



CHANGE OF TOTAL NPK AMOUNTS IN THE SOIL DURING DEVELOPMENT PERIODS OF AFRICAN MILLET

Namozov Normamat Choriyevich

(PhD), Tashkent State Agrarian University, associate professor

Kasimov Botir Sadriddinovich

Tashkent State Agrarian University

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Abstract. Today, with the use of organic and mineral fertilizers in irrigated soils, increasing the yield of grain crops, improving the efficiency of the green mass, and maintaining the fertility of the soil, the norm is N-90, P-65, K-45 kg/ha with the increase the total amount of humus is 0.002-0.001% from the initial state, the norms of mineral fertilizers are N- 60, + 20 tons of manure P205-45, + 20 tons of manure K20-30 + 20 tons of manure with the increase in kg/ha, it was found that the total amount of humus and fertilizers N-60, P205-45, K20-30 kg/ha decreased by 0.002-0.002% of the control of the options used in the norms. This situation indicates that with an increase in the rate of mineral fertilizers, especially nitrogen, the level of decomposition of biological nitrogen, which is part of humus, increases. In addition, similar patterns were observed in the changes in the amount of total nitrogen, phosphorus, and potassium, as it was proven that total nitrogen enters the composition of humus and makes up 0.1% of it.

Keywords. Effect of organic mineral fertilizer feeding on plant development phases on NPK content change.

Introduction. The amount of nutrients in the soil changes under the influence of applied mineral and organic fertilizers and cultivated crops. Special attention is paid to the environment resulting from the effect of mineral and organic fertilizers on soil nutrients as a necessary means of obtaining and growing high yields from agricultural crops.

It is necessary to study the effect of mineral and organic fertilizers with their rate and proportion based on the characteristics of the variety when determining the optimal environment that occurs in the soil. In carrying out such research, it is important to determine the effect of mineral and organic fertilizers and the variety of agricultural crops on the mobile forms of soil nutrients. In this case, it creates an opportunity to find the uniqueness of the soil nutrition regime, which is formed under the influence of applying mineral and organic fertilizers to different types of agricultural crops.

According to S.G. Varadinov L.V. Vilichku T.V. Semenova R.A.Luse and A.D.McLaren, N is found in the soil in an organic form that enters the solid phase of the soil, while a certain part is found in the soil in a mobile form. The plant absorbs nitrogen from the soil in the form of ammonium, nitrate and nitrite.

In the conditions of 2015-2016-2017, after the harvest of African millet, in the fall, the norms of mineral fertilizers used in the samples taken from the plowed (0-30 cm) and under-plowed (30-50 cm) layers of the soil depending on the amount of total humus, nitrogen, phosphorus and potassium was analyzed by options.

There was no effect on changes in properties except for total phosphorus. However, in the following sections, we will describe their influence on the change of mobile forms of food elements.

In control, the total amount of humus in the tillage (0-30) and under-tillage (30-50 cm) layers of the soil is proportionately 1.107-0.982%, total nitrogen 0.101-0.091%, phosphorus 0.127-0.120% and potassium 1.759-1.629%, while humus decreased by 0.001-0.000%, nitrogen by 0.001-0.001, potassium by 0.001-0.001%, only total phosphorus increased by 0.001-0.001%. It was found that the above indicators were close to each other or differed by 0.1-0.0%, regardless of the application rates of mineral and organic fertilizers.

Results. If we give importance to these figures, it was observed that the total NPK amounts of African millet increased from the period of tillering to tuberting and to ripening periods (in grain content), which depends on the level of plant development.

With an increase in the rate of mineral fertilizers N-90, P-65, K-45 kg/ha, the total amount of humus in the control option decreased by 0.002-0.001% from the initial state, norms of mineral fertilizers N- 60, + 20 tons of manure P2O5-45, + 20 tons of manure K2O-30 + 20 tons of manure kg/ha with an increase in the total amount of humus and fertilizer it was determined that fertilizers were reduced by 0.002-0.002% from the control of the variants used in the norms of N-60, P2O5-45, K2O-30 kg/ha. This situation indicates that with an increase in the rate of mineral fertilizers, especially nitrogen, the level of decomposition of biological nitrogen, which is part of humus, increases. In addition, such regularities were also observed in the change of total nitrogen amounts, as it has been proven in many studies that total nitrogen enters the composition of humus and makes up 0.1% of it.

In the experiment, it was analyzed that the change in the amount of total potassium was similar to that of humus and nitrogen, only the amount of total phosphorus increased by 0.001-0.00, 0.002-0.000 and 0.003-0.001%, depending on the applied fertilizer standards. This situation shows that the general balance of humus, nitrogen, and potassium was unsatisfactory under the influence of the mineral fertilizer standards we used, and only phosphorus was satisfactory. Scientific data close to the above were obtained in the following years of research in 2016-2017.

We would like to emphasize one case that African millet leaves behind certain amounts of root and root residues and NPK content in them, but the effect is almost visible at the next sowing.

At this stage of the plant's development, the demand for nutrition through the roots increases, moreover, due to the increase in the surface of the leaf, the processes of photosynthesis accelerate, and even the metabolism accelerates beyond control, as a result, the growth and development of plants improves. Table 1



Table 1

The effect of mineral fertilizers on changes in the general forms of nutrients in the soil, depending on the norms, at the end of the period of operation, 2016

| Variant order | Used mineral and organic fertilizers kg/ha | | | Humus | | N | | P | | K | |
|------------------|--|----------------------------|-------------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Soil layers, cm | | | | | | | |
| | N | P | K | 0-3 0 | 30-50 | 0-30 | 30-50 | 0-30 | 30-50 | 0-30 | 30-50 |
| 1 | Control | | | 1,007 | 0,976 | 0,098 | 0,087 | 0,132 | 0,118 | 1,758 | 1,655 |
| 2 | N-60 | N-45 | K-30 | 1,006 | 0,975 | 0,098 | 0,085 | 0,132 | 0,118 | 1,758 | 1,654 |
| 3 | N-90 | N-65 | K-45 | 1,007 | 0,976 | 0,097 | 0,086 | 0,131 | 0,117 | 1,756 | 1,655 |
| 4 | N-120 | N-85 | K-60 | 1,007 | 0,976 | 0,098 | 0,087 | 0,132 | 0,118 | 1,758 | 1,657 |
| 5 | 20 tons of manure | | | 1,005 | 0,975 | 0,097 | 0,086 | 0,132 | 0,118 | 1,757 | 1,654 |
| 6 | N-60 + 20 tons of manure | N-45+20 tons of manure | K-30+20 tons of manure | 1,005 | 0,975 | 0,097 | 0,087 | 0,131 | 0,118 | 1,757 | 1,654 |
| 7 | N-90+ 20 tons of manure | N-65+20 tons of manure | K-45+20 tons of manure | 1,005 | 0,976 | 0,098 | 0,086 | 0,132 | 0,117 | 1,756 | 1,655 |
| 8 | N-120+ 20 tons of manure | N-85+ 20 tons of manure | K-60+ 20 tons of manure | 1,006 | 0,975 | 0,097 | 0,085 | 0,132 | 0,116 | 1,756 | 1,654 |

In addition, it was observed that the norms of the used mineral fertilizers are also related to the periods.

Mineral fertilizers N-60, P205-45, K20-30 kg/ha were used in the control of the options (1-5) during the period of African millet 0-30 30-50 and 50-70 cm It was found that the amount of nitrate nitrogen in the layer was 12.5, 9.8 and 8.7 mg/kg, which was 2.0 0.7 and 0.7 mg/kg less than the initial values. Because during this period, the annual rates of nitrogenous fertilizers could not be applied according to the experimental system. Therefore, these indicators increased from budding to fruiting and were 16.0, 11.1, and 9.8 mg/kg, and during ripening, they decreased to 14.6, 10.8, and 9.0 mg/kg, was 1.1 0.3 mg/kg observed to decrease in the upper and lower (50-70 cm) layer to 0.9 mg/kg from the initial state.

It is worth noting that, if the effect of the period of use on the change of the total forms of nutrients (NPK) was not observed, it was determined that there was a different effect on the change of nitrate nitrogen.

Conclusion.

So, when nutrients are fed through the roots at the expense of fertilizer, then the changes in the soil are mainly due to the norms of mineral fertilizers, but the applied mineral

fertilizers are also the same, especially nitrogen fertilizer in the soil. It has been observed that it increases the efficiency of fertilizers. Mineral fertilizers N-90, P205-65, K2O-45 kg/ha, when applied with 20 tons of manure, relatively acceptable indicators were obtained, and the amount of N-NO₃ in the 0-30 cm layer reached 19.6 mg/kg and was 1.4 mg/kg higher than the control.

Mineral fertilizers were applied at the rates of N-120, P205-85, K2O-60 kg/ha. The amount of nitrate nitrogen during the growing season of African millet was 19.6, 13.9 and 11.1 mg/kg, respectively, according to the soil layers 3.6 2.8 1.3 and 0.8 0.8 1.0 mg/kg higher than control 21.3 14.8 12.1 mg/kg was found to be 1.7 0.9 1.0 mg/kg different when African millet was given 20 tons of fertilizer per hectare. In all options, by the time of ripening of African millet, nitrate nitrogen content increased by 0.9-2.2 mg/kg from the initial state. To conclude from the above information, the optimal nitrogen nutrition for African millet was determined when mineral fertilizers N-90, P205-65, K2O-45 kg/ha and 20 tons of manure per hectare were used.

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