

**GRAIN QUALITY PARAMETERS OF SOFT WINTER WHEAT
VARIETIES TESTED AT THE KHOREZM SCIENTIFIC
EXPERIMENTAL STATION OF GRAIN AND LEGUMES RESEARCH
INSTITUTE**

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ABSTRACT

In the soil and climate conditions of Khorezm region, despite the fact that winter soft wheat varieties are grown with the same agrotechnics, it was observed that the biochemical composition of the grain is different. Among the varieties, the highest result of wet gluten content was determined in Mars-1 (30.9%), Aziz (30.8%) and Gurt (30.7%). Andijon-2 Tanya and Nadir varieties have significantly higher content of gluten and protein in grain and GDM parameters than other varieties.

KEYWORDS: *Winter Soft Wheat, Grain, Gluten, GDM Parameters, Climate Conditions.*

INTRODUCTION

Nowadays, in the cultivation of wheat varieties, the main requirement is to increase not only the amount of yield, but also the amount and quality of gluten content, transparency and protein content of the grain, which meet the state standards. Because the quality of bread and bread products made from wheat flour is determined by the amount of the above substances [2]. Protein, carbohydrate and enzyme complex properties of wheat grain are also of great importance. Wheat contains proteins known as gliadin and glutenin. These proteins dissolve in water, absorb 2-3 times more water than their own mass, and form an elastic mass connected by disulfide bonds called gluten. The elastic properties of gluten make it possible to make high-quality bread and pasta products from wheat flour [1].

It is important to choose intensive winter wheat varieties, which are suitable for the conditions of irrigated lands, resistant to adverse natural climatic conditions, as well, have stable productivity and high grain quality.

Taking into account the above, laboratory experiments were conducted on the available collection materials at the Khorezm Scientific Experimental Station of Grain And Legumes Research Institute in order to test varieties of soft winter wheat that produce quality grain in irrigated lands and to determine their biochemical parameters.

Materials and Methods

The amount of wet and dry gluten in grain, the index of GDM (gluten deformation measurement) was performed in the laboratory “Analysis of Cereal Crops and Products” of Khorezm Mamun Academy based on the method “UzST13586,1-68” for determining the amount and quality of wheat gluten [3]. 30 varieties of winter wheat grown using the same agrotechnics in the soil and climate conditions of the Khorezm region served as research objects. The Krasnodarskaya-99 variety was taken as a control variety.

Results and Discussion

The data on wet and dry gluten content and GDM parameters in the grains of soft winter wheat varieties tested in the experiment are given in the table.

Wet gluten in grain was performed in the laboratory “Analysis of Cereal Crops and Products” of Khorezm Mamun Academy based on the method “UzST13586,1-68” for determining the amount and quality of wheat gluten [3]. According to this standard, wet gluten is divided into 5 grades. When the wet gluten content is 32-36%, it is included in the high grade, the 1st grade wet gluten content is 28-31.9%, the 2nd grade wet gluten content is 23-27.9%, the 3rd grade wet gluten content is 18-22.9%, the 4th grade wet gluten content is less than 18%. In our experiments, wet gluten content belonging to high grade, 3rd and 4th grade was not observed. Wet gluten content of varieties Krasnodar 99, Antonina, Druzhba, Andijon-2, Tanya, Alekseich, Yogdu, Mars-1, Chillaki, Vekha, Gurt, Yuka, Durдона, Grom, Nadir, Pervitsa, Andijon-4, Zvezda, Bezostaya-100, Navbahor, Babur, Aziz, Velen and Starshina varieties were included in the 1st class, and the remaining Asr, Qadr, Uzbekistan-25, Kroshka, Vassa and Brigada varieties were included in the 2nd grade. The wet gluten content of all tested varieties was around 26.0-30.9% (Table 1).

70-80% of reserve proteins in wheat grain are gliadin and glutenin proteins. Their ratio is about 1:1. The amount of protein varies depending on factors such as the genetic characteristics of the variety, fertilization, irrigation, and temperature [1].

TABLE 1 GRAIN QUALITY PARAMETERS OF SOFT WINTER WHEAT VARIETIES

N	Varieties	Wet gluten content, %	Dry gluten content, gramm	GDM parameters	Group of GDM parameters
	Krasnodar 99, control variety	29,2	2,9	90	II
	Antonina	29,5	3,2	95	II
	Druzhba	30,6	3,0	88	II
	Andijan-2	30,5	3,0	72	I
	Tanya	28,6	2,9	75	I
	Alekseich	29,2	3,0	85	II
	Yogdu	28,6	1,9	75	I
	Mars-1	30,9	3,0	92	II
	Chillaki	29,7	2,9	93	II
	Asr	26,7	2,9	82	II
	Qadr	27,7	2,4	88	II
	Vekha	28,2	3,6	89	II
	Gurt	30,7	3,0	88	II
	Uzbekistan-25	26,4	2,3	90	II

Yuka	28,5	3,1	87	II
Durdona	29,9	2,8	87	II
Kroshka	26,4	2,3	86	II
Grom	28,5	2,5	87	II
Nodir	30,2	3,0	74	I
Pervitsa	29,6	3,0	85	II
Andijan-4	29,9	2,8	91	II
Zvezda	30,1	2,7	89	II
Bezostaya-100	28,5	2,3	95	II
Navbahor	29,4	3,2	90	II
Babur	29,3	2,8	85	II
Wassa	26,0	2,1	95	II
Aziz	30,8	3,0	89	II
Velena	28,9	2,5	87	II
Brigade	27,0	2,2	72	I
Starshina	28,9	2,5	93	II

When we determined the amount of dry gluten in the grain in our experiments, it was observed that it was in the range of 1.9-3.6 grams. The amount of dry gluten in the grains of the Krasnodarskaya-99 variety planted as a control variety was 2.9 grams. Among the varieties, the highest result was 3.6 grams in the Vekha variety, while the lowest result was 1.9 grams in the Yogdu variety.

In the conducted experiments, the index of GDM (gluten deformation measurement) was divided into 5 grade. When determining the groups of varieties according to GDM parameters, Andijan-2, Tanya, Yogdu, Nadir and Brigada varieties were classified as first grade, i.e. “good”, and all other varieties were classified as second grade, i.e. “satisfactorily strong”.

CONCLUSION

Based on the research results, the following conclusions can be drawn:

- In the soil-climatic conditions of Khorezm region, despite the fact that soft winter wheat varieties are grown with the same agrotechnics, the biochemical composition of the grain was observed to be different;
- Among the varieties, the highest result in terms of wet gluten content was determined in Mars-1 (30.9%), Aziz (30.8%) and Gurt (30.7%) varieties;
- Andijan-2, Tanya, Yogdu, Nadir and Brigada varieties were classified as first grade, i.e. “good” according to the GDM parameters;
- Andijan-2, Tanya and Nadir varieties were distinguished by significantly higher gluten and protein content of grain and GDM parameters than other varieties.

In the soil and climate conditions of Khorezm region, it is possible to obtain high-quality grain from soft winter wheat varieties by growing Andijan-2, Tanya and Nadir varieties.

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