A review of the literature suggests that the effects of inbreeding on seed production in alfalfa have not been fully established. On the whole the evidence points toward decided reduction in seed yield upon self-fertilization. Kirk (2) found that as a rule the yield of seed is decreased very markedly with each generation of selfing. His data show that, as an average, the first selfed generation yielded only 62% and the $S_2$ 30% as much as the cross-fertilized parents. Two selfed lines, however, were remarkably high in seed production, suggesting the possibility of breeding for high seed production by selection within self-fertilized lines.

Williams (4) reports that the $L_1$ plants (called $S_1$ in the present paper) considered individually were in every instance less self-fertile than their immediate parent plants. The 14 parent plants produced an average of 2,433 seeds per plant, while the average yield of the $L_1$ plants was only 301 seeds. In general Torssell (3) obtained similar results.

It is the purpose of this paper to report the results of selection for seed production within alfalfa lines self-fertilized up to and including the fourth generation. The effect of different environmental conditions on seed setting are also reported.

MATERIALS AND EXPERIMENTAL RESULTS

In 1932 a number of strains, including open-pollinated, $S_1$, $S_2$, and $S_3$ lines, were sown in the greenhouse in January and transplanted to the field in May in rows of 10 plants each with three replications systematically distributed, making a total of 30 plants per strain. The plants were set at 18-inch intervals in rows 28 inches apart with a Grimm check every seventh row. The strains consisted of open-pollinated seed from carefully selected clonally propagated individual plants; the first selfed generation from the same plants; and the second and third selfed generations obtained by self-pollination of first and second generation plants, respectively.

In 1932, three hay crops were taken from all three series. In 1933, the second crop on the first series was left for seed, the other two series being harvested for hay. The results given in Table 1 represent the seed yield per plant calculated from the yield of 10