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# THE IMPORTANCE OF WINTER WHEAT PLANTING AND AGROTECHNICAL MEASURES TO IMPROVE THE QUALITY OF GRAIN

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**Abstract**
Plant growth and development conditions, as well as grain formation, have a major impact on crop quality and quantity. It should be borne in mind that a variety of seeds sown in different climates and soil conditions can develop and produce differently. Accordingly, their chemical composition, structure, completeness, size and other technological quality indicators will be different. Fertilizing also has a big impact on grain quality.

**Keywords:** technological, norms, hectare, protein, gluten, nature, background, innovation, improvement, optimal term, drought, biological, agrotechnical, fertilizer, quality, loss, physiological, quantity, yield.

The main part of cereals in the country is winter wheat. The area of this crop is 1,134,000 hectares in irrigated areas. The increase in grain yield in irrigated areas leads to a decrease in technological quality of grain. Due to this, improving the technological quality of grain is one of the most pressing tasks today.

The impact of sowing times and standards on wheat grain quality indicators has been studied by many researchers in our country and abroad also.

They noted that when sown at optimal times, wheat yielded high yields and grain quality indicators: natural weight, 1000 grain mass, glassiness, protein content, gluten content. (Sobka et al. 1978; Khafizov, 1988; Remislo, Sayko, 1981; Khalilov, 1994; Ravshanov, 1999, et al.). One of the quality indicators of grain is the mass of a thousand grains, the size and fullness of the grain. This figure varies depending on the growing environment of the plants, the location of the grain in the variety.

The mass of a thousand grains is not only an indicator of the quality of the grain, but also represents the conditions under which the wheat grows. When grain is formed under drought conditions under the influence of high temperatures, the mass of 1000 grains decreases, but the amount of protein increases. (Almanov, 1978; Netis, 1989). Sozinov A.A., Jemela G.P. (1983) showed that 1000 grain mass and natural weight were highest when planted at optimal times. When planted in late and early periods, 1000 grain mass and natural weight were reduced.

All agro-technical measures lead to an increase in yield and crop quality. Unfavorable external environment and internal factors, bed rest, disease and pest infestation reduce the grain mass by 1000.

In our scientific experiments, the timing and norms of sowing had a significant impact on the quality of durum wheat varieties. In terms of the interaction of sowing times and norms, the mass of 1000 grains was higher at the optimal sowing time. When planted early and late, this figure is significantly reduced.

With the increase of sowing norms, the mass of 1000 grains in all sowing periods decreased in both varieties, i.e. Tanya and Krasnodar-99. In the Tanya variety, it was observed that the mass of 1000 grains was significantly higher than in the Krasnodar-99 variety at all sowing times and norms.

The nature of the grain is its weight per unit volume. The higher the specific gravity of the grain and the more grains of a certain size, the higher the nature of the grain. The nature of the grain is influenced by the shape, completeness, surface, density of the grain mass. Its release from the frost also depends to some extent on its nature.

The nature of the grain varied depending on the wheat navigation, sowing times, and norms, with the highest grain nature observed in both varieties at optimal sowing times. In Tanya and Krasnodar-99 varieties when sowing was carried out early, the grain yield averaged 799 according to the varieties; 793 g/l. During the optimal sowing period, the grain yield increased by 9.8 g/l. With the delay of the sowing period, the grain nature decreased. At the optimal sowing period, the grain yield in Tanya was 6-8 g/l higher than in Krasnodar-99.

Planting norms also have a significant effect on the nature of the grain. With the increase of sowing norms in Tanya and Krasnadar-99 varieties from 3 million to 5 million per hectare, the nature of grain decreased to 19-21 g / l, depending on the variety.

There is a direct relationship between the glassiness of the grain and the amount of protein and gluten in it. Therefore, a grain with a high glass content will have the best quality baking properties. The vitreousness of a variety depends on its biological properties and is a sign of variety and species.

In our experiments, the vitreous variability of the grain varied depending on the type, variety, sowing dates, and norms of the wheat. It was observed that the glassiness of the grain was higher in the Tanya variety than in the Krasnodar-99 variety. Grain vitreousness was high in both varieties at optimal sowing times. When sown early and late, the glassiness of the grain decreases. When the effect of the increase in sowing rates on grain vitreousness was studied, it was observed that with the increase of sowing norm in Tanya variety from 3 million to 5 million per hectare, grain viticulture decreased by 10% and in Krasnodar-99 variety by 5%.

The mass of 1000 grains, the nature of the grain and the vitreous were significantly higher than the Krasnodar-99 variety of durum wheat of durum wheat at all sowing times and norms.

In the conditions of Kashkadarya region, the formation and conditioning of durum wheat of Tanya variety with high quality is achieved when sowing is carried out at the optimal time (October 20) and in the norm (5 million germinated seeds per hectare).

Technological quality indicators of grain include such indicators as protein content, gluten content, grain gloss, nature, flour strength, viscosity, bread volume. Data on grain quality requirements are given in Table 1.

Table 1. Requirements for grain quality

| Quality level | Gloss, % | Grain content, 100 g of protein, % | Gluten, % | Bread size, м³ |
|---|---|---|---|---|
| Strong | 86-100 | 14-19 | Above 28 | 600 and above |
| Medium | 70-85 | 12-14 | 25-28 | 400-600 |
| Weak | Below 70 | Below 12 | Below 25 | 400 and below |

The advantage of wheat as a food crop is that, together with the protein water in it, it has the property of forming an elastic, elongated mass, i.e. gluten. Gluten is the main carcass in baking. From 100 grams of high-quality wheat flour it is possible to make up to 1000 cm³ of quality bread. Such flour is not only a source of nutrients, but also a catalyst for other types of flour. One of the important technological quality indicators of grain is the amount of protein in the grain. The vital activity of all organisms depends on the activity of proteins. Everyone should consume an average of 100 grams of protein per day to lead a normal life, of which at least 50-55% is plant protein. Plant protein is easily digested, it does not contain cholesterol, which is difficult to digest in the body. In many countries, including Uzbekistan, the body's need for protein is met mainly by bread. The amount of protein in the grain is important for good baking. There is a direct relationship between protein intake and gluten. The quality of wheat grain, in particular the amount of protein in the grain, increases as it moves from northwest to southeast. The quality of wheat grain is intensely illuminated by a short-wave (380-470 mmk) spectrum and the climate is highest at relatively warm temperatures. Soil fertility and climatic conditions play a decisive role in the formation of high-quality grain only in conditions of extensive farming. In the context of intensive farming, as soil fertility is used more efficiently, other factors begin to play a decisive role. It is known that when grown in the steppe region, the grain content of most strong wheat varieties is 15-17% protein and 30-35% gluten. The effect of sowing times on irrigated grain quality under irrigated conditions has been studied by A.A Amanov, Kh.N. Atabaeva, B.M Azizov and other scientists. In order to grow a quality grain crop from winter wheat under irrigated conditions, seeds of late varieties should be sown in the second half of September, seeds of medium varieties in the first half of October, and early varieties in the second half of October. When the seeds are sown earlier than planned, the plant suffers from root rot and dormancy, which in turn negatively affects the quality of the grain.

Under irrigated conditions, as the yield of wheat grain increases, the amount of protein and gluten in the grain decreases. The main reason for the decrease in protein and

gluten in the grain is the lack of nitrogen that the plant can absorb in the soil as the grain yield of winter wheat varieties increases.

First, it depends on the nature of the assimilation of nitrogen by the plant. For example, if the assimilation of phosphorus and potassium fertilizers by the plant continues until flowering, the assimilation of nitrogen continues even after flowering. During grain formation and filling, wheat requires about 20-30% of its nitrogen needs. However, in many cases, a lack of nitrogen is observed in the soil during this period, especially when such a high yield is observed and leads to a decrease in grain quality. In order to maintain a high grain yield and quality, it is necessary to fully meet the plant's need for nitrogen fertilizers throughout the season. The positive effect of mineral fertilizers, especially nitrogen fertilizers, on the technological quality of grain has been studied in the scientific works of V.N. Remeslo (1977), P.P. Lukyanenko (1990), N.G. Malyuga (1992), A.A. Amonov (2003), R. Siddikov (2006) and others. To improve the grain quality of winter wheat, 20% of nitrogen (N) fertilizers should be applied in the early stages of development, the authors say.

Table 2. The effect of nitrogen nutrition on the quality of winter wheat grain

| Options | Grain composition, % | | Protein composition, % | | |
|---|---|---|---|---|---|
| | Protein | Gluten | Albulin + glibulin | Gliadin | Glyutein |
| RK(Fon) | 11.06 | 25.8 | 3.04 | 4.23 | 4.11 |
| Fon+N200 gathering | 12.62 | 27.0 | 3.15 | 4.25 | 3.85 |
| Fon + N 100 kg accumulation, 100 kg tube | 13.2 | 27.2 | 2.82 | 4.33 | 3.38 |
| Fon + N 80 kg accumulation, 80 kg tube, 40 kg spike. | 14.3 | 30.3 | 2.74 | 5.06 | 4.16 |

From the data in the table above, it can be seen that in the early flowering stage of winter wheat development, supplemental nitrogen feeding has a positive effect on protein content, as well as an increase in grain protein content by 1-1.5%. That is, it provides a significant increase in the amino acids gliadin and glutelin in the protein. Grain quality depends on soil and climatic conditions along with crop care.

According to the results of the study, the protein content of grain in dry conditions is 17-18%, in irrigated conditions - 13-14%, in mountainous areas - 9-10%, in winter wheat - on average 11-12%.

Experiments have shown that sowing seeds at a relatively early stage, ie in the second half of September, has a positive effect on grain quality.

Seeds do not germinate fully due to lack of effective temperature when seeds are sown later than scheduled. Because the plant is sparse, weeds multiply in the field, and the

plant does not have time to enter the accumulation phase of development until the first frost enters. Lagging behind in growth and development, the flowering and harvesting period of the plant falls in the second half of May to early June. During this period, some days when the temperature is above 30$^{o}$C has a negative impact on grain formation, grain quality deteriorates significantly.

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