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INCREASING GENETIC DIVERSITY IN GERMPLASM DEVELOPED BY COTTON IMPROVEMENT LABORATORY

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Abstract

The Cotton Improvement Laboratory (CIL) addresses cotton improvement issues through a broad based, aggressive breeding and genetics program. The CIL seeks to broaden the genetic base of cotton by use of exotic germplasm (interspecific, converted race stocks (CRS) and mutagenesis) to build a foundation for future genotypes with improved yield, fiber, disease, insect and drought resistance. With collaborative efforts from Dr. Dave Stelly and Brian Gardunia, advanced backcross populations between *G. hirsutum* (TM-1) with *G. tomentosum* or *G. mustelinum* have been developed. Tamcot Pyramid, 96WD-18, CA3250, Acala 1517-99, 280K-1-98, 94L-25, 87GGG-27, 96WD-69s, and 88G-104 have been crossed onto these populations. In addition, two *G. barbadense* lines Sea Island-Barbados and New Mexico Sea-Island 1331, developed by Roy Cantrell, were crossed with three CIL germplasm lines. individual F_3 and F_4 plants were selected on the basis of apparent yield and HVI fiber quality in 2002 and 2003. F_5 progeny rows were evaluated in 2004 with both PR and IP selections. Fiber quality was extremely variable for the F_3 and F_4 individual plants with fiber length ranging from 0.89 to 1.49 in., and fiber strength ranging from 22.5 to 50.5 g/tex.

116 Converted Race Stocks developed by Dr. Jack McCarty are being used to screen for resistance to fleahopper, aphid, and whitefly, seed and seedling disease complex resistance, and nematodes resistance. BC2F2 populations of these CRS crossed with TAM 94L-25 as the recurrent parent are being evaluated in Texas and collaboratively with Lloyd May in Georgia. Several of the CRS are part of a study one of our graduate students, Mrs. Polly Longenberger designed to evaluate seedling drought tolerance.

Collaboratively with Dick Auld, TTU, we are evaluating the effects of mutagenesis on our near extra long fiber TAM 94L-25. Approximately 1200 M_2 plants survived during 2004 and are being evaluated for morphological and fiber traits.