

Wilt-Tolerant Breeding Lines Of Upland Cotton Are Tested For Spinning Performance

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Development of a cotton variety involves evaluation and measurement of many different characteristics over a period of several years. Most of these properties are important in their effects either on yield or fiber quality.

Evaluation and selection usually begin in the second generation following a cross. Individual plants are chosen in the field for desirable plant type, apparent productivity, and disease resistance. Then follows fiber evaluation in the laboratory for length, uniformity, strength, and fineness. Those plant selections kept as a result of these tests are grown the following year and the same process repeated. After two to four years of selection and reselection, most lines are sufficiently stable from a genetic standpoint to be entered into yield tests.

At this point another important phase of the quality evaluation is the miniature spinning tests of progeny row samples, run by the U. S. Department of Agriculture Spinning Laboratory at Knoxville,

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Tenn. Because of the relatively large number of samples that can be processed, and because of the small amount of lint required, many breeding lines can be evaluated in fairly early stages of development.

Test Vert.-Tolerant Lines

In 1961 samples from a number of the most promising Arizona breeding lines of short staple cotton, all of which have a high level of tolerance to verticillium wilt, were spun in the Knoxville laboratory. These lines are all in an intermediate stage of development and will appear in yield tests in 1962 for the first time. Our table shows the results of these spinning tests. Two commercial varieties, Acala 4-42 and Deltapine 15, are included for comparison.

Measurement of yarn strength is the most important function of these spinning tests. Acala 4-42, which is considered excellent in yarn strength, gave a skein break of 134. The 20 experimental lines of upland cotton ranged from 135 to 160. These results indicate that all of these lines are highly satisfactory from the standpoint of yarn strength.

Measure Up Well

The fiber length figures show a considerable range, with the shortest being comparable to staple lengths now being produced commercially in Arizona. Several of these lines also appear to be outstanding in length uniformity, the highest being 88 compared to a good length uniformity of 84 for Acala 4-42.

Micronaire values for the 20 lines also vary considerably, but all fall within an acceptable range. All in all, the fiber quality of these new wilt tolerant lines appears to be very good.

Now For the Long Pull

Perhaps the most critical phase in development of a cotton variety is evaluation of yield performance. This requires careful testing for three to six years at several locations, during which time many lines are eliminated. The best may eventually be released as a new variety. These new lines, which appear very good in wilt tolerance and fiber quality, are just entering this critical phase of yield evaluation.

Oil Seed Crops

There was a strong revival of interest in oil producing seeds in Arizona during the past year. Most all the oil seed crops can be grown in Arizona and provide a logical economic alternative to barley and cotton.

Safflower, flax, soybeans, peanuts, castor beans, and sesame were harvested in the state during 1961, and the outlook is for considerable growth in acreage for some of these in the immediate future.

It was safflower that showed the most expansion, rising from 3,500 acres in 1960 to approximately 13,000 acres in 1961. Gila is the predominant variety, yielding an average of about 2,600 pounds per acre. A contract price of \$78 per ton at mill point in 1961 represented an increase of \$4 per ton over the 1960 crop.

The outlook is bright for safflower in that the market is not in surplus. Both domestic and export demand is strong due to the wide variety of usage as a cooking fat and in industrial products such as paints and varnishes.

Castor beans are not living up to the expectations of several years back. Less than 500 acres were harvested, a decline over a year ago, but which seems to represent the trend all over the United States. Shatter losses in harvesting seemed to be one of the reasons for this decline.

Soybeans are also plagued by harvesting losses and until new shatter-resistant varieties are introduced for both these crops they will have a large barrier to overcome in competing in Arizona with more profitable crops.

Approximately 350 acres of flax were harvested in Yuma county. Boosters of flax would like to see this acreage increased. They maintain that cultural practices, especially proper irrigation, hold the secret to higher profits from this crop. Price of flax was strong in 1961, resulting in a substantial increase planted for harvest in 1962.

Peanuts harvested remained at about the same level as in 1960 — approximately 600 acres. This is a bit below the state acreage allotment of about 700 acres, all of which is allotted to Yuma and Pima counties.

Miniature Spinning Results of Arizona Selections

| Line | Fiber Length | | Uniformity Ratio | Skein Break | Fineness Micronaire |
|--------------|--------------|------|---------------------|----------------|------------------------|
| | UHM | M | | | |
| 690-2-3 | 1.17 | 1.01 | 86 | 141 | 4.45 |
| 690-15-1 | 1.19 | 1.04 | 87 | 148 | 4.15 |
| 690-31-7 | 1.14 | 0.98 | 86 | 141 | 4.80 |
| 690-31-8 | 1.12 | 0.97 | 87 | 152 | 4.88 |
| 690-31-10 | 1.17 | 1.01 | 86 | 155 | 4.98 |
| C12-7-4-3 | 1.13 | 0.95 | 84 | 135 | 4.85 |
| C12-7-4-4 | 1.14 | 1.00 | 88 | 143 | 4.45 |
| C12-7-4-8 | 1.18 | 1.02 | 86 | 141 | 4.68 |
| C12-7-9-3 | 1.20 | 1.02 | 85 | 139 | 5.03 |
| C12-7-9-4 | 1.20 | 1.02 | 85 | 151 | 4.88 |
| C13-5-3-1 | 1.15 | 0.97 | 84 | 137 | 4.53 |
| 4447 | 1.14 | 1.00 | 88 | 138 | 4.15 |
| 5683-1 | 1.22 | 1.00 | 82 | 155 | 4.28 |
| 5225-2-3-1 | 1.17 | 0.96 | 82 | 142 | 4.05 |
| 5225-14-3-5 | 1.20 | 1.03 | 86 | 150 | 4.03 |
| 5225-14-4-2 | 1.12 | 0.94 | 84 | 136 | 4.35 |
| 5225-13-2-2 | 1.21 | 1.05 | 87 | 160 | 4.40 |
| 5152-2-1-3 | 1.21 | 1.06 | 88 | 149 | 4.55 |
| 5487-2-1 | 1.16 | 0.97 | 84 | 145 | 4.37 |
| 6618-6 | 1.18 | 1.03 | 87 | 155 | 4.38 |
| Acala 4-42 | 1.15 | 0.97 | 84 | 134 | 4.74 |
| Deltapine 15 | 1.11 | 0.90 | 81 | 111 | 4.50 |