EFFECT OF DEPTH OF SEEDING ON THE OCCURRENCE OF COVERED AND LOOSE SMUTS IN WINTER BARLEY

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Covered smut (Ustilago hordei (Pers.) Kell. and Sw.) and loose smut (Ustilago nuda (Jens.) Kell. and Sw.) are the most common plant diseases affecting fall-sown barley. Their importance as measured by reduced grain yield can only be estimated. However, in a 4-year experiment at the Arlington Experiment Farm, Rosslyn, Va., the reduced grain yield of two smut-susceptible varieties grown from untreated seed as compared to the yield of the two varieties from treated seed was approximately equal to the combined percentages of the loose and covered smuts present in the untreated plots.

The breeding of smut-resistant varieties of barley has been handicapped by lack of a satisfactory technic for obtaining infection. Investigators also have reported unsatisfactory results in varietal tests for covered smut, as infection has been either too low or too variable to be conclusive. Therefore, any factors which influence infection of the barley plant by smut are important.

The seedbed for the varietal experiments with winter barley at the Arlington Experiment Farm in 1922 was prepared in such a manner that a back furrow ran across the middle of each plat. It was observed that in this back-furrow area the barley plants were heavily infected with both smuts, whereas the remainder of the plat contained few smutty plants. Similar non-uniform distribution of infected plants was commonly observed when taking smut records on seed treatment experiments. As a result of these observations depth-of-seeding experiments were begun in 1924, the results of which are reported in this paper.

Tisdale reports unsatisfactory results in obtaining infection of barley with covered smut when the seed was smutted at sowing. Mackie states, "Experiments in California have for three years failed in an attempt to create heavy smut attacks by artificially inoculating barley seed." He further states that low lying river or lake bottom lands usually show the most barley smut.