Arkansas Cotton Variety Test 2016

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Arkansas Cotton Variety Test 2016

A four-season cycle of cotton and a cereal rye cover crop. Clockwise from top left: fall stand of cereal rye, planting cotton into residue, cotton emergence, and cotton growing in cover crop mulch.

F. Bourland • W. Barnett • C. Kennedy
L. Martin • A. Rouse • and B. Robertson

Arkansas Agricultural Experiment Station
February 2017
ARKANSAS
COTTON
VARIETY TEST
2016

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Fayetteville, Arkansas 72701
The primary goal of the Arkansas Cotton Variety Test is to provide unbiased data regarding the agronomic performance of cotton varieties and advanced breeding lines in the major cotton-growing areas of Arkansas. This information helps seed companies establish marketing strategies and assists producers in choosing varieties to plant. These annual evaluations will then facilitate the inclusion of new, improved genetic material in Arkansas cotton production. Adaptation of varieties is determined by evaluating the lines at five University of Arkansas research sites (Manila, Keiser, Judd Hill, Marianna, and Rohwer). Entries in the 2016 Arkansas Cotton Variety Test were evaluated in two groups—transgenic and conventional varieties. The 35 entries in the transgenic test included 18 entries (12 B2XF, 3 WRF, 2 GLT, and 1 GLB2) returning from the 2015 test and 17 first-year entries (11 B2XF, 3 GLT, 2 GLTP, and 1 B2RF) and were evaluated at all five locations. The conventional test included 10 entries and was evaluated at all locations except Manila. Reported data include lint yield, lint percentage, plant height, percent open bolls, yield component variables, fiber properties, leaf pubescence, stem pubescence, and bract trichome density. All entries in experiments were evaluated for response to tarnished plant bug and bacterial blight in separate tests at Keiser. This 2016 report includes results of large-plot variety tests in seven counties that were coordinated by Bill Robertson.
Arkansas Cotton Variety Test 2016

F. Bourland, W. Barnett, C. Kennedy, L. Martin, A. Rouse, and B. Robertson

Introduction

The purpose of the University of Arkansas Cotton Variety Testing Program is to provide unbiased comparisons of cotton varieties and advanced breeding lines over a range of environments. Data from these tests help to identify the potential adaptability of varieties to particular cotton-growing regions of the state. Bourland et al. (2000) documented several unintentional biases, which are inherent to the Arkansas cotton variety testing program. These include management associated with varieties expressing herbicide and insect resistance. The biases tend to cancel each other so that no great advantage is given to any particular variety. Since evaluation of genetic differences among entries is the ultimate goal of the evaluations, all varieties are treated identically within the primary locations (Manila, Keiser, Judd Hill, Marianna, and Rohwer) of the variety test. No specialized production inputs were employed with respect to the various genetically enhanced varieties. All entries in the tests at Manila possessed the RF or G genes, and were uniformly treated with Round-up. Since the plots were over-sprayed with Round-up, the conventional varieties were not evaluated at Manila.

Materials and Methods

The 35 entries in the transgenic test included 18 entries (12 B2XF, 3 WRF, 2 GLT, and 1 GLB2) returning from the 2015 test and 17 first-year entries (11 B2XF, 3 GLT, 2 GLTP, and 1 B2RF) (Table 1). The transgenic test was replicated 8 times at Manila, 5 times at Judd Hill and Keiser, and 6 times at Marianna and Rohwer. The conventional test included 10 entries and was evaluated using 5 replications at Keiser and 6 replications at Judd Hill, Marianna, and Rohwer.

Test sites included the Northeast Research and Extension Center at Keiser; the Judd Hill Cooperative Research Station at Judd Hill (near Trumann); the Lon Mann Cotton Research Station at Marianna; the Manila Airport Cotton Research Farm at Manila; and the Rohwer Research Station at Rohwer. Cultural practices and weather data (heat units and rainfall) associated with the test sites are listed in Table 2 and Table 3, respectively.

Originators of seed supplied double treated (two fungicides) seed for all entries. Prior to planting, all seed were treated with imidacloprid (Gaucho') at a rate of 6 oz/100 lb seed. Plots were planted with a constant number of seed (about 4 seed/row ft). All varieties were planted in two-row plots on 38-inch centers and ranged from 40 to 50 feet in length. Experiments were arranged in a randomized complete block. Although exact inputs varied across locations, cultural inputs at each location were generally based on University of Arkansas System Division of Agriculture Cooperative Extension Service recommendations for cotton production, including COTMAN rules for insecticide termination. All plots were machine-harvested with 2-row or 4-row cotton pickers modified with load cells for harvesting small plots.

Data Collected at Single Location

Leaf Pubescence. Leaf pubescence was visually rated on a scale of 1 (smooth leaf) to 9 (pilose, very hairy) in the irrigated experiments at Keiser using the system described by Bourland et al. (2003). A full-sized leaf, about 5-6 nodes from plant apex, was rated for 6 plants per plot for all 5 replications during August.

Stem Pubescence. Stem pubescence was visually rated on a scale of 1 (smooth stem) to 9 (very hairy) in the irrigated experiments at Keiser using a system similar to that used for leaves. After harvest, the upper 5-6 inches of the plant apex was rated for 6 plants per plot for all 5 replications.

Bract Trichomes. As all plants approached physiological cutout, a bract from a 1st position white flower was sampled from 6 random plants per plot (4 of the 5 replications) in the Keiser experiments. Each bract was examined for marginal trichome density (no. of trichomes/cm) as described by Bourland and Hornbeck (2007). Means for the 6 bracts were evaluated as plot means.

1 F. Bourland is a professor, and W. Barnett and A. Rouse are program technicians at the Northeast Research and Extension Center; C. Kennedy is resident director at the Lon Mann Cotton Research Station; L. Martin is a program technician at the Rohwer Research Station; and B. Robertson is an Extension Cotton Agronomist at the Newport Extension Center.
Arkansas Cotton Variety Test 2016

Tarnished Plant Bug. Entries in both variety tests were evaluated for response to TPB in a separate field at Keiser. The TPB test included 8 replications of 1-row plots (20-feet long on 38-inch wide rows). Four rows of a highly susceptible Frego-bract line were planted between the tests on April 25. The TPB tests were planted on May 11 and received no insecticide treatment for TPB infestations. Early flowering in the susceptible Frego-bract strips encouraged TPB populations to increase, then to migrate from the strips as the test plots began to flower. Response to TPB was determined by examining white flowers (6 flowers/plot/day for 6 days in late August) for presence of anther damage. Accumulative percentage of damaged flowers (“dirty flowers”) was determined for each plot.

Bacterial Blight. Entries in both tests were planted in flats (2 replications, 13 seed/plot) in the greenhouse, and scratch inoculated with Xanthomonas citri pv. malvacearum. The inoculum was obtained from naturally infected leaves collected at the 2015 Manila location. Scratches were examined for water-soaking, and percent of susceptible plants were determined.

Verticillium Wilt. Relative yields of varieties over years at Judd Hill should be indicative of tolerance to Verticillium wilt.

Data Collected at All Locations

Plant Height. Plant height measurements (in cm) were collected after plants had cutout. Average plant heights for varieties were determined by measuring from the soil surface to the terminal of one average-sized plant in each of the two rows. Plot means (average of the two measurements) were evaluated.

% Open Bolls. After first application of defoliants, percentage of open bolls was estimated from the front and back of each plot, then averaged for each plot.

Boll Samples and Lint Percentage. Prior to mechanical harvest, hand-harvested samples of 40 open bolls were obtained from two replications at each location. Within each row of two-row plots, a site having average or above average plant density was chosen and 20 bolls (5 bottom, 10 mid-canopy and 5 top bolls) were harvested and bulked to form a 40-boll sample. The 40-boll samples were ginned (lab gin without the use of lint cleaners) to determine lint fraction (the percentage of lint weight to seedcotton weight).

Fiber Properties. Fiber samples were taken from each boll sample and were evaluated using HVI classification. Parameters included micronaire, fiber length, length uniformity index (Ul), strength, and elongation. To reflect market demand for fiber quality, a weighted quality score (Q-score) was calculated as described by Bourland et al. (2010). Parameters (and weighting) included in Q-score were fiber length (50%), micronaire (25%), length uniformity index (15%), and strength (10%).

Seed Index. Two sets of 25 fuzzy seed from the ginned seed of each 40-boll sample were counted and weighed. If the two weights varied more than 0.2 g, a second set of samples were taken. Two consistent weights of 25 seed were used to calculate fuzzy seed index (weight of 100 seed).

Seed Per Acre. For each plot, an estimate of number of seed per acre was determined by multiplying seedcotton yield (lb/A converted to g/A) times average seed percentage (the percentage of seed weight to seedcotton weight in ginned sample, averaged by entry and location over reps), then divided by average seed weight (average seed index by entry over reps divided by 100).

Lint Index. Lint index (weight of lint on 100 seed) was determined from 40-boll sample data by dividing lint weight from ginned sample by the number of seed per sample (estimated using average seed weight) then multiplying by 100.

Fibers Per Seed. Fibers per seed were estimated by dividing lint index by an estimated weight of individual fibers. Weight of an individual fiber was estimated by: (fiber length × length uniformity × (micronaire/1,000,000)).

Fiber Density. Fiber density, reported as the number of fibers per mm², was estimated by dividing fibers per seed by seed surface area. Seed surface area (SSA) was estimated by the regression equation suggested by Groves and Bourland (2010): SSA = 35.74 + 6.59 SI, where SI is equal to seed index associated with the sample.

Lint Yield. Seedcotton yield per plot (determined by mechanical cotton picker) was converted to seedcotton yield per acre then multiplied by average lint percentage (determined by variety and location) to estimate lint per acre.

Yield Comparisons

Uncontrolled variation is inherent to collection of variety performance data (particularly yield data). In addition to their genetic ability, variation among varieties may be due to slight differences in soil, pest or climatic conditions within a field, various interactions with specific management practices, or experimental error. Statistics allow users
to define the degree of uncontrolled variation and to interpret data. The statistical tool used to compare means in these tests was Fisher’s Protected Least Significant Difference (LSD). An LSD was calculated when the F value from analysis of variance was significant. Yields of varieties are considered significantly different if the difference between mean yields of two varieties is greater than the LSD value. Differences that are smaller than the LSD may have occurred by chance or may be associated with uncontrolled variation, and are therefore considered not significant.

Additional estimates of variation are provided by measures of R-squared and coefficient of variation (CV). R-squared (times 100) indicates the percentage of variation that is explained by defined sources of variation (e.g., replication and variety effects within a location). Confidence in data increases as R-squared increases. Generally, the meaningfulness of difference among means is questionable when data have R-squared values of less than 50%. Also, confidence in data becomes greater as CV declines.

Results

Entries and participants in the test are listed in Table 1. Cultural inputs and production information for variety trials at Manila, Keiser, Judd Hill, Marianna, and Rohwer are reported in Table 2. Table 3 includes weather information for north, central, and south Arkansas locations during the 2016 production season.

All of the locations of the 2016 tests were planted from May 5 through May 9 (Table 2). This narrow planting window resulted in a two-week harvest window. Monthly heat unit accumulation was higher than the historical average for June through October at Keiser, Marianna and Rohwer, and at Keiser in May (Table 3). Although total rainfall approached normal conditions, Marianna experienced a wet July and Keiser and Rohwer had a wet August. Harvest conditions were optimum at each location.

Performance data of entries in the 2016 Arkansas Transgenic Cotton Variety Test at Manila, Keiser, Judd Hill, Marianna and Rohwer are provided in Tables 4 through 15 with yield and yield-related variables in the even-numbered tables and fiber properties in the odd-numbered tables. Performance data across all five locations are presented in Tables 4 and 5. Morphological and host-plant resistance measurements for the transgenic entries are in Table 16. Two- and three-year yield means for entries evaluated in previous years are in Table 17. Performance data of entries in the 2016 Arkansas Conventional Cotton Variety Test at Keiser, Judd Hill, Marianna and Rohwer are provided in Tables 18 through 27 with yield and yield-related variables in the even-numbered tables and fiber properties in the odd-numbered tables. Morphological and host-plant resistance measurements for the conventional entries are in Table 28. Two- and three-year yield means for the conventional entries evaluated in previous years are in Table 29.

Other observations associated with each test site include:

Manila (Tables 6 and 7). The test at Manila was planted in the same field used in 2014 and 2015, and in the same area of the field used in 2015. In anticipation of high field variability, the test was replicated eight times with two tiers used per replication. The R-squared values for lint yield were relatively low, but relative yield differences among the varieties at Manila were similar to other locations. Mepiquat chloride (total of 64 oz/A) was used to control plant height.

Keiser (Tables 8, 9, 20 and 21). Excellent stands and early growth were obtained at Keiser, but upper canopy bolts did not develop well. Mepiquat chloride was not applied to the plots.

Judd Hill (Tables 10, 11, 22 and 23). Incidence of Verticillium wilt was relatively severe at this site due to relatively cool, wet conditions in early August. Yields may have been reduced by Verticillium wilt, extended cloudy conditions, and the lack of timely insect control. Mepiquat chloride (8 oz/A) was applied early in season to control plant height.

Marianna (Tables 12, 13, 24 and 25). Cereal rye was planted in the test plot area as a cover crop on October 28, 2015. Urea (45 lb N/A) was applied on March 28 to push growth of the cover crop. Gramoxone (40 oz/A) and Brake FX (42 oz/A) were applied to the cereal rye on April 25, and cotton was planted into the standing dead cereal rye on May 9. No other herbicides were applied until June 6. The cover crop and herbicides provided excellent weed control. Good plant stands were achieved, and plants grew at a rapid, unrestricted pace. Subsequently, early maturation and high yields were attained. Yields at Marianna exceeded yields at all other locations. After harvest, roots of some cotton plants indicated the presence of hard pan, so the test area was subsoiled on October 10 prior to being seeded with cereal rye. Mepiquat chloride (total of 90 oz/A) was used to control plant height.

Rohwer (Tables 14, 15, 26 and 27). Weather conditions allowed normal planting at Rohwer, but conditions were
wet during much of August. The wet August conditions contributed to high incidence of boll rots throughout the test area. Hot temperatures appeared to have restricted upper crop development. Mepiquat chloride (total of 40 oz/A) was used to control plant height.

**References**


**Acknowledgments**

We express our appreciation to the Directors, Program Technicians and staff at the University of Arkansas System Division of Agriculture’s Northeast Research and Extension Center, Lon Mann Cotton Research Station, and the Rohwer Research Station. Annually, the Judd Hill Foundation generously provides the test site for experiments at Judd Hill. We are particularly grateful to the City of Manila for making land available for testing, and to the Mississippi County Cooperative Extension Agents and Wildy Farms for assisting with the test site at the Manila Airport. Annual evaluation of cotton varieties is made possible by the work of the research assistants and technicians at these locations, and by the contributions of seed companies participating in the Arkansas Cotton Variety Test.
Table 1. Participants and entries in the 2016 Arkansas Cotton Variety Test.

<table>
<thead>
<tr>
<th>Institution/Contact person</th>
<th>Returning entries</th>
<th>Experimental no.</th>
<th>1st year entries</th>
<th>Experimental no.</th>
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<tr>
<td>Americot Inc./ Thomas Brooks</td>
<td>NG 3405 B2XF</td>
<td>AMX1601 B2XF</td>
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<td>NG3522 B2XF</td>
<td>AMX1604 B2XF</td>
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<td>AMDG-7824</td>
<td>AMX1605 B2XF</td>
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<td>Bayer Crop Science/ Steve Lee</td>
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<td>BX 1346GLB2</td>
<td>ST 4848 GLT</td>
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<td>ST 5115GLT</td>
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<td>BX EXP GLT</td>
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<td>ST 5289GLT</td>
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<td>BX 1737 GLT</td>
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<td></td>
<td>BX 1775 GLTP</td>
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<td>DP 1522 B2XF</td>
<td>14R922B2XF</td>
<td>MON 14R229B2XF</td>
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<td>MON 14R934B2XF</td>
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<td>MON 15R551B2XF</td>
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<td></td>
<td>MON 15R513B2XF</td>
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<tr>
<td>PhytoGen Seed Co./ Chris Main</td>
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<td>PX3122b-51WRF</td>
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<td>PHY 333 WRF</td>
<td>PX31224WRF</td>
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<td>Conventional entries</td>
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<td>University of Arkansas/ Fred Bourland</td>
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### Table 2. Cultural practices for locations of the 2016 Arkansas Cotton Variety Test.

<table>
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<tr>
<th>Input</th>
<th>Location</th>
<th>Keiser</th>
<th>Judd Hill</th>
<th>Marianna</th>
<th>Rohwer</th>
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<tr>
<td>Soil type</td>
<td>Routon-Dundee-Crevasse complex</td>
<td>Sharkey clay</td>
<td>Dundee silt loam</td>
<td>Callaway silt loam</td>
<td>Hebert silt loam</td>
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<tr>
<td>N, P, K (lbs)</td>
<td>100-0-0</td>
<td>130-0-0</td>
<td>100-0-0</td>
<td>113-0-60</td>
<td>100-0-109</td>
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<td>Planting date</td>
<td>5/9</td>
<td>5/5</td>
<td>5/7</td>
<td>5/9</td>
<td>5/5</td>
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<tr>
<td>Irrigation method</td>
<td>furrow</td>
<td>furrow</td>
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<td>Defoliation date</td>
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<td>9/12, 9/21</td>
<td>9/13, 9/22</td>
<td>9/8, 9/15</td>
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<td>Harvest date</td>
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<td>9/30</td>
<td>10/7</td>
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### Table 3. Weather summary for the 2016 production season in north, central and south Arkansas.

<table>
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<tr>
<th>Month</th>
<th>Keiser (northeast)</th>
<th>Historical avg.(^a) in DD60s</th>
<th>Rainfall (in.)</th>
<th>Historical avg.(^a) rainfall</th>
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<td></td>
<td>May</td>
<td>395</td>
<td>314</td>
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<td>June</td>
<td>653</td>
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<td>July</td>
<td>735</td>
<td>644</td>
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<td></td>
<td>August</td>
<td>680</td>
<td>583</td>
<td>5.4</td>
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<td>September</td>
<td>536</td>
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<td>October</td>
<td>286</td>
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<tr>
<td></td>
<td>Total</td>
<td>3284</td>
<td>2563</td>
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<td></td>
<td>Marianna (central)</td>
<td>May</td>
<td>293</td>
<td>336</td>
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<td></td>
<td>June</td>
<td>616</td>
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<td>October</td>
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<tr>
<td></td>
<td>Total</td>
<td>3060</td>
<td>2766</td>
<td>22.0</td>
</tr>
</tbody>
</table>

\(^a\) DD60 (growing degree days based on 60 °F) and rainfall from historical weather data from 1960 through 2007.
Table 4. Yield and related properties—2016 Arkansas Cotton Variety Test across five test sites.

<table>
<thead>
<tr>
<th>Variety</th>
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<th>Lint frac.</th>
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Prob (var x loc) < 0.0001  0.077 < 0.0001  0.160  0.092 < 0.0001  0.024  0.003
## Arkansas Cotton Variety Test 2016

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Mean: 1265, LSD 0.10: 121, C.V. %: 11.6, R-sq x 100: 40.8

*UI = Fiber length uniformity Index.
### Table 8. Yield and related properties—2016 Ark. Cotton Variety Test, with irrigation on a Sharkey clay soil at Keiser.

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| LSD 0.10              | 120        | 1.4    | 7      | 11    | 0.8       | 0.7      | 0.724  | 1223      | 12        |
| C.V.%                 | 8.7        | 2.0    | 7.5    | 17.2  | 5.0       | 5.7      | 8.7    | 4.7       | 4.4       |
| R-sq x 100            | 54.9       | 88.3   | 68.3   | 59.9  | 85.2      | 77.2     | 58.3   | 89.7      | 86.7      |</p>
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| LSD 0.10           | 158          | 1.3    | 8     | 8            | 0.6          | 0.5           | 1.041            | 1734    |
| C.V.%              | 19.1         | 1.8    | 5.7   | 16.0         | 3.7          | 4.0           | 19.3               | 6.5     |
| R-sq x 100         | 51.8         | 92.8   | 65.3  | 67.1         | 93.3         | 84.0          | 50.1               | 79.9    | 77.3    |
Table 11. Fiber properties–2016 Arkansas Transgenic Cotton Variety Test, with irrigation on a Dundee silt loam soil at Judd Hill.

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| Mean | 790 | 65 | 4.3 | 1.20 | 85.3 | 30.2 | 7.0 |
| LSD 0.10 | 158 | 17 | 0.4 | 0.04 | 1.8 | 2.1 | 0.9 |
| C.V. % | 19.1 | 15.8 | 5.3 | 2.1 | 1.2 | 4.1 | 7.3 |
| R-sq x 100 | 51.8 | 77.6 | 68.5 | 82.9 | 64.2 | 81.2 | 84.1 |

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**Table 12. Yield and related properties—2016 Ark. Cotton Variety Test, with irrigation on a Calloway silt loam soil at Marianna.**

**LSD 0.10**

Mean 1198 40.6 114 54 10.2 7.2 7.620 15666 152

LSD 0.10 80 2.0 8 8 0.9 0.8 0.495 1655 15

C.V. % 7.0 3.0 7.3 15.6 5.5 6.3 6.8 6.2 5.6

R-sq x 100 67.1 80.6 48.2 53.5 84.2 75.1 75.0 84.4 82.3
### Table 13. Fiber properties–2016 Arkansas Transgenic Cotton Variety Test, with irrigation on a Calloway silt loam soil at Marianna.

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Mean: 1198 64 4.4 1.21 86.2 32.0 7.0
LSD 0.10: 80 16 0.4 0.04 1.7 2.1 0.9
C.V.%: 7.0 15.4 4.8 2.0 1.2 4.0 7.4
R-sq x 100: 67.1 72.0 84.9 81.5 65.1 66.5 83.7

<sup>a</sup>UI = Fiber length uniformity Index.
Table 14. Yield and related properties–2016 Ark. Cotton Variety Test, with irrigation on a Hebert silt loam at Rohwer.

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<th>Ht.</th>
<th>Open bolls</th>
<th>Seed index</th>
<th>Lint index</th>
<th>Seed/ acre</th>
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<th>Fiber density</th>
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<td>cm</td>
<td>%</td>
<td>g</td>
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Mean: 1025, LSD 0.10: 98, C.V.%: 10.0, R-sq x 100: 51.0.
Table 15. Fiber properties--2016 Arkansas Transgenic Cotton Variety Test, with irrigation on a Hebert silt loam at Rohwer.

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<th>Lint yield (lb/A)</th>
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<th>Micronaire (r)</th>
<th>Length (in.)</th>
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*UI = Fiber length uniformity Index.
Table 16. Morphological and host-plant resistance traits in the 2016 Arkansas Cotton Variety Test.

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<tr>
<th>Variety</th>
<th>Leaf pubescence (a)</th>
<th>Stem pubescence (a)</th>
<th>Bract trichomes (b)</th>
<th>Tarnished plant bug damage (c)</th>
<th>Bacterial blight (d)</th>
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<td>rating (r)</td>
<td>no./cm (r)</td>
<td>% dam. flowers</td>
<td>% sus</td>
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\(a\) Leaf and stem pubescence rated at Keiser irrigated test (6 plants per plots, 6 reps) using scale of 1 (smooth leaf) to 9 (pilose, very hairy).

\(b\) Marginal trichome density of bracts determined on 6 bracts/plot (4 reps) at Keiser irrigated test.

\(c\) Response to tarnished plant bug was determined by examining white flowers (6 flowers/plot/day for 6 days) for presence of anther damage. Plots were 1-row, replicated 8 times.

\(d\) Varieties/breeding lines were planted in flats (2 replications, 13 seed/plot) in greenhouse, and scratch inoculated with *Xanthomonas citris* pv. *malvacearum*. The inoculum was obtained from naturally infected leaves collected at the 2015 Manila location. Scatches were examined for water-soaking, and percent of susceptible plants were determined.
Table 17. Two-year and three-year average lint yields (lb/a) for transgenic varieties at the five locations of the 2014-2016 Arkansas Cotton Variety Test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Traits</th>
<th>Manila Irrigated</th>
<th>Keiser Irrigated</th>
<th>Judd Hill Irrigated</th>
<th>Marianna Irrigated</th>
<th>Rohwer Irrigated</th>
<th>All locations</th>
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<td>lb/A</td>
<td>lb/A</td>
<td>lb/A</td>
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Three-year (2014-2016) means

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<th>Judd Hill Irrigated</th>
<th>Marianna Irrigated</th>
<th>Rohwer Irrigated</th>
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Table 18. Yield and related properties—2016 Arkansas Cotton Variety Test across four test sites.

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<th>Ht.</th>
<th>Open bolls</th>
<th>Seed index</th>
<th>Lint index</th>
<th>Seed/acre</th>
<th>Fibers/seed</th>
<th>Fiber density</th>
<th>C.V.%</th>
<th>Loc. LSD 0.10</th>
<th>C.V.%</th>
<th>Var. LSD 0.10</th>
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<td>0.814</td>
<td>0.083</td>
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<td>5.603</td>
<td>6</td>
<td>12846</td>
<td>124</td>
<td>9</td>
<td>0.814</td>
<td>0.083</td>
<td>1.17</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BR - 293</td>
<td>779</td>
<td>38.4</td>
<td>126</td>
<td>3</td>
<td>11.3</td>
<td>7.2</td>
<td>4.990</td>
<td>10</td>
<td>14286</td>
<td>130</td>
<td>6</td>
<td>0.814</td>
<td>0.083</td>
<td>1.17</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BR - 335</td>
<td>744</td>
<td>37.5</td>
<td>131</td>
<td>2</td>
<td>10.5</td>
<td>9.4</td>
<td>5.266</td>
<td>9</td>
<td>14136</td>
<td>135</td>
<td>3</td>
<td>0.814</td>
<td>0.083</td>
<td>1.17</td>
<td>0.091</td>
</tr>
</tbody>
</table>

Mean                | 909        | 38.1       | 120 | 52         | 11.5       | 7.3        | 5.699     | 14416       | 129        |

Table 19. Fiber properties—2016 Arkansas Conventional Cotton Variety Test across four test sites.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Quality score</th>
<th>Micronaire</th>
<th>Length</th>
<th>Ul</th>
<th>Strength</th>
<th>Elongation</th>
<th>C.V.%</th>
<th>Var. LSD 0.10</th>
<th>R-sq x 100</th>
<th>Prob (var x loc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ark 0701-17</td>
<td>1098</td>
<td>68</td>
<td>4.6</td>
<td>1.24</td>
<td>3</td>
<td>86.4</td>
<td>5</td>
<td>32.6</td>
<td>8</td>
<td>6.4</td>
<td>7</td>
</tr>
<tr>
<td>SSG UA222</td>
<td>1010</td>
<td>67</td>
<td>4.7</td>
<td>1.24</td>
<td>4</td>
<td>86.6</td>
<td>4</td>
<td>33.4</td>
<td>4</td>
<td>8.0</td>
<td>1</td>
</tr>
<tr>
<td>Ark 0614-49</td>
<td>989</td>
<td>57</td>
<td>5.0</td>
<td>1.21</td>
<td>6</td>
<td>87.1</td>
<td>2</td>
<td>33.2</td>
<td>5</td>
<td>7.2</td>
<td>2</td>
</tr>
<tr>
<td>DP 393</td>
<td>969</td>
<td>50</td>
<td>5.0</td>
<td>1.19</td>
<td>7</td>
<td>86.3</td>
<td>6</td>
<td>33.0</td>
<td>7</td>
<td>6.5</td>
<td>5</td>
</tr>
<tr>
<td>AM UA48</td>
<td>935</td>
<td>86</td>
<td>5.2</td>
<td>1.32</td>
<td>1</td>
<td>88.6</td>
<td>1</td>
<td>36.9</td>
<td>1</td>
<td>5.1</td>
<td>10</td>
</tr>
<tr>
<td>SSG UA103</td>
<td>932</td>
<td>72</td>
<td>4.6</td>
<td>1.25</td>
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<td>86.9</td>
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<td>33.9</td>
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<td>843</td>
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<td>1.19</td>
<td>8</td>
<td>85.7</td>
<td>7</td>
<td>31.9</td>
<td>9</td>
<td>5.7</td>
<td>9</td>
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<tr>
<td>SSG HQ 210CT</td>
<td>787</td>
<td>38</td>
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<td>1.17</td>
<td>10</td>
<td>84.0</td>
<td>10</td>
<td>33.1</td>
<td>6</td>
<td>6.1</td>
<td>8</td>
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<td>9</td>
<td>85.7</td>
<td>8</td>
<td>35.0</td>
<td>2</td>
<td>6.8</td>
<td>4</td>
</tr>
<tr>
<td>BRS - 335</td>
<td>744</td>
<td>63</td>
<td>4.4</td>
<td>1.22</td>
<td>5</td>
<td>85.7</td>
<td>9</td>
<td>31.7</td>
<td>10</td>
<td>6.5</td>
<td>6</td>
</tr>
</tbody>
</table>

Mean                | 909        | 60            | 4.8        | 1.22   | 86.3 | 33.5     | 6.5       |

Var. LSD 0.10       | 132        | 9             | 0.2        | 0.02   | 0.9   | 0.8      | 0.4       |

Loc. LSD 0.10       | 81         | ns            | 0.1        | ns     | ns    | 0.5      | 0.2       |

C.V.%              | 11.3       | 17.0          | 3.9        | 2.0    | 1.3   | 3.0      | 7.2       |

R-sq x 100          | 84.2       | 82.9          | 91.2       | 88.0   | 75.5  | 87.5     | 88.8      |

Prob (var x loc)    | <0.0001    | 0.775         | 0.180      | 0.755  | 0.818 | 0.131    | 0.294     |
Table 20. Yield and related properties—2016 Ark. Cotton Variety Test, with irrigation on a Sharkey clay soil at Keiser.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield r</th>
<th>Lint frac. r</th>
<th>Ht. cm</th>
<th>Open bolls r</th>
<th>Seed index r</th>
<th>Lint index r</th>
<th>Seed/acre r</th>
<th>Fibers/seed r</th>
<th>Fiber density r</th>
<th>Mean</th>
<th>LSD 0.10</th>
<th>C.V.%</th>
<th>R-sq x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRS - 293</td>
<td>1101</td>
<td>1</td>
<td>40.7</td>
<td>2</td>
<td>117</td>
<td>35</td>
<td>10</td>
<td>11.1</td>
<td>7</td>
<td>7.8</td>
<td>3</td>
<td>6.353</td>
<td>2</td>
</tr>
<tr>
<td>DP 393</td>
<td>1068</td>
<td>2</td>
<td>40.5</td>
<td>3</td>
<td>106</td>
<td>58</td>
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<td>11.5</td>
<td>4</td>
<td>8.0</td>
<td>2</td>
<td>6.082</td>
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<tr>
<td>SSG UA222</td>
<td>1063</td>
<td>3</td>
<td>40.2</td>
<td>4</td>
<td>98</td>
<td>8</td>
<td>55</td>
<td>4</td>
<td>11.4</td>
<td>5</td>
<td>3</td>
<td>6.195</td>
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</tr>
<tr>
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<td>1017</td>
<td>4</td>
<td>38.8</td>
<td>9</td>
<td>113</td>
<td>3</td>
<td>45</td>
<td>6</td>
<td>10.8</td>
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<td>8</td>
<td>6.625</td>
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</tr>
<tr>
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<td>5</td>
<td>41.2</td>
<td>1</td>
<td>99</td>
<td>7</td>
<td>65</td>
<td>2</td>
<td>11.8</td>
<td>2</td>
<td>8.5</td>
<td>5.311</td>
<td>10</td>
</tr>
<tr>
<td>Ark 0614-49</td>
<td>967</td>
<td>6</td>
<td>40.1</td>
<td>5</td>
<td>103</td>
<td>5</td>
<td>52</td>
<td>5</td>
<td>11.3</td>
<td>6</td>
<td>7.4</td>
<td>5.637</td>
<td>8</td>
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<tr>
<td>AM UA48</td>
<td>948</td>
<td>7</td>
<td>36.6</td>
<td>10</td>
<td>95</td>
<td>9</td>
<td>45</td>
<td>6</td>
<td>12.6</td>
<td>1</td>
<td>7.4</td>
<td>5.781</td>
<td>7</td>
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<td>7</td>
<td>100</td>
<td>6</td>
<td>68</td>
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<td>11.8</td>
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<td>7.7</td>
<td>5.555</td>
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<td>39.8</td>
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<td>94</td>
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<td>9.9</td>
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<td>115</td>
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<td>40</td>
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<td>104</td>
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<td>11.2</td>
<td>7.5</td>
<td>6.014</td>
<td>14045</td>
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<tr>
<td>LSD 0.10</td>
<td>97</td>
<td>0.8</td>
<td>0.8</td>
<td>7</td>
<td>0.9</td>
<td>0.8</td>
<td>0.583</td>
<td>1815</td>
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</tr>
<tr>
<td>C.V.%</td>
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<td>2.3</td>
<td>7.4</td>
<td>1.3</td>
<td>4.4</td>
<td>5.4</td>
<td>2.6</td>
<td>6.6</td>
<td>1.7</td>
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</tr>
<tr>
<td>R-sq x 100</td>
<td>41.1</td>
<td>95.5</td>
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<td>75.9</td>
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Table 21. Fiber properties—2016 Arkansas Conventional Cotton Variety Test, with irrigation on a Sharkey clay soil at Keiser.

<table>
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<tr>
<th>Variety</th>
<th>Lint yield r</th>
<th>Quality score r</th>
<th>Micronaire r</th>
<th>Length r</th>
<th>Ulb r</th>
<th>Strength r</th>
<th>Elongation r</th>
<th>Mean</th>
<th>LSD 0.10</th>
<th>C.V.%</th>
<th>R-sq x 100</th>
</tr>
</thead>
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<tr>
<td>BRS - 293</td>
<td>1101</td>
<td>36</td>
<td>9</td>
<td>5.5</td>
<td>2</td>
<td>85.8</td>
<td>38.0</td>
<td>6.9</td>
<td>3</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>DP 393</td>
<td>1068</td>
<td>52</td>
<td>7</td>
<td>5.5</td>
<td>2</td>
<td>87.3</td>
<td>34.1</td>
<td>6.1</td>
<td>7</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td>SSG UA222</td>
<td>1063</td>
<td>58</td>
<td>2</td>
<td>4.8</td>
<td>8</td>
<td>86.5</td>
<td>33.3</td>
<td>8.6</td>
<td>1</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BRS - 286</td>
<td>1017</td>
<td>54</td>
<td>6</td>
<td>4.8</td>
<td>8</td>
<td>86.5</td>
<td>33.3</td>
<td>6.1</td>
<td>7</td>
<td>6.1</td>
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</tr>
<tr>
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<td>4</td>
<td>5.0</td>
<td>6</td>
<td>86.0</td>
<td>34.1</td>
<td>6.3</td>
<td>6</td>
<td>6.3</td>
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<td>33.6</td>
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<td>5.1</td>
<td>10</td>
<td>5.1</td>
<td></td>
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<td>7</td>
<td>85.9</td>
<td>33.8</td>
<td>6.9</td>
<td>3</td>
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<td>926</td>
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<td>10</td>
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<td>83.6</td>
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<td>9</td>
<td>6.1</td>
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<td>5</td>
<td>4.7</td>
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<td>6.6</td>
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<td>6.6</td>
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<td></td>
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</tr>
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<td>84.2</td>
<td>62.8</td>
<td>86.9</td>
<td>90.6</td>
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## Table 22. Yield and related properties—2016 Ark. Cotton Variety Test, with irrigation on a Dundee silt loam soil at Judd Hill.

<table>
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<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Lint frac.</th>
<th>Ht.</th>
<th>Open bolls</th>
<th>Seed index</th>
<th>Lint index</th>
<th>Seed/acre</th>
<th>Fibers/seed</th>
<th>Fiber density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>%</td>
<td>cm</td>
<td>%</td>
<td>g</td>
<td>g</td>
<td>mil.</td>
<td>no.</td>
<td>no.</td>
</tr>
<tr>
<td>Ark 0701-17</td>
<td>1129</td>
<td>39.0</td>
<td>126</td>
<td>70</td>
<td>12.4</td>
<td>8.1</td>
<td>6.354</td>
<td>1</td>
<td>151</td>
</tr>
<tr>
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<td>1049</td>
<td>37.7</td>
<td>132</td>
<td>63</td>
<td>11.7</td>
<td>7.3</td>
<td>6.560</td>
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</tr>
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<td>135</td>
<td>42</td>
<td>11.8</td>
<td>7.6</td>
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<td>5.792</td>
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<td>119</td>
<td>61</td>
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<td>11.6</td>
<td>7.2</td>
<td>5.452</td>
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<td>4.1</td>
<td>11.1</td>
<td>3.4</td>
<td>3.5</td>
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<td>4.9</td>
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<td>82.9</td>
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<td>94.4</td>
<td>93.9</td>
<td>47.8</td>
<td>88.4</td>
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## Table 23. Fiber properties—2016 Arkansas Conventional Cotton Variety Test, with irrigation on a Dundee silt loam soil at Judd Hill.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Quality score</th>
<th>Micronaire</th>
<th>Fiber properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>r</td>
<td>in.</td>
<td>r</td>
</tr>
<tr>
<td>Ark 0701-17</td>
<td>1129</td>
<td>74</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td>Ark 0614-49</td>
<td>1049</td>
<td>66</td>
<td>4</td>
<td>4.8</td>
</tr>
<tr>
<td>SSG UA222</td>
<td>992</td>
<td>61</td>
<td>5</td>
<td>4.6</td>
</tr>
<tr>
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<td>55</td>
<td>9</td>
<td>4.7</td>
</tr>
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<td>91</td>
<td>1</td>
<td>4.9</td>
</tr>
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<td>BRS - 286</td>
<td>801</td>
<td>56</td>
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</tr>
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<td>795</td>
<td>75</td>
<td>2</td>
<td>4.1</td>
</tr>
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<td>44</td>
<td>10</td>
<td>4.7</td>
</tr>
<tr>
<td>BRS - 293</td>
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<td>58</td>
<td>6</td>
<td>4.5</td>
</tr>
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<td>56</td>
<td>7</td>
<td>4.2</td>
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<td>4.5</td>
<td>1.22</td>
</tr>
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<td>17</td>
<td>0.4</td>
<td>0.04</td>
</tr>
<tr>
<td>C.V.%</td>
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<td>15.0</td>
<td>4.5</td>
<td>2.0</td>
</tr>
<tr>
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### Table 24. Yield and related properties–2016 Ark. Cotton Variety Test, with irrigation on a Calloway silt loam soil at Marianna.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (lb/A)</th>
<th>Lint Yield (%)</th>
<th>Ht. (in.)</th>
<th>Open Bolls</th>
<th>Seed index</th>
<th>Lint Index</th>
<th>Seed/Acre</th>
<th>Seed/Seed</th>
<th>Fibers/Fiber Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ark 0701-17</td>
<td>1457</td>
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<td>39.0</td>
<td>108</td>
<td>71</td>
<td>11.5</td>
<td>7.5</td>
<td>8.866</td>
<td>16294</td>
</tr>
<tr>
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<td>1329</td>
<td>2</td>
<td>38.1</td>
<td>106</td>
<td>50</td>
<td>11.2</td>
<td>7.0</td>
<td>8.572</td>
<td>14747</td>
</tr>
<tr>
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<td>37.6</td>
<td>106</td>
<td>75</td>
<td>11.1</td>
<td>6.9</td>
<td>8.055</td>
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<td>6.6</td>
<td>7.984</td>
<td>13762</td>
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<td>110</td>
<td>63</td>
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<td>6.806</td>
<td>14690</td>
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<td>110</td>
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<td>7.3</td>
<td>6.866</td>
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<td>6.825</td>
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<td>7.007</td>
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<td>105</td>
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<td>7.0</td>
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<td>61</td>
<td>11.2</td>
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<td>5</td>
<td>11</td>
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<td>ns</td>
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<td>5.1</td>
<td>18.2</td>
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<td>70.0</td>
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<td>82.0</td>
<td>87.0</td>
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### Table 25. Fiber properties–2016 Arkansas Conventional Cotton Variety Test, with irrigation on a Calloway silt loam soil at Marianna.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (lb/A)</th>
<th>Score</th>
<th>Micronaire</th>
<th>Length (in.)</th>
<th>Uf</th>
<th>Strength (g/tex)</th>
<th>Elongation (%)</th>
</tr>
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<tbody>
<tr>
<td>Ark 0701-17</td>
<td>1457</td>
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<td>4.2</td>
<td>12.6</td>
<td>86.5</td>
<td>6</td>
<td>33.2</td>
</tr>
<tr>
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<td>2</td>
<td>4.4</td>
<td>12.5</td>
<td>87.1</td>
<td>4</td>
<td>34.6</td>
</tr>
<tr>
<td>Ark 0614-49</td>
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<td>4.8</td>
<td>12.3</td>
<td>87.8</td>
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<td>33.1</td>
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<td>11.9</td>
<td>86.8</td>
<td>5</td>
<td>33.4</td>
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<td>34.1</td>
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<td>36.8</td>
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<td>8</td>
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</tr>
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<td>85.3</td>
<td>8</td>
<td>32.4</td>
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<td>1.17</td>
<td>84.2</td>
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<td>7</td>
<td>34.7</td>
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<td>86.5</td>
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<td>1.0</td>
</tr>
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<td>4.9</td>
<td>1.6</td>
<td>1.4</td>
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<td>73.4</td>
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**Table 26. Yield and related properties—2016 Ark. Cotton Variety Test, with irrigation on a Hebert silt loam at Rohwer.**

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<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Lint frac.</th>
<th>Ht.</th>
<th>Open bolls</th>
<th>Seed index</th>
<th>Lint index</th>
<th>Seed/acre</th>
<th>Fibers/seed</th>
<th>Fiber density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>%</td>
<td>cm</td>
<td>%</td>
<td>g</td>
<td>g</td>
<td>mil.</td>
<td>no.</td>
<td>no.</td>
</tr>
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<td>39.1</td>
<td>2</td>
<td>133</td>
<td>6</td>
<td>47</td>
<td>4.32</td>
<td>2</td>
</tr>
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<td>793</td>
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<td>39.8</td>
<td>1</td>
<td>140</td>
<td>3</td>
<td>47</td>
<td>11.82</td>
<td>7</td>
</tr>
<tr>
<td>AM UA48</td>
<td>781</td>
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<td>39.5</td>
<td>10</td>
<td>129</td>
<td>7</td>
<td>53</td>
<td>13.21</td>
<td>7</td>
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<td>38.1</td>
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<td>57</td>
<td>11.82</td>
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<td>38.6</td>
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<td>53</td>
<td>11.82</td>
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<td>38.7</td>
<td>3</td>
<td>135</td>
<td>5</td>
<td>47</td>
<td>13.21</td>
<td>3</td>
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<td>607</td>
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<th>Mean</th>
<th>Lint yield</th>
<th>Lint frac.</th>
<th>Ht.</th>
<th>Open bolls</th>
<th>Seed index</th>
<th>Lint index</th>
<th>Seed/acre</th>
<th>Fibers/seed</th>
<th>Fiber density</th>
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<td>1.8</td>
<td>0.9</td>
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**Table 27. Fiber properties—2016 Arkansas Conventional Cotton Variety Test, with irrigation on a Hebert silt loam at Rohwer.**

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<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>Uf</th>
<th>Strength</th>
<th>Elongation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>in.</td>
<td>%</td>
<td>g/tex</td>
<td>%</td>
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<td>6</td>
<td>1.23</td>
<td>86.8</td>
<td>34.7</td>
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<td>8</td>
<td>1.23</td>
<td>86.3</td>
<td>31.1</td>
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<td>89.4</td>
<td>38.0</td>
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<td>87.3</td>
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<td>2</td>
<td>1.17</td>
<td>85.7</td>
<td>33.6</td>
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<tr>
<td>BRS - 335</td>
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<td>5.0</td>
<td>10</td>
<td>1.23</td>
<td>86.0</td>
<td>30.4</td>
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</table>

<table>
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<th>Variety</th>
<th>Mean</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>Uf</th>
<th>Strength</th>
<th>Elongation</th>
</tr>
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<tbody>
<tr>
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<td>5.0</td>
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<td>1.22</td>
<td>86.6</td>
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<td>6.0</td>
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<td>0.04</td>
<td>1.5</td>
<td>2.4</td>
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<td>14.8</td>
<td>2.3</td>
<td>1.8</td>
<td>0.9</td>
<td>4.0</td>
<td>6.6</td>
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<td>79.1</td>
<td>84.7</td>
<td>90.3</td>
</tr>
</tbody>
</table>
### Table 28. Morphological and host-plant resistance traits in the 2016 Arkansas Cotton Variety Test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Leaf pubescence&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Stem pubescence&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Bract trichomes&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Tarnished plant bug damage&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Bacterial blight&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rating</td>
<td>rating</td>
<td>no./cm</td>
<td>% dam. flowers</td>
<td>% sus.</td>
</tr>
<tr>
<td>BRS - 286</td>
<td>3.6</td>
<td>1</td>
<td>4</td>
<td>45.6</td>
<td>6</td>
</tr>
<tr>
<td>BRS - 293</td>
<td>2.3</td>
<td>5</td>
<td>3.1</td>
<td>48.9</td>
<td>5</td>
</tr>
<tr>
<td>BRS - 335</td>
<td>3.6</td>
<td>1</td>
<td>5.1</td>
<td>62.5</td>
<td>1</td>
</tr>
<tr>
<td>SSG UA222</td>
<td>2.5</td>
<td>4</td>
<td>4.1</td>
<td>55.5</td>
<td>2</td>
</tr>
<tr>
<td>SSG UA103</td>
<td>2.7</td>
<td>3</td>
<td>2.8</td>
<td>39.2</td>
<td>8</td>
</tr>
<tr>
<td>SSG HQ 210CT</td>
<td>1.5</td>
<td>10</td>
<td>3.4</td>
<td>29.8</td>
<td>10</td>
</tr>
<tr>
<td>Ark 0614-49</td>
<td>2.3</td>
<td>6</td>
<td>5.4</td>
<td>55.4</td>
<td>3</td>
</tr>
<tr>
<td>Ark 0701-17</td>
<td>1.8</td>
<td>9</td>
<td>3</td>
<td>34.6</td>
<td>9</td>
</tr>
<tr>
<td>AM UA48</td>
<td>2.1</td>
<td>8</td>
<td>3.5</td>
<td>45.5</td>
<td>7</td>
</tr>
<tr>
<td>DP 393</td>
<td>2.2</td>
<td>7</td>
<td>4.4</td>
<td>49.8</td>
<td>4</td>
</tr>
<tr>
<td>Frego bract, ck.</td>
<td>85</td>
<td>11</td>
<td>11</td>
<td>46.7</td>
<td>55</td>
</tr>
</tbody>
</table>

Mean

LSD 0.10

C.V.%

R-sq x 100

---

<sup>a</sup> Leaf and stem pubescence rated at Keiser irrigated test (6 plants per plots, 6 reps) using scale of 1 (smooth leaf) to 9 (pilose, very hairy).

<sup>b</sup> Marginal trichome density of bracts determined on 6 bracts/plot (4 reps) at Keiser irrigated test.

<sup>c</sup> Response to tarnished plant bug was determined by examining white flowers (6 flowers/plot/day for 6 days) for presence of anther damage. Plots were 1-row, replicated 8 times.

<sup>d</sup> Varieties/breeding lines were planted in flats (4 replications, 13 seed/plot) in greenhouse, and scratch inoculated with *Xanthomonas citri* pv. *malvacearum*. The inoculum was obtained from naturally infected leaves collected at the 2015 Manila location. Scatches were examined for water-soaking, and % of susceptible plants were determined.

---

*Xanthomonas citri* pv. *malvacearum.* The inoculum was obtained from naturally infected leaves collected at the 2015 Manila location. Scatches were examined for water-soaking, and % of susceptible plants were determined.
Table 29. Two-year and 3-year average lint yields (lb/A) for conventional varieties at the four locations of the 2014-2016 Arkansas Cotton Variety Test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Traits</th>
<th>Judd Hill</th>
<th>Marianna</th>
<th>Rohwer</th>
<th>All locations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Irrigated</td>
<td>Irrigated</td>
<td>Irrigated</td>
<td>Irrigated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lb/A</td>
<td>lb/A</td>
<td>lb/A</td>
<td>lb/A</td>
</tr>
<tr>
<td>Two-year (2015-2016) means</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SGS UA222</td>
<td>conv</td>
<td>855</td>
<td>1161</td>
<td>1480</td>
<td>970</td>
</tr>
<tr>
<td>DP 393</td>
<td>conv</td>
<td>873</td>
<td>1135</td>
<td>1330</td>
<td>972</td>
</tr>
<tr>
<td>SGS UA103</td>
<td>conv</td>
<td>815</td>
<td>1000</td>
<td>1259</td>
<td>1056</td>
</tr>
<tr>
<td>AM UA48</td>
<td>conv</td>
<td>778</td>
<td>1042</td>
<td>1250</td>
<td>1008</td>
</tr>
<tr>
<td>BRS - 286</td>
<td>conv</td>
<td>771</td>
<td>940</td>
<td>1177</td>
<td>780</td>
</tr>
<tr>
<td>SGS HQ210CT</td>
<td>conv</td>
<td>722</td>
<td>957</td>
<td>1119</td>
<td>835</td>
</tr>
<tr>
<td>BRS - 293</td>
<td>conv</td>
<td>754</td>
<td>910</td>
<td>1085</td>
<td>808</td>
</tr>
<tr>
<td>BRS - 335</td>
<td>conv</td>
<td>689</td>
<td>859</td>
<td>1156</td>
<td>819</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>782</td>
<td>1000</td>
<td>1232</td>
<td>906</td>
</tr>
<tr>
<td>Three-year (2014-2016) means</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SGS UA222</td>
<td>conv</td>
<td>1022</td>
<td>1175</td>
<td>1444</td>
<td>1057</td>
</tr>
<tr>
<td>DP 393</td>
<td>conv</td>
<td>958</td>
<td>1063</td>
<td>1313</td>
<td>1027</td>
</tr>
<tr>
<td>SGS UA103</td>
<td>conv</td>
<td>898</td>
<td>953</td>
<td>1264</td>
<td>1019</td>
</tr>
<tr>
<td>AM UA48</td>
<td>conv</td>
<td>893</td>
<td>1025</td>
<td>1182</td>
<td>1015</td>
</tr>
<tr>
<td>BRS - 335</td>
<td>conv</td>
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<td>893</td>
<td>1089</td>
<td>910</td>
</tr>
<tr>
<td>BRS - 286</td>
<td>conv</td>
<td>872</td>
<td>895</td>
<td>1062</td>
<td>859</td>
</tr>
<tr>
<td>SGS HQ210CT</td>
<td>conv</td>
<td>826</td>
<td>882</td>
<td>1064</td>
<td>879</td>
</tr>
<tr>
<td>BRS - 293</td>
<td>conv</td>
<td>784</td>
<td>889</td>
<td>978</td>
<td>927</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>885</td>
<td>972</td>
<td>1174</td>
<td>962</td>
</tr>
</tbody>
</table>
Appendix Table A1. Lint yield and fiber properties—Lee county conventional variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>Fiber properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>in.</td>
<td>%</td>
<td>g/tex</td>
</tr>
<tr>
<td>SGS UA 222</td>
<td>1535</td>
<td>4.7</td>
<td>1</td>
<td>84.4</td>
</tr>
<tr>
<td>DP 1518 B2XF</td>
<td>1474</td>
<td>3.7</td>
<td>3</td>
<td>84.0</td>
</tr>
<tr>
<td>PHY 333 WRF</td>
<td>1440</td>
<td>4.3</td>
<td>6</td>
<td>84.4</td>
</tr>
<tr>
<td>NG 3406 B2XF</td>
<td>1191</td>
<td>4.5</td>
<td>5</td>
<td>84.3</td>
</tr>
<tr>
<td>DP 393</td>
<td>1131</td>
<td>5.3</td>
<td>1</td>
<td>84.0</td>
</tr>
<tr>
<td>DP 493</td>
<td>1102</td>
<td>4.9</td>
<td>2</td>
<td>82.8</td>
</tr>
<tr>
<td>Mean</td>
<td>1312</td>
<td>4.7</td>
<td>1.17</td>
<td>84.0</td>
</tr>
<tr>
<td>Var. LSD 0.05</td>
<td>132</td>
<td>0.2</td>
<td>0.04</td>
<td>1.2</td>
</tr>
<tr>
<td>C.V.%</td>
<td>6.7</td>
<td>3.2</td>
<td>2.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Prob (var)</td>
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<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>0.0896</td>
</tr>
</tbody>
</table>

* UI = Fiber length uniformity index.

Appendix Table A2. Lint yield and fiber properties—Ashley county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>Fiber properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>in.</td>
<td>%</td>
<td>g/tex</td>
</tr>
<tr>
<td>DP 1518 B2XF</td>
<td>1253</td>
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<td>11</td>
<td>82.4</td>
</tr>
<tr>
<td>DP 1522 B2XF</td>
<td>1172</td>
<td>5.1</td>
<td>1</td>
<td>84.3</td>
</tr>
<tr>
<td>NG 3406 B2XF</td>
<td>1087</td>
<td>4.6</td>
<td>7</td>
<td>83.5</td>
</tr>
<tr>
<td>PHY 312 WRF</td>
<td>1118</td>
<td>4.5</td>
<td>8</td>
<td>84.6</td>
</tr>
<tr>
<td>NG 3522 B2XF</td>
<td>1111</td>
<td>4.5</td>
<td>9</td>
<td>83.7</td>
</tr>
<tr>
<td>PHY 333 WRF</td>
<td>1109</td>
<td>4.3</td>
<td>10</td>
<td>84.8</td>
</tr>
<tr>
<td>DG 3385 B2XF</td>
<td>1045</td>
<td>4.7</td>
<td>4</td>
<td>83.7</td>
</tr>
<tr>
<td>ST 5115 GLT</td>
<td>1004</td>
<td>4.7</td>
<td>5</td>
<td>83.6</td>
</tr>
<tr>
<td>ST 4848 GLT</td>
<td>1074</td>
<td>4.8</td>
<td>2</td>
<td>83.4</td>
</tr>
<tr>
<td>ST 4946 GLB2</td>
<td>940</td>
<td>4.7</td>
<td>3</td>
<td>83.8</td>
</tr>
<tr>
<td>DG 3544 B2XF</td>
<td>854</td>
<td>4.6</td>
<td>6</td>
<td>84.7</td>
</tr>
<tr>
<td>Mean</td>
<td>1070</td>
<td>4.6</td>
<td>1.17</td>
<td>83.9</td>
</tr>
<tr>
<td>Var. LSD 0.05</td>
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<td>0.03</td>
<td>2.2</td>
</tr>
<tr>
<td>C.V.%</td>
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<td>3.2</td>
<td>1.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Prob (var)</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>0.0007</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* UI = Fiber length uniformity index.
Appendix Table A3. Lint yield and fiber properties—Craighead county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>UIa</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/A</td>
<td>r</td>
<td>in.</td>
<td>%</td>
<td>g/tex</td>
</tr>
<tr>
<td>NG 3406 B2XF</td>
<td>1303</td>
<td>4.8</td>
<td>1.17</td>
<td>9</td>
<td>84.6</td>
</tr>
<tr>
<td>DG 3385 B2XF</td>
<td>1285</td>
<td>4.7</td>
<td>1.24</td>
<td>1</td>
<td>86.3</td>
</tr>
<tr>
<td>ST 4946 GLB2</td>
<td>1215</td>
<td>5.0</td>
<td>1.21</td>
<td>5</td>
<td>85.6</td>
</tr>
<tr>
<td>NG 3522 B2XF</td>
<td>1169</td>
<td>4.7</td>
<td>1.16</td>
<td>11</td>
<td>84.1</td>
</tr>
<tr>
<td>DP 1518 B2XF</td>
<td>1147</td>
<td>4.7</td>
<td>1.24</td>
<td>2</td>
<td>85.7</td>
</tr>
<tr>
<td>PHY 312 WRF</td>
<td>1126</td>
<td>4.2</td>
<td>1.22</td>
<td>4</td>
<td>84.5</td>
</tr>
<tr>
<td>PHY 333 WRF</td>
<td>1064</td>
<td>4.4</td>
<td>1.24</td>
<td>3</td>
<td>85.5</td>
</tr>
<tr>
<td>DP 1522 B2XF</td>
<td>1049</td>
<td>4.9</td>
<td>1.18</td>
<td>7</td>
<td>84.7</td>
</tr>
<tr>
<td>ST 5115 GLT</td>
<td>1000</td>
<td>4.8</td>
<td>1.19</td>
<td>6</td>
<td>83.9</td>
</tr>
<tr>
<td>ST 4848 GLT</td>
<td>903</td>
<td>4.4</td>
<td>1.17</td>
<td>10</td>
<td>83.4</td>
</tr>
<tr>
<td>DG 3544 B2XF</td>
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<td>1.18</td>
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<td>85.3</td>
</tr>
<tr>
<td>Mean</td>
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<td>1.20</td>
<td>84.9</td>
<td>32.2</td>
</tr>
<tr>
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<td>59</td>
<td>0.2</td>
<td>0.03</td>
<td>2.2</td>
<td>2.0</td>
</tr>
<tr>
<td>C.V.%</td>
<td>3.8</td>
<td>3.2</td>
<td>1.9</td>
<td>1.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Prob (var)</td>
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<td>0.0007</td>
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</tr>
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</table>

*a UI = Fiber length uniformity index.
### Appendix Table A4. Lint yield and fiber properties—Lee county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Micronaire r</th>
<th>Length</th>
<th>Length r</th>
<th>UIa</th>
<th>Strength</th>
<th>Strength r</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG 3522 B2XF</td>
<td>1819</td>
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<td>5</td>
<td>1.12</td>
<td>11</td>
<td>82.9</td>
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<td>28.3</td>
</tr>
<tr>
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<td>1797</td>
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<td>1</td>
<td>1.16</td>
<td>5</td>
<td>84.8</td>
<td>3</td>
<td>30.9</td>
</tr>
<tr>
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<td>1734</td>
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<td>1.16</td>
<td>7</td>
<td>84.4</td>
<td>7</td>
<td>33.2</td>
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<td>DP 1518 B2XF</td>
<td>1717</td>
<td>4.6</td>
<td>8</td>
<td>1.18</td>
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<td>29.9</td>
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<td>4.5</td>
<td>9</td>
<td>1.21</td>
<td>3</td>
<td>84.7</td>
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<td>30.2</td>
</tr>
<tr>
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<td>85.3</td>
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<td>1614</td>
<td>4.9</td>
<td>3</td>
<td>1.15</td>
<td>8</td>
<td>83.5</td>
<td>9</td>
<td>30.3</td>
</tr>
<tr>
<td>DG 3385 B2XF</td>
<td>1606</td>
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<td>1.16</td>
<td>6</td>
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<td>5</td>
<td>29.2</td>
</tr>
<tr>
<td>NG 3406 B2XF</td>
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<td>4.6</td>
<td>6</td>
<td>1.14</td>
<td>10</td>
<td>84.7</td>
<td>4</td>
<td>29.2</td>
</tr>
<tr>
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<td>11</td>
<td>1.15</td>
<td>9</td>
<td>82.5</td>
<td>11</td>
<td>31.5</td>
</tr>
<tr>
<td>DG 3544 B2XF</td>
<td>1501</td>
<td>4.6</td>
<td>7</td>
<td>1.21</td>
<td>2</td>
<td>84.9</td>
<td>2</td>
<td>33.6</td>
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</tbody>
</table>

Mean 1659 4.7 1.17 84.2 30.7
Var. LSD 0.05 156 0.4 0.03 1.3 1.8
C.V.% 6.5 5.2 1.7 1.1 4.1
Prob (var) 0.0021 0.0010 <0.0001 0.0015 <0.0001

a UI = Fiber length uniformity index.
Appendix Table A5. Lint yield and fiber properties—Poinsett county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>UI</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP 1522 B2XF</td>
<td>1401</td>
<td>4.5</td>
<td>1.20</td>
<td>6</td>
<td>85.0</td>
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<tr>
<td>DP 1518 B2XF</td>
<td>1395</td>
<td>4.1</td>
<td>1.21</td>
<td>5</td>
<td>83.3</td>
</tr>
<tr>
<td>DP 1614 B2XF</td>
<td>1393</td>
<td>4.4</td>
<td>1.24</td>
<td>2</td>
<td>84.6</td>
</tr>
<tr>
<td>DG 3385 B2XF</td>
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<td>1.17</td>
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<tr>
<td>PHY 333 WRF</td>
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</tr>
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</tr>
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<td>1.20</td>
<td>8</td>
<td>84.0</td>
</tr>
<tr>
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<td>1.15</td>
<td>12</td>
<td>83.7</td>
</tr>
<tr>
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<td>82.5</td>
</tr>
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<td>ST 5115 GLT</td>
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<td>1.18</td>
<td>10</td>
<td>83.1</td>
</tr>
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<table>
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<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>UI</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1266</td>
<td>4.2</td>
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<td>10</td>
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<td>Var. LSD 0.05</td>
<td>222</td>
<td>0.3</td>
<td>0.04</td>
<td>2</td>
<td>1.6</td>
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<tr>
<td>C.V.%</td>
<td>12.2</td>
<td>5.4</td>
<td>2.1</td>
<td>1.7</td>
<td>3.5</td>
</tr>
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<td>Prob (var)</td>
<td>0.0314</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>0.0718</td>
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</tr>
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*a UI = Fiber length uniformity index.*
### Appendix Table A6. Lint yield and fiber properties—Mississippi county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Lint yield</th>
<th>Micronaire r</th>
<th>Length r</th>
<th>Ul(^a) r</th>
<th>Strength r</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP 1518 B2XF</td>
<td>1521</td>
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<td>4.1</td>
<td>8</td>
<td>1.21</td>
</tr>
<tr>
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<td>1355</td>
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<td>4.3</td>
<td>6</td>
<td>1.14</td>
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<tr>
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<td>5</td>
<td>1.20</td>
</tr>
<tr>
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<td>1289</td>
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<td>1.17</td>
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<tr>
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<td>4.6</td>
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<td>1.18</td>
</tr>
<tr>
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<td>7</td>
<td>4.0</td>
<td>9</td>
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<td>NG 3522 B2XF</td>
<td>1213</td>
<td>8</td>
<td>4.6</td>
<td>1</td>
<td>1.15</td>
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<tr>
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<td>1114</td>
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<td>3.9</td>
<td>11</td>
<td>1.20</td>
</tr>
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<td>1102</td>
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<td>10</td>
<td>1.20</td>
</tr>
<tr>
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<td>4.5</td>
<td>4</td>
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**Mean**

<table>
<thead>
<tr>
<th>Lint yield</th>
<th>Micronaire</th>
<th>Length</th>
<th>Ul(^a)</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1248</td>
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<td>84.2</td>
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**Var. LSD 0.05**

<table>
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<th>Micronaire</th>
<th>Length</th>
<th>Ul(^a)</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
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<td>2.0</td>
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</tbody>
</table>

**C.V.%**

<table>
<thead>
<tr>
<th>Micronaire</th>
<th>Length</th>
<th>Ul(^a)</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
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<td>8.7</td>
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**Prob (var)**

<table>
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<th>Length</th>
<th>Ul(^a)</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0002</td>
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<td>0.1582</td>
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\(^a\) Ul = Fiber length uniformity index.
Appendix Table A7. Lint yield and fiber properties—St. Francis county transgenic variety test.

<table>
<thead>
<tr>
<th>Variety</th>
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<th>Micronaire</th>
<th>Length</th>
<th>UIa</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
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<td>NG 3406 B2XF</td>
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<td>1.18</td>
<td>85.2</td>
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<td>83.3</td>
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<td>84.2</td>
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<td>85.3</td>
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Mean: 1151, 5.2, 1.18, 84.6, 31.4
Var. LSD 0.05: 232, 0.2, 0.03, 1.1, 2.2
C.V.%: 14.0, 2.6, 1.5, 0.9, 4.6
Prob (var): 0.0326, <0.0001, <0.0001, 0.0040, 0.0007

a UI = Fiber length uniformity index.

Appendix Table A8. Summary of lint yields across six transgenic county variety tests.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Ashley Lint yield</th>
<th>Craighead Lint yield</th>
<th>Lee Lint yield</th>
<th>Poinsett Lint yield</th>
<th>Mississippi Lint yield</th>
<th>St Francis Lint yield</th>
<th>Average Lint yield</th>
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<tbody>
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