

GENETICS OF FIBER STRENGTH

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Abstract

The widespread use of high speed spinning technology has increased the demand for high strength raw cotton. This is especially true in the Acala gene pool. A high strength Acala population was created by crossing Acala 1517-95 and NM24052. The latter parent is derived from the Del Cerro gene pool. One hundred and twenty-two F2 progeny were grown and evaluated in 1995 at Las Cruces, New Mexico. All plants were selfed to produce F3 families which were grown in replicated tests at two locations in New Mexico in 1996. All fiber was tested with the stelometer for T1 fiber strength determination. The range in T1 for the F2 population was 17.3 g/tex to 34.2 g/tex. The range in 1996 was 19.4 to 29.3 g/tex on an F3 progeny mean basis. The mean of the top 10 percent of F3 families was 27.7 g/tex, compared to 22.5 g/tex for Acala 1517-95. The average micronaire of the top ten families was 4.1. Heritability on an F3 progeny mean basis was estimated to be 0.60 by the variance component method. The standard unit heritability of T1 from parent-offspring regression was 0.47. The genotype by environment interaction was non-significant in the F3 generation grown in two New Mexico environments. Therefore, the genetic potential for improvement of T1 fiber strength in this Acala population is high. Future selection in this population will focus on tolerance to Verticillium wilt, agronomic performance, and other important Acala fiber properties.