

LOOSE SMUT OF WHEAT.

II. FIELD EXPERIMENTS ON SEED-DISINFECTION BY HOT WATER.

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THE following article presents the results of field experiments for the 1924-25 season on the hot-water method for the control of loose smut in wheat (*Ustilago tritici* Jens.). These experiments are the direct continuation of the laboratory experiments the results of which appeared in the *Journal* for September, 1924.

METHOD EMPLOYED.

Small samples of seed wheat, taken from the same bulk sample of Major used in the previous work, were treated on 25th to 28th July, 1924, dried quickly in an air-current at 90°-100°,* and stored in paper packets in the laboratory. From each sample 300 seeds were taken for germination in the laboratory, and 400 seeds were sown in the field 2 in. apart, in rows each 5½ yards long, with 12 in. between rows. Between each four rows of treated seed two rows of untreated seed from the same bulk sample were sown to act as controls. The sowing took place at the Ashburton Experimental Farm on 9th to 12th September, the soil being in good tilth but very dry. No wheat had been grown on this portion of the farm for at least five years. The plots were covered with wire netting until sufficiently advanced to be safe from birds. A first count of germination was made on 14th to 17th October, the seedlings being then about 4 in. high, and the plants were finally pulled and counted on 6th to 16th January, 1925.

RESULTS OF EXPERIMENTS.

The results of the experiments are set out in the appended tabular statements. The main data and general conclusions may be summarized as follows:—

(1.) A three-minute dip, following a presoaking of five to six hours in water at a temperature of 63°, gave complete control of loose smut at 131° and 133°, though a single smutted plant appeared in the sample treated at 135°. With a presoaking of five to six hours in water maintained at 84° the three-minute dip gave complete control from 129° to 135°.

(2.) A five-minute dip, following a presoaking of five to six hours at 63°, gave complete control from 127° to 133°, but again a single smutted plant appeared at 135°. With a presoaking of five to six hours at 84° the five-minute dip gave complete control from 125° to 135°.

(3.) A ten-minute dip, following presoaking at 63°, gave complete control from 123° to 131°, and, with presoaking at 84°, from 123° to 131°.

* All temperatures are given in the Fahrenheit scale.