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The Formation of the Nutrient Medium in the Soil is Influenced by Varieties and Fertilizer and Its Impact on Grain Yield of Winter Wheat

Samad Makhammadiev[1], Sattarov Djurakul[2], Atoev Bakhtiyor[3], Zafarjon Jabbarov[4], Bakhrom Jobborov[5], Turgunov Muzaffar Mirzarakhmatovich[6], Muydinov Khoshimjon Gulomovich[7]

[1]Department of Soil Science, National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan.
E-mail: mahammadiev3@gmail.com
[2]Department of Soil Science, National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan.
[3]Research Institute of Soil Science and Agrochemistry, Tashkent, Uzbekistan.
[4]Department of Soil Science, National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan.
E-mail: jabbarov@gmail.com
[5]Department of Ecology, National University of Uzbekistan named after MirzoUlugbek, Tashkent, Uzbekistan.
E-mail: jobborov@mail.ru
[6,7]Department of "Agrochemistry, Soil Science and Technology of Organic Products, Andijan institute of agriculture and agrotechnology, Andijan Uzbekistan.

Abstract: Fertilizers are an effective and fast-acting factor in increasing yield and grain quality. In this regard, in order to solve the problem of cultivating a high and high-quality wheat yield, it is important to pay attention to the properties and characteristics of soils and varieties, the development of an optimal system for the use of mineral fertilizers, the formation of a good nutrient medium in soils and the creation of the chemical composition necessary for plants, which is relevant. ... When fertilizers (chemical substances) applied to the soil meet with the soil solution and the soil-absorbing complex, they enter into a chemical reaction and form a new chemical substance. As a result, changes occur in the amount and ratio of nutrients, on the basis of which an appropriate nutrient medium for plants is formed. By forming an optimal nutrient medium in the soil, you can get a high quality grain yield. Sometimes there is a concept - once fertilizer is used, it means there will be a good harvest. But this is not the case. When developing a mechanism for improving grain quality, in addition to fertilizers, it is necessary to take into account the genotypic characteristics of varieties. Since the needs of different varieties for nutrients are different, they have their own reactions to the nutrient medium in the soil. Our research was carried out on an irrigated typical sierozem, widespread in the Kibray district of the Tashkent region. The results of the analysis of soils showed that, in terms of the mechanical composition, all horizons of the soil profile are medium loamy, in the arable layer fractions of more than 0.25 mm are 0.5%, 0.05-0.01 mm - 54.4%, fractions less than 0.01 mm - 38.7%. In this layer, the humus content is 1.56%, CO2 is 0.90%, the amount of total nitrogen is 0.13%, phosphorus is 0.14%, potassium is 1.61%, the ratio of carbon to nitrogen is 6.80, in the arable layer, the amount of nitrate nitrogen is 27.5 mg /

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kg, mobile phosphorus - 37.0 mg / kg, exchangeable potassium - 283.7 mg / kg, and the content of these elements in the underlying horizons decreases. Field experiments of 8 options were carried out during 2010-2012 (sowing of winter wheat was carried out in October 2009) on the territory of the "Educational-experimental and research station" of the Tashkent State Agrarian University with 3 varieties of winter wheat - Tanya, Khosildor, Polovchanka in 3 replicates. The optimal fertilizer option is noticeable from the emergence of seedlings, growth, and development of the plant. A relatively high and high-quality grain yield was formed for the Tanya variety on the $N_{250}P_{150}K_{150}$ kg / ha variant, for the Polovchanka variety - $N_{250}P_{150}K_{150}$ kg / ha, for the Khosildor variety - $N_{200}P_{100}K_{100}$ kg / ha. On irrigated typical gray soil, the variety and fertilization have a specific effect on the formation of a nutrient medium on which the cultivated winter wheat grows, develops and forms the appropriate yield. It is very important to determine (establish) the nutrient medium in the soil, which forms the maximum grain yield with good quality.

Key words: soil, arable layer, variety, mineral fertilizers, nitrogen, phosphorus, potassium, mobile forms, nitrates, ammonium nitrogen.

Introduction

Having studied in different options (soil-fertilizers) the formation of a nutrient medium in the soil under the influence of fertilizers and varieties, it is possible to establish the environment that forms the maximum yield with good grain quality. A similar experiment must be carried out on different soils, i.e. each soil creates its own nutrient medium based on its properties and state. In addition, the formation of a high yield with good grain quality on a particular nutrient medium depends on the specific reaction of the crop variety [24, 25]. Therefore, in order to obtain a high grain yield, it is necessary to establish the optimal nutrient medium on a specific soil for a specific variety of winter wheat.

In this regard, the response of different varieties of winter wheat to different rates and ratios of mineral fertilizers was studied on the same soil.

This fertilization scheme will allow you to determine the fertilized version of the highest and highest quality yield. In the soil of this option, you can determine the most optimal nutrient medium for the plant. A number of authors have carried out interesting scientific works on this problem. They emphasize that an increase in the rate of nitrogen fertilizers leads to a significant increase in the gluten content in wheat grain (Linser, H .: 1955, Pelshenke, P.F .: 1938, Petersburg, A.V. 1957, Selke, W .: 1938). An increase in the amount of gluten in the grain increases the volume of dough and bread (A. Akerman, 1938).

A.A. Sobko, E.V. Nikolaev, I.D Filipyev (1973) grain powderiness was divided into the following groups: 76%, high, 75.9-73.0% above average, 72.9-70.0% average, 69.9-67.0 % below average 66.9% low.

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I.K Boldirov (1959) in rainfed conditions established that if during the flowering period in the upper 4 leaves the nitrogen content is higher than 2.7–3.0%, then the grain forms a good quality. If the nitrogen content is less than 2.70%, it will be impossible to obtain grain of good quality without additional application of nitrogen fertilizer, since there is a correlation between the nitrogen content in the leaves of the flowering phase and the amount of puppy in the grain in the amount of up to 0.9–1.0%. On the 12th day of flowering, if the nitrogen content in the leaves is less than 1.7%, then the protein in the grain does not exceed 12%, Seiberg and Fishbeck (1997) wrote. Consequently, the nitrogen content in plants during the flowering and heading period predicts the quality of the grain (M.M. Strelnikov, 1977).

A German scientist (F. Vettel, 1956), on the basis of more than 50 field and vegetation experiments, came to the conclusion that it is very difficult to increase the gluten content in grain through selection, but with the help of optimal rates and ratio of fertilizers, this can be easily increased.

Scientific research carried out in foreign countries has shown that the use of nitrogen fertilizers increases the content of albuminous compounds, raw gluten, etc. (Parades lopez, et al. 1985)

In the experiments of J.R. Abrol and others, with an increase in the NPK dose in fodder wheat, gluten and protein in the grain increase. When fractionating the protein, it was found that prolamine and glutelin increase, the cytoplasmic protein decreases (J. Abrola).

As many researchers wrote, the yield and protein structure in grain depends on the variety and the use of fertilizers (She et al 2010, Shi-Zhao et al 2011, Zhong Zhi et al, 2012; Fang Jiao et al, 2012, Borkovskiy 1993). The authors emphasize that there is a direct relationship between NP and wheat gluten.

In the Shangdong province of China, experiments with wheat varieties "Zhimai 20" were carried out against the background of 3 t / ha of organic + $P_{225}K_{150}$ kg / ha of mineral fertilizers using N_0, N_{150}, N_{225}, N_{300} kg / ha. On N_{225} kg / ha, the largest number of grains in one ear was obtained and the yield was 91.35 c / ha. In the composition of grain, with an increase in the nitrogen fertilization rate, an increase in albumin, globulin, glutenin and a decrease in the hemadin content occurred. The remainder in the protein composition noticeably increases with an increase in nitrogen fertilization rates up to 300 kg / ha, against the background of nitrogen fertilization of 0–150 kg / ha, gluten increases sharply, and against the background of 150–300 kg / ha it remains at the same level (Dandan Liu and Yan Shi 2013).

The main indicators of the quality of the winter wheat crop are as follows: shape, size, uniformity, grain colors, quantity and quality of protein, gluten, fats, starch, etc. there are authors who write that there is a negative correlation between the increase in the quantity and quality of

grain harvest. However, the authors note that such a correlation is not always found. Only when the yield rises to a potential maximum (M.A. Fomenko, A.I. Grabovets, 2017). With low, medium and even higher average yields, the quantity and quality of grain continue to increase in parallel.

According to the results of research by Nevolina K.N. (1912) on soddy-podzolic heavy loamy soils after two harvests of alfalfa against the background of mineral fertilizers $N_{30}P_{30}K_{30}$ + N_{30} kg / ha, winter rye and triticale yielded 4 t / ha each, winter wheat 3 t / ha grain yield of good quality. In the studies of other authors, winter rye against the background of fertilizers $N_{95}P_{45}K_{40}$ kg / ha increases the grain yield, but the protein content slightly decreased (Zhukov Y.P., Chukhina O.V., Kulikova E.I., Usova K.A., Tokareva N. V., 2011).

In the studies of O.V Makshakov, the use of organic and mineral fertilizers together (3–6 tons of manure + $N_{50}P_{50}K_{50}$ kg / ha) increased the yield by 20–23%, with a high content of whitefish (Makshakova O.V 2014).

The number of irrigations and fertilizers also influenced the yield and quality properties of durum wheat varieties (Istiklol and Aleksandrovka). In both varieties, protein was 16.8–17.5%, gluten 34–35.2%, vitreousness 87.4–89.1% (Turdieva, Boboeva X, Boimirzaeva. 2014).

A.A. Kryushina (2017) writes that selenium (Se) leads to the accumulation of nitrogen and potassium in the plant, as a result increases the synthesis of protein and gluten.

H. Linser (1955), P.F. Pelshenke (1938), A.V. Petersburg (1957), V. Selke (1938) emphasized that a high rate of nitrogen fertilizers significantly increases gluten in the grain (Linser, H. : 1955, Pelshenke, P.F: 1938, Petersburg, A.V. 1957, Selke, W .: 1938). An increase in the amount of gluten in the grain increases the volume of dough and bread (A. Akerman, 1938).

However, in the republic, insufficient research has been carried out to establish the optimal norms and ratios of mineral fertilizers, to create an appropriate nutrient medium in soils to ensure sustainable assimilation of nutrients by plants by winter wheat cultivated on irrigated typical gray soils of the Tashkent region, in order to obtain a high and high-quality harvest of winter wheat grain.

The purpose of the work is to develop an optimal system for the use of mineral fertilizers, ensuring high and high-quality grain yields of winter wheat varieties on irrigated typical gray soils of the Tashkent region, establishing against this background the norms and ratios of mobile N–NO_3:P_2O_5:K_2O in the soil at certain stages of plant development , the amount and ratio of NPK in plants, and develop a standard based on these indicators.

Objects and research methods. Field and production experiments were carried out according to the methodological guidelines "Methodology of field experience" and "Methods of conducting field experiments." The selection of soil and plant samples and their chemical analyzes were carried out according to the "Methods of agrochemical analyzes of soils and plants in Central Asia", the

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quality indicators of winter wheat grain, their milling and baking properties were carried out on the basis of the manual "Grains, legumes and oilseeds". The obtained results of the experiment were processed by the method of statistical analysis of variance according to B.A Dospekhov based on the Microsoft Excel program. Mobile nitrogen (nitrates) according to the Granwald method - I'm lying. Mobile phosphorus and potassium by the method of B.P. Machigin and P.V. Protasov (1% solution of $(NH_4)_2CO_3$). Weight of 1000 grains according to GOST 10842–76. Protein in grain according to GOST 10846-74. Content and quality of gluten in grain according to GOST 13586.1–68.

In 2010–2012, field experiments were carried out on typical old-irrigated serozem of the Tashkent region according to the scheme presented in Table 1. The experiments used urea (46% N) ammophos (11–12% N, 46% P_2O_5) potassium chloride (60% K).

Table 1.

Fertilizer application scheme for winter wheat under conditions old irrigated typical gray soil, kg / ha

№	Annual rate of mineral fertilizers			Under the chill			When sowing			When tillering			When earing	At milky ripeness
	N	P	K	N	P	K	N	P	K	N	P	K	N	N
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	150	100	50	30	70	25	20	30	25	50	-	-	50	30
3	200	100	50	30	70	25	30	30	25	60	-	-	70	40
4	200	100	100	30	70	50	30	30	50	60	-	-	70	40
5	200	150	100	30	100	50	30	50	50	60	-	-	70	40
6	200	150	150	40	100	100	30	50	50	60	-	-	70	40
7	250	150	150	40	100	100	40	50	50	70	-	-	90	50
8	250	200	150	40	140	100	40	60	50	70	-	-	90	50

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Results. The experimental site is located on the territory of the III terrace of the Chirchik river. Indicators for relief, erosion, etc. the same as in the limit of the Tashkent fog.

Soil samples were subjected to chemical analysis. According to the results of the analysis, the highest content of total nitrogen was determined in the solid phase of the soil of the arable layer. In the arable layer of the studied soils, the content of mobile forms of nitrogen, phosphorus and potassium, respectively, is 24.7, 32.6, 246.7 mg / kg of soil. In deep soil horizons, their content decreases.

In the irrigated soils of Central Asia, it has been established that mobile forms of nitrogen are very dynamic. The ammonia form of nitrogen, after being applied to the soil, will completely transform into the nitrate form in a week. Nitrates are not absorbed by the soil AUC, they quickly dissolve in soil moisture and, under the influence of irrigation, are washed out to a depth of 40–60 cm. At the same time, in the process of moisture evaporation, nitrates simultaneously rise to the soil surface. As a result, in the upper soil horizons, the content of nitrates is restored to the level before the irrigated period, sometimes nitrates accumulate even more than before irrigation.

There is also a lot of literature on the changes in the content of different forms of phosphates, but the opinions on this issue are very different. Some researchers believe that phosphorus is immutable and immovable. Because the high content of Ca^{+2} ion in gray soils quickly binds phosphorus anions and poorly soluble phosphorus compounds are formed. According to the data of chemical analyzes of soils, the highest content of mobile forms of phosphates is found in the arable layer (32.6 mg / kg), and in the subsoil there is a small amount of mobile phosphorus. Consequently, phosphorus fertilizers applied to the topsoil cannot increase the content of mobile phosphorus in deeper horizons. In the irrigated gray soil in the arable layer, the reserve of mobile potassium is greater than that of phosphate. Proceeding from this, some experts believe that potash fertilization is not necessary when growing winter wheat. However, in foreign countries (China, USA), experiments have proved the high efficiency of potash fertilizers for any crop, especially for winter wheat. The formation of a high yield of agricultural crops provides mainly a nutrient medium in the soil after fertilization. Because it is from this environment that the plant feeds, builds its structure and forms the harvest. Establishing a nutrient medium in the soil on one or another soil that allows you to get a high yield is of great practical importance.

The smallest significant difference (HCP_{05}) with 95% probability for the variety "Tanya" in 2010 was 2.4; in 2011 - 4.38; in 2012 it was 3.82 and the average difference was 3.55 c / ha. It was found that in variants 5 and 6 with the "Tanya" variety, HCP_{05} was relatively high relative to other variants. The average HCP_{05} index for the "Khosildor" variety was noted on options 4, 5 and the difference was 3.49 c / ha, for the "Polovchanka" variety on options 5, 6, 7, where the average difference was 4.03 c / ha.

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On irrigated typical gray soil, a field experiment with three agility was carried out, consisting of 8 options for fertilizers with winter wheat varieties Tanya, Khosildor and Polovchanka. In the control variant, the content of mobile nitrogen, phosphorus, and potassium in the soils gradually decreased towards the end of the growing season. In the soil, variants with fertilizers nitrogen, phosphorus and potassium change according to the same scheme, but in a more increased amount.

However, it should be noted where such a change in elements in the soil, for different varieties and for different rates and ratios of fertilizers occurs in different ways.

This situation can be explained by the consumption of nutrients by winter wheat varieties and the use of different rates of fertilizer ratios. Varieties Tanya (68.35 c / ha) and Polovchanka (70.23 c / ha) showed the highest grain yield against the background of mineral fertilizers with an annual rate of $N_{250}P_{150}K_{150}$ kg / ha, variety Khosildor has the highest yield (63.22 c / ha) of grain formed when applying mineral fertilizers with an annual rate of $N_{200}P_{150}K_{100}$ kg / ha (Fig. 1).

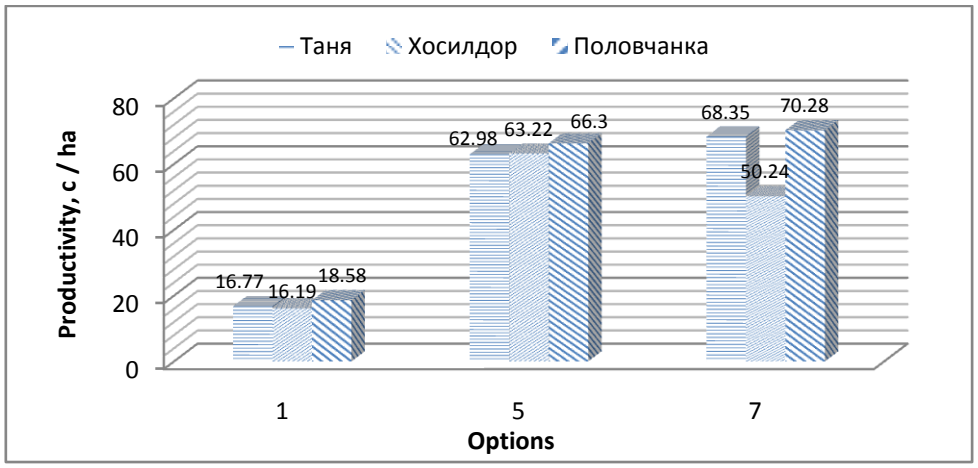

Fig-1. Grain harvest of different varieties of winter wheat.

With the formation of the maximum grain yield by the Tanya variety (68.35 c / ha) in the tillering phase in the soil, the content of mobile NO_3–39.62: P_2O_5–66.45: K_2O – 266.76 mg / kg their ratio N: P: K 1 : 1.68: 6.73; in the booting phase NO_3–17.32: P_2O_5–61.51: K_2O – 246.14 mg / kg, their ratio is 1: 3.55: 14.21; in the earing phase, the content of NO_3–27.08: P_2O_5–53.21: K_2O – 242.89 mg / kg and the ratio is 1: 1.96: 8.97; in the phase of milk ripeness NO_3–28.28: P_2O_5–54.44: K_2O – 245.74 mg / kg and the ratio 1: 1.93: 8.69 (Table 2).

Table 2

Mobile forms of nutrients in the arable horizon of soils by phases of plant development

Time taken samples	N–NO_3	P_2O_5	K_2O
Tanya $N_{250}P_{150}K_{150}$ kg / ha			
tillering (February)	39,62	66,45	266,76
trumpet (March)	17,32	61,51	246,14

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earing (April)	27,08	53,21	242,89
milk ripeness (May)	28,28	54,44	245,74
yield, c / ha	**68,35**		
Khosildor $N_{200}P_{100}K_{100}$ kg / ha			
tillering (February)	35,45	66,29	258,03
trumpet (March)	15,33	61,72	237,37
earing (April)	20,91	54,04	234,36
milk ripeness (May)	25,27	55,26	236,99
yield, c / ha	**63,22**		
Palovchanka $N_{200}P_{150}K_{150}$ kg / ha			
tillering (February)	39,21	66,50	268,79
trumpet (March)	16,96	61,42	245,82
earing (April)	26,25	52,88	242,48
milk ripeness (May)	32,59	54,16	246,17
yield, c / ha	**70,28**		

At the maximum yield of the Polovchanka variety (70.28 c / ha), mobile forms of nutrients were contained in the soil during the tillering phase NO_3–39.21 mg / kg, P_2O_5 –66.66, K_2O – 269.37, their ratio is 1: 1, 7: 6.87; in the booting phase NO_3–16.96, P_2O_5–61.39, K_2O 245.75 mg / kg, their ratio is 1: 3.62: 14.49; in the earing phase under this variety in the soil, the content was: NO_3–26.25, P_2O_5–52.76: K_2O – 242.29, their ratio was 1: 2.01: 9.23; NO_3–32.59 P_2O_5–54.10: K_2O – 246.05 mg / kg and their ratio was 1: 1.66: 7.55.

As the results of analyzes of soils for the content of mobile nitrogen, phosphorus and potassium on the same background of mineral fertilizers show, different varieties of winter wheat showed different reactions both in terms of yield, grain quality and chemical composition of soils. In particular, the nutrient regime of soils was established to obtain the maximum grain yield. But, the nutrient medium in the soil is determined at all stages of plant development. It would be good if it was possible to establish a correlation between the yield and the nutrient medium in the soil under one decisive phase of the development of winter wheat. It is for the future to modify such a nutrient medium.

The next important issue is the improvement of the quality of grain and flour under the influence of mineral fertilizers. The greatest accumulation of gluten in grain occurs in the Tanya variety - 28.44%, the Hosildor variety takes the second place (27.74%). It is followed by the Polovchanka variety (27.67%). A high content of gluten of the Tanya variety was observed against the background of fertilizer $N_{250}P_{150}K_{150}$ kg / ha, at Hosildor $N_{200}P_{100}K_{100}$ kg / ha. The variety

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Polovchanka $N_{200}P_{150}K_{150}$ kg / ha. Against this background of fertilizers in the soil under the varieties Tanya, a nutrient medium was formed in the tillering phase NO_3–39.62: P_2O_5–66.45: K_2O – 266.76 mg / kg N: P: K ratio 1: 1.68: 6.73 ; in the booting phase NO_3–17.32: P_2O_5–61.51: K_2O – 246.14 mg / kg, their ratio is 1: 3.55: 14.21; in the earing phase, the content of NO_3–27.08: P_2O5–53.21: K_2O –242.89 mg / kg and the ratio is 1: 1.96: 8.97; in the phase of milk ripeness NO_3–28.28: P_2O_5–54.44: K_2O – 245.74 mg / kg and the ratio 1: 1.93: 8.69 (Table 3).

Table 4 shows the results of field experiments on the effect of different norms and ratios of fertilizers on the quality of winter wheat grain.

One of the indicators of grain quality is the protein content in it. According to Table 4, the protein content in the grain of the experimental plot ranges from 8.20 to 13.94% for the Tanya variety. 8.63-13.52% for the Hosildor variety and 8.50-13.52% for the Polovchanka variety. The maximum accumulation of protein in grain occurred in variety Tanya against the background of fertilizers $N_{250}P_{150}K_{150}$ kg / ha, in variety Khosildor 13.61% in the variant $N_{200}P_{100}K_{100}$ kg / ha and in variety Polovchanka 13.52% against the background of $N_{200}P_{150}K_{150}$ kg / ha. The lowest protein content in grain for all varieties was obtained on those variants, completely different nutrient media were formed. According to the quality of grain, according to the classification of Uzbek scientists, all three studied varieties belong to the low-protein group.

Agrarian Research Center "Donskoy" noted that the maximum yield of the winter wheat variety forms in the years of early moisture. And in dry years, all varieties had the highest protein content (> 14%) (O. V. Skripka et al. 2019)

Table 4.

Influence of different norms and the ratio of mineral fertilizers on grain quality

Options	Mineral fertilizers rates, kg / ha	Protein in grain,%			Gluten in grain,%		
		Tanya	Hosildor	Polovchanka	Tanya	Hosildor	Polovchanka
1.	$N_0P_0K_0$	8,20	8,63	8,50	20,89	21,01	20,25
2.	$N_{150}P_{100}K_{50}$	10,71	11,20	10,80	23,11	23,74	23,03
3.	$N_{200}P_{100}K_{50}$	11,21	13,10	11,85	24,05	25,91	24,38
4.	$N_{200}P_{100}K_{100}$	12,15	13,61	12,02	24,36	28,04	25,68
5.	$N_{200}P_{150}K_{100}$	11,96	12,31	11,67	24,13	26,79	24,71
6.	$N_{200}P_{150}K_{150}$	12,01	11,45	13,52	24,91	26,06	27,67
7.	$N_{250}P_{150}K_{150}$	13,94	11,10	12,80	28,44	26,55	26,11
8.	$N_{250}P_{200}K_{150}$	12,70	11,61	11,01	26,81	24,76	25,36

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The bulk of scientific works by various authors are aimed at increasing the gluten content. The high content of gluten, not only increases the nutritional value of bread products, but also is the main condition for the high baking quality of flour. With a grain content of 14–16% protein and not less than 28–30% gluten, bread with good porosity and high volumetric yield is usually baked.

In our experience, the Tanya cultivar accumulated 28.44% gluten when fertilized at a rate of $N_{250}P_{150}K_{150}$ kg / ha. The Hosildor variety showed the maximum gluten (28.04%) against the background of fertilizers $N_{200}P_{100}K_{100}$ kg / ha. To accumulate the maximum amount of gluten (27.67%) for the Polovchanka variety, the fertilizer $N_{200}P_{150}K_{150}$ kg / ha was required.

In addition, the most important physical indicators are given to nature, vitreousness and weight of 1000 grains. Normal nature is about 800 g / l, high is 850 g / l. Grains with a high nature have a higher flour yield. Depending on the type and variety of wheat, the conditions of its cultivation, the high weight (completeness) of 1000 grains fluctuates between 40 and 50 g. Physical indicators of the grain quality of winter wheat are given in Table 5. The winter wheat variety Tanya and Polovchanka in terms of the full-scale indicator turned out to be similar (Table 5) ... The greatest numbers of 801 and 795.0 were against the background of mineral fertilizers $N_{250}P_{150}K_{150}$ kg / ha. Local variety Khosildor, the maximum nature showed 796.6 g / l against the background of fertilizers $N_{200}P_{150}K_{100}$ kg / ha. Consequently, this variety is unresponsive to potash fertilization and, secondly, the nature of the grain is noticeable lower than that of the Tanya variety.

Table 5

Physical indicators of grain quality of winter wheat varieties and the effect of fertilizers on them

Options	Mineral fertilizers rates, kg / ha	Tanya			Hosildor			Polovchanka		
		nature, g / l	weight 1000, g	glass visibility,%	nature, g / l	weight 1000, g	glass visibility,%	nature, g / l	weight 1000, g	glass visibility,%
1	$N_0P_0K_0$	693,5	36,5	52,3	719,0	37,9	54,7	706,8	37,2	53,1
2	$N_{150}P_{100}K_{50}$	742,9	39,1	68,5	770,2	40,6	73,1	739,1	38,9	69,2
3	$N_{200}P_{100}K_{50}$	761,9	40,1	69,2	783,5	41,3	75,5	754,3	39,7	70,5
4	$N_{200}P_{100}K_{100}$	771,4	40,6	72,0	781,6	41,2	78,7	756,2	39,8	71,6
5	$N_{200}P_{150}K_{100}$	786,6	41,4	71,3	796,6	42,1	76,8	792,3	41,7	72,4
6	$N_{200}P_{150}K_{150}$	794,2	41,8	73,4	772,1	40,7	70,7	794,2	41,8	77,7
7	$N_{250}P_{150}K_{150}$	801,8	42,2	78,2	755,0	39,8	68,5	795,0	42,0	74,1
8	$N_{250}P_{200}K_{150}$	765,7	40,3	77,6	728,4	38,4	71,9	782,8	41,2	68,1

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The maximum weight of 1000 grains for all varieties of winter wheat is very similar (Table 5) (42.0–42.2 g). However, they formed on different backgrounds of fertilizers. Varieties Tanya and Polovchanka gave these indicators against the background of fertilizers $N_{250}P_{150}K_{150}$ kg / ha, while variety Khosildor formed against a noticeably low background of potash fertilization ($N_{200}P_{150}K_{100}$ kg / ha).

The next equally important quality feature of grain is glassiness. The vitreousness will determine the grain structure, its hardness, and hence the flour yield.

In our experiments, winter wheat varieties gave different results (Table 5). The vitreous readings of the Tanya and Polovchanka varieties were very close. 78.2% for the Tanya variety and 77.7% for the Polovchanka variety. The difference between the varieties is only 0.5%. These indicators of both varieties were formed against the nutritional background of the Tanya variety $N_{250}P_{150}K_{150}$ kg / ha and the Polovchanka variety $N_{200}P_{150}K_{150}$ kg / ha. The maximum glassiness of the Hosildor grain was 78.7%, i.e. 0.5-1.0% more than Tanya and Polovchanka. It was formed against the background of fertilizers $N_{200}P_{150}K_{150}$ kg / ha.

Thus, it was estimated for ourselves that fertilizers affect the quality aspects of grain, this is as a result of metabolism in plants under the influence of fertilizers.

Conclusion. The soils of the field experiments are irrigated typical gray soils with a high bonitet score.

Wheat varieties are highly responsive to the use of mineral fertilizers.

Variety Tanya (68.50 c / ha) showed the highest grain yield against the background of fertilizers $N_{250}P_{150}K_{150}$ kg / ha, which creates a nutrient medium in the soil: NO_3–39,62:P_2O_5–66,45:K_2O–266.76 mg / kg ratio N: P: K 1: 1.68: 6.73 in the tillering phase; the booting phase NO_3–17,32:P_2O_5–61,51:K_2O –246.14 mg / kg, their ratio is 1: 3.55: 14.21; in the earing phase NO_3–27,08:P_2O_5–53,21:K_2O – 242.89 mg / kg and the ratio 1: 1.96: 8.97; in the phase of milk ripeness NO_3 28,28:P_2O_5–54,44:K_2O – 245.74 mg / kg and the ratio 1: 1.93: 8.69. And the variety Polovchanka 70.28 c / ha showed against the same background of fertilizers, which creates in the tillering phase in the soil there is NO_3 –39.21 mg / kg P_2O_5 –66,66, K_2O – 269.37, their ratio is 1: 1 , 7: 6.87; in the booting phase NO_3–16,96, P_2O_5–61,39, K_2O – 245.75 mg / kg, their ratio is 1: 3.62: 14.49; in the heading phase under this variety, the soil contained: NO_3–26,25, P_2O_5–52,76:K_2O – 242.29, their ratio is 1: 2.01: 9.23; and in the phase of milk ripeness, the content of subheated forms of nutrients was NO_3–32,59 P_2O_5–54,10:K_2O – 246.05 mg / kg and their ratio was 1: 1.66: 7.55.

References

1. Boldyrev N.K. "Plant Physiology", Volume 6, no. I. - 1959. -67-71 p.

2. Zhukov Y.P., Chukhina OV, Kulikova EI, Usova KA, Tokareva NV. The effectiveness of fertilizers for winter rye in the Volgograd region // Fertility. M., - 2011. No. 6. –S. 7-9.

3. Ivanova O.M Optimization of nitrogen nutrition for various varieties of winter wheat in the Central Chyological Plant. Author's abstract. dis ... cand. agricultural sciences. - Moscow: 2013 .-- 4 p.

4. Kiryushina N.P. Influence of foliar treatment with sodium selenate on the productivity and quality of grain crops under conditions of different mineral nutrition. Author's abstract. dis. ... Cand. b. sciences. - Moscow. 2017 .-- 4 p.

5. Makshakova O.V. The aftereffect of prolonged use of organic and mineral fertilizers on the yield and quality of winter rye. Dis ... cand. agricultural sciences. - Moscow: 2014 .-- 6 p.

6. Nevolina K.N. The influence of mineral fertilizers on the yield and grain quality of winter grain crops in the Urals. Author's abstract. diss. Cand. agricultural sciences. - Perm: 2012.15 p.

7. Petersburgsky A.V. Soil Science. - 1957. No. (11). - S. 88-97.

8. Sattorov Zh.S., Makhammadiev S.K. Interaction of varieties of winter wheat and fertilizers on old-irrigated typical sierozem // Fertility journal.-Moscow. –2016. –№ 2 (89). –S.12-16.

9. Sattorov Zh.S., Atoev B.K. The technology of the differentiated application of fertilizers to obtain a high grain yield on irrigated soils in the desert zone of Uzbekistan // Proceedings of the Uzbek Japan symposium on ecotecynologies. Innouation for sustainabilty-harmonizing science, technology and economic development with human and natural environment. –Toshkent. –2016. - FROM. 209-210.

10. Sobko A.A., Nikolaev E.V. Filpev I.D. Strong wheat agricultural technology. - S .: Tavria, 1974. –20-90 p.

11. Strelnikova M.M. Improving the quality of wheat grain. - Kiev: Harvest, 1971. –115-118 p.

12. Turdieva N, Boboeva X, Boimirzaeva. Sukorish sonining katti buudoy sifat kursatkichlariga va kosildorligiga tatsiri. Ўzbekiston κ / x journals 2014, no. 3, - B. 40.

13. Fomenko M.A, Grabovets AI, The relationship between the yield of winter wheat and the elements of its structure at the present stage in the steppe zone of the Rostov region // Agronomy and forestry. M., 2017 .-- S. 22-25.

14. Fomenko M.A, Grabovets AI, Relationships between the yield of winter wheat and the elements of its structure at the present stage in the steppe zone of the Rostov region // Agronomy and forestry. M., 2017 .-- S. 22-25

15. Abrol Y.P, Uprety D.C., Ahujia V.P. and Naik M.S. 2006. Soil fertilizer levels and protein quality of wheat grains. http://www.publish.csiro.au/paper/AR9710195.html. Verified on 24 October 2006.

16. Achremowicz B., Borkowska H., Styk B., Grundas S. The effect of nitrogen fertilization on gluten quality in spring wheat grain (in Polish). Biul. IHAR, 1993: P. 29-34.

17. Akerman, A .: 1938. Z. Zuchtung, R. A Pflanzenzuchtung 22, -P. 551-563.

18. Borkowska H., Grundas S. and Styk B. Influence of nitrogen fertilization of winter wheat on its gluten quality // International Agrophysics. 1999. No. 13. -R. 333-335.

19. Dandan L. and Yan Sh. Effects of Different Nitrogen Fertilizer on Quality and Yield in Winter Wheat // Advance Journal of Food Science and Technology. - 2013. No. 5 (5). - P 646-649.

20. Feng-Jiao, X., Z. Guang-Cai, T. Qi-Zhuo, C. Xu-Hong, Y. Yu-Shuang, W. De-Mei and L. Xin. Effects of nitrogen fertilizer on grain yield and processing quality of different wheat genotypes // Plant Nutrition Fertilizer Sci. - 2012. No. 18 (2). -R. 300-306.

21. Linser, H .: 1955. Landwertsch. Forsch., Sonderh. 6, 105-113.

22. Parades-Lopes O., Covarrubias-Alvarez M.M., Barquin-Carmona J. Influence of nitrogen fertilization on the physicochemical and functional properties of bread wheat's // Cereal Chern. - 1985. No. 62. -R. 427-430.

23. Pelshenke, P.F .: 1938. Zuchter 10, –P. 6-9

24. Peltonen J., Virtanen A. Effect of nitrogen fertilizers differing in release characteristics on the quantity of storage proteins in wheat // Cereal Chern. - 1994. No. 71. -R. 11-17.

25. Shi Y., Y. Zhang and Z. Yu. Effects of nitrogen fertilizer on protein components contents and processing quality of different wheat genotype // Plant Nutr. Fert. Sci., 2010. No. 16 (1). - R. 33-40.

26. Shi-Zhao, L., G. Wei, X. Shu-Ping, M. Xin-Ming, Z. Ying-Wu, D. Shao-Yong, Effect of different fertilizer treatments on the relative indexes of the nitrogen metabolism and yield of different wheat varieties // J. Henan Agric. Univ., - 2011. No. 45 (5). -R. 514-518.

27. Vettel, F .: Sitz-Ber. Dt. Akad. Landwertsch.-Wiss. Berlin: –1956. No. 5 (11).

28. Kenjaev Y. Jabbarov Z., Makhammadiev S., Makhkamova D., Turdibaev D., Oripov R. Green Manure Crops Effects On Cotton Growth, Development And Productivity At Different Terms. European Journal of Molecular & Clinical Medicine. Volume 08, Issue 02, p 235-246, 2020.

29. Jabbarov Z., Jobborov B., Fakhrutdinova M., Iskhokova Sh., Abdurakhmonov N., Zakirova S., Makhammadiev S. Remediation of the Technogenic Soils. Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 1, 2021, Pages. 4503 – 4510.