Pearling Index and Wheat Meal Fermentation Time in Two Winter Wheat Crosses

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THE studies reported in this paper were designed to determine (a) the inheritance of the characters measured by wheat meal fermentation time and pearling index, (b) the influence of variations in environment on the two characters, and (c) the relationship between the two characters.

The pearling index was originated by Taylor, Bayles, and Fifield (17) to measure the texture (softness or hardness) of a wheat sample. It is the amount of material pearled off the sample by a barley pearler in a given time. The wheat meal fermentation time measures the gluten strength and is the time in minutes before a doughball made of ground wheat and yeast solution begins to disintegrate. Longer times are indicative of stronger gluten. The fermentation time test is a modification of the Saunders test (15) developed by Cutler and Worzella (5).

MATERIALS AND METHODS

The crosses used in this study, Rex × No Name and Brevon × No Name, were made for the purpose of modifying and improving the milling quality of Rex and the baking quality of Brevon by the backcross method. All three varieties are classed as soft white winter wheats.

Rex, C. I. 11689, originally known as Rex M 1, is moderately soft in texture and usually has a very long fermentation time. Because of its many desirable agronomic characters, it is grown rather extensively in Washington, Oregon, and Idaho. Its milling quality is considered unsatisfactory, because its flour does not readily pass through the last bolting cloths in commercial mills. Consequently, the entire milling process is slowed down, and the mill cannot be run at maximum capacity.

No Name, a selection from a Fortyfold × Federation cross, is a very soft wheat with a short fermentation time. Although grown commercially to a limited extent, it lacks many important agronomic characters. However, it appears to possess good milling and baking quality and, consequently, was selected for use in the crosses discussed in this paper.

Brevon is a selection from a Turkey-Florence × Fortyfold-Federation cross. It has a harder kernel than Rex or No Name and frequently is mottled with respect to texture, i.e., the kernels contain both soft and hard portions. It has a relatively short fermentation time. Although very desirable agronomically, it has not been distributed commercially because of inferior baking quality.

The pearling indices were determined according to the method described by Taylor, Bayles, and Fifield (17). The standard procedure recommended by

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3Figures in parenthesis refer to "Literature Cited", p. 939.