BUNT REACTION OF HARD RED WINTER WHEATS
IN 1938-42

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SINCE the fall of 1930 a coordinated cooperative improvement program for hard red winter wheat has been in operation in the principal winter wheat-growing states of the Great Plains. As a part of this program there has been carried, on a rather extensive scale, a study of the reaction of wheats to bunt. Data obtained during the years 1932 to 1937, inclusive, have been published. Since the general plan of the nursery was changed with the crop of 1943, it seems desirable to present the information available up to that time.

MATERIALS AND METHODS

The general plan as outlined previously was followed in the work reported here. Fifty varieties and strains of wheat were planted in duplicate 6- or 8-foot rows each year. These included (1) new hybrid strains found to be bunt resistant at some stations, (2) varieties from agronomic tests on which more information was desired, and (3) a few wheats primarily adapted for growing in the western wheat region. Two susceptible checks, Kharkof (C. I. 1442) and Cheyenne (C. I. 8885), were included, as well as a few varieties that would give some indication of the physiologic races of the organisms present in the composite mixtures of the inoculum. Except for this group, strains were discontinued when found to be highly susceptible, when it appeared that a satisfactory determination of their bunt reaction had been obtained, or when they proved to be undesirable agronomically.

Seed for the tests was obtained from sources apparently free from bunt and no special treatment was applied. The inoculum for each nursery was a composite of chlamydospores obtained from the previous test at the same station. From time to time collections of inoculum obtained from commercial wheat fields in the area represented by the individual nursery were added to the composite of bunt spores. In these preliminary tests only approximate determinations were made as to the proportions of Tilletia foetida (Wallr.) Liro and T. caries (D. C.) Tul. that occurred in the mixtures. The inoculum for the Manhattan, Kans., and Denton, Tex., nurseries was pure for T. foetida; for the Bozeman and Moccasin, Mont., nurseries there was approximately 30% T. caries in the mixture, and only small percentages of this species in the inoculum for the other stations.

In some or all of the 5 years reported, nurseries were grown at Denton and Amarillo, Tex.; Stillwater and Woodward, Okla.; Manhattan, Kans.; Akron and Fort Collins, Colo.; Lincoln and North Platte, Nebr.; St. Paul, Minn.; Moccasin and Bozeman, Mont.; Kearneysville, W. Va.; and Beltsville, Md. At Logan, Utah, clean seed was put into soil that was presumed to be contaminated with the dwarf bunt fungus.

In each row the percentage of bunt was determined by estimating the total number of heads and then counting those bunted. Actual counts of the total number of heads were made on several rows in each nursery to check the accuracy of these estimates.

1Cooperative investigations of the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Dept. of Agriculture, and the agricultural experiment stations of Texas, Oklahoma, Kansas, Colorado, Nebraska, Minnesota, Montana, Utah, and West Virginia. Received for publication March 8, 1945.

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4C. I. refers to accession number of the Division of Cereal Crops and Diseases.