INFLUENCE OF CORN SMUT AND HAIL DAMAGE ON THE
YIELD OF CERTAIN FIRST-GENERATION HYBRIDS
BETWEEN SYNTHETIC VARIETIES

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In an earlier paper (2) some evidence was presented which indicated that yield in corn may not be reduced because of smut (Ustilago zeae) to the extent that is commonly supposed. In this earlier work both with selfed lines and with first-generation crosses between them, the only significant decrease in yield was that attributable to the greater incidence of barrenness among smutted plants. On the other hand, somewhat similar studies conducted in Minnesota (3, 4) and in Ohio (5), with few exceptions, showed marked decreases in yield caused by smut. The more vigorous selfed lines and first-generation crosses as reported by Kyle (6) of the U. S. Dept. of Agriculture showed the greater number of smut boils. The purpose of this paper is to present additional data relative to the influence of smut on yield, and incidentally, to present some data which show the extent to which yields may be lowered because of hail damage.

MATERIAL AND METHODS

During the seasons of 1932 and 1933 certain first-generation hybrids between synthetic varieties were grown on the agronomy farm near Morgantown, W. Va. Each synthetic variety was made up from three to six selfed lines isolated from various varieties. The relative time of maturity and color of seed are indicated by the names of the synthetics as follows: Early Yellow, Medium Yellow, Medium White, Late Yellow, and Late White. The first generation crosses between Early Yellow and each of the others, as well as crosses between Medium White and Medium Yellow, were classified into Group I, and all other crosses into Group II on the basis of relative maturity.

Each first-generation hybrid was grown in single-row plats repeated six times in randomized blocks. The rows were approximately 136 feet long and 3 ½ feet apart, with the hills spaced 15 inches along the row. Two and three seeds were planted per hill and later the stand was thinned to a single stalk. The parental synthetic varieties and certain commercial varieties, namely, Lancaster Sure Crop, Reid's Yellow Dent, and Woodburn White Dent, were also included in the planting.

When the corn was about knee high an application of horse manure, which a few days previously had been treated with smut spores, was made. Two later similar applications were made at intervals of 10 days.

Detailed notes on smut infection as to size of boil and place of occurrence on each individual host plant were made twice during the growing season—late in August and about the middle of September. Additional notes on ear infection were made when the corn was harvested. The location of a smut boil was indicated by an appropriate descriptive note. For example, “neck” meant that the host carried