Comparative Effectiveness of Three Breeding Methods in Modifying Coarseness of Cotton Fiber

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THE present-day cotton breeder has several breeding methods from which to choose. Each of these methods has certain advantages and disadvantages, and no one method seems to be superior in attaining all breeding objectives. It seems logical, therefore, that breeders should in some cases evaluate two or more methods as to their relative effectiveness in resolving certain types of breeding problems.

The relative effectiveness of a breeding method can be evaluated in terms of progress effected and also in terms of time and labor required to make this progress.

The primary objective of this study was to evaluate the relative effectiveness of three breeding methods in modifying fiber coarseness. The breeding methods were recurrent selection, selection-while-inbreeding, and mass selection.

REVIEW OF LITERATURE

Recurrent, pedigree, and mass selection methods have been used extensively by breeders. (The pedigree method when used with self-pollination might be more properly termed "selection-while-inbreeding"). However, in most cases no attempt was made to compare the effectiveness of two or more breeding methods concurrently.

Sprague and Brimhall (4) in 1950 and Sprague et al. (5) in 1952 published results of studies of the relative effectiveness of selection within selfed lines and recurrent selection for increasing oil content of the corn kernel. They concluded that recurrent selection was superior.

Fetooh compared recurrent selection with pedigree selection in a study of breeding for high and low fiber strength in populations derived from a three-species cotton hybrid. In view of the results obtained, Fetooh stated: "... pedigree selection is recommended when the main object is to produce strains with exceptionally high levels of a certain character. Recurrent selection, on the other hand, . . ."