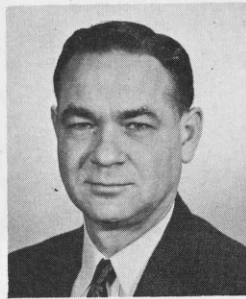


From the DIRECTOR

A. G. HAZEN



This issue of Farm Research includes information relative to the quality of our 1969 wheat production in North Dakota.

Wheat quality is not a simple or single characteristic of wheat. It is not something which can be determined easily, and it is variable not only between varieties but also between geographic locations and different seasons of weather. Once produced and harvested, wheat quality can be affected further by storage and transportation conditions.

To arrive at a valuable and enduring judgment of wheat quality, one must keep in mind two principal parties. These are the producer of the wheat and the first purchaser of the wheat who will begin its processing — the miller.

Many years of experience have demonstrated that plant breeding techniques can greatly influence wheat quality. While breeding a new variety cannot in itself guarantee every crop produced from the variety will be either equal or entirely consistent in quality, these same years of experience have provided ample evidence that plant breeding provides the best single potential for quality control and consistent quality. Giving careful attention to quality together with disease and other environmental factors which can be controlled is why plant breeding techniques have been so successful in developing and maintaining what we regard today as desired wheat quality standards.

A judgment of hard red spring wheat quality is the result of analyzing some twenty factors which can be measured in the laboratory. Some of these factors are considered more important to quality than others, but it is the combination of all of them which constitutes the basis for judgment.

Measurement starts with the kernels of wheat where test weight, 1,000 kernel weight, kernel size, protein content, and enzymes are the principal factors.

In changing the raw kernel to a milled wheat flour, additional factors of flour yield (pounds of flour from pounds of kernels), conditioning properties, ease of milling, ash content, protein content of the flour (some wheat kernels have more

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ON THE COVER

Charles Berry, graduate student in the Department of Cereal Chemistry and Technology, adds compressed yeast to form a broth. This is an important step in the process of continuous baking that ends in laboratory analysis of the quality in the final baked loaf product.

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Table 5. Pounds of seed per acre from several grasses seeded in 3-foot spaced rows and solid stands at Edgeley in 1964 and at Langdon in 1963-64.

Species	Pounds per acre ¹							
	Edgeley		Langdon					
	1964		Row			Solid		
	Row	Solid	1963	1964	Ave	1963	1964	Ave
Lodorm green needlegrass	312	237	307	157	232	154	147	150
Lincoln bromegrass	500	155	206	109	158	147	73	110
Primar slender wheatgrass	1057	879	308	71	190	461	52	256
Vinall Russian wildrye	241	106	70	286	178	132	60	96
Climax timothy	176	— ²	384	170	277	359	127	243
Nordan crested wheatgrass	298	171	410	312	361	227	142	184

¹Yields are averages from plot fertilized annually in the fall with 0, 50 and 100 pounds of nitrogen and 200 pounds of 0-46-0 per acre.

²Stand too thin in solid stand.

only under contract for delivery to a definite market. Limited amounts of Foundation Lodorm seed is available from the North Dakota Agricultural Experiment Station cooperatively with the Northern Great Plains Research Center, USDA, Mandan, North Dakota. Requests for Foundation seed should be directed to the Seed Stocks Project, in care of David Ebeltoft, at North Dakota State University, Fargo.

FROM THE DIRECTOR (From Page 2)

protein in the bran than others, thus it is not transferred to the milled flour), and speck count are measured.

Following the milling of the wheat to flour, it is possible to develop further measurements of quality as the flour is converted to bread dough. Plasticity of the dough is recorded on Farinograph machines, the mixing time which is critical in automatic machine bakeries is measured, and the elastic properties of the dough are determined.

And finally, as the dough is allowed to ferment and then is baked into a loaf of bread, the loaf volume, crust color, crumb color, panning characteristics, and absorption are among the useful factors which are measured.

Quality of the durum wheat is determined in a similar manner to hard red spring wheat, except instead of the baking of the dough into bread the semolina is extruded into spaghetti or macaroni where similar characteristics may also be determined.

It is true that the domestic and foreign millers do not buy wheat from our area on the basis of a specific variety. Rather, this geographical area has developed a reputation over time as being dependable for consistently high quality from the several

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varieties produced each year. Therefore, the quality reports of our total crop are a reflection of the total or average quality of all the varieties combined during a particular season. These quality determinations can be accepted with a high degree of confidence so long as all the wheat, or at least a high percentage of it, is produced from varieties having comparable quality characteristics.

To the present time the North Dakota Agricultural Experiment Station has maintained a program of hard red spring and durum wheat research and information directed toward the dual objectives of maintaining as high a yield and as high a quality among our wheat varieties as we can. Based upon numerous visits by foreign trade teams and frequent consultation with domestic processors, it is our belief we have a unique market, both domestic and foreign, which is based upon this concept of quality. And unless the currently utilized standards of the several factors are at least maintained, if not improved, we stand the distinct risk of losing this unique market. Alternative sources of lower quality wheat are available to the millers. These sources would have an economic advantage over our area if our wheats were not of any higher quality than wheat from those areas.

A market once lost due to lowering of quality can be most difficult, if not impossible, to regain.