COMPARATIVE FREQUENCY OF DEFECTIVE SEEDS AND CHLOROPHYLL ABNORMALITIES IN DIFFERENT VARIETIES OF CORN FOLLOWING SELF-FERTILIZATION

C. M. Woodworth

INTRODUCTION

When a variety of corn is self-fertilized many kinds of abnormalities appear with more or less frequency. This seems to be the common experience of all who have self-fertilized corn. The most common abnormalities observed are defective kernels on the selfed ears and chlorophyll deficient types of seedlings. In the ordinary variety propagated by natural crossing few such abnormalities are found, due to the fact that they are covered up by the normal dominant type, and only occasionally does a gamete carrying an abnormal recessive type unite with another gamete carrying the same abnormal recessive type. It appears, therefore, that cross-fertilization, such as occurs in corn under natural conditions, protects or shields these germ plasm changes from the rigorous action of natural selection, and hence causes or permits them to accumulate in the variety in the heterozygous condition.

In the corn breeding program at the Illinois Agricultural Experiment Station, the plan is followed of selfing a large number of ears of a given variety so that an extensive amount of material is available for study and test, on the assumption that the greater the number of ears studied the better the chances of obtaining strains of superior merit. For selfing, plants are chosen that are apparently healthy, vigorous, erect, and normal in every way. At maturity, the selfed ears are harvested only from the erect, vigorous, apparently healthy plants that are maturing normally. Considerable selection is therefore exercised, not only at the time of selfing but also at the time of harvest. The purpose is to start the breeding work with the best material in the variety. Nevertheless, a relatively high proportion of the ears are found to segregate for seed and seedling abnormalities. Whether in random plant and ear selection this proportion would be increased, has not been determined.

1Contribution from the Division of Plant Breeding, Department of Agronomy, University of Illinois. Published with the approval of the Director of the Station. Received for publication April 15, 1929.

2Associate Chief in Plant Breeding.

1929