

Influence of norms of mineral fertilizers on the spike structure, on the grain of grain and straw, and also on the number of organic residues of winter powder

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Abstract: The article describes the influence of top-dressing of winter wheat on its growth and development, productivity and agrochemical properties of the soil.

Keywords: winter wheat, mineral fertilizers, productivity, nitrogen, phosphorus, potassium

The data presented in our article were obtained as a result of research on the influence of various standards of mineral fertilizers on the growth, development and productivity of winter wheat are shown in table No. 1

It should be noted that we limited ourselves to the information obtained in 2010, because the information obtained over the years of research is very close to each other. In 1 - option when applying mineral fertilizers N -120; P₂O₅-80; K₂O - 60 kg / ha the height of winter millet during the growing season was 97.8 cm; the total number of stalks was 470 pcs / m², the productive stalks were 350 pcs / m², the spike length was 8.9 cm, the number of grains in one spike was 35.2 pcs, the weight of grains per one ear of 1.50 g, m weight 1000 grains of 35.8 grams

In the second embodiment, where the mineral fertilizers are extra-normal in the norm N -180; P₂O₅-120; K₂O - 90 kg / ha; the above indicators were 99.1 cm, respectively; 475 pcs / m², 360 pcs / m². 9.0 cm; 37.6 pcs.; 1.51 g and 36.5 g with a difference with the first option respectively 1.3; 5 pcs / m²; 10 pcs / m², 0.1 cm; 2.4 pcs.; 0.001 g and 0.007 gr. However, in the second variant, the stems of winter wheat were no less than 2.3 from the beginning of development; 1.7; 2.5 cm higher than in the embodiment where the rate of mineral fertilizer application was N -120; P₂O₅-80; K₂O - 60 kg / ha.

In the third embodiment, where mineral fertilizers are applied in the norm N -240; P₂O₅-160; K₂O - 120 kg / ha at the end of the growing season, the height of the stems reached 100 cm, the total number of stems 476 pcs / m²; the number of productive stems 361 pcs / m²; spike length 9.1 cm; the number of grains on one ear 37.5 pcs. mass of grains on one ear 1.25 g. Mass of 1000 grains 36.8 gr. and these figures are respectively 0.9 cm higher; 1.0 pcs.; 1.0 pcs ; 0.1 cm; 0.1 pcs; 0.01 g and 0.032 gr. than in the second option.

If we analyze the difference between these indicators, we can see the following difference in stem height between the first and second options is exactly 1.3 cm, and between the second and third options this difference is 0.9 cm. The difference between the options in the number of grains on one spike, which is the main indicator of winter wheat is 1.8 cm and 0.1 cm, and for the mass of 1000 grains the difference was 0.7 g. and 0.3 grams. So, the best indicators of growth and development were observed in the third option.

The differences between the options for the harvest of winter wheat were preserved over the years of research. In the embodiment where the rate of application of mineral fertilizers was N -180; P₂O₅-120; K₂O - 90 kg / ha, yields, respectively, reached 68.0; 67.2 m 62.8 Ts./g, on average for 3 years at 66.0% q / ha. This means that in the 2nd variant of the experiment, 16.1 c / ha was obtained more than from the 1st variant, where mineral fertilizers were applied according to the norm N -120; P₂O₅-80; K₂O - 60 kg / ha. It should be noted that these yield increases in subsequent years of the study were 20.5 c / ha and 15.2 c / ha.

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In the third embodiment, where the rate of application of mineral fertilizers was N -240; P₂O₅-160; K₂O - 120 kg / ha, the grain yield increased to 70.1, 69.2 and 64.3 c / g, respectively, over the years, on average for 3 years 67.8 c / g, the yield increase is 17.9 c / ha. This latter indicator is 1.8 c / ha higher than in the second embodiment. So, in conditions of light gray-earth soils, in order to get a high yield of winter wheat, you need to make mineral fertilizers in the norm of N -180; P₂O₅ -120; K₂O - 90 kg / ha. Similar results were observed in experiments carried out on typical gray earth soils.

Table1.

The influence of different standards of mineral fertilizers on	Mineral fertilizer application rates kg / ha			The height of the stems, cm				The total number of stems pcs / m ²	The number of productive stems .pcs / m ²	Spike length cm	The number of grains in 1 ear	The mass of grains in 1 ear of g	Weight1000 grains g.
	N	P ₂ O ₅	K ₂ O	1.03	1.04	1.05	1.06						
1	120	80	60	9.8	48.1	77.6	97.8	470	350	8.9	35.2	1.50	35.8
2	180	120	90	12.1	49.8	80.1	99.1	475	360	9.0	37.6	1.51	36.5
3	240	160	120	12.0	50.0	81.2	100.0	476	361	9.1	37.5	1.52	36.8

The results for straw yields for the options and for the year are very similar to the results of the grain harvest. Thus, in the first variant, for three years of research, the straw yield averaged 55.9 kg / ha, and in the second variant, 73.1 kg / ha and in the third, 77.0 kg / ha. The straw yield increase in the 2nd variant was 17.2 centner / ha, and in the third variant higher - 21.1 centner / ha. The difference between the grain yield and the straw yield in the 2nd embodiment is 1.1 c / ha, and in the 3rd embodiment 3.2 c / ha. This shows that the applied mineral fertilizers are spent on increasing the grain mass of winter wheat. After harvesting grain and straw of winter wheat, samples are taken from each experimental field for options to determine the amount of total NPK in the biological residues of winter wheat in the soil. In the conditions of 2010, in the first embodiment, where the norm for applying mineral fertilizers is N -120; P₂O₅-80; K₂O - 60 kg / ha, the sum of the remains of the stems was 13.7 kg / ha, and the remains of the roots - 25.1 kg / ha, a total of 38.8 kg / ha. If in the composition of the remains of the stems the amount of total nitrogen was 1.090%, phosphorus 0.75% and potassium 1.060%, then in the composition of the residues of the roots these indicators were 0.64%, respectively; 0.2% and 0.79% of the total mass of residues of stems and roots -1.73%; 0.95% and 1.85%.

In the second embodiment, where the rate of mineral fertilizer is N -180; P₂O₅ -120; K₂O - 90 kg / ha, the total amount of residues of roots and stems was 42.1 kg / ha, and the total amount of NPK in their composition, respectively, 1.98; 1.010; 1.885%.

The difference with the first option for organic residues was 3.3 kg / ha, and for the total amount of NPK 0.150; 0.060 and 0.035%.

In the third embodiment, where is the rate of mineral fertilizer application: N -240; P₂O₅-160; K₂O – 120 kg / ha, the total mass of organic residues amounted to 45.4 c / ha, the total amount of NPK in their composition is N -180; P₂O₅ -120; K₂O - 90 kg / ha N - 2.01; P - 1.05; K - 1.92%. This is compared with the first option higher by 6.6 kg / ha, and 0.27; 0.1 and 0.12%, and in comparison with the second option, the leash is higher by 3.3 kg / ha and by 0.03; 0.04 and 0.035%.

Table2. *The influence of mineral fertilizer application rates on winter wheat grain yield (t / ha)*

Options	Mineral application rates. fertilizers. kg / ha			Years			3 years average	Increase
	N	P ₂ O ₅	K ₂ O	2010	2011	2012		

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1	120	80	60	53,5	48,7	47,6	49,9	-
2	180	120	90	68,0	67,2	62,8	66,0	16,1
3	240	160	120	70,1	69,2	64,3	67,8	17,9
straw yield c / ha								
1	120	80	60	58,5	57,0	52,2	55,9	-
2	180	120	90	75,0	74,8	69,5	73,1	17,2
3	240	160	120	78,0	77,6	75,0	77,0	21,1

This means that the difference in the indicators between the 1st and 2nd variants of the experiment is higher than the difference in the indicators between the 2nd and 3rd variants, this shows that the optimal rate of applying mineral fertilizers for the growth and development of winter wheat is the norm of applying N -180; P₂O₅ -120; K₂O - 90 kg / ha.

Table 3. *The influence of various norms of mineral fertilizers on the amount of organic residues and the total NPK in their composition.*

Options	Norms of mineral fertilizers kg / ha			The total amount of organic residues and NPK in their composition			
	N	P ₂ O ₅	K ₂ O	ц/га	N	P	K
1	120	80	60	38,8	1,73	0,95	1,85
2	180	120	90	42,1	1,98	1,01	1,885
3	240	160	120	45,4	2,01	1,05	1,920

Thus, according to the results of field studies with the introduction of mineral fertilizers in different doses (3 species) under winter wheatgrass varieties "Krasnodar - 99" in conditions of light gray-earth soils of the Andijan region showed that with an increase in doses of mineral fertilizers from N -120; P₂O₅-80; K₂O - 60 kg / ha to N-180; P₂O₅-120; K₂O-90 kg / ha improved agrochemical properties for plant growth and development.

LITERATURE

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