A Comparison of the Quantity and Quality of Protein in Certain Varieties of Soft Wheat

G. K. Middleton, C. E. Bode, and B. B. Bayles

Several workers have shown that climate and soil fertility, especially available nitrogen, greatly influences the protein content of wheat, but that differences between varieties grown under comparable conditions seldom have been greater than 1% if their grain yields were approximately the same. This relation is so generally recognized, it does not seem necessary to give a complete review of the literature on the subject. This paper presents information on new varieties which are significantly higher in protein content and at the same time high in yield.

Material and Methods

Fifteen to twenty varieties, consisting of those grown extensively in the South, together with the most promising selections from the breeding programs in the region, have been grown in uniform yield nurseries at several stations since 1942. These nurseries are conducted cooperatively by the United States Department of Agriculture and the state agricultural experiment stations in the South. The data from all stations are summarized each year and made available in a processed report.

Each year, samples of these varieties from certain of these stations have been sent to the Soft Wheat Quality Laboratory, Wooster, Ohio, for quality evaluation. There they have been composited in definite proportion for milling, baking, and other quality tests.

Samples were excluded from stations where any varieties were seriously affected by disease or other factors which might affect the quality of the grain. Only those varieties grown at the same station each year, and hence comparable as far as possible, have been used. Thirteen varieties were included at all stations in each of the years 1948 to 1950. Milling samples were obtained from six to eight stations each year. For yield comparisons, only data obtained from these same stations are considered in this paper. In 1949 milling samples were obtained from plots grown for this purpose at two locations where yields were not taken, and in 1950 the same was true for one location. For this reason, the yield data reported herein are the mean of six locations each year, while the composite milling sample for each variety came from six, eight, and seven locations for the 3 years, respectively.

All of the wheat and flour quality data were obtained by methods in common use at the Soft Wheat Quality Laboratory with the ash, protein, and absorption data reported on a moisture basis.

Results

Results from the experimental milling and baking conducted on the 1948, 1949 and 1950 crops of a group of new varieties, all with either Frondoso or Fronteira as one parent, were different in certain respects from those of the older, typical soft wheats. Frondoso and Fronteira were developed in Brazil and were selected from a group of new varieties, all with either Frondoso or Fronteira as one parent.


The protein content varied from 10.1% for the older, typical soft wheats. Frondoso and Fronteira were developed in Brazil and were selected from a group of new varieties, all with either Frondoso or Fronteira as one parent.

Viscosities were generally high for the high protein varieties. The five varieties with Frondoso or Fronteira in their pedigrees were grown at Experiment and Tifton, Ga., by the Ga. Agr. Exp. Sta.; at Stoneville and Holly Springs, Miss., by the Miss. Agr. Exp. Sta.; at McCullers and Statesville, N. C., by the N. C. Agr. Exp. Sta.; at Clemson, S. C., by the S. C. Agr. Exp. Sta.; at Hartsville, S. C., by the Coker's Pedigreed Seed Co.; at Westminster, S. C., by the Marett Farm and Seed Co.; at Knoxville, Tenn., by the Tenn. Agr. Exp. Sta.; and at Blacksburg, Va., by the Va. Agr. Exp. Sta.; at Hartsville, S. C., by the Coker's Pedigreed Seed Co.; and at Hartsville, S. C., by the Coker's Pedigreed Seed Co.