CRESTED wheatgrass, *Agropyron cristatum* (L.) Beauv., was studied because of its promise as a drought-resistant, winter-hardy grass for use in western and northwestern Minnesota. The primary objectives were to study the variability among plants tested in individual plant nurseries and in replicated clonal progenies and to determine the effects of self-fertilization in relation to many characters. The characters studied included yield, plant height, damage from root rot, fertility, chromosome number, pollen size, pollen fertility, and content of beta carotene pigment.

Crested wheatgrass is naturally cross-pollinated. Two types have been studied by various workers. The shorter, leafier type was selected at the University of Saskatchewan (9) and given the variety name of Fairway. The taller and more variable type is usually called the forage or standard type. The Fairway variety has given somewhat higher yields of hay than the forage type in trials conducted in Saskatchewan (18). Reitz, et al. (15) reported that the Fairway variety yielded slightly less than the forage type in limited tests in Montana.

The forage types appeared much more variable in Minnesota in plant characteristics than the Fairway variety and contained some very vigorous and leafy plants. Because of these facts, the forage type was used principally in these researches on breeding methods.

**REVIEW OF LITERATURE**

Very little data are available on the value of different methods of breeding the forage grasses. The various breeding methods which are available to breeders of forage grasses have been discussed by many workers. Space permits the review of only those papers which seem to have some relationship with the findings from this study.

Hayes and Clarke (5), in 1925, observed that self-fertilization in timothy did not lead to as great a reduction in vigor as in corn. Some selfed lines yielded less and others considerably more than the average of the commercial variety. Lines were readily obtained which excelled in such important characters as yielding ability and disease resistance. Few abnormalities were observed among the selfed...