

GRAIN QUALITY INDEXES OF SOFT WHEAT VARIETIES

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ANNOTATION

Grain quality indices of winter soft wheat are varied depending on the planting place, agro-practices and soil-climatic conditions. Beside this, there is correlation between amount of protein and gluten in the grain of winter soft wheat, altering of protein amount in the wheat grain depending on the growing condition has also been enlightened in the paper.

Keywords: winter wheat, grain quality indices, soil-climatic condition, correlation, protein, gluten, productivity.

INTRODUCTION

The world population's demand for food and protein is increasing. The demand for plant protein is 1.6 times less than the demand for animal protein by more than 3 times. If the level of vegetable protein consumption is 70 percent, 55 percent of it is accounted for by wheat protein.

Today's modern agriculture of Uzbekistan requires wheat breeders to create high-yield, high-quality soft wheat varieties. Therefore, one of the main directions in wheat breeding today is to improve grain quality along with increasing productivity.

Development of soft wheat varieties of intensive type with high grain quality is important in grain production. The quality of wheat grain is mainly determined by the conditions of growing the plant, based on the genetic characteristics of the variety. The formation of a high and quality grain crop depends on the genetic characteristics of the cultivated variety, soil-climatic conditions, predecessor, feeding and watering regimes. It is possible to increase the amount of protein in grain by 1-5 percent by improving agrotechnical methods, ensuring the norm of the amount of applied fertilizers (mainly nitrogen) [Amanov O, Faizullaev A].

It has been proven in scientific experiments that if the effect of genetic factors determining grain quality indicators is low in a wheat plant, the quality cannot be increased by using high agrotechnics [M. Joraev, R. Siddikov, A. Amanov, T. Orinboev 50].

Weather conditions affect the protein and gluten content of wheat grain. In the formation of grain quality, temperature and humidity are of great importance during plant growth, mainly in the phase of grain filling. At this time, the low moisture content along with sufficiently high temperature leads to an increase in the content of high-quality protein in the grain.

But during this period, as the temperature rises above +35°C, the grain's technological quality indicators decrease. As a result of drought tolerance of plants, grain quality increases. In wet conditions, the drought that continues after the wax ripening period does not have a significant effect on productivity, but can lead to a decrease in grain quality [RS Sharma, Z.Khalikulov, A.Amanov].

As the grain yield increased, its quality indicators decreased. This is due to the fact that the nitrogen accumulated in the leaves and stems of the wheat when the wheat spikes cannot provide the grain with enough protein, and the nitrogen in the soil is used to form the blue mass, and it becomes difficult for the grain to absorb nutrients without sufficient moisture.

Breadability of grain is determined by gluten-forming proteins and rheological properties, and grain quality depends on agrotechnics, genotype and variety characteristics. Wheat grain quality is divided into strong, expensive and ordinary groups.

High-quality bread can be made from durum wheat, with a natural content of 755 g/l, transparency of 60 percent, protein of 14 percent, and gluten content of not less than 28 percent. Strong wheat flour is mixed with weak wheat flour, and when the bread is closed, the volume of the bread increases and the quality improves.

Expensive wheat grain is considered the best raw material for the flour and bread industry, and high-quality bread is produced. The content of such grain is 11-12% protein and 23-27% gluten, the physical properties of the dough are average and the breadiness is high.

A. Amanov stated that wheat gluten contains 3 types of proteins: insoluble fibrin, partially soluble casein and gliadin. The amount and quality of gluten is an indicator of the technological and nutritional value of wheat grain and is determined by the IDK (gluten viscosity measurement) tool.

If the IDK index is 0-15, the quality of gluten is group III very unsatisfactory, if it is 20-40, group II is very satisfactory, if it is 45-75, group I is good, if it is 80-100, group II is satisfactory, and if it is 105-120, group III is unsatisfactory [R. Sharma, O. Amanov, Sh. Hazratkulova].

Soil-climatic conditions, air temperature, amount of precipitation and sunlight affect the accumulation of protein in grain. After flowering, wheat uptake of phosphorus and potassium decreases, but nitrogen uptake continues. Therefore, during this period, the soil should have enough moisture and easily assimilated nitrogen.

If there is not enough nitrogen in grain formation, protein will decrease and grain quality will decrease. When wheat is fed from leaves during earing and flowering, the amount of protein increases by 1.5-3.0 percent, and gluten by 4-5 percent. External factors, cultivation conditions, fertilizers, and climatic conditions also affect grain quality.

Research results. Autumn soft wheat varieties created in our republic and imported from Krasnodar ITI have high yield and protein and gluten conversion properties. However, these characteristics of varieties change strongly under the influence of unfavorable soil and climate conditions. The quality indicators of winter soft wheat grain vary depending on the place of planting, agrotechnics, soil and climate conditions. In addition, there is a correlation between the protein and gluten content of winter soft wheat grain yield, and the protein content of wheat grain tends to vary depending on the growing conditions.

The temperature, humidity, and extension of the winterization period during the plant vegetation period and especially during grain formation are of great importance for grain quality. A decrease in the protein content of winter soft wheat grain was observed in cases of high yield.

In most countries, including our Republic, the body's need for protein is mainly satisfied at the expense of bread products. Our experience shows that the amount of protein and gluten in

grain varies depending on the conditions of cultivation. The strength of flour is determined not by the amount of protein, but by its quality.

According to the results of the research, relatively high indicators of the protein content of soft wheat varieties grown in the northern region among local varieties were observed in Uzbek-25, Yaksart, Babur varieties and amounted to 11.2%, 11.1%, 11.0%, respectively (see table 1). In the remaining varieties, the indicator according to the sign is 10.2%

Table 1 Protein content of soft wheat varieties grown in the northern region (Nukus 2016-2018)

No	Varietal name	Nukus district			
		2016 year	2017 year	2018 year	Average
1	2	3	4	5	6
1	Impartiality	10.1	10.2	10.9	10.4
2	Sharp	10.1	10.5	10.4	10.3
3	Uzbekistan -25	11.2	11.5	11.0	11.2
4	Kuren	11.0	10.1	10.5	10.5
5	Hazrat Bashir	11.0	11.2	10.0	10.7
6	Yaksart	11.0	11.1	11.2	11.1
7	Babur	11.0	11.0	11.2	11.0
8	Floor-1	10.5	10.5	11.5	10.8
9	A masterpiece	10.2	10.2	10.1	10.2
10	century	10.0	10.1	10.5	10.3
11	Krosnodar-99	9.2	9.8	9.1	9.4
12	Zvezda	10.5	10.7	10.6	10.6
13	Grace	11.0	11.1	11.0	11.5
14	Zemnitsa	10.2	10.1	10.5	10.3
15	Grom	11.2	11.3	11.2	11.3
16	Moskvich	10.8	10.9	10.5	10.7
17	Moskovskaya	11.2	11.2	11.5	11.9
18	Ice cream	10.8	10.9	10.7	10.8
19	Vershina	10.9	10.8	10.7	10.8
20	Kalim	10.7	11.0	10.8	10.8

It was noted that it was up to 10.8%. Among the varieties of Krasnodar ITI, relatively high protein content was found mainly in Moskovskaya (11.9%), Gratsiya (11.5%), Grom (11.3%) varieties. In the rest of the varieties, the indicator according to the sign was 10.3% (Zimnitsa) to 10.8% (Zimorodok, Vershina, Kalim).

In our research, it was found that there is a negative correlative relationship between grain quality indicators, protein and productivity. When studying the studied varieties, it was observed that the higher the yield, the lower the grain quality. Or, on the contrary, we can see that the yield is somewhat lower in varieties with a high protein content.

It was noted that the protein content was slightly lower in the high-yielding Garazsizlik, Otkir, Hazrat Bashir and Krasnodar-99 varieties. Instead, Uzbekistan-25 and Moskovskaya varieties with high yield and high protein content were isolated.

The results of the analysis of the gluten content of the soft wheat varieties grown in the northern region showed that the sample Gharazsizlik variety had a gluten content of 28.4%. was equal to .3% (see Table 2). In the rest of the varieties, this indicator ranges from 28.1% (Acute) to 28.5% (Acute). Among Krasnodar ITI varieties, the content of gluten is relatively high in the Grom variety

Table 2 Gluten content of soft wheat varieties grown in the Northern region (Nukus 2016-2018)

No	Varietal name	Nukus district			Average
		2016 year	2017 year	2018 year	
1	Impartiality	28.1	28.2	28.3	28.4
2	Sharp	28.7	28.3	28.5	28.5
3	Uzbekistan-25	29.6	29.1	29.4	29.4
4	Kuren	29.0	29.0	29.1	29.3
5	Hazrat Bashir	28	28.2	28.5	28.4
6	Yaksart	27.9	28.1	28.3	28.1
7	Babur	28.1	28.0	28.5	28.3
8	Floor-1	29.1	29.2	29.3	29.2
9	A masterpiece	29.0	29.1	29.1	29.1
10	century	29.5	29.3	29.2	29.3
11	Krasnodar-99	28.0	28.0	28.0	28.0
12	Zvezda	28.5	28.3	28.5	28.4
13	Grace	28.5	28.1	28.0	28.3
14	Zimnitsa	28.0	27.9	27.9	27.5
15	Grom	29.5	29.7	29.5	29.2
16	Moskvich	28.6	28.5	28.7	28.6
17	Moskovskaya	28.0	28.6	28.6	28.4
18	Ice cream	28.3	28.5	28.4	28.4
19	Vershina	28.6	28.7	28.4	28.5
20	Kalim	28.0	28.1	28.0	28.0

was observed and amounted to 29.2%. A relatively low rate was recorded in the Zimnitsa variety and was equal to 27.5%. At this point, it should be noted that the yield was average in varieties with somewhat higher gluten content.

CONCLUSION

Among the varieties of soft wheat in the conditions of the northern region, Uzbek-25 (11.2 %), Yaksart (11.1 %) and Babur (11.0 %) varieties with a high protein content, Garazsizlik variety with a high gluten content (28.4 %), Uzbekistan-25 variety (29.4%), Kuren variety (29.3%) and Grom (29.2%) varieties were recorded.

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