A Comparison of Hill and Conventional Yield Tests Using Oats and Spring Barley

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TESTING and breeding methods with small grains are fairly well established, with variations depending upon land availability, labor, seed supply, desired statistical precision, and convenience. Though few small grain experimenters have used anything but short rows for line evaluation, corn investigators were introduced to the ear-to-hill breeding method in 1934 by Jones and Singleton. Jugenheimer and his group at Illinois have used the hill method extensively and with success for both development of corn inbred lines and evaluation of hybrids. The main advantage claimed for replicated corn hill tests was the larger volume of material that could be observed and tested in relatively small areas.


Schertz, K. F. Comparative accuracy of single hill and larger plots for testing three-way crosses of corn. M.S. Thesis. Univ. of Ill. 1950.

METHODS

At Hays, Kans., in 1952 and 1953 the oat and variety tests were planted in hills and rod-rows. Three-seed drill plots were not grown in 1954, only one seedling per hill in a tenth-acre drill plot was planted. Both hills and rod-rows were randomized, and spaced 1 foot apart in 1-foot rows. hills was surrounded by border rows. Seeding rates were 23 seeds per hill; this about equals the recommended acre rate of both oats and spring barley for the area.

Yields and ranks with oats in hills compared favorably with rod-row tests of the same varieties, but differential winterkilling in winter wheat gave a poor relationship in that crop.

RESULTS AND DISCUSSION

Yield test data in the Great Plains are subject to great variability because of drought, heat, and other natural factors. This largely explains the high L.S.D.'s sometimes shown for individual tests summarized in table 1.

It is evident, however, that variability in hill yield tests was higher than with other methods, primarily because of the great multiplication required to place hill yields on a bushel per acre basis. In spite of precautions, seed losses occurred from lodging, shattering, and harvesting, and difficulties were encountered in threshing small lots without loss.

Differences in yield levels among methods were expected and are explained on the basis of local factors.