PUBLIC BREEDING ACALA COTTONS

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Abstract

Western Irrigated Cotton was produced in Far West Texas, New Mexico, Arizona and California. These areas produced Acala Cotton all from the same introduction from Mexico.

Cotton from these areas, in the twenties and early thirties performed poorly in the mills and irrigated cotton became a cuss word in the trade.

In the late twenties the New Mexico Agricultural Experimental Station hired G. N. Stroman with the objective of producing a variety of cotton that would be suitable to the trade.

His first release was Acala 1064 in the Pecos Valley of New Mexico. Word soon got around that there was some good cotton to be found in the Roswell and Carlsbad areas of New Mexico. Acala 1064 resulted from several years of selection from Young's Acala.

Further selection in the same family produced Acala 1517 which was grown in New Mexico and Far West Texas. This strain performed better in the mills than 1064 and was sold at a premium.

At the time of development of these varieties there was little equipment to measure fiber quality in the laboratory. The Pressley hand sorter was used to separate cotton into 1/8 in groups. It was but a crude instrument.

Later came the Pressley mechanical sorter, but the more important advance came with the Pressley strength tester which came to be used by many breeders and by the trade to measure fiber strength.

Before these instruments were available breeders used only the cotton sense in their fingers to determine fiber character. If a tuft of fibers broke with a snap that could be heard and felt, it was good character. If the bundle of fibers just tore apart it was poor character.

Acala 1517 went to the USDA Field Station at Shafter, California where George Harrison with one generation of selection secured Acala 4-42. This variety gradually took over the San Joaquin Valley and was the only variety produced there. Acala 4-42 became a world famous variety of cotton known for its good performance in the mills although its length and strength was not as good as Acala 1517.

Acala 1517 also went to the Arizona Agricultural Experiment Station where Professor Pressly crossed it with Santan Acala and from this cross came Acala 44.

Thus western cotton was changed from a cotton nobody wanted to a quality fiber that was purchased at a bonus.

New Mexico's further exploration produced Acala 1517C, of which three releases were made. It was a very popular variety in Far West Texas, New Mexico and the cool areas of Arizona.

In New Mexico a strain cross of unknown parentage produced Acala 1517D which produced stronger yarns than 1517C. In many spinning tests Acala 1517C never in any test, equaled 1517D. There was a very obvious introgression of G. barbadense in 1517D, which showed up in boll shape and pigmentation. Acala 1517D has never been surpassed in yarn strength by an Acala cotton.

Acala 1517D went to the USDA Field Station at Shafter, California where John Turner crossed it with an experimental strain Cal. AXTE-1, a result of complex parentage. From this cross came Acala SJ1 which replaced Acala 4-42 in the San Joaquin Valley in 1967.

In New Mexico multiple races of bacterial blight became a problem in eastern New Mexico. H. B. Cooper developed a germ plasm pool of blight resistant materials and from this source nursery came Acala 1517BR-2 and Acala 1517-70 which solved the problem of bacterial blight.

Verticillium wilt was also a serious production problem. John Cotton developed a nursery of tolerant materials. This was a very difficult breeding problem. Strains that were vigorous growing and slow fruiting would stay green. We called this physiological tolerance. Finally, the 2503 by Coquette family produced early cottons that fruited well and were tolerant.

Work by Carl Roberts showed this tolerance to be the result of 1.7 to 1.9 recessive genes.

The 2503 by Coquette family produced Acala 1517V which pretty well solved the Verticillium wilt problem.

I came from alfalfa breeding into cotton and was accustomed to thinking in terms of polycrosses. We used 4 New Mexico Acalas, Paymaster 54B from the Plains, Stoneville and Deltapine from the midsouth, and Auburn from the south east. Carl Roberts made 4 single crosses the first year, two double crosses the second year and one cross the third year with four parents on each side. We turned the material over to John Cotton for exploration. He didn't get

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anything out of it for us but Deltapine secured a line which supplied 25% of the parentage of Deltapine Acala 90, which in turn became the parent of several varieties.

We still think the polycross would be a good way of jazzing up third germ plasm pools.

We believe that germplasm pools should be very wide. The introgression of G. hirsutum into G. barbadense resulted in better Pimas, and the introgression of G. barbadense into G. hirsutum gave us verticillium tolerance and bacterial blight resistance.

Cooper went from New Mexico to the USDA Cotton Research Station at Shafter and in his words "wore out Acala SJ1 germ plasm" by selection until he got SJ2 which in the words of one grower, "Would have been the perfect variety of cotton if it had wilt tolerance". Acala SJ2 was grown for 22 years before it was replaced.

Cooper could not get wilt tolerance from his nursery, so he secured four wilt tolerant strains from New Mexico. Used in various single crosses these produced Acala SJ3, 4 and 5.

At this point the Shafter Station closed out its breeding program and the germ plasm was made available to commercial breeders.

Along the way we subjugated Verticillium wilt and whipped the hell out of multiple races of bacterial blight.

With the disease problems solved in Mew Mexico the only objectives were yields and quality and resulted in Acala 1517-75 which was not replaced for 13 years. Later varieties were 1517-88, 91, and 95.

The New Mexico Experimental Station received a sample of Sea Island seed from the Barbados Islands, and planted it for observation. It was a jumble of types. Dwarfy plants were selected and produced New Mexico Sea Island with fiber of 1.6 inches, plant height of about 6 inches more than Pima and a yield of about 83% of Pima. Only a very small acreage is grown under contract for one Japanese firm, but it shows that the west can produce cotton of any desired quality.