

**GENERATION MEANS ANALYSIS OF FIBER LENGTH AND FIBER BUNDLE STRENGTH USING
EXTRA LONG STAPLE UPLAND, MUTATED UPLAND, AND INTERSPECIFIC HYBRID
GERMPLASM**

**Kolbyn S. Joy
C. Wayne Smith
Steve Hague
Texas A&M University
College Station, TX
Don C. Jones
Cotton Incorporated
Cary, NC**

Abstract

The quality of upland cotton fiber continues to be improved by breeders, providing longer and stronger cotton fibers capable of producing high-quality spun yarns while withstanding faster processing speeds. An understanding of the inheritance of fiber length and strength within and between wide-genetic bases will aid breeders in this effort. Thus, high volume instrumentation (HVI) upper half mean length and HVI fiber bundle strength of five cotton genotypes, representing a wide-genetic base, were subjected to a generation means analysis. Genotypes included one TAM ELS Upland line, one mutated line of TAM 94L-25, one experimental line derived through interspecific hybridization exhibiting high length, one experimental upland line exhibiting high strength, and TAMCOT 22 as a modern cultivar with average quality. Parents, their F_1 progeny without reciprocals, F_2 , and backcross generations were grown near College Station, TX in 2010 and 2011 in a split-plot design inside a randomized complete block design with four replications. Samples were ginned on laboratory saw gin and sent to Cotton Incorporated for HVI evaluation. Additive and dominant gene action for both HVI UHML and fiber bundle strength was significant in most populations. Populations with the interspecific hybrid parent exhibited more significant epistatic gene effects. Positive transgressive segregation ranged from 0 to over 30 percent for both fiber quality traits.