THE RELATION OF SMUT INFECTION TO YIELD IN MAIZE

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It is usually supposed that corn smut (Ustilago zeae) causes a great deal of damage and considerable reduction in yield. It is certainly one of the most common of corn diseases if not the most destructive. Numerous estimates of the extent of injury caused by this fungus have been made, but there seem to have been few, if any, careful studies.

The purpose of the present paper is to present some data dealing with the relation of smut infection to yield and to report further progress in connection with the project in breeding corn for resistance to smut. This work was begun at the West Virginia Agricultural Experiment Station in 1920 and has continued to the present. A report of the work was published in an earlier number of this Journal.

METHODS

The same general plan of experiment has been followed in the last three years as previously, except that each strain of corn has been grown in duplicate rows of 50 single-stalk hills per row and the notes on smut infection have been taken three times during a season, the first after the corn was in silk, the second a month to six weeks later, and the third, to obtain particularly the ear infection, when the corn was husked.

The smut notes were taken on the basis of individual plants and recorded on especially prepared mimeographed sheets. Place, or places, of infection and the size of the smut boils at a given date were recorded. It was found convenient for three persons to work together in taking the notes—two persons examined each individual plant and the third set down the notes.

The method of producing the smut epidemic was similar to that followed previous to 1925. In addition to a heavy application of horse manure in the spring before plowing, an application of manure treated with smut was made when the corn was about knee high.

Many of the selfed strains of corn which were reported in 1925 are still being carried in the nursery and may be supposed to be more nearly homozygous. The practise of discarding the strains (with few

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