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# EARLY GENERATION TESTING IN UPLAND COTTON

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## Abstract

Early generation testing (EGT) is often used to identify segregating populations that are expected to contain the greatest frequency of favorable genotypes and to eliminate inferior populations that show limited promise. Early generation testing methods utilized at College Station (CS) and Weslaco (WS), TX since 1990 and 1992, respectively, were evaluated to determine [1] if EGT can be used to predict selection numbers in later generations based on lint yield, lint percent, micronaire, fiber length, fiber strength, fiber elongation, and fiber uniformity, and [2] if lint yield and fiber quality of early generations can be used to predict advanced strain performance. Data from 283 unique $F_2$ populations at CS and 146 unique $F_2$ and $F_3$ populations at WS were evaluated by correlating respective generational data to the number of selections per generation at each location. $F_2$ data from each location were correlated with the average advanced performance trial data from multiple locations in central and south TX. No associations (P=0.05) were found between $F_2$ EGT data from CS and the number of advanced strains selected from each population for lint yield, lint percent, fiber elongation, or fiber uniformity. However, associations ($P \leq 0.08$) were present for fiber length and fiber strength. At WS, $F_2$ EGT lint yield data were associated with the number of plants and strains selected through the $F_6$ generation, yet no associations were found for fiber quality characteristics. $F_3$ EGT lint yield data from WS were associated (P=0.05) only with the number of $F_5$ strains, however, associations ($P \leq 0.09$) were detected for fiber length, fiber strength, and fiber uniformity using the $F_3$ EGT data. Correlations of $F_2$ yield and fiber data with bulked yield and fiber data of advanced strains in standard performance trials across multiple locations in central and south TX indicated that early generation yield and fiber quality data will identify advanced generation performance potential. Lack of consistent r values across generations and locations suggest a large environmental influence on both lint yield and fiber quality parameters.