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BREEDING BEHAVIOR OF SEEDLING VIGOR AND FORAGE PRODUCTIVITY
IN TWO BIRDSFOOT TREFOIL (LOTUS CORNICULATUS) CULTIVARS

The nature of the research was such as to study seedling vigor and seedling characteristics and try to develop a technique which can select against seeds of inherent low vigor. F₁ and F₂ crosses among selected seedlings were studied under greenhouse, growth cabinet, and field conditions. Diallel crosses were made among 15 fall-selected clones from two cultivars, Leo and Mirabel. Comparisons of performance of within and between cultivars were made and breeding behavior of seedling and plant characteristics were studied.

The results indicate that:

1. Significant differences occur among different seed size classes of the two cultivars for most studied characters.
2. Heritability of selection characteristics in the depth of planting selection technique is very low and not significant. This is an indication that a high proportion of the variability is environmentally controlled.
3. F₁ crosses among selected seedlings were not significantly superior to F₁ diallel crosses, but superior to maternal F₁ clones.
4. The different diallel crosses indicate that the variability of characteristics is mostly due to general combining ability variance, although some good specific combiners were found.
5. There is an equal likelihood of getting clones with good general combining ability within both gene pools (cultivars). Inter-cultivar crosses exhibited slightly more vigor than intra-cultivar ones for most of the studied characteristics.
6. In general, phenotypic correlations among characters showed that high forage yield vigor and winter hardiness were closely associated. High yield was associated with prostrate growth habit and good seed-pod production. Winter hardiness was associated with prostrate growth habit.
7. A few clones were identified which had high positive general combining ability effects for erect growth, high seedling vigor, good winter hardiness, high forage productivity, and moderate seed production (a hay-type birdsfoot trefoil).