IMPROVEMENT by plant breeders of quantitatively inherited characters of alfalfa has been limited. Information is necessary as to the heritability of quantitatively inherited attributes, the nature of the gene action conditioning the expression of a particular trait, and more efficient methods of selecting and combining superior genotypes. Although alfalfa can be vegetatively propagated, permitting estimates of environmental variance, loss of self-fertility and vegetative vigor with inbreeding precludes satisfactory statistical analyses of progenies beyond the F_2 and BC_1 generations. Additional difficulties are encountered when genetic investigations of characters exhibiting discrete and discontinuous variation are considered, since in alfalfa genetic ratios have been observed suggesting disomic (2), tetrasomic (5, 11, 12), and tetra-disomic (6, 13) types of inheritance.

Few genetic studies of agronomic characters in alfalfa have progressed beyond indicating that heritable differences existed and a type of quantitative inheritance (2). Adams and Semeniuk (1) estimated the genetic variance of family differences in reaction to *Pseudopeziza medicaginis* (Lib.) Sacc. comprised about 79 to 90% of the total variation in two populations of tetraploid alfalfa. The estimates were derived from the mathematical model...