THE LOSS IN YIELD THAT MAY BE EXPECTED FROM PLANTING SECOND GENERATION DOUBLE-CROSSED SEED CORN

FREDERICK D. RICHEY, G. H. STRINGFIELD, AND GEORGE F. SPRAGUE

Farmers have been advised generally against planting second-generation seed from corn hybrids which they have purchased or obtained in other ways. Most of this hybrid seed has been the first generation of either three-way or double crosses among selfed lines, and the advice relative to planting the progeny appears to have been based upon the theories of hybrid vigor and the demonstrated reduction in yield from the F1 to the F2 in single crosses rather than on experiments with three-way and double crosses as such. It accordingly seemed worth while to obtain some definite evidence on the relative yields of F1's and F2's and the present paper reports such data.

MATERIAL AND METHODS

Ten double crosses which were entered in the Iowa yield test in 1931 were grown in 2-row plats at the Arlington Experiment Farm, Rosslyn, Va., in the same year. Pollinations were made across the two rows of each plat and more than 30 F2 ears of each double cross were obtained. These ears were shelled to obtain seed representative of the F1. F1 seed of the same double crosses was produced by hand pollinating between the parent single crosses in the same season at the same place.

The F1 and F2 generations were compared at the Southwestern Experiment Farm of the Ohio Agricultural Experiment Station at Germantown, Ohio, in 1932. Each generation of each cross was grown in seven plats of 4 x 10 hills. Four seeds were planted in each hill with no subsequent thinning. The experiment was divided into seven series, the crosses being arranged at random within each series. The individual rows of the plats were harvested separately and the yields were computed for the entire plats and also for the two interior rows of each plat. A comparison indicated that there was some effect from competition and the data presented herein, except for marketable ears, are based on only the two interior rows.

EXPERIMENTAL DATA

The yields and other data are presented in Table I. Yield data are for shelled corn containing 15.5% of moisture. The moisture contents and shelling data were based on 10-pound samples taken from...