Effectiveness of Recurrent Selection for General Combining Ability in Sweetclover, *Melilotus officinalis*

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Methods used in the improvement of cross-pollinated forage crops very largely have been based upon general principles developed from many years of research with maize. Obviously, the specific procedures in forages and maize breeding may be quite dissimilar, due to differences in length of life of the individual plant, occurrence of varying degrees of self-incompatibility, method of evaluation, and ultimate utilization of selected plants or lines. Certain of these differences may be advantageously used in breeding forage crops—particularly the perennial growth habit and self-incompatibility.

Natural selection undoubtedly played an important role both in the improvement of forage crops and maize. But the rate of change in gene frequency for specific characters in annual and perennial crops may be quite different. In annual cross-pollinated crops, propagation by seed is the only means of survival. In a given period, these crops will have had a more effective evolutionary history as measured in terms of phenotypic selection for adaptation to a given environment. Under the influence of partial control, the rate of change for a given character in maturity in northern latitudes has been pronounced. Indeed, the early experiments by farmer-seedsmen and experiment stations in selecting for this character may be cited as an example of a type of recurrent selection differing only in degree of genetic control from the concepts now used in crop breeding.

In contrast, perennial forages have evolved in a system in which major emphasis has been placed upon the survival of the *individual* rather than upon the *individual* and its cross-bred progeny. In old stands of sod-forming perennial grasses, the opportunity for success...