Barley is classed as a naturally self-pollinated plant and, since pollination frequently takes place before the flower opens and while the spike is still in the sheath, the amount of natural crossing is very small. Off-type plants which could be accounted for by natural crossing have been observed by a number of investigators, and it is generally recognized that this phenomenon occurs occasionally. The present study was outlined to test the amount of natural crossing in two-rowed and six-rowed varieties of barley as well as the effect of seasonal variation on natural crossing. Studies of the frequency of natural crossing have been reported by Hayes and Garber and need not be reviewed further.

MATERIALS AND METHODS

The various types of barley used were selected on the basis of their period of maturity, were grown in rod rows 1 foot apart, and were seeded at the same rate as the rod-row tests. White-hulled varieties were grown between two rows of black-hulled of the same species which had a similar habit of growth and approximately the same date of heading. One bearded six-rowed variety was grown between two rows of a hooded six-rowed barley.

The names of the varieties, the type of plant, the differentiating character used in the study, as well as the date of heading for the seasons of 1924, 1925, and 1926 are given in Table 1.

Hanna was grown between two rows of Jet, Consul between two rows of Gatami, Oderbrucker between two rows of Lion, and Manchuria, Minn. No. 184, between two rows of Nepal. The varieties grown side by side were selected because of their similarity in type, growth habit, and date heading.

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Assistant Professor of Plant Genetics and Assistant Plant Geneticist. This study is one of several which have been conducted at University Farm, for the purpose of learning the normal mode of pollination of crop plants. The project with barley was outlined in 1924 and was turned over to the writer in the fall of 1925. The writer wishes to express his appreciation to Dr. H. K. Hayes for the opportunity of completing this study and for valuable suggestions made during the progress of the work.