HARD GRAIN TEXTURE OF WHEAT IN MECHANICAL MIXTURES AND IN CROSSES

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The association of hard grain texture in bread wheats with high protein content, and in general with high milling and baking qualities, has attracted the attention of plant breeders and wheat growers for several years. The opinion is rather widely held among wheat growers that the texture of wheats, and particularly that of bread wheats, is determined almost entirely by the climatic conditions under which wheat is grown. This opinion is largely due to the softening of hard-grained varieties in wet seasons or with heavy irrigation, and also to the apparently progressive change to soft texture from year to year of certain hard wheats when grown under irrigation for several years. This paper is a partial report of studies which have been made for the purpose of ascertaining to what extent hard grain texture is permanent in certain pure lines of wheats grown under irrigation.

MECHANICAL MIXTURES

During the past 10 years more than a hundred pure line selections of hard Baart have been tested in comparison with a high yielding, soft strain of Baart. The grain yield and constancy of the hard texture of certain of these hard strains have been discussed in a previous publication (1). In this publication it was shown that nearly all of the hard Baart strains tested were lower in yield than the soft strain with which they were compared. It was also shown that when these hard strains were grown on a fertile soil, such as alfalfa sod, the hard texture of the hard Baart strains was constant from year to year. Among these hard Baart strains, strain No. 34-14-17 over a period of 3 years averaged 8 bushels of grain per acre less than that of soft Baart strain No. 34-16. Since certain hard-grained varieties have appeared to soften progressively, it was thought that such change might have been due to admixtures of high yielding soft strains as was suggested by Freeman (2). In order to test this possibility, certain known mixtures of hard Baart strain No. 34-14-17 and soft Baart strain No. 34-16 were made up on the basis of grain count, as follows: (a) 25% 34-14-17 hard and 75% 34-16 soft; (b) 50%