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VARIETIES OF COTTON IN  
NORTHWEST TEXAS

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†As of August 1, 1922.

\*In cooperation with School of Veterinary Medicine, A. and M. College of Texas.

\*\*In cooperation with United States Department of Agriculture.

1Resigned July 1, 1922.

## VARIETIES OF COTTON IN NORTHWEST TEXAS

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BY

R. E. KARPER.\*

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Substation No. 8 of the Texas Agricultural Experiment Station is located on the High Plains, three miles east of the city of Lubbock, near the center of Lubbock County. It is midway between Amarillo and Sweetwater, near the center of the South Plains region and about seventy-five miles east of the western border of the State.

The topography of the Plains in general is that of a nearly level plain with occasional shallow basins or intermittent lakes. The area of the substation farm is nearly flat. The altitude is 3240 feet.

The greater portion of the farm belongs to either the Amarillo or Richfield fine sandy loam type of soil underlaid with a clay subsoil which reaches down to the marl or calcareous rock below, and embraces the principal soil types of the surrounding country of the South Plains region above the Caprock line. The soil is well supplied with lime and the clay subsoil is valuable in the retention of moisture through periods of scant rainfall.

This bulletin gives briefly the results of experiments with different varieties of cotton at this substation for the ten-year period of 1912 to 1921, inclusive. During the first part of this period the variety tests were of a preliminary nature, including a large number of different varieties, many of which were dropped from year to year and new ones added as their performance seemed to justify or new varieties came into prominence. During the latter years the number of varieties carried has been reduced to include largely the better varieties from the standpoint of yield and staple and to permit of testing them out more thoroughly in larger areas.

### COTTON PRODUCTION ON THE PLAINS.

The cotton production of the counties which are wholly or partly on the Plains has increased from 9240 bales in 1909 to 132,489 bales in 1919, or about fourteen hundred per cent. The counties having the largest increase were Crosby, Lubbock, and Floyd. In these counties and others above the Caprock cotton growing was practically unknown in 1909. At the present time this is the principal cash crop grown in the South Plains counties, being exceeded in acreage only by grain sorghum crops. The most rapid increase in acreage has taken place within the past four or five years. This advance in cotton growing here has developed with the testing out of numerous varieties and the

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\*Credit is due A. L. Paschall, who had charge of this work in 1912, and to V. L. Cory, who conducted the tests from 1913 to 1915. Credit is also due the Division of Agronomy for instituting this work and for active leadership in it up to and including 1919. Since 1919 this work has been under the supervision of the Division of Cotton Breeding.

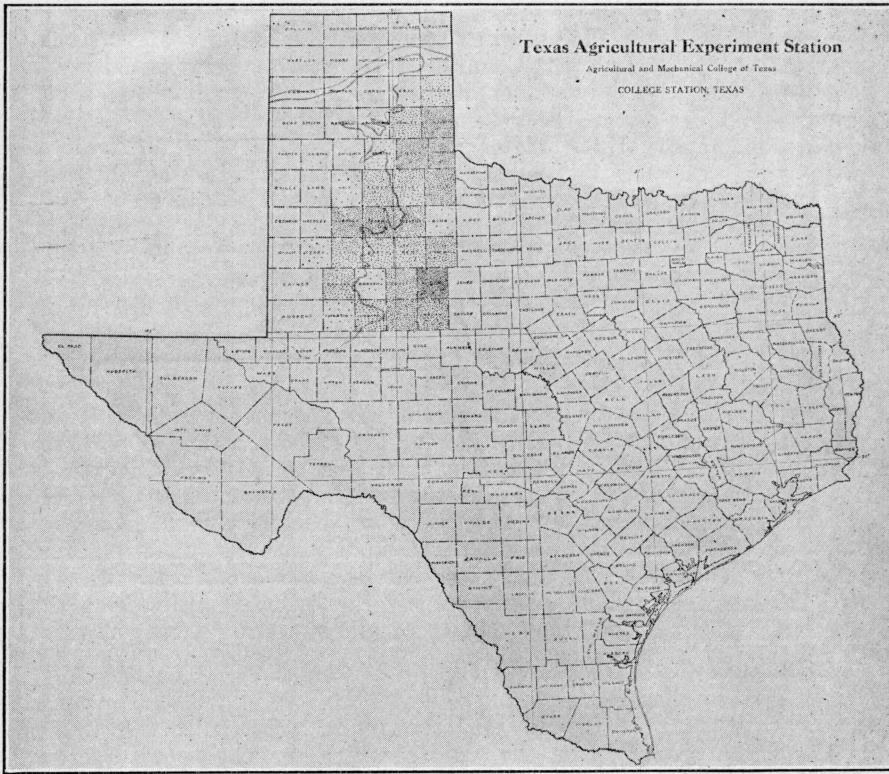


Fig. 1. Showing the distribution and production of cotton in Northwest Texas as of the 1919 Census. One dot equals 100 bales. The Caprock separating the High and Low Plains is shown by the irregular line traversing the region north and south.

adoption of the better ones for general culture and also from the fact that experiments and general farm experience has proved that this crop is one of the most drouth resistant crops which can be grown. This increase has also been due to the influx of farmers from the eastern or cotton growing parts of the State, the freedom from the boll weevil on the Plains and success attending the growing of early maturing varieties. The increase in cotton growing in this section of Texas is rapidly taking on such proportions as to be a factor in the total cotton production of the State. With an immense area of land available yet to be brought into cultivation which is suitable for cotton growing and free of serious insect pests the production of this crop here will undoubtedly continue to increase rapidly.

The accompanying map (Fig. 1) shows the distribution and production of cotton as of the census of 1919 in the Panhandle and South Plains counties of the State and shows the northern and western range of cotton production at that time. The Caprock separating the High and Low Plains is shown on the map. While cotton growing has increased materially in all these counties, practically all of the extension of cotton production as shown above the Caprock has taken place in the past ten years, and it is to this area particularly that the results reported in this bulletin are applicable.

Embracing wholly or partly a number of counties lying directly on the Plains there is a section thirty to seventy-five miles wide and one hundred and fifty miles long following around the Caprock, in which the climatic and soil conditions are such that cotton growing has been particularly successful most seasons unless unusually dry or having an unfavorable growing season or very early frost in the fall to interfere with maturity.

Cotton has proven to be one of the most drouth resistant crops grown in this section and its production on the Plains is perhaps influenced adversely more often by altitude, low mean temperatures and cool nights in the late summer and early fall growing months, and consequent prolonged maturity and delayed opening, than by lack of moisture. When such is the case a large bollie crop oftentimes follows, especially with the late maturing varieties, and picking is prolonged into unfavorable and cold weather in late fall and winter months.

Quick maturing varieties, which will reduce the tendency to produce bollies and permit of earlier harvesting, are essential for the dependable and continued success with cotton growing on the Plains and maturity will be of even more importance in extending the area appreciably to the north and west. The most satisfactory results in the extension of the cotton growing area in these directions will undoubtedly have to be brought about through the development and use of early maturing varieties particularly adapted to that area.

#### THE WEATHER AND COTTON PRODUCTION.

The record of the rainfall at this station by months for the ten-year period, 1912 to 1921, inclusive, is given in an accompanying table. The average annual rainfall at this point for the period for which records are available is between 20 and 21 inches. The distribution is favorable to summer crops, with 81 per cent. of the total precipitation fall-

ing during the growing season, from April to October, inclusive, for this period and the lowest rainfall during the winter months.

The average number of days between the last frost in the spring and the first killing frost in the fall for this ten-year period is 203. The shortest season was 166 days and the longest 246 days, or a spread of 24 days between the earliest and the latest date of the first killing frost in the fall, and a difference of 79 days between the longest and shortest season. The mean temperature for the months of June to September is quite uniform and ranges above 70 degrees, while the mean temperature for October drops to 60 degrees. The cool nights at this altitude tend to retard development and prolong maturity so that with late maturing varieties there is a tendency to produce too large a crop of bollies.

The yields of cotton presented in the accompanying table for comparison with the rainfall represents the average of the ten highest yielding varieties in the variety test for each year, respectively, with the exception of 1917. The variety test was a failure in that year and the yield given is the average yield of Mebane cotton produced in another test that season. Including the yield in 1917 as stated the average yield of lint cotton for this test for a ten-year period was 348 pounds.

Table 1.—Showing the Monthly, Mean Monthly, Annual and Mean Annual Precipitation and the Annual and Average Date of First Killing Frost in the Fall, Together with the Average Yield of Lint Cotton to the Acre for the 10 Year Period, 1912-1921.

| Year         | Precipitation by Months |      |      |       |      |      |      |      |       |      |      |      | Total | Date first killing frost in fall | Average yield lint cotton |
|--------------|-------------------------|------|------|-------|------|------|------|------|-------|------|------|------|-------|----------------------------------|---------------------------|
|              | Jan.                    | Feb. | Mar. | April | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |       |                                  |                           |
| 1912.....    | .02                     | 1.28 | .61  | .50   | 1.58 | .96  | 3.35 | 2.37 | .73   | 2.81 | .01  | .38  | 14.60 | Nov. 1                           | *130.44                   |
| 1913.....    | .04                     | .20  | 1.18 | 1.82  | .24  | 5.88 | .40  | .32  | 4.19  | 1.53 | 1.54 | 2.13 | 19.47 | Oct. 26                          | *345.42                   |
| 1914.....    | .15                     | .10  | .29  | 1.47  | 4.04 | 3.86 | 6.17 | 5.95 | .46   | 7.12 | .35  | 1.47 | 31.43 | Oct. 27                          | 663.17                    |
| 1915.....    | .09                     | 3.00 | 2.52 | 6.18  | 1.52 | 4.01 | 1.42 | 2.96 | 7.86  | 1.52 | .04  | .76  | 31.88 | Nov. 12                          | 427.82                    |
| 1916.....    | .17                     | T    | 1.15 | 2.63  | .39  | 1.52 | .36  | 2.45 | 2.79  | 2.91 | .55  | .11  | 15.03 | Oct. 19                          | 255.86                    |
| 1917.....    | .35                     | .05  | .21  | .58   | 1.07 | .64  | 1.42 | 1.16 | 3.03  | .14  | .08  | .00  | 8.73  | Oct. 19                          | *137.60                   |
| 1918.....    | .84                     | .58  | .05  | .72   | 1.67 | 2.95 | .53  | .79  | .79   | .51  | .69  | 2.03 | 12.15 | Nov. 9                           | 395.16                    |
| 1919.....    | .12                     | .25  | 3.39 | 3.53  | 2.10 | 3.52 | 2.28 | 2.83 | 5.70  | 7.34 | .36  | .19  | 31.61 | Nov. 12                          | 371.07                    |
| 1920.....    | .90                     | .11  | .24  | .15   | 2.91 | 3.66 | 2.19 | 2.64 | 1.63  | 1.43 | 2.21 | .09  | 18.16 | Nov. 2                           | 323.32                    |
| 1921.....    | .14                     | .45  | 1.47 | .24   | .43  | 7.71 | .84  | .92  | 4.50  | .02  | T    | T    | 16.72 | Nov. 9                           | 438.87                    |
| Average..... | .29                     | 1.07 | 1.04 | 1.83  | 1.51 | 3.18 | 2.33 | 2.05 | 3.00  | 2.40 | .55  | .79  | 20.04 | Oct. 31                          | 348.87                    |

\*Yield of lint obtained by taking one-third of seed cotton.

## THE TEST OF VARIETIES.

The cotton varieties were grown in rows three feet apart and the plants spaced a uniform distance apart in the row by measurement and count. The row space to the plant was usually eighteen inches, except in earlier years when the space was twelve inches. Up until 1920, during which time a large number of varieties were tested each year they were planted in plats of one one hundred and tenth acre in size and replicated from two to three times. Since 1920 the plats have been one-sixteenth acre in size and duplicated. In each instance the plats have been protected by proper guard rows. The yields recorded are the average for the variety.

Uniform and clean cultivation was practiced. No commercial fertilizer or barnyard manure was used in these tests. All tests were conducted under dry land conditions and grown on areas in established rotations; however, the land on which these variety tests were grown was oftentimes preceded by a green manure crop or fallow. The green manure crop consisted of sorgo plowed under when in full boot. When planted on land thus treated as well as that fallowed the previous year the varieties in these tests as a whole were given an advantage in the way of moisture and plant food which permitted maximum production and gave yields above the average for the season.

A separate table is given presenting the results of cotton variety tests for each year from 1912 to 1921, except the year of 1917, when the variety test of cotton was a complete failure. The results are reported for each variety in the experiment each year. The varieties are listed in the tables in order of their rank in yield.

## 1912 AND 1913.

Tables Nos. 2 and 2A give the yields of seed cotton for the varieties tested in 1912 and 1913 and include twenty-four and thirty-three varieties, respectively. The linting per cent. and lint yield were not obtained in these two seasons.

In 1912 the upland long staple varieties were among the best producers, but No. 669 Burnett, which is a short staple and small boll variety, was outstanding in yield above all other varieties.

It will be noted that Sea Island and Yuma, two typical long staple varieties, produced very low yields this year as they did also in all future years during which they were tested.

In 1913 six varieties produced above 1000 pounds of seed cotton to the acre. No. 479 Toole produced 1511 pounds of seed cotton and was the best yielding variety. Favorable yields were made by some of the better staple varieties but the shorter staple varieties are the more prominent in yield this year.



Table 2.—Cotton Variety Tests in 1912. Varieties arranged in order of yield of seed cotton.

| T. S. No. | Variety Name                 | Acre yield pounds seed cotton |
|-----------|------------------------------|-------------------------------|
| 669       | Burnett.....                 | 518.8                         |
| 118       | Clarksville Long Staple..... | 487.1                         |
| 121       | Allen's Long Staple.....     | 425.0                         |
| 2         | Bolivia.....                 | 403.1                         |
| 128       | Mebane.....                  | 388.5                         |
| 122       | Cook's Long Staple.....      | 365.6                         |
| 24        | Ferguson Round Nose.....     | 350.0                         |
| 74        | Allen's Long Staple.....     | 331.3                         |
| 8         | Brabham.....                 | 325.0                         |
| 11        | Lone Star.....               | 318.8                         |
| 120       | Burns' Long Staple.....      | 312.5                         |
| 15        | Rowden.....                  | 290.6                         |
| 1         | Cleveland Big Boll.....      | 253.1                         |
| 119       | Keenan.....                  | 240.6                         |
| 3         | Columbia Long Staple.....    | 240.6                         |
| 16        | Crowder.....                 | 234.4                         |
| 14        | Unknown Long Staple.....     | 203.1                         |
| 5         | Allen's Long Staple.....     | 200.0                         |
| 7         | Burns Long Staple.....       | 181.3                         |
| 79        | Jackson.....                 | 178.1                         |
| 78        | Hendricks.....               | 171.9                         |
| 77        | Rowden.....                  | 168.8                         |
| 10        | Yuma.....                    | 75.0                          |
| 17        | Sea Island.....              | 25.0                          |

Table 2A.—Cotton Variety Tests in 1913. Varieties arranged in order of yield of seed cotton.

| T. S. No. | Variety Name                  | Acre yield, pounds seed cotton |
|-----------|-------------------------------|--------------------------------|
| 479       | Toole.....                    | 1511.12                        |
| 472       | Peterkin.....                 | 1168.75                        |
| 475       | Texas Wood.....               | 1111.00                        |
| 476       | Texas Oak.....                | 1069.75                        |
| 469       | Hawkins.....                  | 1046.30                        |
| 446       | Simpkin's Prolific.....       | 1022.60                        |
| 669       | Burnett.....                  | 949.80                         |
| 16        | Crowder.....                  | 860.75                         |
| 443       | Half and Half.....            | 818.60                         |
| 152       | Mortgage Lifter.....          | 804.00                         |
| 700       | Long Staple.....              | 798.87                         |
| 128       | Mebane.....                   | 792.83                         |
| 444       | Haaga's Ex. Long Staple.....  | 759.90                         |
| 698       | Mebane Triumph.....           | 754.00                         |
| 478       | Allen's Imp. Long Staple..... | 750.75                         |
| 348       | Black Rattler.....            | 724.60                         |
| 135       | Union Big Boll.....           | 720.50                         |
| 415       | Huffman.....                  | 714.90                         |
| 412       | Foster's Long Staple.....     | 699.85                         |
| 486       | Roberts' Big Boll.....        | 669.60                         |
| 118       | Clarksville Long Staple.....  | 662.75                         |
| 129       | Edgeworth.....                | 648.83                         |
| 77        | Rowden.....                   | 643.50                         |
| 170       | Hartsville.....               | 635.25                         |
| 474       | Truitt.....                   | 616.00                         |
| 414       | Durango.....                  | 562.80                         |
| 14        | Unknown Long Staple.....      | 550.00                         |
| 7         | Burns Long Staple.....        | 532.00                         |
| 413       | Snowflake.....                | 531.66                         |
| 11        | Lone Star.....                | 473.00                         |
| 130       | Bank Account.....             | 415.25                         |
| 473       | Willets Red Leaf.....         | 378.12                         |
| 10        | Yuma.....                     | 272.25                         |

1914.

The performance of the varieties in the test in 1914 is especially interesting because this season was particularly favorable to cotton pro-

duction and the best yields of the ten-year period were made this year. The planting was made May 12 in duplicate. The plants were thinned when about six inches high to a stand of ten inches between plants. The abundant rainfall from April to August followed by a dry September enabled most varieties to mature well a heavy yield which was harvested in from three to five pickings of all varieties.

The per cent. of lint, yield of seed cotton and yield of lint is given for fifty-seven varieties of cotton in the test in 1914. Thirty of these varieties yielded above a bale to the acre and thirteen yielded over 600 pounds of lint to the acre. The season of 1914 was very favorable to cotton production because of abundant rainfall well distributed and a growing season of about average length. The early spring rains permitted a rapid and early development of the young plants. In this season of favorable weather conditions and high production it is worthy of note that the varieties of superior length of staple do not in general come among the highest yielders.

Data on the number of bolls required to make a pound of seed cotton and the total number of bolls to the stalk were obtained from the different varieties. It is worthy of note that the highest yielding varieties were generally small balled cottons and carried a large number of bolls to the stalk.

Table 3.—Cotton Variety Test in 1914. Arranged in order of yield of lint.

| T. S.<br>No. | Variety Name               | No. Bolls<br>to the |       | Per<br>cent<br>lint | Acre<br>yield<br>pounds<br>seed<br>cotton | Acre<br>yield<br>pounds<br>lint |
|--------------|----------------------------|---------------------|-------|---------------------|---|---------------------------------|
|              |                            | Pound               | Stalk |                     |   |                                 |
| 469          | Hawkins                    | 85                  | 19    | 34.2                | 2116.2                                    | 723.7                           |
| 476          | Texas Oak                  | 81                  | 18    | 34.7                | 2035.1                                    | 704.9                           |
| 485          | Cleveland Big Boll         | 63                  | 16    | 32.7                | 2355.9                                    | 680.8                           |
| 783          | King                       | 99                  | 16    | 34.1                | 1944.3                                    | 663.0                           |
| 446          | Simpkin's Prolific         | 87                  | 16    | 33.3                | 1973.9                                    | 656.2                           |
| 480          | Culpepper's Big Boll       | 61                  | 14    | 30.8                | 2103.4                                    | 647.8                           |
| 474          | Truitt                     | 63                  | 14    | 31.5                | 2059.8                                    | 645.2                           |
| 699          | Burnett                    | 78                  | 16    | 30.4                | 2129.9                                    | 640.5                           |
| 481          | Cook's Imp. Big Boll       | 62                  | 14    | 30.9                | 2056.6                                    | 634.9                           |
| 487          | Dongola Big Boll           | 64                  | 14    | 29.8                | 2133.3                                    | 634.7                           |
| 700          | Long Staple                | 70                  | 13    | 28.9                | 2129.2                                    | 613.1                           |
| 698          | Mebane Triumph             | 54                  | 10    | 34.2                | 1779.3                                    | 604.8                           |
| 472          | Peterkin                   | 91                  | 16    | 35.3                | 1702.3                                    | 601.5                           |
| 443          | Half and Half              | 61                  | 12    | 35.4                | 1650.0                                    | 587.9                           |
| 415          | Huffman                    | 54                  | 13    | 30.0                | 1930.1                                    | 585.0                           |
| 496          | Broadwell's Double Jointed | 55                  | 10    | 32.9                | 1766.9                                    | 580.9                           |
| 479          | Toole                      | 89                  | 21    | 33.3                | 1717.4                                    | 571.1                           |
| 482          | Bohler's Triple Jointed    | 54                  | 14    | 31.8                | 1632.4                                    | 561.1                           |
| 938          | Cook                       | 54                  | 10    | 32.8                | 1689.2                                    | 555.6                           |
| 445          | Webber                     | 57                  | 16    | 26.6                | 2082.1                                    | 553.8                           |
| 941          | Triumph                    | 52                  | 11    | 33.1                | 1664.5                                    | 550.9                           |
| 135          | Union Big Boll             | 62                  | 16    | 29.9                | 1831.5                                    | 548.1                           |
| 129          | Edgeworth                  | 62                  | 16    | 32.9                | 1625.3                                    | 534.7                           |
| 7            | Burns' Long Staple         | 54                  | 10    | 30.5                | 1755.0                                    | 534.1                           |
| 152          | Mortgage Lifter            | 54                  | 12    | 29.7                | 1959.0                                    | 533.4                           |
| 475          | Texas Wood                 | 97                  | 17    | 32.3                | 1635.0                                    | 531.5                           |
| 411          | Hite's Early Prolific      | 70                  | 22    | 31.7                | 1668.6                                    | 528.7                           |
| 130          | Bank Account               | 82                  | 15    | 32.7                | 1590.5                                    | 519.4                           |
| 16           | Crowder                    | 50                  | 17    | 30.2                | 1845.3                                    | 513.7                           |
| 414          | Durango                    | 66                  | 15    | 29.8                | 1625.0                                    | 500.0                           |
| 466          | Webber                     | 58                  | 16    | 27.6                | 1781.4                                    | 491.6                           |
| 504          | Durango                    | 67                  | 15    | 30.7                | 1586.1                                    | 486.8                           |
| 413          | Snowflake                  | 70                  | 13    | 28.5                | 1715.6                                    | 484.1                           |
| 486          | Roberts' Big Boll          | 64                  | 13    | 30.8                | 1568.9                                    | 482.3                           |
| 483          | Columbia                   | 48                  | 13    | 29.1                | 1667.9                                    | 481.6                           |
| 11           | Lone Star                  | 47                  | 11    | 33.0                | 1419.3                                    | 465.6                           |
| 118          | Clarksville Long Staple    | 73                  | 14    | 28.2                | 1628.0                                    | 460.7                           |
| 412          | Foster's Long Staple       | 71                  | 15    | 29.0                | 1508.4                                    | 437.4                           |
| 939          | Floradora                  | 81                  | 15    | 27.4                | 1571.0                                    | 433.5                           |
| 444          | Haga's Early Long Staple   | 95                  | 14    | 26.6                | 1591.9                                    | 430.0                           |
| 495          | Hendricks                  | 85                  | 14    | 32.5                | 1289.1                                    | 421.1                           |
| 498          | Bolivia                    | 71                  | 15    | 28.5                | 1465.1                                    | 418.6                           |
| 14           | Unknown Long Staple        | 56                  | 11    | 27.1                | 1544.1                                    | 418.0                           |
| 942          | Lone Star                  | 45                  | 10    | 33.3                | 1243.0                                    | 413.1                           |
| 77           | Rowden                     | 49                  | 13    | 29.5                | 1482.2                                    | 410.3                           |
| 348          | Black Rattler              | 73                  | 11    | 24.2                | 1509.1                                    | 363.7                           |
| 170          | Hartsville                 | 55                  | 12    | 29.5                | 1223.1                                    | 362.8                           |
| 473          | Willet's Red Leaf          | 93                  | 19    | 34.6                | 1039.1                                    | 350.9                           |
| 478          | Allen's Imp. Long Staple   | 92                  | 16    | 29.0                | 1175.7                                    | 340.8                           |
| 494          | Cannon's World Skinner     | 49                  | 14    | 30.7                | 961.4                                     | 294.4                           |
| 940          | Pemiscot                   | 59                  | 16    | 27.1                | 1067.1                                    | 289.0                           |
| 470          | Sunflower Long Staple      | 88                  | 16    | 26.6                | 1025.8                                    | 277.8                           |
| 471          | Dillon                     | 71                  | 25    | 33.1                | 649.7                                     | 214.6                           |
| 477          | Webber                     | 55                  | 7     | 26.9                | 545.2                                     | 147.0                           |
| 484          | Keenan                     | 70                  | 7     | 24.5                | 314.9                                     | 77.1                            |
| 10           | Yuma                       | 94                  | 4     | 29.2                | 49.5                                      | 14.5                            |
| 958          | Sea Island                 | .....               | ..... | 25.8                | 53.3                                      | 13.8                            |

## 1915.

The yields of forty-four varieties in 1915 are reported. This season represents one of abundant rainfall, well distributed, and a long growing season, and was in general favorable to cotton but not as favorable as the preceding year. The first killing frost in the fall occurred November 12, or twelve days later than normal.

The planting was done May 11 and the plants thinned to eighteen inches apart in the row. The stand was injured somewhat by several days of high winds and drifting sand the latter part of May and the plants were set back and prevented from making a good growth early.

This injury to the stand on the duplicate planting made it necessary to discard those yields and the yields given, therefore are from only single plats.

Cleveland T. S. No. 1375 was the highest yielding variety. Burnett, Cook and Mebane were other high yielding varieties which have also yielded well in other years.

Table 4.—Cotton Variety Test in 1915. Arranged in order of yield of lint.

| T. S. No. | Variety Name             | Per cent lint* | Acre yield, pounds seed cotton | Acre yield, pounds lint |
|-----------|--------------------------|----------------|--------------------------------|-------------------------|
| 1375      | Cleveland.....           | 34.0           | 1533.13                        | 521.26                  |
| 1373      | Layton.....              | 42.1           | 1179.06                        | 496.38                  |
| 699       | Burnett.....             | 31.6           | 1419.69                        | 448.62                  |
| 1357      | Bates.....               | 41.4           | 1031.25                        | 426.93                  |
| 1369      | Cook.....                | 38.8           | 1093.13                        | 424.13                  |
| 700       | Long Staple.....         | 29.9           | 1381.88                        | 413.18                  |
| 804       | Mebane.....              | 34.0           | 1185.95                        | 403.21                  |
| 1376      | Cleveland.....           | 54.0           | 1130.94                        | 384.51                  |
| 1264      | Keenan-Goodson.....      | 28.1           | 1000.31                        | 381.11                  |
| 1377      | Cook.....                | 38.8           | 976.69                         | 378.95                  |
| 1363      | Moneymaker.....          | 38.4           | 962.50                         | 369.60                  |
| 1277      | Rublee.....              | 42.7           | 862.81                         | 368.41                  |
| 1370      | Simpkins.....            | 34.8           | 1038.13                        | 361.26                  |
| 1361      | Columbia.....            | 29.1           | 1203.13                        | 350.11                  |
| 1364      | Bank Account.....        | 34.4           | 979.69                         | 337.01                  |
| 1371      | Bostwick.....            | 38.7           | 866.25                         | 335.23                  |
| 1360      | Roberts.....             | 30.8           | 1086.25                        | 334.56                  |
| 1372      | Mortgage Lifter.....     | 30.1           | 1093.13                        | 329.03                  |
| 1260      | Ricks.....               | 34.0           | 924.69                         | 314.39                  |
| 1366      | Toole.....               | 33.3           | 935.00                         | 311.35                  |
| 1362      | Cleveland.....           | 34.0           | 904.06                         | 307.38                  |
| 1152      | King X Triumph.....      | 37.7           | 800.94                         | 301.95                  |
| 1358      | Texas Oak.....           | 34.7           | 859.38                         | 298.20                  |
| 469       | Hawkins.....             | 33.7           | 828.44                         | 279.18                  |
| 1266      | Virgatus.....            | 42.0           | 646.25                         | 271.42                  |
| 1359      | Roberts.....             | 30.8           | 866.25                         | 266.80                  |
| 1274      | Huffman.....             | 30.0           | 873.13                         | 261.93                  |
| 1367      | Truitt.....              | 31.5           | 828.44                         | 260.95                  |
| 1368      | Texas Wood.....          | 32.3           | 807.81                         | 260.92                  |
| 1151      | Cleveland.....           | 34.0           | 763.13                         | 259.46                  |
| 698       | Mebane.....              | 34.2           | 752.81                         | 257.46                  |
| 1267      | Ferguson Round Nose..... | 29.9           | 852.50                         | 254.64                  |
| 1378      | Lone Star.....           | 35.6           | 708.13                         | 252.09                  |
| 1379      | Mebane.....              | 34.0           | 739.06                         | 251.28                  |
| 793       | Belton.....              | 39.8           | 598.13                         | 238.05                  |
| 1263      | Hartsville.....          | 28.5           | 790.63                         | 225.32                  |
| 1374      | Durango.....             | 30.2           | 718.44                         | 216.96                  |
| 2020      | Lone Star.....           | 33.0           | 574.06                         | 189.43                  |
| 1261      | Webber.....              | 30.0           | 625.63                         | 187.68                  |
| 804       | Mebane.....              | 34.1           | 505.31                         | 172.31                  |
| 1262      | Webber.....              | 27.4           | 608.44                         | 166.71                  |
| 1276      | Mebane.....              | 34.1           | 443.44                         | 151.21                  |
| 942       | Lone Star.....           | 33.3           | 360.94                         | 120.19                  |
| 1275      | Rowden.....              | 31.3           | 364.38                         | 114.05                  |

\*Note.—The per cent. lint was obtained from the average of tests in other years.

### 1916.

The season of 1916 was characterized both by light rainfall and a short growing season, which factors materially reduced the yields obtained. The yields are somewhat low in all cases.

Of the better staple varieties the Allen's Express gave the highest yield of seed cotton and matured early but gave a low per cent. of lint. Cook gave the highest yield of lint and a high per cent. of lint turnout. Allen's Express and Cook, while outstanding in both yield and maturity, showed poor storm resistance. Three strains of the Lone Star variety

all made a yield above the average of the varieties this year and comparatively a better showing for the variety than it made either of the two previous years, which were seasons more favorable to high production. The proportionately better showing of this variety this year is due probably to the character of the season, having a tendency to promote maturity and retard vegetative growth.

Table 5.—Cotton Variety Test in 1916. Arranged in order of yield of lint.

| T. S. No. | Variety Name                    | Per cent lint | Acre yield, pounds seed cotton | Acre yield, pounds lint |
|-----------|---------------------------------|---------------|--------------------------------|-------------------------|
| .....     | Cook.....                       | 44.8          | 745.85                         | 334.14                  |
| 1861      | Ideal.....                      | 39.4          | 768.24                         | 302.68                  |
| 1852      | Bank Account.....               | 36.2          | 742.44                         | 268.76                  |
| 1849      | Sunbeam.....                    | 37.6          | 704.66                         | 264.95                  |
| 1830      | Wannamaker.....                 | 35.0          | 744.20                         | 260.47                  |
| 1889      | Stormproof.....                 | 34.5          | 738.98                         | 254.94                  |
| 1815      | Allen's Express.....            | 28.9          | 845.57                         | 244.36                  |
| 1933      | Lone Star.....                  | 42.0          | 512.16                         | 215.10                  |
| 1826      | Cleveland Big Boll.....         | 35.3          | 594.66                         | 209.91                  |
| 1825      | Hawkins.....                    | 33.2          | 601.53                         | 199.70                  |
| 1827      | Lone Star.....                  | 33.5          | 560.28                         | 187.69                  |
| 2540      | Lone Star.....                  | 35.9          | 462.27                         | 165.95                  |
| 1818      | Rowden.....                     | 33.7          | 429.66                         | 144.79                  |
| 804       | Mebane.....                     | 34.0          | 424.68                         | 144.39                  |
| 1834      | Simpkins' Prolific.....         | 36.4          | 393.58                         | 143.26                  |
| 1848      | Matchless Ex. Ev. Big Boll..... | 37.7          | 372.90                         | 140.58                  |
| 1800      | Wooten's Columbia Big Boll..... | 27.8          | 493.24                         | 137.12                  |
| 1851      | Union Big Boll.....             | 34.2          | 395.28                         | 135.18                  |
| 1850      | Hastings' Upright.....          | 33.9          | 390.11                         | 132.24                  |
| 1835      | Webber 82.....                  | 32.7          | 385.00                         | 125.89                  |
| 1847      | Mortgage Lifter.....            | 30.5          | 402.98                         | 122.90                  |
| 1823      | Early King.....                 | 34.5          | 328.24                         | 113.24                  |
| 699       | Burnett.....                    | 32.9          | 302.50                         | 99.52                   |
| 1828      | Rowden.....                     | 33.2          | 285.28                         | 94.71                   |
| 1837      | Keenan-Goodson.....             | 38.1          | 247.44                         | 94.27                   |
| 1846      | Surecrop.....                   | 31.3          | 252.61                         | 79.06                   |
| 1829      | Long Staple.....                | 30.9          | 206.20                         | 63.71                   |
| 1838      | Webber 49.....                  | 27.3          | 190.74                         | 52.07                   |
| 1836      | Hartsville 9.....               | 27.6          | 108.24                         | 29.87                   |
| 1853      | Yuma.....                       | 29.9          | 77.33                          | 23.12                   |
| 1824      | Sea Island.....                 | 28.5          | 36.80                          | 10.48                   |

## 1917.

The variety test of cotton was a complete failure in 1917 because of deficient moisture in the spring and inability to get the cotton up to a stand in time to mature. The varieties were planted May 14 in soil too dry to give a good stand and later light showers came in amounts just sufficient to spoil the seed. Subsequently a stand was obtained from later planting of some varieties but it was too late for cotton to mature and no yields were obtained.

## 1918.

The comparative yields of the different varieties in the test in 1918 are given below. Lack of stand in a number of varieties rendered them incomparable, and they are omitted from the table, which includes thirty-two of the varieties tested. The season of 1918 was one of low rainfall, preceded by a year similarly deficient. The late date of killing frost in the fall gave a long growing season for the later maturing varieties.

Improved Champion and F. G. 33 were the best short staple varieties.

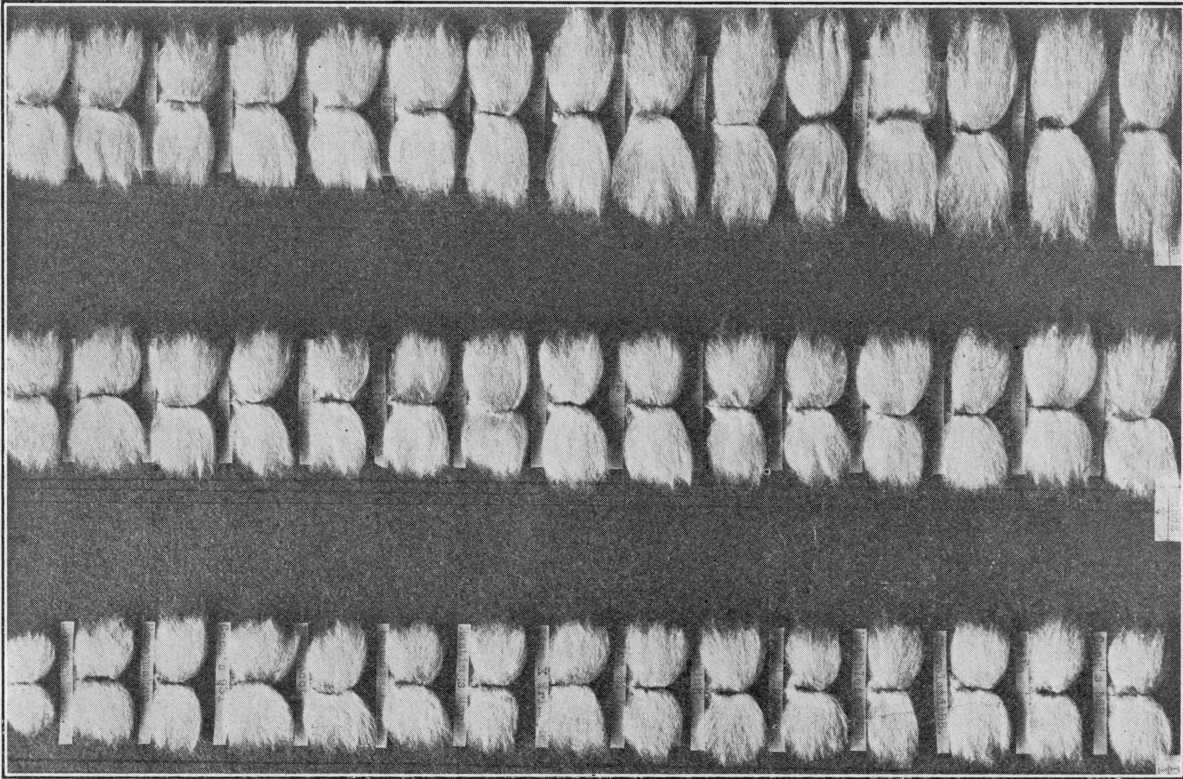


Fig. 2. Combed samples showing the length of lint of varieties of cotton grown in 1918.

Of the better staple varieties Allen's Express, Acala, Trice, Express and Durango, the first mentioned was the only one which yielded as much as the average of all varieties. Allen's Express also gave a high yield in 1916.

Beginning with 1918 the grade of lint and length of staple data are included in the tables. The samples were graded and stapled by specialists from the Bureau of Markets of the U. S. Department of Agriculture and the Extension Service of the Texas Agricultural and Mechanical College, co-operating from 1918 to 1920 and by the Division of Cotton Breeding of the Experiment Station in 1921.

The data on length of staple is of value in arriving at the acre value of different varieties where a known premium is paid for extra staple length. No attempt is made to analyze the varieties each year from this standpoint, but with the yield and staple given for each variety the necessary premium to give acre profit can be easily arrived at.

Table 6.—Cotton Variety Test in 1918. Arranged in order of yield of lint.

| T. S. No. | Variety Name                    | Per cent lint | Length of staple, inches | Grade of lint | Acre yield in pounds, |        |
|-----------|---------------------------------|---------------|--------------------------|---------------|-----------------------|--------|
|           |                                 |               |                          |               | Seed cotton           | Lint   |
| 3056      | Improved Champion.....          | 37.28         | 5/8                      | S M           | 1474.57               | 475.12 |
| 3000      | F. G. 33.....                   | 35.95         | 15/16                    | S M           | 1209.99               | 434.78 |
| 3047      | Simpkins' Prolific.....         | 35.17         | 15/16                    | M             | 1327.73               | 423.29 |
| 3046      | Early King.....                 | 39.34         | 7/8                      | S L M         | 1017.50               | 399.41 |
| 3022      | Bank Account.....               | 39.72         | 7/8                      | S L M         | 1020.93               | 398.75 |
| 3028      | Cook 588.....                   | 38.61         | 5/8                      | M             | 1096.56               | 393.58 |
| 3030      | Cook 931.....                   | 43.07         | 5/8                      | M             | 952.18                | 385.00 |
| 3006      | Mebane.....                     | 35.31         | 7/8                      | S L M         | 1350.69               | 363.72 |
| 3004      | Webb.....                       | 37.38         | 1                        | L M           | 1125.02               | 354.89 |
| 3027      | Wannamaker.....                 | 38.21         | 7/8                      | S M           | 936.71                | 323.12 |
| 3045      | Allen's Express.....            | 28.47         | 1 3/16                   | M             | 1129.21               | 302.50 |
| 3037      | Mebane.....                     | 40.27         | 1                        | G M           | 811.24                | 302.50 |
| 3002      | Mebane.....                     | 38.88         | 1 1/16                   | S L M         | 923.88                | 284.48 |
| 3040      | Mebane.....                     | 39.44         | 7/8                      | G M           | 737.34                | 269.83 |
| 3033      | Simpkins.....                   | 36.59         | 5/8                      | M             | 782.03                | 269.83 |
| 3036      | Lone Star.....                  | 37.82         | 1                        | M             | 756.25                | 268.29 |
| 3029      | King X Triumph.....             | 37.77         | 3/4                      | M             | 811.24                | 262.95 |
| 3026      | Cook's Silk Long Staple.....    | 36.15         | 3/4                      | M             | 783.75                | 250.03 |
| 3020      | Surecrop.....                   | 35.69         | 7/8                      | S L M         | 859.10                | 239.96 |
| 3044      | Cleveland Big Boll.....         | 35.06         | 15/16                    | M             | 701.24                | 220.00 |
| 3025      | Acala.....                      | 36.66         | 1 1/8                    | S M           | 663.43                | 219.01 |
| 3057      | Rowden.....                     | 31.48         | 1 1/16                   | S M           | 667.05                | 209.82 |
| 3063      | Trice.....                      | 30.85         | 1 3/16                   | S M           | 783.54                | 199.37 |
| 3048      | Kasch.....                      | 37.72         | 1                        | S M           | 598.12                | 190.30 |
| 3034      | Ferguson Round Nose.....        | 29.49         | 3/4                      | G M           | 785.81                | 189.03 |
| 3062      | Express.....                    | 32.37         | 1 1/8                    | M             | 804.37                | 178.64 |
| 3023      | Wannamaker.....                 | 38.63         | 5/8                      | G M           | 724.80                | 177.07 |
| 3061      | Durango.....                    | 33.08         | 1 1/8                    | S M           | 556.87                | 162.14 |
| 3035      | Mebane.....                     | 31.62         | 15/16                    | G M           | 605.00                | 158.73 |
| 2995      | Union Big Boll.....             | 35.25         | 3/4                      | M             | 476.95                | 139.20 |
| 2998      | Vandiver's Heavy Fruiter.....   | 36.92         | 15/16                    | S M           | 358.35                | 98.16  |
| 2997      | Matchless Ex. Ey. Big Boll..... | 33.33         | 7/8                      | G M           | 558.46                | 77.31  |

1919.

Forty-three varieties were tested in duplicate plats in 1919. Planting was done with a lister planter May 16 and the cotton thinned to eighteen inches between plants July 2. The climatic conditions this year were very favorable. The rainfall was above normal and well distributed. The growing season was longer than normal, the late killing frost in the fall giving an ample growing season. High winds were not prevalent so that little damage resulted to non-storm resistant varieties. The frequent and heavy rainfall in October, however, did materially lower the grades of lint from all varieties.

Union Big Boll, Burnett, Cleveland, Half and Half, Mebane T. S. No. 3676, and Cook were the six best yielding varieties. Of these varieties the Mebane carries desirable storm resistance and size of boll qualities which are lacking in the others.

Snowflake, Acala No. 5, and Allen's Express were the highest yielders of the longer staple varieties and stood well up toward the top of the list this season. Neither of the Acala cottons tested this year gave the expected length of staple.\*

Table 7.—Cotton Variety Test in 1919. Arranged in order of yield of lint.

| T. S. No. | Variety Name             | Per cent lint | Length of staple, inches | Grade of lint | Acre yield in pounds, |        |
|-----------|--------------------------|---------------|--------------------------|---------------|-----------------------|--------|
|           |                          |               |                          |               | Seed cotton           | Lint   |
| 3674      | Union Big Boll.....      | 36.01         | 3/4                      | S G O         | 1567.60               | 532.11 |
| 4226      | Burnett.....             | 38.94         | 3/4                      | L M           | 1333.75               | 421.75 |
| 3673      | Cleveland.....           | 36.60         | 7/8                      | S L M, T      | 1192.81               | 409.87 |
| 3675      | Half and Half.....       | 38.69         | 3/4                      | L M           | 1148.12               | 407.74 |
| 3676      | Mebane.....              | 40.50         | 3/4                      | S L M         | 1062.18               | 393.30 |
| 3707      | Cook.....                | 41.83         | 3/4                      | S L M, T      | 959.05                | 356.86 |
| 3670      | Snowflake.....           | 35.65         | 1 1/8                    | S L M         | 924.68                | 316.14 |
| 3659      | Acala No. 5.....         | 35.16         | 1                        | S L M         | 924.68                | 301.99 |
| 3045      | Allen's Express.....     | 34.29         | 1 1/8                    | L M           | 1024.37               | 287.08 |
| 3639      | Webb.....                | 32.84         | 1                        | S L M         | 914.37                | 283.86 |
| 3645      | Lone Star.....           | 32.43         | 3/4                      | L M, T        | 892.02                | 270.97 |
| 3656      | Acala.....               | 33.92         | 1                        | S L M, T      | 842.18                | 269.01 |
| 3657      | Acala.....               | 35.25         | 1 1/16                   | S L M         | 797.50                | 266.32 |
| 3637      | Express.....             | 31.62         | 1 1/16                   | L M           | 859.37                | 264.94 |
| 3634      | Mebane.....              | 37.97         | 3/4                      | L M           | 880.62                | 255.28 |
| 3655      | Ferguson Round Nose..... | 30.26         | 7/8                      | S L M, T      | 862.81                | 253.17 |
| 3635      | Mebane.....              | 37.17         | 7/8                      | L M           | 701.25                | 248.07 |
| 3647      | Jackson.....             | 32.66         | 1                        | S L M         | 697.81                | 237.06 |
| 3671      | Webber 82.....           | 32.44         | 1                        | L M, T        | 768.27                | 236.69 |
| 3672      | Hartsville 12.....       | 31.42         | 1 3/16                   | L M           | 752.80                | 236.54 |
| 3646      | Lone Star.....           | 33.33         | 7/8                      | L M           | 670.31                | 223.41 |
| 3642      | Lone Star.....           | 33.72         | 7/8                      | L M           | 653.11                | 209.17 |
| 3638      | Boykin.....              | 36.25         | 3/4                      | S L M         | 598.12                | 206.56 |
| 3661      | Chisholm.....            | 33.33         | 7/8                      | S L M, T      | 625.62                | 203.30 |
| 3666      | Durango.....             | 32.60         | 1 1/8                    | S L M, T      | 642.31                | 201.01 |
| 3636      | Triumph (406).....       | 35.76         | 3/4                      | S L M, T      | 570.61                | 196.89 |
| 3632      | Mebane.....              | 34.58         | 7/8                      | S G O         | 594.68                | 193.06 |
| 3640      | Bennett.....             | 38.78         | 7/8                      | M, T          | 507.02                | 191.46 |
| 804       | Mebane.....              | 34.58         | 7/8                      | S G O         | 567.18                | 183.01 |
| 3637      | Kasch.....               | 35.59         | 7/8                      | S L M, T      | 512.18                | 182.28 |
| 3650      | Rowden.....              | 34.92         | 7/8                      | S L M, T      | 544.84                | 180.31 |
| 3654      | Willis.....              | 35.17         | 1                        | L M           | 512.18                | 178.97 |
| 3658      | Acala.....               | 31.03         | 7/8                      | M, T          | 625.61                | 178.75 |
| 3660      | Truitt.....              | 37.09         | 1 1/16                   | S L M         | 450.30                | 167.02 |
| 3644      | Lone Star.....           | 33.33         | 1                        | S L M         | 498.43                | 166.13 |
| 3649      | Holden.....              | 31.95         | 7/8                      | S L M, T      | 546.56                | 166.06 |
| 3633      | Mebane.....              | 37.14         | 1                        | L M           | 429.68                | 159.58 |
| 3669      | Kekchi.....              | 27.90         | 1                        | S L M         | 587.81                | 156.78 |
| 3668      | Foster.....              | 26.08         | 1                        | L M           | 548.27                | 137.62 |
| 3665      | Buckelew Big Boll.....   | 35.71         | 1                        | S L M, T      | 366.09                | 129.19 |
| 3664      | Gilstrap.....            | 33.94         | 3/4                      | S L M, T      | 381.55                | 121.71 |
| 793       | Belton.....              | 28.02         | 1                        | L M           | 372.96                | 101.93 |
| 3662      | Harvell.....             | 33.33         | 7/8                      | S L M, T      | 161.56                | 51.02  |

\* 1920.

The number of varieties was reduced to eleven in 1920. These were grown in duplicate in one-sixteenth-acre plats. The annual rainfall for the year was below normal. The distribution, however, was good. Moreover, a good supply of stored soil moisture carried over from 1919 provided conditions rather favorable to cotton. The first killing frost was only two days later than normal and a fairly large bollie crop was produced by some varieties which reduced their yield of lint.

\*For a comparison of the staple of all varieties grown at stations at different points in the State see bulletin No. 266, The Staple of Texas Cotton.



Burnett, Mebane, and Lone Star gave the highest yields in the order named. The yield of Lone Star was reduced by the larger crop of bollies. Durango stood first among the better staple varieties.

Table 8.—Cotton Variety Test in 1920. Varieties arranged in order of lint yield.

| T. S. No. | Variety Name   | Per cent lint | Length of staple inches | Grade of lint | Acre yield in pounds |        |
|-----------|----------------|---------------|-------------------------|---------------|----------------------|--------|
|           |                |               |                         |               | Seed cotton          | Lint   |
| 4226      | Burnett.....   | 33.89         | 1                       | S L M         | 1936.0               | 582.67 |
| 4120      | Mebane.....    | 37.38         | 3/4                     | S L M         | 1336.5               | 477.09 |
| 4119      | Lone Star..... | 34.32         | 1                       | M             | 1204.5               | 398.09 |
| 3150      | Lone Star..... | 32.01         | 1                       | M             | 1028.5               | 315.72 |
| 793       | Belton.....    | 32.00         | 1 1/16                  | M             | 951.5                | 287.40 |
| 4116      | Rowden.....    | 31.36         | 1 1/16                  | M             | 1001.0               | 281.57 |
| 4114      | Durango.....   | 35.13         | 1 1/8                   | S L M         | 797.5                | 259.13 |
| 4131      | Acala.....     | 32.47         | 1 1/8                   | M             | 770.0                | 230.75 |
| 4117      | Kasch.....     | 34.74         | 5/8                     | M             | 654.5                | 211.00 |
| 4118      | Snowflake..... | 27.70         | 1 3/16                  | M             | 726.0                | 189.83 |
| 4115      | Bennett.....   | 37.40         | 1 1/16                  | M             | 478.5                | 163.37 |

1921.

Thirteen varieties were tested in 1921 in the same manner as the previous year. The season of 1921 was characterized by low rainfall, but this rainfall was so distributed as to make it an extremely favorable year for cotton production. The months up to June were unfavorable, but the ample rains in June, during which month almost one-half the total annual rainfall fell, started cotton off to a vigorous growth and the heavy setting of fruit. Light rainfall in the summer months prevented excessive vegetative growth and the low rainfall in October, together with the late killing frost, were very favorable for complete maturity. The negligible rain in the fall months was ideal for harvesting and production of high grade samples. Next to 1914 this was the most favorable year for cotton reported herein.

Burnett, a small boll variety, and Lone Star, Truitt, and Rowden, three large balled varieties, stood at the top in yield this year. The value of the better staple and larger boll varieties is apparent in such a season favorable to maturity and free from bollies. An examination of the comparative yields of the leading varieties this year with their yields in 1920, which was less favorable for later maturing varieties, shows the advantage in earliness for consistently good yields.

Of the better staple cottons, Acala gave a higher yield than Durango but produced a shorter staple. There was a wide difference in yield between the two strains of the Mebane variety. T. S. No. 804 had a shorter staple but gave the highest yield.

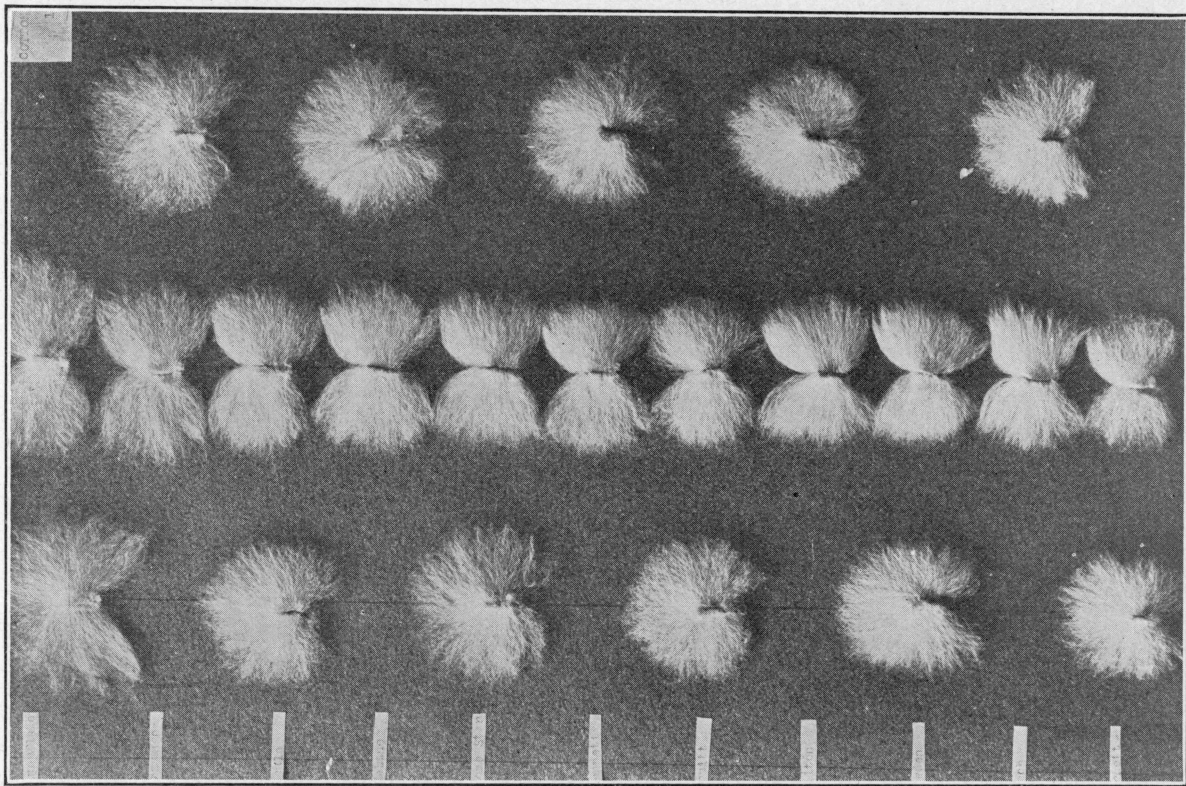


Fig. 3. Combed samples showing the comparative length of staple cotton varieties grown in 1921. From the top: Snowflake, Durango, Acala, Mebane, Lone Star, Bennett, Truitt, Belton, Rowden, Kasch, and Burnett.

Table 9.—Cotton Variety Test in 1921. Varieties arranged in order of lint yield.

| T. S. No. | Variety Name   | Per cent lint | Length of staple inches | Grade of lint | Acre yield in pounds, |        |
|-----------|----------------|---------------|-------------------------|---------------|-----------------------|--------|
|           |                |               |                         |               | Seed cotton           | Lint   |
| 4226      | Burnett.....   | 33.98         | 7/8                     | S M           | 1773.72               | 581.15 |
| 5995      | Lone Star..... | 38.48         | 1 3/16                  | S M           | 1377.08               | 491.24 |
| 5990      | Truitt.....    | 37.12         | 1 1/16                  | G M           | 1340.44               | 478.25 |
| 5993      | Rowden.....    | 34.62         | 1 1/8                   | M             | 1376.08               | 448.19 |
| 804       | Mebane.....    | 35.64         | 1 1/32                  | G M           | 1354.74               | 441.08 |
| 5986      | Lone Star..... | 35.16         | 1 1/8                   | S M           | 1269.17               | 431.58 |
| 5988      | Acala.....     | 36.56         | 1 1/16                  | S M           | 1279.84               | 403.58 |
| 5994      | Bennett.....   | 37.24         | 1 5/32                  | S M           | 1131.30               | 399.97 |
| 5987      | Durango.....   | 32.74         | 1 5/16                  | S M           | 1225.60               | 375.72 |
| 5992      | Kasch.....     | 37.64         | 1                       | S M           | 948.62                | 338.03 |
| 5991      | Snowflake..... | 33.33         | 1 5/16                  | S M           | 1016.55               | 334.18 |
| 5989      | Mebane.....    | 36.89         | 1 1/8                   | G M           | 921.26                | 324.50 |
| 5984      | Belton.....    | 34.64         | 1 1/8                   | S M           | 830.50                | 273.18 |

COMPARISON OF LENGTH OF STAPLE AND YIELD.

The table appearing below is presented for the purpose of showing the comparison between the length of staple and yield. Varieties considered representative, and the best in their class, of the various staple lengths from seven-eighths to one and three-sixteenths-inch are given and their actual yields of lint to the acre recorded for the past three years for which comparable data are available. Taking the one-inch staple represented by the Mebane variety as 100 per cent., it is of value to notice the gradual decline in yield directly as the length of staple increases. The seven-eighths-inch, or shortest staple, gave an increase in yield of 20 per cent. over the inch staple and an increase of 56 per cent., or more than double that of the longest staple. The average per cent. gain or loss in yield is given for each class of staple.

The best varieties having a length of staple from one and one-sixteenth to one and three-sixteenths-inch yielded 67.5 per cent., approximately two-thirds as much lint to the acre as the best varieties having a staple of seven-eighths to one inch.

While the results of this three-year period may not be considered entirely conclusive, they are indicative of the average results to be expected and point out the relative premium it is necessary to receive for the extra length of staple in order to make up for the loss in yield.

There has been considerable emphasis placed on the production of longer staple cotton in recent years. Until such time as the premium commanded by extra length of staple is sufficient to offset the difference in yield the short staple varieties will continue to be the most profitable for the farmer to grow here.

Table 10.—Showing the relation between yield and length of lint for representative varieties of cotton.

| Variety        | Length of lint inches | Yield lint to the acre, lbs. |        |        |         | Per Cent                              |              |
|----------------|-----------------------|------------------------------|--------|--------|---------|---------------------------------------|--------------|
|                |                       | 1919                         | 1920   | 1921   | Average | Average yield of 1-inch staple = 100% | Gain or loss |
|                |                       |                              |        |        |         |                                       |              |
| Burnett.....   | 7/8                   | 421.75                       | 582.67 | 581.15 | 528.52  | 120.90                                | +20.9        |
| Mebane.....    | 1                     | 393.30                       | 477.09 | 441.08 | 437.15  | 100.00                                | 0.0          |
| Lone Star..... | 1 1/16                | 270.97                       | 398.09 | 491.24 | 386.76  | 88.47                                 | -11.53       |
| Acala.....     | 1 1/8                 | 301.99                       | 230.75 | 403.58 | 312.10  | 71.39                                 | -28.61       |
| Snowflake..... | 1 3/16                | 316.14                       | 189.83 | 334.18 | 280.05  | 64.06                                 | -35.94       |

## SUMMARY OF VARIETY EXPERIMENTS.

Table 11 lists the yields of lint of some of the better varieties tested more or less continuously throughout this ten-year period. Each year is represented except 1917, when the variety test was a failure. Consideration should be given this year of failure in examining the nine-year average shown in the table.

This table is self-explanatory and shows the average yields of lint cotton to the acre for nine, four and three-year periods for the varieties represented. The four varieties tested for the nine-year period maintain the same relative rank also for the four and three-year averages.

Table 11.—Average yields of lint produced by some of the better varieties tested.

| Variety        | Yield of lint to the acre, pounds. |        |        |        |        |        |        |        |        | Average |        |        |
|----------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|
|                | 1912                               | 1913   | 1914   | 1915   | 1916   | 1918   | 1919   | 1920   | 1921   | 9 yrs.  | 4 yrs. | 3 yrs. |
| Burnett.....   | 172.91                             | 316.56 | 640.50 | 448.62 | 99.52  | .....  | 421.75 | 582.67 | 581.15 | 407.96  | *      | 528.52 |
| Mebane.....    | 129.48                             | 264.25 | 604.80 | 403.21 | 144.39 | 363.72 | 393.30 | 477.09 | 441.08 | 357.92  | 418.79 | 437.15 |
| Lone Star..... | 106.25                             | 157.65 | 465.60 | 252.09 | 187.69 | 268.29 | 270.97 | 398.09 | 491.24 | 288.65  | 357.14 | 386.75 |
| Rowden.....    | 96.85                              | 214.47 | 410.30 | 114.05 | 144.79 | 209.82 | 180.31 | 281.57 | 448.19 | 233.36  | 279.97 | 303.35 |
| Acala.....     | .....                              | .....  | .....  | .....  | .....  | 219.01 | 301.99 | 230.75 | 403.58 | .....   | 288.83 | 312.10 |
| Durango.....   | .....                              | 187.58 | 500.00 | 216.96 | .....  | 162.14 | 201.01 | 259.13 | 375.72 | .....   | 271.79 | 278.62 |
| Kasch.....     | .....                              | .....  | .....  | .....  | .....  | 190.30 | 182.28 | 211.00 | 338.03 | .....   | 230.40 | 243.77 |
| Snowflake..... | .....                              | 177.20 | .....  | .....  | .....  | .....  | 316.14 | 189.83 | 334.18 | .....   | .....  | 280.05 |
| Bennett.....   | .....                              | .....  | .....  | .....  | .....  | .....  | 191.46 | 163.37 | 399.97 | .....   | .....  | 251.60 |
| Belton.....    | .....                              | .....  | .....  | 238.05 | .....  | .....  | 101.93 | 287.40 | 273.18 | .....   | .....  | 220.83 |

\*8 year average, not grown in 1918.

Table 12 has been suggested by Dr. G. F. Freeman, Chief of the of the Division of Cotton Breeding, as a means of summarizing the results of the variety tests of cotton for the entire period.

All of the varieties tested during this period are listed in the left-hand column. The order of listing the varieties is maintained with reference to the number of years the variety was tested, those grown the greater number of years appearing first and in descending order of the relative yielding per cent.

The average yield of seed cotton of all the varieties grown any given year is obtained and this average taken as 100 per cent. The individual yield of each variety is then divided by this average, giving the comparative yields as percentages of the average.

The arrangement adopted in this table lays the varieties out before us in a way that their average performance can be analyzed without too great emphasis on an occasional very good or very poor yield. It affords a convenient comparison of the relative yielding ability of each variety with any other variety for any given season.

The last column showing the average relative yield percentage is a reliable index of comparison, especially when comparing varieties grown for the same period of years and when grown for a sufficient number of years to warrant conclusions. While a single trial will give some indications as to the merits of a variety, the performance covering several years is necessary to establish its final merits as being a safe and profitable variety to grow.







From a study of the last two tables the relative standing of the varieties grown practically throughout the entire period is readily determined. If yield alone was the only factor to consider the Burnett variety is outstanding. It lacks storm resistance, which does not warrant its recommendation for general and exclusive growing in this section in its present state of development. On account of its consistent early maturity in this section, however, it can be used very profitably when late planting is forced for any reason or when replanting is necessary at a date too late to be safe with the later maturing varieties. It will be valuable also for growing farther to the north and west in the cotton area in this section where maturity is of first importance.

Mebane has yielded consistently above the average for a long period of years. It has stood the test among the growers and held its place as a popular variety in this section. Until some other variety proves to be superior or more profitable Mebane can be recommended as a safe and reliable variety for general planting.

Toole, Cook, and Hawkins are varieties which yielded considerably above the average for the years tested. Lone Star has valuable storm resistance and quality of lint which make it desirable for this section and does well in favorable years. Its lateness in maturity and tendency to produce an occasional crop of bollie cotton are unfavorable to its being a consistently profitable variety.

Acala has given a better yield than Durango as an average for the past four years. The actual length of staple of Acala, however, has averaged one to one and one-sixteenth-inch, while the Durango has averaged a full inch and one-eighth. Snowflake has yielded less but given a longer staple than either of these two varieties. Among the longer staple varieties attention should also be called to the favorable yields made by Allen's Express during the period of its trial.

A comparison of the yield of lint to the acre and the length of staple of the best varieties of each type or class shows a decided decrease in yield as the length of staple increases. The average acre yield of the varieties having a staple length of one and one-sixteenth inches and upwards was 67.5 per cent. as much as for those with a staple length of seven-eighths and one inch.

#### SUMMARY.

The data presented here warrant the following conclusions:

1. That cotton is a dependable crop on the Plains thirty to seventy-five miles from the Caprock.
2. That cotton is fully as resistant to drouth as grain sorghum.
3. Earliness and storm resistance are most desirable characters for this region.
4. The Burnett cotton is consistently the best yielder here, chiefly because of its earliness. It lacks storm resistance, however, and has a relatively short staple, but it is a profitable cotton under extreme conditions on account of its earliness.
5. The Mebane cottons have consistently been good yielders, possess a fair degree of storm resistance and produce a fair staple. Under ordinary conditions the Mebane cotton should be grown here.
6. Too much emphasis has been placed on long staple cotton for this region, for the reason that, as elsewhere, the longer the staple the lower

the yield. The premium for the better staple cottons is insufficient at present to compensate for the loss in yield here, therefore the cottons that produce from seven-eighths to an inch staple give the largest returns under present conditions.

The following bulletins of the Texas Agricultural Experiment Station report a part of the work conducted at Substation No. 8:

Bulletin No. 172—Sudan Grass.

Bulletin No. 204—The Recurving of Milo and Some Factors Influencing It.

Bulletin No. 219—Progress Report, Substation No. 8, 1909-14.

Bulletin No. 236—Grain Sorghum Improvement.

Bulletin No. 266—The Staple of Texas Cotton.

Bulletin No. 279—Type and Variability in Kafir.

Bulletin No. 292—The Blueweed and Its Eradication.

Bulletin No. 294—Shelling Percentages in Grain Sorghum.