

**DEVELOPMENT OF STRESS TOLERANT
UPLAND COTTON GERMPLASM
WITH HIGH QUALITY FIBER**

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Abstract

Physiological and molecular traits linked with cotton stress tolerance and fiber quality have been evaluated on advanced generation progeny of promising interspecific cotton hybrids grown under irrigation in Arizona. The expression of multiple favorable physiological and molecular traits was used to select individuals which exhibited optimum levels of one or more of these traits. These plants were allowed to intermate at random and their progeny, including some backcrosses, were evaluated across several generations at several locations under various levels of environmental stresses. Selection pressure for favorable agronomic plant type (phenotype) and for fiber quality (superior length and strength) was alternated across successive generations by a convergent selection method. Seed of the best individual selections at the F₈, F₉, or F₁₀ generations will be bulked and evaluated for lint yield at several Arizona locations in 1999. Data are presented which illustrate the progressive development of these advanced generation materials and their fiber characteristics through the 1998 season.