INTRODUCTION OF MORPHOLOGICALLY PURE-BREEDING VARIETIES OF FIELD CROPS

The 1935 April issue of this Journal (Volume 27, page 318) described the method used by the Michigan Experiment Station to prepare for the introduction of morphologically pure-breeding varieties of field crops. The method explained has been found to be only partially sufficient.

Quoting from the original note, “Once the strains from the breeding plots have been reduced to one or two considered worthy to be placed in over-state trials, to obtain a random sample of the material already tested, 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.”

Now, the increasing of the purified strains is carried forward (usually requiring two to three years) until sufficient seed of each progeny is available to plant two to three field grain drill strips 300 feet long. All progenies having external characters judged to be alike are combined into one population and the seed used as foundation stock.

The additional work is found necessary because certain morphological characters are not expressed each year. For example, in a recent increase of a barley variety, 1 progeny out of 24 in the drill width stage developed a very nodding head just before harvest time. Examination of this progeny in the preceding years had shown no tendency for nodding.

Again, in 1947, eight oat progenies of a Bond × D 60 strain were planted in drill widths. This group of progenies had been already greatly reduced because they showed segregation of height of straw and maturity. Three of the eight progenies were definitely heterozygous for maturity and height of straw. These had not shown tall plants or plants with tall and short culms in the past 3 years. Two were at least 3 days later than the rest. Only three were judged to be sufficiently uniform to combine the seed for foundation stock. This indicates that possibly the expression of somatic segregation and of certain morphological characters is dependent on environmental conditions.—E. E. Dowd, Michigan State College, East Lansing, Mich.

WILD OAT SELECTIONS RESISTANT TO RUST

The wild oat, Avena fatua L., has been a weed on cultivated land as well as an important range and hay grass in California since