EFFECT OF SEED DISINFECTION AND DELAYED SOWING ON THE CONTROL OF BUNT IN INFESTED SOIL

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CONSIDERABLE infestation by bunt spores (*Tilletia tritici* (Bjerck.) Wint. and *T. levis* Kühn) sometimes occurs in the soils of the Columbia Basin region, although the introduction of resistant varieties of wheat and more efficient seed treatment methods have significantly reduced the hazard from bunt. Susceptible varieties frequently develop 1 to 10% or more of infected heads when sown in fields in which the soil is infested with bunt spores despite the use of clean and carefully disinfected seed.

In dry years, there is not sufficient soil moisture to germinate all soil-borne bunt spores before the desirable time for fall sowing arrives, although occasionally the soil may be moist enough to sprout wheat. Bunt infection usually is low in wheat sown early when the soil temperature is high. Some farmers in districts of eastern Oregon where bunt infection is unusually heavy take advantage of this situation and sow wheat before fall rains begin, in spite of the hazard of thin stands that may result from the consequent deep sowing in a dry seedbed. If, by delaying sowing for 2 or 3 weeks after the advent of fall rains, soil infestation could be reduced sufficiently for bunt infection to be controlled by seed disinfection, the improvement in stands and better control of weeds as compared with early dry seeding should be of material benefit to farmers. With this in mind, experiments were begun at Pendleton, Ore., in 1931 to determine (a) the relative efficiency of certain seed disinfectants in preventing infection from bunt in the soil, and (b) the length of time sowing must be delayed after the beginning of favorable moisture conditions in the fall to permit the germination and destruction of sufficient soil-borne bunt spores so that resulting infection will be at a minimum. Results of 4 years' experiments are reported here.

REVIEW OF LITERATURE

As early as 1907, Sutton and Pridham (9) noted the value of copper sulfate in protecting seed from recontamination by soil-borne bunt spores. Heald, Zundel, and Boyle (5) stated that 3 ounces of copper carbonate per bushel gave equal or better protection than copper sulfate, but that 2 ounces was not quite so effective. Leukel (7) and Heald and Gaines (4) concluded that these two disinfectants were about equal in fungicidal value. In the experiments of Twentyman (10), however, copper sulfate was superior to copper carbonate in preventing reinfection. Twentyman treated the seed and then re-inoculated it before sowing. In the experiments of Sutton and Pridham (9), Heald, Zundel, and Boyle (5), Heald and Gaines (4),

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Footnotes:
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3 Figures in parenthesis refer to "Literature Cited", p. 876.