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Comparison of Sediment Strength of Kazakh and Local Wheat Grains

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ABSTRACT: Increase in the cultivation of wheat in the world, increasing productivity, technological properties, a baker, a decrease of creation of different varieties of grain for flour and bread, pasta and bakery products, production technology complicate studied. This suggests that one of the urgent tasks facing experts in the field is to study the impact of changes in the biological, genetic and botanical properties of local wheat grains to increase or increase their productivity, regional differences in the quality of grain grown are the main obstacles to the production of quality products. The quality of grains grown in the regions of Uzbekistan and Kazakhstan was compared, and the reasons for the significantly higher sedimentation rate were studied. Problems related to wheat yield and quality, water availability, soil fertility, environment, pests and diseases were studied.

KEYWORDS: wheat, flour, dough, sedimented sediment, gluten, sediment, protein, enzymes, sediment content, pests, crude gluten, harmful sediment, functional properties, technological properties, quality indicators, wheat grain strength, high temperature.

I. INTRODUCTION

Movements during the years 2017-2021 Strategy of the Republic of Uzbekistan "... the sphere of agricultural production intensive methods, particularly adapted to local soil and climatic and environmental conditions selection new varieties of agricultural crops, grain crops Special attention was paid to the introduction of modern agro-technologies in the fields, especially the development of grain growing.

International statistical reports that are currently produced in the countries of the world total wheat production of 772 million tons. China, India, Russia, the United States, France, Canada, Pakistan, Ukraine, Australia and Germany are among the top 10 wheat-growing countries. The most important tasks in the cultivation of winter wheat varieties are the introduction of intensive agro-technologies, along with increasing grain yield, efficient use of irrigated land, improving the technological quality of grain[1].

Its assessment of the strength of the grain of wheat will be determined by the following indicators: the amount of protein, glassy, the quantity and quality of raw features. In this case, the main indicator is the volume of bread. Its potential is fully determined using standard baking.

Determination of the strength of wheat grains by sedimentation is a method of measuring the technological properties of bread. Sediment is a chemical method of checking the quality of wheat for baking bread. Sediment analysis complements the data on gluten content and quality. This is one of the most important indicators of test quality. Sediment number objectively describes the quality and quantity of gluten in wheat grain (as the number increases, the swelling of gluten increases and its cooking properties improve) [6,7].

Another name for this method is the determination of the sedimentation index by the Zeleni method, which is the volume of sediment from a suspension of wheat flour in a solution of lactic acid. This method was invented in 1947 by L. Zeleni [4,5,13].

The sediment tester is often ordered by grain exporters. Sediment number is one of the criteria for determining the quality and price of wheat sold.

According to experts, the low sedimentation rate is also due to the fact that wheat grains are infested with tortoiseshell mites [2,6,7].

Anatoly Syurtukov noted that flour made from insect-infested grain has the same appearance as flour made from healthy grain. This is because the enzymes react in a humid environment and lose their properties in a dry environment.

But once the dough is kneaded, the enzymes start working again. The dough will be sticky and dense, with a dark gray color. That is why he has shown in his scientific research that such flour cannot be used for baking [14].

In his research, M.A. Avramenko emphasizes the importance of sedimentary sediment in the creation of new frost-resistant varieties, the low sedimentation rate does not allow the varieties to develop well, and the resulting product is low in protein, crude gluten content and quality. studied the negative effects.

A. R. Markarova also studied the germination of several types of wheat grains using the SDS-sedimentation method and studied the effect of sediment on germination and changes in the quality of harvested wheat grains [6,10].

Research materials and methods: Determination of wheat grain strength by sedimentation is carried out in the following sequence. 100 grains are ground in a laboratory mill and sieved using a sieve with a hole size of 150 or 200 microns. 3.2 grams of flour are added to a 100 ml stopper glass cylinder (the glass cylinder must be weighed with a section of 0.1 ml). Pour 50 ml of distilled water mixed with blue bromphenol dye on it (50 ml). The stopwatch starts (it does not stop until the end of the detection process). Close the cylinder with a stopper and mix thoroughly in a horizontal position for 5 seconds to form a single-suspension suspension. The cylinder is placed in a vertical position with the suspension for 55 seconds. The stopper is then removed and a 25% solution of 6% acetic acid is added. The cylinder is closed and rotated 4 times for 15 seconds, holding the stopper well with the finger. The cylinder is then left at rest for 45 seconds. The cylinder is then rotated 18 times slowly for 30 s, the cylinder is left at rest for 5 s 3 times, and then a volume of sediment sediment to a precision of 0.1 ml is observed. If a small portion of the sediment floats to the surface of the solution, it can be incorporated into the main sediment. The volume (ml) of sedimented sediment with respect to 14.5% moisture is calculated according to the following formula:

$$V = V_{Eksp} \left(\frac{100 - 14,5}{100 - W_x} \right);$$

Here: V_{Eksp} - the actual experimentally measured value of the sedimentary sediment, ml;

W_x - the actual moisture content of the flour under study, %.

The following approximate criteria are recommended for estimating the non-binding strength of grain by the value of sedimented sediment (Table 1): $W_x=11,9\%$ [2].

1-jadval

Flour category	Sieve announcement	
	150 m.km	200 m.km
Very strong	>60	>45
Strong	60...40	45...30
Moderately strong	40...20	30...15
Weak	<20	<15

YÜCEBAŞ MACHINERY Y15 using a sedimentation sediment detection device (Figure 1) to determine its



quality based on the amount of sediment in wheat and flour samples. If the precipitation values in wheat are low, it means low protein quality. The sedimentation device works on the principle of analysis for 5 minutes. The user can perform tests with 6 different samples at the same time. The device does not have any buttons to control the device. The device can be controlled directly from the touch screen LCD. The device is suitable for sedimentary rock and modified sedimentary rock tests. During the rest period of the modified sedimentation test, the user can take a sedimentation test. On the touch LCD display, the user can see the rest time of the Modified Sedimentation Test in minutes when performing another Sedimentation test. The test period, vibration number, internal temperature, date and time of the device can be easily seen on the screen [12].

II. RESULTS AND DISCUSSIONS

In this study, Kazakhstan and local wheat grains were compared, and the main goal in the comparison process was to determine the degree of interdependence of grain quality indicators and how they are affected by the region of cultivation and the effect of changes in the amount of sedimentation of wheat grains using sedimentary sediment on other quality indicators. Existing standard methods are used to perform technological analysis of the wheat grains under study.

The obtained sample was analyzed according to the following standards: wheat moisture in accordance with GOST 13586.5-85, the nature of wheat grain in accordance with GOST 10840-64, the strength of wheat grain in accordance with GOST R 51403-99 sedimented sediment The strength and quantity of gluten in wheat according to GOST 23586.1-68 were determined.

Studies and results have shown that the amount of sedimented sediment in the varieties “Astana-2” in Kazakhstan and “Sila” in Uzbekistan, which have similar quality indicators, differed significantly. This shows that the amount and quality of raw gluten in wheat grains, as well as the impact of latent and overt pests during the ripening and storage of wheat grains, is very large (Table 2).

Table 2

S/n	Wheat growing area	The amount of gluten , %;	Gluten quality is an indicator of IDK	Humidity , %;	Nature , g/l;	Sedimentation rate
1	“Sila” (Uzbekistan)	27	86	10,2	760	36
2	“Astana-2” (Kazakhstan)	26	75	12,8	800	52

Studies by J. G. Nuttall et al have shown that maintaining the quality and functionality of wheat grains, which are important for human nutrition during climate change, can reduce yields as a result of rising consumption values and temperatures[2]. Reduces the ratios of gluten / gliadin proteins under the influence of high temperatures and limits the synthesis of large amounts of insoluble SDS gluten polymers, which leads to a deterioration of the elastic properties of flour dough from wheat grains.

According to A.D. Nikolayev’s research, the quality of wheat grain depends on previous generations, which for the newly obtained variety contained 15.2% protein, 43.5% crude gluten, 16.0% dry gluten. The high content of raw protein, crude and dry gluten in fresh wheat bran provides the soil with the necessary nutrients and moisture, according to the researcher [8].

Changes in the physical properties of gluten under the influence of various factors, for example, under the influence of high temperatures (as a result of overheating of the grain during hard drying, self-heating, under the influence of dry winds) they swell and gluten is found to lose its natural properties.

Another reason for the significant difference in the results of sedimentation is the **Eurygaster integriceps Put.**, which is the main pest of wheat grains. was estimated to occur as a result of damage by. Harmful weed - **Eurygaster integriceps Put.** damage during the accumulation, threshing, threshing and ripening of wheat. Harmful weeds overwinter as they mature into plant debris and leaf litter. During the third decade of March, April, it begins to fly towards the fields. During the tubing period, the damaged stem does not produce spikes or becomes completely white (i. e, empty). As a result of damage to unripe corn, the amount of protein and gluten in the grain decreases. Infection of 2% of grains in the grain with harmful weeds makes such grains unfit for flour production. Reduces wheat yield by up to 60%. The germination of the obtained seed grain is reduced by up to 50%. Harmful weeds reproduce once a season [1]. Regionally, Uzbekistan is a southern region compared to Kazakhstan, and the summer season begins hotter and



earlier. Due to this, the main pests of wheat grains cause great damage to the grains during milk ripening and wax ripening, which leads to differences in grain quality.

III. CONCLUSION

Due to the southern part of the country, the moisture content of wheat varieties is significantly lower. This has been shown to cause a number of complications in their processing. In particular, it was found that the effect of hydrothermal treatment on the baking properties of these varieties of wheat has not been studied. [9].

The sowing period of autumn soft wheat grain has a significant impact on the entire cycle of plant development, grain yield and its technological quality, as the completeness and suitability of seedlings of autumn soft wheat, the growth of plants during the autumn growing season it has been theoretically studied that the rate of growth and development, the determination of the passage of maturation stages increase its winter hardness.

The study also found that different weather conditions did not have the same effect on the quality of wheat grains of the same variety. Y.N. Titov's research shows that when one variety of wheat is grown under the same conditions and in different weather conditions, one of them leads to a 0.3-1.3% increase over the other, which suggests that the variety does not depend on protein content. [10].

REFERENCES

1. Wheat cultivation [Text]: scientific edition / "Agrobank" B 95 ATB.-Tashkent: "Image" publishing house, 2021.- P. 76.
2. Nuttall, J.G. Models of grain quality in wheat // Nuttall J.G., G.J.O'Leary, J.F.Panozzo, C.K.Walker, K.M.Barlow, G.J.Fitzgerald // Field Crops Research. – 2017. V. 202. – P. 136-145.
3. Xaitov R.A. etc. Evaluation and quality control of grain and grain products // Tashkent: "University" -2000. P. 256.
4. Zeleny L. A simple sedimentation test [Text]. // Cereal Science Today. -1962.-V.7.-P. 226-2.
5. Zeleny L. A simple sedimentation test for estimating the breadbaking and gluten qualities of flour [Text], // Cereal Chem. -1947. -24. - 6. - P. 465-475.
6. A.R. Markarova, The relationship of grain quality of winter soft wheat with productivity and resistance to frost, diseases and pests in the south of the Rostov region // Zernograd-2012. P.166.
7. Avramenko M.A.Study and use of the initial material according to the SDS-sedimentation test in the selection of durum wheat for quality // Krasnodar -2017. P. 192.
8. Nikolaev A.D. Influence of predecessors on the quality of spring wheat grain / A.D. Nikolaev // Sat. scientific. tr. Buryat Agricultural Institute. –2012. - P.41-43.
9. Ravshanov S.S., Tursunkhodzhaev P.M., Khusanov I.N. Influence of moisture on the ultimate strength of wheat grain and its model of stress-strain state // Journal "Chemistry and Chemical Technology". -Tashkent, 2008. - № 3. - P. 65-70.
10. Samofalova N.E. Use of the SDS-sedimentation method in assessing the quality of the source material of durum winter wheat // Samofalova N.E., Leshchenko M.A., Samofalov A.P., Kopus M.M. // Grain economy of Russia - 2014. -No4 - P.25-31.
11. Titov, Yu.N. The influence of soil and climatic conditions on the reaction of varieties by protein content / Yu.N. Titov, F.M. Strizhova // Bulletin of the Altai State Agrarian University. - 2007. - № 10 (36). - P.28-32.
12. <http://metronltd.com/single.php?lang=en&cat=3|4|0&uid=48>
13. <https://docs.cntd.ru/document/1200028476>
14. <https://www.zol.ru/n/19b30>



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