EFFECT OF AWNS ON KERNEL WEIGHT, TEST WEIGHT, AND YIELD OF WHEAT

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The coordinated wheat improvement experiments at 17 stations in eight western states (3) have offered an excellent opportunity for a study of the performance of awned and awnless wheats under very diverse environments. The problem is of both theoretical and practical interest. Many of the previous experiments with wheat to determine the influence of awns on yield and kernel weight have not been conclusive and no attempt has been made to test similar material at more than one location. In general, awned plants have tended to produce heavier kernels and a higher weight of grain per plant, although this has not always been the case. Clark and Quisenberry (1) and Lamb (2) have reviewed the literature on the effect of awns in wheat.

The data on the effect of awns presented here were obtained from composite populations of awned and awnleted segregates from two crosses, one between two winter varieties and the other between two spring varieties. Material for another method of comparing awned and awnless wheats is being developed, but results will not be available for several years. This material is being produced by repeated backcrossing of awnless segregates with the awned parent and awned segregates with the awnless parent. It is planned to continue backcrossing until types similar to the two parents in all genetic characteristics except presence or absence of awns have been obtained. These should be better suited for further studies on the influence of awns on the development of the wheat kernel.

MATERIAL AND METHODS

In the experiments reported here composites of awned and of awnless or awnleted segregates from two crosses involving parents of considerable prominence in the western states were studied. Plants in the F3 generation of the cross, Triplet × Oro, grown at Moscow, Idaho, in 1933 were classified as awned, heterozygous awnleted, and awnleted. Samples totaling about 2 pounds each of seed of the awned and awnleted segregates were composited and planted at Pendleton, Ore., in the fall of 1933. Seed from this crop was distributed for seeding uniform yield trials in the fall of 1934, the first yields thus being obtained in 1935 on the F4 generation.

A smaller F2 population of the second cross, Baart × Onas, was grown at Aberdeen, Idaho, in 1933. Plants were separated into three classes, viz., awned, heterozygous awnleted, and homozygous awnless or awnleted, and the F3 generation of each class was grown during the winter at Tucson, Ariz., where the homozygous plants were again separated from the segregating population and added.

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2Agronomist and Associate Agronomist in Wheat Investigations, respectively.
3Figures in parenthesis refer to "Literature Cited", p. 388.