



ABOVE IS a "strip view" of the first increase field of A-44 upland cotton at the UA Campbell Avenue Farm in 1947.

Breeding Upland Cotton Is Never-Ending Task

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The Plant Breeding Department began experimenting with upland cottons in the early 1920's. The first efforts were confined to testing southern varieties in an attempt to find one or more that were suited to growing under Arizona conditions. Numerous plant selections were made from these introductions and progeny rows grown, with very little improvement shown.

Among the varieties tested during these early years were Hartsville, Delta-type Webber, Webber 49 and various strains of Mebane, Lone Star and Stoneville. California type Acala was usually used as a check in these tests.

Hybridization of these southern varieties, particularly Hartsville and Stoneville, failed to produce anything of importance. Yields were not increased and the fiber properties that could be measured at that time were not satisfactory.

Santan Developed In 1937

In 1937, in cooperation with USDA personnel at Sacaton, a large number of plant selections were made in a field of California-type Acala cotton grown in the Phoenix area. Progeny rows from these selections were grown at Queen Creek for several years. This cooperative effort resulted in the introduction of a new strain called Santan. Yields, fiber properties and spinning quality were the same as those of California strains. Efforts to select for strong fiber were fruitless.

In 1941 an extensive program of hybridization was begun. Parents used in making the crosses were Santan, New Mexico 1517, Deltapine 12, Deltapine 44-51, Stoneville 2B, Coker Wilds 9 and Coker Wilds 13. Eight crosses were made, mainly between the two Acalas and the southern varieties. The F_1 of these crosses was grown in 1942 and 14 backcrosses made in which the two Acalas, Deltapine 12, Stoneville 2B and Coker Wilds 13

were used as the recurrent parents. These crosses and backcrosses were grown at the Mesa Branch Experiment Station in 1943.

Selections were made from this material for several years. By the F_4 all crosses and backcrosses in which the southern varieties were used were eliminated either for poor yields, poor fiber quality or both. All that remained were selections from the cross Santan x N. M. 1517, and from the backcross Santan (Santan x N. M. 1517).

The Birth of A-44

After 1945, when the F_4 was grown, all selections from the cross Santan x N. M. 1517 were discarded except numbers 44 and 47. One year later, 1946, all selections from the backcross Santan (Santan x N. M. 1517) were discarded except numbers 28 and 33. The first increase field of 44 was grown on the Campbell Avenue farm at Tucson in 1947. In 1948 a commercial increase field of 85 acres of 44 was grown on the Midvale farm south of Tucson. Small increase fields of 28 and 33 were also grown in 1948. For various reasons, including lack of storm resistance and poor spinning performance, 28 and 33 were dropped from the program in the early 1950's.

The original breeder's seed of 44 came from 12 families that originated from plant selections out of progeny rows grown in 1945. Six of the 12 were dropped later because of fiber fineness. In 1958 an additional family was dropped and the proportion of family 44-10 in

the breeder's seed was increased to 40%.

All of the selfed seed given to the Arizona Cotton Planting Seed Distributors Association for increase in 1960 came from three subfamilies of 44-10. These have outyielded commercial 44 by 8% over the last three-year period. Their spinning quality shows some improvement. Their greatest improvement, however, seems to be in strength of plant.

More Crosses In 1948

In 1948 fourteen crosses were made in which 28, 33, 44, 47, California 4-42, Acala-Durango and Paula C were used as parents. The following year 28 backcrosses were made in which each parent used in the 1948 crosses was used as recurrent parent.

Elimination in succeeding generations removed all of this hybrid material from the program except selections from the backcross A x D (44 x A x D). The variety, 124, came from this backcross. It yields well under certain conditions and has given good spinning results, but it is highly susceptible to Verticillium Wilt.

The variety 44 WR was developed from a small amount of seed received from the Shafter Station in 1948. It was grown for a number of years in the Safford area where selection pressure was on resistance to Verticillium Wilt and to storm loss. In 1955 sufficient seed was available to plant 60 acres at Aguila, Arizona. Five hundred plant selections were taken from the Aguila field in the fall of 1955. The remainder of the seed produced was used as foundation seed for planting on wilt infested soils.

Refinements Continue

The 500 plant selections from Aguila were laboratory tested for fiber properties. Four hundred were discarded. The remaining 100 were planted in duplicate in a badly infested field at Eloy in 1956. Ten were finally selected for increase on the basis of yield and resistance to wilt. Since that time, three of these 10 have been discarded for one reason or another so that at the present time breeder's seed given to the Seed Distributors comes from seven out of the original 500 selections made in 1955.

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