

The Effect of Mineral and Organomineral Fertilizers Used at Different Rate in Repeated Crop Sunflower on Agrophysical Properties of Soil

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ABSTRACT

The article highlights the effect of mineral and organomineral fertilizers applied under re-sowing sunflower in various norms on the agrophysical properties of the soil.

Repeated crops are an integral part of our country's agriculture. Agrophysical properties of the soil are important in increasing the productivity of repeated crops. Because repeated crops require heat, moisture and nutrients in the soil. Soil temperature and nutrients are the main factors limiting plant growth and development.

The development of agriculture, especially increasing the productivity of repeated agricultural crops, is one of the most urgent tasks in our republic today. It is not a secret that increasing the productivity of crops is solved by increasing their fertility on the basis of a deep study of the properties and processes of soils. In most cases, the physical properties of the soil, which are considered as one of the indicators determining the soil fertility, are neglected in the experience of agricultural production, and the work of increasing the soil fertility is carried out mainly at the expense of applying mineral fertilizers.

Taking into account the above, scientific research is being conducted in 2022-2023 on the topic of "Study of the effect of using mineral and organomineral fertilizers on soil fertility" in the conditions of the meadow soils of the "Boytora harvest baraka" farm, Izboskan district, Andijan region. One of the tasks of our scientific research is to study the effect of mineral and organomineral fertilizers applied in different rates on the agrophysical properties of the soil in repeated crop sunflower.

Scientific research was carried out in accordance with the methodological manuals "Metodokiya polevyx opytov s xlopchatnikom" (1981), "Methods of conducting field experiments" (2007) adopted at UzPITI. The statistical analysis of data on productivity is carried out according to the method of BA Dospheov "Metodika polevogo opyta" (1979; 1985). The practical system of scientific research is presented in Table 1.

Table 1
Experience system

No	Sunflower variety	Used organomineral fertilizer, t/ha	Amounts of applied (NPK), kg/ ha
1.	Yangi zamon	-	
2.		10 tons	
3.		15 tons	
4.		20 tons	
5.		-	N-60, P-90, K-60
6.		10 tons	
7.		15 tons	
8.		20 tons	
9.		-	N-100, P-90, K-60
10.		10 tons	
11.		15 tons	
12.		20 tons	

10 tons Meadow soils of Andijan region were selected for field study of the issues raised on the subject of the dissertation. In the experiments, the New Age variety of sunflower, 12 variants, is tested in 4 replications. Watering standards are carried out at 70-75-75% of soil moisture ChDNS before watering, the pieces are placed in one row (tier). The total area of 1 plot is 240 m², the calculated area is 120 m².

One of the important indicators determining soil fertility is its agrophysical properties. Soil grain affects the movement of soil water and protects soil nutrients from leaching erosion, reduced crop productivity, external and internal factors, and helps to increase biodiversity.

Particles in the soil are in a granular state under the influence of humus and mineral nutrients. The characteristics of soil granularity create conditions for optimal changes in water, air, heat, and

nutrient regimes in it, as well as rapid microbiological processes.

In 2022, the effects of mineral and organomineral fertilizers applied in different rates on repeated crop sunflower were determined on soil granularity, volume mass and porosity. The obtained data are presented in Table 2.

Table 2
Effect of mineral and organomineral fertilizers applied in different rates on soil granularity, volume mass and porosity. 2022 year

Used organomineral fertilizer, t/ha	Soil layer, cm	Change in soil granularity, %	Soil mass volume change, gr/cm ³	Soil porosity, %
2022 at the beginning of the season				
-	0-30	19,9	1,28	52,6
	30-50	16,6	1,41	48,1
2022 at the end of the season				
-	0-30	19,4	1,36	50,4
	30-50	16,2	1,42	47,2
10 tons	0-30	21,0	1,34	51,0
	30-50	17,1	1,42	47,5
15 tons	0-30	21,2	1,33	51,3
	30-50	17,3	1,41	47,5
20 tons	0-30	21,3	1,32	51,6
	30-50	17,3	1,41	47,6

According to the results of the research conducted to study the effect of mineral and organomineral fertilizers applied in different standards on soil grain properties, it was found that at the beginning of the season, it was 19.9 and 16.6 percent, respectively, in the soil layers of 0-30 and 30-50 cm. By the end of the season, in the first option, where mineral and organominerals were not applied, the granularity of the soil decreased by 0.5 and 0.4%, respectively, in the upper layers. 1.1 and 0.5% of the soil layers in 2 options with 10 tons of minerals and organominerals, 1.3 and 0.7% in 3 options with 15 tons of minerals and organominerals, 4 options with 20 tons of minerals and organominerals it was found that it increased by 1.4 and 0.7 percent, respectively.

According to the results of many scientific researches, increasing or decreasing the volume mass of the soil depends primarily on crop rotation. Alfalfa is a crop that improves the physical and agrochemical properties of the soil among all crops in the crop rotation complex.

The root of each crop requires its own optimal soil compaction. If the density exceeds this norm, it will have a negative effect on the growth and development of the plant and the weight of the crop will decrease.

As soil bulk density improves, porosity increases proportionally. The increase in porosity improves water, air, and nutrient conditions in the soil, strengthens the activity of microorganisms, and as a result, the development of crops changes in a positive direction.

In the conditions of irrigated agriculture, the effect of almost all agrotechnical measures on the volume mass of the soil is observed. If the soil density is at an acceptable level before sowing seeds in spring or sowing repeated crops in summer, it will reach the initial density condition after the first

watering. The obtained data are presented in Table 2.

According to the results of the research conducted to study the effect of mineral and organomineral fertilizers applied in different standards on the volume mass of the soil, it was found that it was 1.28 and 1.41 gr/cm³, respectively, in the 0-30 and 30-50 cm soil layers of the soil at the beginning of the season. By the end of the season, in the first option, where mineral and organominerals are not applied, the volume mass of the soil is 0.08 and 0.01 gr/cm³, respectively, and in option 2, where 10 tons of mineral and organomineral are applied, it is 0.06 and 0.01 gr/cm³, respectively, for the soil layers, 15 It was found that it increased by 0.04 and 0.01 g/cm³, respectively, in the 3 options where mineral and organomineral were used, and by 0.04 and 0.01 g/cm³, respectively, in the 4 options where 20 tons of mineral and organomineral were used.

According to the results of the research conducted to study the effect of mineral and organomineral fertilizers applied in different standards on the volume mass of the soil, it was found that it was 52.6 and 48.1%, respectively, in the 0-30 and 30-50 cm soil layers of the soil at the beginning of the season. By the end of the season, in the first option, where mineral and organominerals were not applied, the volume mass of the soil was reduced by 50.4 and 47.2%, respectively, in the second option, when 10 tons of mineral and organomineral were applied, by 51.0 and 47.5%, respectively, by 15 tons of mineral and organomineral. It was found that in the 3 options used, the soil layers decreased by 51.3 and 47.5%, respectively, in the 4 options where 20 tons of mineral and organomineral were used, the soil layers decreased by 51.6 and 47.6%.

Conclusions

1. When mineral and organomineral fertilizers were used in different rates, the grain characteristics of the soil were improved, as a result of which optimal conditions were created for the cultivation of high and quality crops from the main crops to be planted in the future. It was found that the granularity of the soil did not change with the increase in the rate of mineral fertilizer nitrogen.
2. It was found that when mineral and organomineral fertilizers were used in different standards, the volume mass of the soil increased, and the porosity decreased.

Used literature.

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