CORN-ROOTROT AND WHEATSCAB

[PRELIMINARY PAPER]

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In the progress of the investigations of rots of the root, stalk, and ear of Indian corn (Zea mays) being conducted by one of the authors (Hoffer) certain things have developed which have such an important bearing on certain phases of the wheatscab problem which is being investigated by the other authors that it has seemed desirable to publish a preliminary statement.

Field observations have shown a conspicuously greater abundance of wheatscab in fields where the wheat (Triticum aestivum) was grown immediately following corn that was infected with the Fusarium-rot of the root and stalk. This was especially true in Shelby County, Indiana, where wheat, according to a common practice, was sown in standing corn.

A similar condition was also noted in Dane County, Wisconsin, this summer, where spring wheat was grown immediately following a corn crop. Both in Indiana and in Wisconsin under these conditions abundant development of perithecia of Gibberella spp. was found on the old corn-stalks remaining in these fields. These perithecia were mature and well filled with viable ascospores at the time when the wheat, in all cases observed, was in head.

Water suspensions of these ascospores both from Indiana and from Wisconsin cornstalks gave positive results when used as inocula on wheat heads. The inocula were applied by means of an atomizer spray. In some cases the heads were subsequently covered with glassine bags for three days, and in other cases no coverings were used. In all cases positive infections were obtained, while the controls sprayed with sterile water and similarly treated remained unaffected. The appearance of the infected heads thus artificially inoculated was identical with that of wheat heads naturally infected with scab.

Cultures from Gibberella spp. on old cornstalks have also proved virulently parasitic on the roots of corn plants grown both in large, sterile agar tubes and in sterilized pots of soil.

Similar results on both wheat and corn have been obtained by using cultures from naturally infected wheat heads.

The organisms from both sources have also been found to be similar morphologically. In view of the facts developed by this evidence, it seems certain that these are intercrop parasites which are of great impor-
tance in developing control measures for one of the rots of the root, stalk, and ear of corn and for scab of wheat. As both corn and wheat are such highly important food crops, it is imperative that the investigations bearing on any of these disease problems should be pushed forward with utmost vigor at the present time.

While the data are as yet somewhat fragmentary, it seems evident that, in order to lessen the losses from these diseases on corn and wheat, it is necessary to recognize this intercrop parasitism and develop field practices accordingly. In general, the use of the best-adapted, disease-free seed on clean soil should be practiced. The details of control measures for these diseases of corn and wheat are as yet not worked out, and no simple ones are evident. A crop rotation avoiding wheat following diseased corn is undoubtedly important, unless the cornstalks can be cut close to the ground, removed, and the remaining stubble plowed under before the wheat is planted. Badly scabbed wheat should not be used for seed. Ordinary seed treatments will not control wheatscab; hence, only clean seed on carefully prepared clean soil should be used.
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