# COTTON CULTIVAR TESTS FOR 1998

# IN CENTRAL AND SOUTH TEXAS

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# Cotton Cultivar Tests for 1998 in Central and South Texas

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Cotton cultivar tests (CCT) are conducted each year by the Texas Agricultural Experiment Station to determine the relative performance of cultivars (varieties) available to producers in Texas. These tests are conducted statewide to evaluate commercial cultivars in every cotton growing region. Since Texas is a large state with diverse climates and growing seasons, the CCT results are reported separately for Central and South Texas, the Rolling and High Plains, and Far West Texas. This report concentrates on the cotton production regions of Central and South Texas.

Test locations, soil types, planting dates, and harvest dates are given in Table 1, with yield and fiber characteristics presented in Tables 2 - 28.

Yield and other characteristics were analyzed as randomized complete blocks. Least significant differences (LSD) are used to determine if two cultivars are different at k=100, which approximates the 5% probability level. Values reported for any two cultivars that differ by more than the LSD value are expected to be different in 95 of every 100 comparisons. The test average (mean) and the coefficient of variation (CV) also are reported for each characteristic measured at each location. The coefficient of variation is a measure of the uniformity of the test site (e.g. soil uniformity, drainage, disease, etc.). The lower the coefficient of variation, the more reliable the test results.

## Agronomic Determinations

**Lint yield:** Lint yield per acre is determined as follows: (lbs. Seed Cotton/plot) x (appropriate gin turnout) x (area conversion factor).

**Gin turnout:** Amount of lint in a random sample of machine harvested Seed Cotton expressed as a percent of Seed Cotton in the sample.

## Fiber Quality Determinations

Fiber quality parameters were determined by high volume instrument (HVI) testing at the Texas Tech International Textile Research Center at Lubbock, TX.

**Fiber Fineness:** Fiber fineness, micronaire, is a measure of the maturity and/or the fineness of cotton fibers and is reported in micronaire units. Micronaire is a relative measure of the development, or maturity, of the secondary wall of the cotton fiber throughout its entire length. Processing rates, fabric dyeing, and yarn and fabric appearance are adversely affected by immature fibers. Fine fibers, although mature, weigh less per unit length and may require reduced

processing speeds compared to thicker fibers, yet these finer fibers may produce stronger yarns. Thick or coarse fibers result in fewer fibers in a cross section of yarn, and therefore, may produce weaker yarns.

Fiber fineness is determined by forcing air through a specified weight of lint. The rate of air flow is related to fiber thickness. Finer fibers result in more fibers per specified weight and, therefore, have greater resistance to air flow. Micronaire values of 3.4 or below indicate fine and perhaps immature fibers, and values of 5.0 or higher indicate coarse fibers. Values of 3.5 to 4.9 are desirable and indicate mature, well-developed fibers.

**Fiber Length:** Fiber length is reported in hundredths of an inch as measured by a fibergraph instrument and is the average of the longest 50 percent of the fibers in the sample, usually referred to as the upper half mean (UHM). Long fibers are desirable because they produce greater yarn strength, aid in spinning finer yarns, and can be processed at higher speeds.

HVI fiber lengths (in.)
and descriptive designation

| | |
|---|---|
| Below 0.97 | Short |
| 0.97 - 1.10 | Medium |
| 1.11 -1.28 | Long |
| Above 1.28 | Extra long |

**Fiber Uniformity:** Fiber uniformity index (UI) provides a relative measure of the length uniformity of cotton fibers. Uniformity is calculated as the ratio of the average length of all fibers to the average length of the longest 50 percent of the fibers in the sample. High uniformity values indicate uniform fiber length distribution and are associated with a high-quality product and with low manufacturing waste.

Uniformity ratios
and descriptive designation

| | |
|---|---|
| Below 77 | Very low |
| 77-79 | Low |
| 80-82 | Average |
| 83-85 | High |
| Above 85 | Very high |

**Fiber Strength:** Yarn strength and ease of processing are positively correlated with strong-fibered cottons. Strength values are reported in grams of force required to break a bundle of cotton fibers with the holding jaws separated by 1/8 inch. The size of the bundle of fibers is described in tex units. Fiber strength is described from very low to very high within UHM classifications.

| HVI 1/8-inch gauge strength (grams/tex) | Fiber length group and descriptive designation |
|---|---|
| Short | |
| (0.96 inch or less) | |
| 18-19 | Very low |
| 20-21 | Low |
| 22-23 | Average |
| 24-25 | High |
| 26-27 | Very high |
| Medium | |
| (0.97-1.10 inch) | |
| 17-19 | Very low |
| 20-22 | Low |
| 23-25 | Average |
| 26-28 | High |
| 29-31 | Very high |
| Long | |
| (1.11-1.28 inch) | |
| 18-20 | Very low |
| 21-23 | Low |
| 24-26 | Average |
| 27-29 | High |
| 30-32 | Very high |

**Fiber Elongation:** Elongation is the degree of extension of the fibers before a break occurs when measuring strength. Fiber bundle elongation is correlated with yarn elongation but has an insignificant effect on yarn strength. Its value and importance in yarn manufacture has not been fully established.

Fiber elongation
and descriptive designation

| | |
|---|---|
| 4.9 and below | Very low |
| 5.0-5.8 | Low |
| 5.9-6.7 | Average |
| 6.8-7.6 | High |
| 7.7 and above | Very high |

**Fiber Color:** The color of upland cotton is defined in terms of the degree of grayness and yellowness. Cotton fibers are whitest when the boll first opens with the color becoming duller with exposure to weather. The degree of gray is expressed as percent reflectance (Rd) and usually ranges from 50 to 85% with higher values desirable. Yellowness is expressed as Hunter's +b that ranges from 5, least yellow, to 18. The relationship of color and grade are shown below.

## General Growing Conditions

Cool and wet conditions delayed planting and stand establishment in South Texas. The cotton variety trial was planted twice in the Upper Coast production area but was abandoned due to erratic stands. Dry weather conditions prevented the third planting. Drought conditions prevailed from mid-April through September. Extreme drought and heat resulted in low yields at all dryland locations except San Patricio County where normal yields were recorded. Relatively light infestations of insects occurred. Bronze wilt affected susceptible cultivars at San Patricio County and at College Station.

Table 1. Locations, soil types, planting dates, harvest dates, and irrigation of cultivars evaluated in Central and South Texas, 1998.

| Location (nearest town) | Soil type | Planting dates | Harvest dates | Irrigation |
|---|---|---|---|---|
| Weslaco | Hildago s.c.l.[1] | 3/9/98 | 8/4/98 | Yes |
| Corpus Christi | Victoria clay | 3/24/98 | 7/21/98 | No |
| San Patricio Co. (Sinton) | Victoria clay | 3/26/98 | 8/3/98 | No |
| Upper Coast (Jackson Co.) | Lake Charles clay | 4/2/98 | ---- | No |
| College Station | Westwood s.l.[2] | 4/13/98 | 9/28/98 | Yes |
| Uvalde | Uvalde s.c.l.[1] | 4/1/98 | 9/2/98 | Yes |
| Thrall | Burleson clay | 4/7/98 | 8/11/98 | No |
| Dallas (Prosper) | Houston c.l.[3] | 5/4/98 | 10/15/98 | No |
| Chillicothe | Abilene c.l. | 5/22/98 | 10/29/98 | Yes |

1. s.c.l. = sandy clay loam
2. s.l. = silt loam
3. c.l. = clay loam