ONE of the major objectives of oat improvement is to incorporate adequate resistance to crown and stem rust (caused by *Puccinia coronata* Cda. var. *avenae* Fraser & Led. and *P. graminis* Pers. f. sp *avenae* Eriks. & E. Henn., respectively) into superior commercial oat varieties. Outstanding progress has been made with genes for resistance found within the hexaploid species. In recent years, however, races of crown rust have been found in North America that are parasitic on many or all of the varieties of the hexaploid species. Seedling resistance to these virulent races has been found in only a few varieties of the diploid species, *Avena strigosa* Schreb., and in a selection from the tetraploid species, *A. abyssinica* Hochst. P.I. 193958 (3).

The diploid and tetraploid species, which constitute important sources of disease resistance, lack the desired characteristics of cultivated varieties. Consequently, the utilization of the genes for disease resistance found in them depends upon the transfer of these genes from the diploid and tetraploid varieties through interspecific hybridization. Difficulty in obtaining hybrids, not usually encountered within and between species of a common ploidy, must be expected in interspecific hybridization between species of different ploidy. Zillinsky (4) obtained no seeds from crosses between diploid and hexaploid species, although the percentage of successful crosses was lower than in crosses within a chromosome group.

The transfer to hexaploid oats of genes may be accomplished by crosses with synthetic hexaploids, i.e., amphiploids produced by doubling the chromosome number of tetraploid-diploid hybrids. Such crosses have been obtained, but this approach has certain drawbacks. The percentage of successful crosses is lower than between ordinary tetraploid and hexaploid species.