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A COMPARISON OF EARLY GENERATION F_2 TESTING AND PEDIGREE SELECTION IN PIMA COTTON

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Abstract

Pedigree selection has been the primary breeding method utilized in cotton improvement efforts. Among its many modifications, one that has gained favor is early generation testing accompanied by deferred individual plant selection. The present investigation was conducted to examine the correspondence of results from F_2 generation bulk population testing and historical pedigree selection records. Fifteen F_2 populations of crosses made in 1983 were recreated and tested at Maricopa and Safford, AZ in 2000. Yield, plant height, and fiber traits of F_2 populations were compared to pedigree selection records of F_2, F_3, and F_4 generations using correlation analyses. No correlation occurred between F_2 population yields at Maricopa or Safford and the number of selections made within populations of the F_2, F_3, or F_4 generations. Plant heights of F_2 populations grown at Maricopa correlated negatively with the number of individual plants advanced from populations of the F_3 generation and with the number of individual plants selected in the field in the F_4 generation (0.05 and 0.10 *P* levels, respectively). Plant heights of F_2 populations grown at Safford were negatively correlated (0.05 and 0.10 *P* level) with plant selection numbers in all generations. No correlations occurred between fiber traits (lint percent, length, strength, and micronaire) of F_2 populations grown at Maricopa and selection numbers within populations of the F_2, F_3, or F_4 generations. A few correlations occurred between fiber traits of F_2 populations grown at Safford and plant selection numbers in either the F_2, F_3, or F_4 generations. These correlations were not consistent across generations, however. With the possible exception of plant heights, results from early generation testing corresponded poorly with documented pedigree selection practices within the 15 populations of the investigation. Maricopa , the site of pedigree selection, produced fewer correlations between F_2 generation performance and pedigree selection numbers than did the Safford location.