THE INTRODUCTION OF VARIETIES OF FIELD CROPS FREE OF DETECTABLE MIXTURES OR SEGREGATIONS

MODERN methods of plant breeding require the growing of a tremendous number of field plants in small areas. Strains with different morphological characters are often grown in adjoining plats. These conditions give ample opportunity for the cross fertilization and the mechanical mixing of types to take place at some time during the testing of a strain or variety. Mechanical equipment with which varieties and strains are handled also gives further opportunity for mixing.

A strain that is developed by an experiment station and eventually found worthy of introduction has been exposed to these conditions. No matter how carefully the material has been handled there is always the possibility that a trace of off-type plants will appear in commercial fields grown from increases of such introductions. A plan is now followed by the Farm Crops Department at the Michigan Agricultural Experiment Station that should reduce to a minimum the possibility of introducing varieties having any detectable mixtures or segregations.

Roguing of plats and cleaning of equipment is carefully executed with all material. Once the strains from the breeding plats have been reduced to one or two considered worthy to be placed in over-state trials, a large number of selections is made from each of them. Seed from these is planted in progeny head or plant rows. Each progeny is carefully examined in the field and the laboratory for any indications of mixture or segregation. Seed of plants from rows judged to be pure is grouped by progenies and planted a second year and the examination process is repeated. This prevents the overlooking of any segregations that depend on several factor differences for their expression. Any progeny showing segregation in the field is discarded before blooming time whenever the character appears in time.

After this rigid test, all progenies having external characters judged to be morphologically alike are grouped into one population and the seed used as foundation stock. The method is followed with wheat, oats, barley, and beans.—E. E. Down, Michigan Agricultural Experiment Station, East Lansing, Mich.

BEAN HYBRIDIZATION

THE hybridization of beans presents problems not encountered in the crossing of other field crops. Nearly all workers who have attempted to make bean crosses have found that artificial pollinations made under field conditions generally are unsuccessful. Field pollinations are successful in Michigan when cool weather prevails during the blooming period, but this condition occurs so seldom that all bean hybridization work is carried on in the greenhouse.

The points considered essential for the successful hybridizing of beans in the greenhouse as followed at the Michigan Agricultural