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Revised Grain Standards . . .

their effect on Nebraska wheat in 1957

Although Federal grain standards for Hard Red Winter Wheat were revised in 1957, a Nebraska Experiment Station study shows that the new regulations had very little effect on grades received by wheat marketed at country points by Nebraska farmers in 1957.

On the other hand, the change in subclass tolerance included in the new regulations had an important effect on classifications of Nebraska wheat. About 10 per cent of the samples in the study were dropped to a lower subclass.

Ninety-one per cent of the samples collected in the study were either Pawnee, Nebred, or Cheyenne. The samples were about equally divided among the three varieties, and there was little difference in the grades each variety received.

Results of the study are described in this circular.

The study reported in this circular was made possible by a grant from the Nebraska Wheat Commission. The circular was prepared by J. A. Goodding and C. J. Miller of the Nebraska Agricultural Experiment Station, and Donald J. Lehr and J. C. Swinbank of the Nebraska Agricultural Extension Service. It is based on a bulletin (now in press) entitled "Revised Grain Standards and the 1957 Nebraska Wheat Crop" by Dr. Goodding and Dr. Miller.

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The Revised Grain Standards and Their Effect on Grades Received by Wheat

In 1957 the U. S. Department of Agriculture issued revised Federal grain standards for Hard Red Winter Wheat. The new standards lowered the permissible amount of shrunken and broken kernels by 2 per cent in grades 1, 2 and 3. The permissible amount of foreign material was lowered from one half of 1 per cent in grade No. 1 to 2 per cent in grade No. 5.

The Hard Red Winter class of wheat is divided into three subclasses—Dark Hard Winter, Hard Winter, and Yellow Hard Winter. When grain is inspected at terminal shipping points the subclass designation appears on the inspection certificate, but it is not considered in determining the numerical grade.

The requirements for the color subclasses, which are an indication of protein content, were also changed by the new regulations. The minimum requirement for dark, hard and vitreous kernels* in the Hard Winter Wheat subclass (formerly 25 per cent) was raised to 40 per cent. Kernels that are dark, hard and vitreous generally contain more protein than soft, starchy kernels.

Another change in the standards involved wheats of other classes, but this factor does not apply to most Nebraska wheat.

Detailed changes in the Federal standards are shown in the table on page 4.

A number of questions were raised by wheat growers and the grain trade as to how these revisions would affect the grades and prices of Nebraska wheat. To help answer these questions, a study was undertaken in the summer of 1957 by the Nebraska Agricultural Experiment Station in cooperation with the Nebraska Agricultural Extension Service and the Nebraska Grain Improvement Association. The study was made possible by a grant from the Nebraska Wheat Commission.

A total of 848 samples were collected from trucks delivering farm wheat to country elevators. The samples were collected under county agent supervision in nine counties representing the main wheat growing areas of the state. They were graded by the Lincoln Grain Exchange under both the old and new standards.

Here are the findings of the Experiment Station study:

(1) **Of the 848 samples collected**, seven were lowered in grade because of the revised standards. Each of the seven samples was lowered one grade, and in each case this was due to rye content.

(2) **Because of the higher requirement** for dark, hard and vitreous kernels in the Hard Winter Wheat subclass, about 10 per cent of the

* Bleached kernels may still be considered as dark, hard and vitreous.

samples were lowered from that subclass to the Yellow Hard Winter Wheat subclass.

(3) **About 91 per cent** of the samples collected were either Pawnee, Nebred, or Cheyenne. The samples were about equally divided among the three varieties, and there was little difference in the grades each variety received.

Grading Factors

According to Federal grain standards, the factors considered in determining the grade of wheat are test weight, damaged kernels, foreign material, wheat of other classes, and shrunken and broken kernels. Wheat cannot receive a grade higher than the limits imposed by any one of these grading factors. For example, a sample might be free of foreign material, wheat of other classes, and damaged kernels, but still receive a low grade because of test weight.

Test weight was the only major factor left unchanged in the 1957 revision of the standards, yet it had a greater influence on the grades received than any other factor. Of the 848 samples in the Experiment Station study, 672 received a grade lower than No. 1. Of these 672 samples, seven were limited in grade because of some factor other than test weight. Test weight and foreign material were equally responsible in limiting grade in an additional seven samples. In 640 of the 672 cases, the samples would have graded No. 1 except for the limit imposed by test weight.

Besides test weight, the only factor effective in lowering grade was foreign material, which in all cases was rye.

Although not effective in limiting grade, the following defects were found: shrunken and broken kernels in 46 samples, and damaged kernels in 8 samples. Foreign material was found in 30 samples, but was a limiting factor in only the 14 cases mentioned above. In 24 of the 30 samples the foreign material was rye.

Dockage

Although dockage is not a grading factor, it does affect the net price received by the farmer since he is not paid for the percentage of his load that is considered dockage. Dockage is defined in part as "material other than wheat which can be removed readily from the wheat by the use of appropriate sieves and cleaning devices."

There were 42 samples in the Experiment Station study which contained 1 per cent or more dockage. This included chaff, unthreshed kernels, weed seeds, cracked kernels and dirt. In only two samples was there as much as 3 per cent dockage.

Price

Changes in market grades and subclasses may affect the prices farmers receive for their wheat. The Experiment Station study did not include a complete investigation of the relationship between grades and sub-

classes and prices received. However, the 1957 Commodity Stabilization Service loan rate for the Yellow Hard Winter Wheat subclass was 2 cents under that specified for the Hard Winter Wheat subclass. On the Omaha cash market, Yellow Hard Winter Wheat usually received a lower price than the other subclasses.

Subclasses

The changes in Federal standards affected the subclass ratings of wheat grown in the counties west of Adams and Howard more than the ratings of wheat grown in counties to the east. This difference was probably the result of 1957 weather conditions in western and central Nebraska which favored the formation of yellowberry kernels.

In years of normal weather conditions, a larger proportion of the wheat grown in eastern Nebraska would be expected to fall into the Yellow Hard Winter Wheat subclass than would be true for wheat grown in the western part of the state.

**Grade Requirements for Hard Red Winter Wheat
(As Revised in 1957)**

Maximum limits of—									
Grade No.	Shrunken & broken kernels		Foreign material			Wheats of other classes			
	1956		1956		1957	1956		1957	
	%	%	Matter except other grains	Total	Total	Total	Durum &/or Red Durum	Total	Durum &/or Red Durum
			%	%	%	%	%	%	%
1	7	5	0.5	1	0.5	5	1	5	0.5
2	7	5	1.0	2	1.0	10	2	5	1.0
3	10	8	2.0	3	2.0	10	3	10	2.0
4			3.0	5	3.0	10	10	10	10.0
5			5.0	7	5.0	10	10	10	10.0
Sample grade: Sample grade shall be wheat which does not meet the requirements of any of the above grades.									

Subclasses for Hard Red Winter Wheat Grades

Percentage dark, hard and vitreous kernels											
Dark Hard Winter				Hard Winter				Yellow Hard Winter			
Min. %		Max. %		Min. %		Max. %		Min. %		Max. %	
1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957
75	75	100	100	25	40	74.9	74.9	0	0	24.9	39.9

The above tables were adapted from OFFICIAL GRAIN STANDARDS OF THE UNITED STATES, Service and Regulatory Announcement AMS-177, 1957 (USDA, AMS, Grain Division).

(8 M—June 1958)