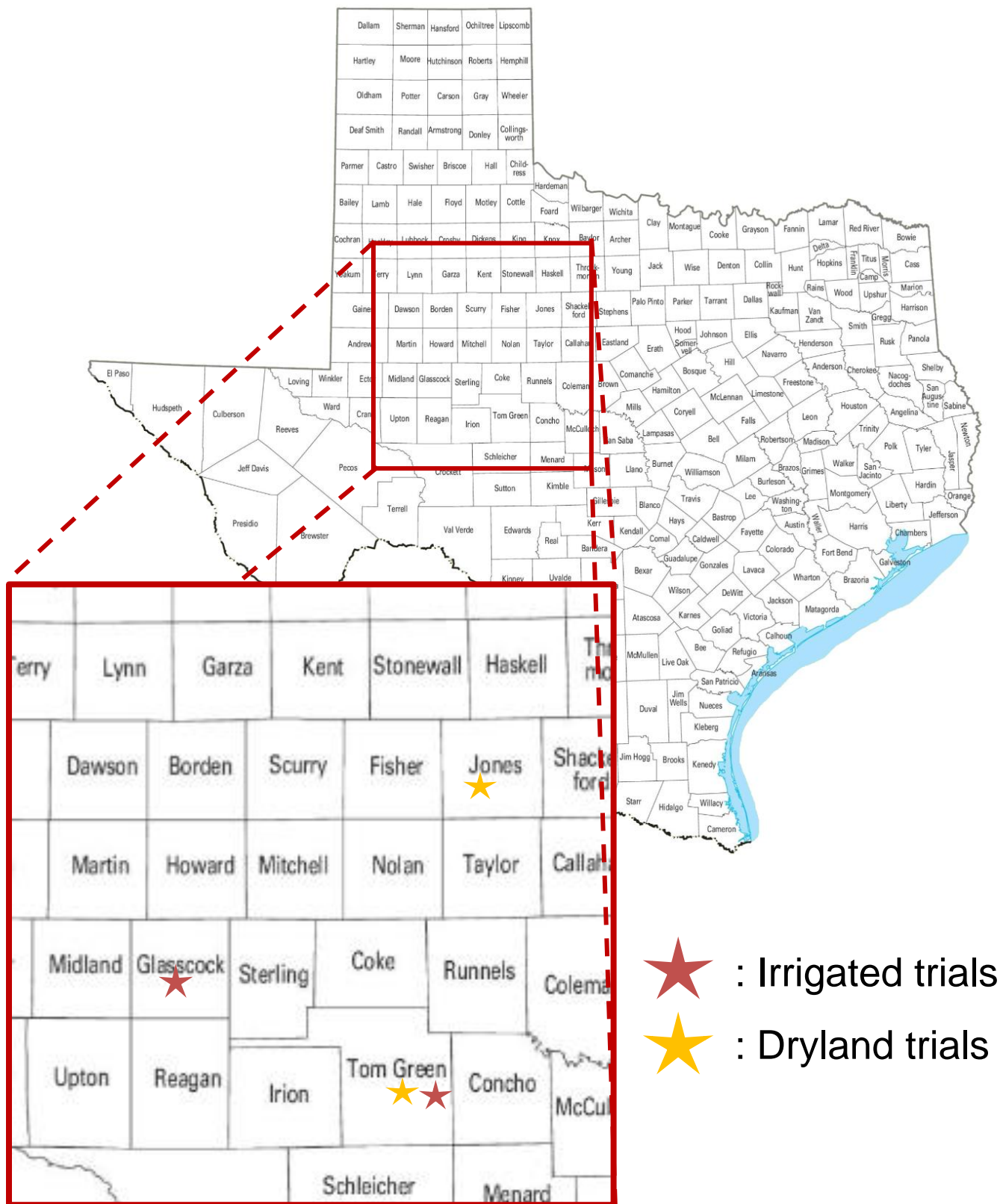


Figure 1. 2019 monthly rainfall vs. the 30-yr normal at San Angelo, TX.

# Figure 2. 2019 West Central Texas RACE Trial Locations



## OVERVIEW OF METHODS

The Texas A&M AgriLife Extension Service agronomy program in San Angelo, TX managed four large-plot, on-farm, replicated variety trials across West Central Texas in 2019 (Fig. 2, Table 2). Lint samples from all locations were ginned at the Texas A&M AgriLife Research Gin at the Texas A&M AgriLife Research and Extension Center in Lubbock, TX. This is a small-scale Lummus gin with lint cleaners that affect turnout and lint quality similar to a commercial gin. HVI quality parameters (Table 1) were measured and reported by the Texas Tech University Fiber and Biopolymer Research Institute. The color, leaf grade, micronaire, length, strength, and uniformity of each sample were used to calculate loan values using the 2019 Cotton Incorporated Loan Value Calculator with a base lint value of \$0.52 lb<sup>-1</sup>. Color and leaf grade did not affect loan value premiums or discounts among any of the samples in 2019. As these are qualitative parameters (not quantitative), and they did not influence the outcomes, treatment averages for color and leaf grade are not presented in this report.

Replication and statistical analyses were used to account for variability within test sites and identify effects that can be confidently attributed to the genetic differences between varieties rather than inconsistent conditions or other sources of error. Differences were declared at  $\alpha = 0.10$  (or  $P < 0.10$ ), meaning we accept a 10% chance of declaring a false positive, and maintain a 90% chance that declared differences are true and due to the treatments. When  $P$  is greater than 0.10, no significant differences exist for that response. Significant  $P$  values are indicated by bold font in the results tables. The CV (coefficient of variation) presented in the results table for each site indicates the range of variability in the raw data. A lower CV is better and indicates a more uniform trial. The LSD (least significant difference) is the margin of variation within groups that are statistically similar, so if  $P < 0.10$  and the difference between two values is greater than the LSD, then those values are statistically different. In the results for each site, LSD values are only shown if significant differences exist. Otherwise, non-significance is indicated as “n.s.”

### Resources for Texas cotton production

- General cotton production information for new cotton growers: <http://cotton.tamu.edu/index.html>
- Cotton variety trial results: <http://varietytesting.tamu.edu/cotton/>
- Other agronomy information from the Texas A&M AgriLife Extension Center at San Angelo, TX: <https://sanangelo.tamu.edu/extension/agronomy/>

## FIBER EVALUATION

**Table 1.** Description of fiber quality metrics used to calculate cotton loan value.

Parameters	Definition	Degrees
<b>Micronaire (Mic)</b>	Relative measurement of fiber linear density (mass per unit length). Often associated with thickness/fineness and maturity.	Premium range: 3.7-4.2 Base range: 3.5-3.6 or 4.3-4.9 Discount range: ≤ 3.4 or ≥ 5.0
<b>Fiber length</b>	The average length of the longer half of the fibers.	Extra-long: >1.26 Long: 1.11-1.26 Medium: 0.99-1.10 Short: <0.99
<b>Fiber strength</b>	Measured as the force (in grams) required to break a bundle of fibers (one tex).	Very strong: > 31 Strong: 29-30 Average: 26-28 Intermediate: 24-25 Weak: < 23
<b>Uniformity (unif)</b>	Uniformity of fiber length, measured as the ratio of the mean length to the upper half mean length, expressed as a percentage.	Very high: >85 High: 83-85 Intermediate: 80-82 Low: 77-79 Very low: <77

Source: "Classification of Upland Cotton" Adapted from Cotton Incorporated website (<http://www.cottoninc.com/fiber/quality/Classification-Of-Cotton/Classification-Upland-Cotton/>)

## SITE INFORMATION

**Table 2.** Trial locations and details for 2019 West Central Texas RACE trials.

County	Water Regime	Cooperators	County Extension Agents	Planting date	Harvest date	Rows × width	Seeding Rate (seeds ac <sup>-1</sup> )	Plot size (ac)	Soil Series §
Glasscock	Irrigated	Cole Schwartz	Brad Easterling	5/28	10/22	8 rows x 40"	33,000	0.83	Reagan Silty Clay Loam
Jones	Dryland	Larry Lytle	Steve Estes	6/25	10/25	8 rows x 30" †	28,000	0.002 ‡	Abilene Clay Loam
Tom Green	Dryland	Neil Schwartz	Josh Blane Haley Kennedy	6/12	10/23	8 rows x 40"	28,000	1.336	Angelo Clay Loam
Tom Green	Irrigated	Kenny Gully	Josh Blane Haley Kennedy	5/22	11/4	8 rows x 40"	51,500	1.289	Angelo Clay Loam

† The Jones County site row pattern was as follows: plant three, skip one, plant two, skip one, plant three, skip one; achieving eight planted rows on 30" centers per 11-row pass.

‡ Yield samples were hand picked (1/1000 acre) from two rows to represent the row pattern.

§ Soil series and texture obtained from web soil survey.

## VARIETY CHARACTERISTICS

**Table 3.** Characteristics of cotton varieties included in the 2019 RACE trials in West Central Texas. Information was obtained from seed company websites.

Variety	Maturity	Leaf Type	Plant Height	Mic	Storm Tolerance	Verticilium	Bacterial Blight
Phytogen 350 W3FE	Early-Mid	Semi-Smooth	Medium-Tall	4.2	Very Good	Very Good	Resistant
Phytogen 480 W3FE	Medium	Semi-Smooth	Medium-Tall	3.9	Very Good	Susceptible	Resistant
DeltaPine 1612 B2XF	Early	Lt. Hairy	Medium	4.3	Good	Susceptible	Mod. Susceptible
DeltaPine 1822 XF	Early-Mid	Semi-Smooth	Medium-Tall	4.3	Fair	Good	Resistant
DeltaPine 1845 B3XF	Mid-Full	Semi-Smooth	Medium	4.2	Good	Mod. Susceptible	Mod. Resistant
DeltaPine 1948 B3XF	Mid-Full	Semi-Smooth	Medium-Tall	4.1	Good	Mod. Susceptible	Mod. Resistant
NexGen 4936 B3XF	Medium	Smooth	Medium-Tall	4.1-4.5	Good	Good	Mod. Susceptible
NexGen 5711 B3XF	Mid-Full	Smooth	Tall	4.1-4.5	Very Good	Mod. Susceptible	Resistant
Stoneville 5600 B2XF	Mid-Full	Semi-Smooth	Tall	4.9	Good	Good	Susceptible
Stoneville 5707 B2XF	Mid-Full	Semi-Smooth	Tall	4.5	Fair	Fair	Resistant
FiberMax 2498 GLT	Medium	Semi-Smooth	Medium-Tall	4.4	Good	Very Good	Resistant
FiberMax 2574 GLT	Mid-Full	Smooth	Medium-Tall	4.1	Good	Very Good	Resistant

## COMBINED LOCATIONS

**Table 4.** Results of irrigated trials (combined) in 2019 West Central Texas RACE trials

Variety	Lint (lbs/acre)	Turnout (%)	Loan Value (cents/lb)	Lint Value (\$/acre)
DP1948B3XF	959	35	51.6	495
PHY480W3FE	937	36	51.3	482
DP1845B3XF	929	36	51.7	480
FM2498GLT	955	37	49.6	475
PHY350W3FE	924	35	50.8	471
ST5600B2XF	930	37	49.2	460
NG4936B3XF	866	35	51.8	449
NG5711B3XF	773	36	51.7	400
<i>P &gt; F</i>	0.51	0.32	0.16	0.56

Note: There were no significant differences between varieties with irrigated trials combined across locations.

**Table 5.** Results of dryland trials (combined) in 2019 West Central Texas RACE trials

Variety	Lint (lbs/acre)	Turnout (%)	Loan Value (cents/lb)	Lint Value (\$/acre)
PHY480W3FE	<b>427<sup>†</sup></b>	33	52.0	<b>222</b>
DP1822XF	375	32	52.1	196
PHY350W3FE	362	31	51.7	188
ST5707B2XF	345	29	52.2	180
DP1612B2XF	343	31	52.1	179
NG4936B3XF	333	32	52.0	179
NG5711B3XF	325	31	51.7	168
FM2574GLT	319	34	51.9	166
<i>P &gt; F</i>	<b>0.02</b>	0.18	0.49	<b>0.03</b>

<sup>†</sup> Within columns, bold values represent the uppermost statistical grouping.



# ON-FARM RACE TRIAL RESULTS

Glasscock County RACE trial (Irrigated), 2019

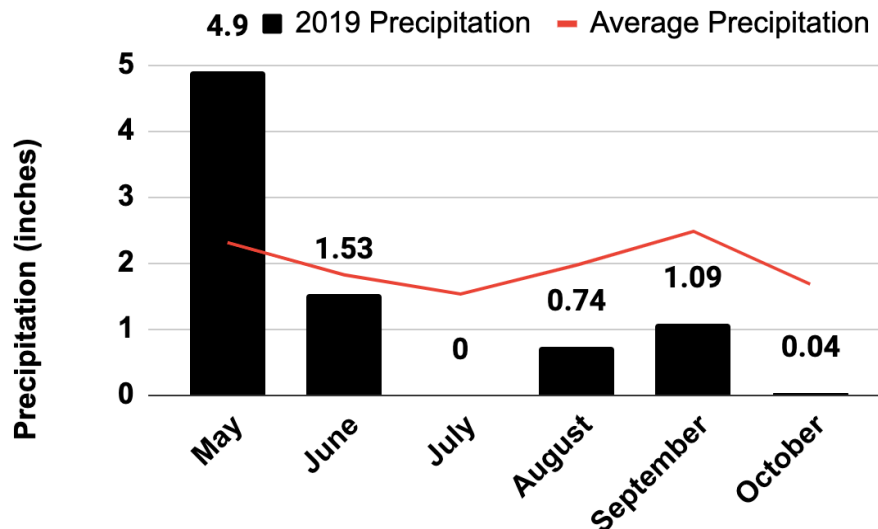
Cooperator: Cole Schwartz

County Extension Agent: Brad Easterling

Variety	Lint (lbs/ac)	Turnout (%)	Mic	Length (in)*	Strength (g/tex)	Uniformity	Loan Value (¢/lb)	Lint Value (\$/ac)
PHY480W3FE	837 <sup>†</sup>	<b>37.6</b>	5.0	1.00	29.7	79.1	50.8	<b>425</b>
FM2498GLT	<b>826</b>	<b>37.0</b>	<b>5.5</b>	1.02	28.4	79.6	48.0	<b>396</b>
PHY350W3FE	<b>798</b>	35.6	5.1	1.03	28.6	79.8	49.6	<b>395</b>
DP1845B3XF	<b>747</b>	<b>36.6</b>	4.9	<b>1.09</b>	31.0	80.2	<b>52.2</b>	<b>390</b>
NG4936B3XF	733	34.4	4.8	<b>1.10</b>	28.0	79.2	<b>51.6</b>	378
NG5711B3XF	692	35.6	4.9	1.06	29.6	79.2	<b>51.6</b>	357
DP1948B3XF	687	35.4	4.9	<b>1.10</b>	<b>32.6</b>	80.2	<b>51.5</b>	353
ST5600B2XF	721	<b>37.5</b>	<b>5.4</b>	1.04	29.9	79.9	48.2	347
<b>P &gt; F</b>	<b>0.06</b>	<b>0.002</b>	<b>&lt;.00</b>	<b>&lt;.0001</b>	<b>0.0001</b>	0.59	<b>&lt;.000</b>	<b>0.10</b>
<b>LSD (<math>\alpha = 0.0.1</math>)</b>	<b>91</b>	<b>1.2</b>	<b>0.12</b>	<b>0.03</b>	<b>1.20</b>	n.s.	<b>0.99</b>	<b>45.00</b>
<b>CV (%)</b>	<b>8.5</b>	<b>2.3</b>	<b>1.6</b>	<b>1.9</b>	<b>2.3</b>	1.1	<b>1.4</b>	<b>8.3</b>

† Within columns, bold values represent the uppermost grouping, and are not statistically different from each other.

\*Staple (32<sup>nds</sup>) = Length (in) × 32



Tom Green County RACE trial (Irrigated), 2019

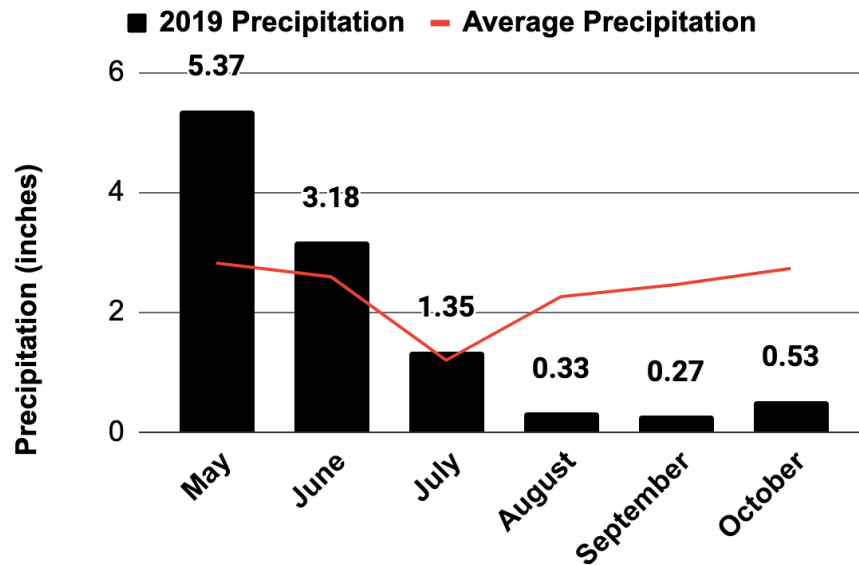
Cooperator: Kenny Gully

Extension Agents: Josh Blane & Haley Kennedy

Variety	Lint (lbs/ac)	Turnout (%)	Mic	Length (in)*	Strength (g/tex)	Uniformity	Loan Value (¢/lb)	Lint Value (\$/ac)
DP1948B3X	1230	<b>35.4<sup>†</sup></b>	4.6	<b>1.11</b>	<b>30.0</b>	79.7	<b>54.2</b>	670
FM2498GLT	1146	<b>37.1</b>	<b>5.0</b>	1.07	27.4	79.8	52.0	596
ST5600B2XF	1140	<b>36.1</b>	<b>5.1</b>	1.07	<b>29.6</b>	79.2	52.1	595
NG4936B3X	1067	34.5	4.5	1.08	27.0	80.8	<b>54.2</b>	577
DP1845B3X	1006	34.5	4.2	<b>1.14</b>	<b>30.4</b>	81.0	<b>56.4</b>	567
PHY480W3F	1038	34.6	4.4	1.05	<b>29.3</b>	79.8	52.6	547
PHY350W3F	1006	33.8	4.6	1.08	<b>29.2</b>	80.7	53.9	542
NG5711B3X	862	<b>36.0</b>	4.4	<b>1.10</b>	<b>29.1</b>	80.4	<b>54.7</b>	472
<i>P</i> > <i>F</i>	0.16	<b>0.09</b>	<b>&lt;.000</b>	<b>0.049</b>	<b>0.07</b>	0.62	<b>0.07</b>	0.33
LSD ( $\alpha = 0.1$ )	n.s.	<b>1.8</b>	<b>0.2</b>	<b>0.05</b>	<b>1.9</b>	n.s.	<b>2.4</b>	n.s.
CV (%)**	13.7	<b>3.7</b>	<b>3.0</b>	<b>2.9</b>	<b>4.5</b>	1.6	<b>3.1</b>	15.2

† Within columns, bold values represent the uppermost grouping, and are not statistically different from each other.

\*Staple (32<sup>nds</sup>) = Length (in) × 32



Tom Green County RACE trial (Dryland), 2019

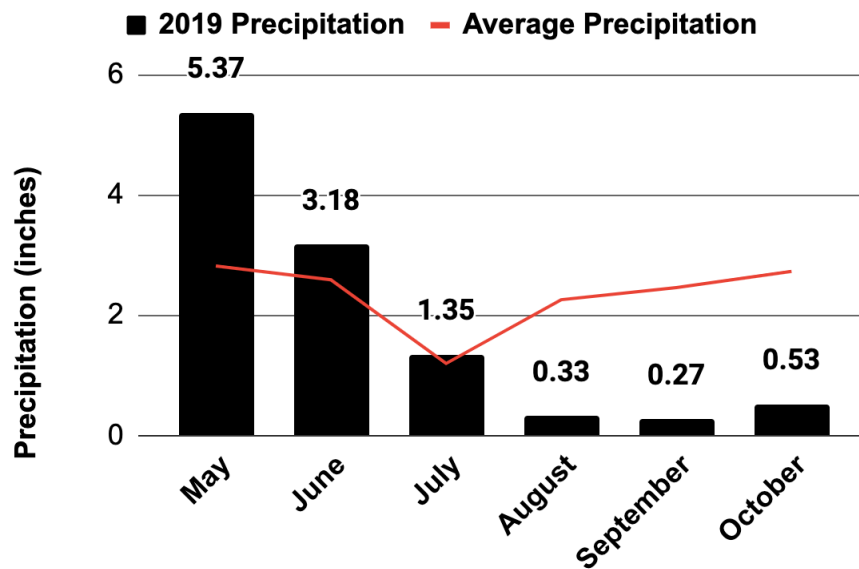
Cooperator: Neil Schwartz

Extension Agents: Josh Blane & Haley Kennedy

Variety	Lint (lbs/ac)	Turnout (%)	Mic	Length (in)*	Strength (g/tex)	Uniformity	Loan Value (¢/lb)	Lint Value (\$/ac)
PHY480W3FE	<b>373<sup>†</sup></b>	33.8	4.0	1.00	28.1	79.3	51.6	<b>192</b>
DP1822XF	326	34.2	4.6	<b>1.06</b>	<b>30.8</b>	79.0	51.6	168
ST5707B2XF	310	31.5	<b>4.8</b>	<b>1.04</b>	<b>30.9</b>	79.8	52.1	162
DP1612B2XF	311	32.7	4.4	<b>1.04</b>	30.2	79.2	51.7	161
NG4936B3XF	309	33.3	4.2	<b>1.04</b>	27.4	79.6	51.9	160
PHY350W3FE	294	32.3	4.4	1.03	29.2	78.2	51.4	151
FM2574GLT	293	<b>37.3</b>	4.6	<b>1.06</b>	29.3	79.0	51.4	150
NG5711B3XF	278	33.4	4.1	<b>1.05</b>	28.8	77.8	51.4	143
<i>P</i> > <i>F</i>	<b>0.033</b>	<b>&lt;.0001</b>	<b>&lt;.0001</b>	<b>0.009</b>	<b>&lt;.0001</b>	0.38	0.11	<b>0.02</b>
LSD ( $\alpha = 0.1$ )	<b>41</b>	<b>1.0</b>	<b>0.1</b>	<b>0.02</b>	<b>0.7</b>	n.s.	n.s.	<b>20</b>
CV (%)	<b>9.2</b>	<b>2.1</b>	<b>1.7</b>	<b>1.6</b>	<b>1.7</b>	1.4	0.7	<b>8.9</b>

<sup>†</sup> Within columns, bold values represent the uppermost grouping, and are not statistically different from each other.

\*Staple (32<sup>nds</sup>) = Length (in) × 32



**Jones County RACE trial (Dryland), 2019**

**Cooperator: Larry Lytle**

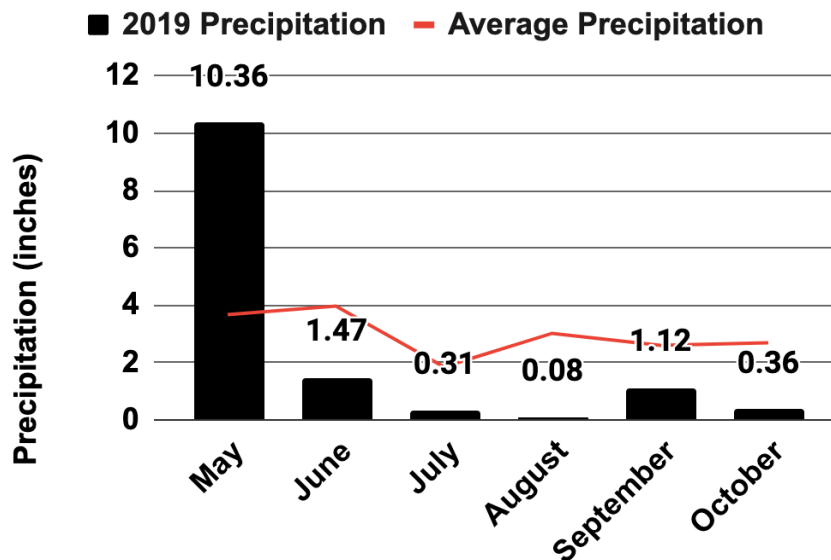
**County Extension Agent: Steve Estes**

Variety	Lint (lbs/ac)	Turnout (%)	Mic	Length (in)*	Strength (g/tex)	Uniformity	Loan Value (¢/lb)	Lint Value (\$/ac)
PHY480W3F	480	32.0	4.5	1.09	31.2	82.0	52.4	252
PHY350W3F	431	29.8	<b>4.7<sup>†</sup></b>	1.06	29.6	80.9	52.1	224
DP1822XF	425	30.0	<b>4.6</b>	<b>1.13</b>	<b>34.0</b>	81.8	<b>52.5</b>	223
ST5707B2XF	379	27.2	<b>4.7</b>	1.09	32.8	81.3	52.3	198
DP1612B2X	375	28.6	4.5	1.09	32.3	81.2	<b>52.4</b>	196
NG5711B3X	371	29.4	4.6	1.08	30.0	80.7	52.1	193
NG4936B3X	358	31.3	4.6	1.09	29.2	80.8	52.1	186
FM2574GLT	346	29.7	<b>4.8</b>	<b>1.12</b>	31.5	81.6	<b>52.4</b>	181
<i>P</i> > <i>F</i>	0.54	0.11	<b>0.02</b>	<b>&lt;.0001</b>	<b>&lt;.0001</b>	0.56	<b>0.002</b>	0.53
LSD ( $\alpha = 0.1$ )	n.s.	n.s.	<b>0.15</b>	<b>0.02</b>	<b>0.9</b>	n.s.	<b>0.19</b>	n.s.
CV (%)	21.3	6.1	<b>2.3</b>	<b>1.1</b>	<b>2.1</b>	1.1	<b>0.3</b>	21.3

† Within columns, bold values represent the uppermost grouping, and are not statistically different from each other.

\*Staple (32<sup>nds</sup>) = Length (in) × 32

‡Samples were hand-picked (not machine harvested) which may influence fiber quality measurements.





<http://cotton.tamu.edu/>

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