



Influence of Previous Crops on the Amount of Nutrients In the Soil

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Abstract: *Soils of the Republic of Karakalpakstan are salty and low in fertility. In such soils, the meliorative condition of soils should be improved and soil fertility should be increased for receiving high yield from agricultural crops. Crop rotation, organic and siderate fertilizers give good results in increasing soil fertility.*

In the field experiment, studies were conducted to determine the effect of crops included in short crop rotation systems on the amount of soil nutrients. In determining the effect of mung bean, sesame, and soybeans planted before winter wheat in the crop rotation system on the amount of nutrients in the soil, when planted by the method of cotton: previous crop mung bean + mung bean for siderate + 20 t/ha of manure + winter wheat: winter wheat the amount of humus in the soil has been found to have increased to 0.040%.

Keywords: *crop rotation, nutrients, previous crops, humus, winter wheat, fertility, soil salinity, agrochemical properties*

Introduction:

The soils of the Republic of Karakalpakstan are characterized by saline and low fertility. High yield of agricultural crops in these lands is achieved by using mineral fertilizers in high rates. The use of mineral fertilizers in high rates every year has a negative effect on the ecological condition of the soil and reduces the agrochemical and agrophysical properties of the soil. Therefore, it is necessary to increase soil fertility - use of crop rotation, organic and siderate crops, and include crops that leave more roots and leguminous residues in the soil. Increasing organic matter in the soil at the expense of plant residues is the most economically and ecologically effective.

Methods of the research. Using the field method, the experiment includes 9 variants, in four repetitions, in one layer, arranged in a systematic way.

1st variant of the experiment, continuous sowing winter wheat, 2-4th variants, sowing mung bean, sesame and soybean for grain before sowing winter wheat, 5-7th variants, sowing mung bean, sesame, soybean for grain, before winter wheat and additionally 10 t/ha manure was used and then winter wheat was sown, 8th variant, mung bean was sown for grain before winter wheat and additionally manure added in the amount of 20 t/ha, 9th variant, mung bean was sown for grain, then it was sown for siderate and additionally 20 t/ha manure was used, then winter wheat was sown.

The results of the research and analyzing them. Soil samples were taken from the 0-30 and 30-50 cm layers to determine the effect of crop rotation on the content of nutrients.

The productivity of agricultural crops depends on land reclamation and soil fertility. The more organic mass the soil contains, the more humus it contains. For it, it is necessary to increase the amount of plant residues left in the soil.

In the experiment, the predecessor crops planted before winter wheat, and how they affect soil fertility when winter wheat and cotton are planted, were determined in two periods, at the beginning and at the end of the operation period.

In 2019, in the control option (var. 1), winter wheat was grown (planted in the fall of 2018), previous crops, mung bean, sesame, soybean were planted and cared for.

At the beginning of the season in 2019, the amount of humus in the 0-30 cm layer of the soil was 0.720-0.730%, and at the end of the season it was 0.720-0.740%, it can be noted that the amount of humus increased by 0.010%. As can be seen from the data, in the control option of the experiment, that is, in the control option planted with winter wheat, the amount of humus decreases by 0.010% at the end of the season. In other options, due to the planting of leguminous grains and leguminous oil crops, the amount of humus did not decrease, on the contrary, it increased by 0.010%.

The total and mobile amounts of nitrogen, phosphorus and potassium from nutrients are observed to decrease in the control option at the end of the season. In options 2-9 of the experiment, these indicators differ very little.

In the fall of 2019, all options were planted with winter wheat. To determine the effect of previous crops on soil fertility, soil samples were taken from the 0-30 cm and 30-50 cm layers at the beginning and end of the 2020 season.

At the beginning of the season, the amount of humus in the soil is 0.720-0.760% in the 0-30 cm layer, and the lowest value is observed in the control variant. Preceding crops planted before winter wheat, rates of organic fertilizers applied, and intercrops have different effects on soil humus content.

At the end of the season, the amount of humus in the control option is reduced by 0.010% compared to the beginning of the season, it is worth noting that in all the options, due to the planting of winter wheat, it decreases by 0.005-0.010% at the end of the season compared to the beginning of the season, but the total amount of humus is 0.720-0.730% in the autumn of 2019, in autumn 2020 it is 0.710-0.755% and 0.730-0.755% in crop rotation options.

Previous crops, applied organic fertilizer standards have created an opportunity to increase soil fertility. When leguminous crops used in short crop rotation options are planted for grain and then winter wheat is planted (var. 2-4), the amount of humus is 0.730-0.735% at the end of the 2020 season, when manure is applied in the amount of 10 t/ha after leguminous crops (var. 5-7) it was 0.740%, 0.760% when 20 t/ha of manure was applied, and 0.775% in the 9th option, where mung bean for grain + intercrop mung bean + 20 t/ha of manure + winter wheat was planted.

So, when winter wheat is planted after the previous crops, the soil nutrition regime is short crop rotation to maintain and increase productivity, cotton: mung bean for grain + 20 t/ha of manure + winter wheat, or cotton: mung bean for grain + mung bean for siderate + 20 t/ha of manure winter wheat : achieved when winter wheat system is used.

When we determined the amount of nutrients in the soil in 2021, the effect of the second year of previous crops was revealed. In the 0-30 cm layer of the soil at the beginning of the growing season, the average of the variants was 0.700-0.755% and at the end of the season 0.700-0.750%.

In the control variant planted with winter wheat, the amount of humus at the end of the season decreased by 0.010% of the amount in spring. In options 2-4, where the predecessor crops were planted for grain before winter wheat, and then winter wheat was planted, it was 0.715-0.730% in spring and 0.715-0.735% in autumn, and there was no decrease in the amount of humus.

After legumes and oilseed crops + 10 t/ha of manure + winter wheat in 5-7 options, the amount of humus in the 0-30 cm layer of the soil is 0.730% at the beginning of the season and 0.720-0.725% at the end of the season, and the reduction of humus is 0.005-0.010% it was 0.750% and 0.755% in the 8th variant, where the mung bean for grain + 20 t/ha manure + winter wheat system was used,

and when the mung bean for grain + mung bean for siderate + 20 t/ha manure + winter wheat system was used, 0.750% and 0.750% at the beginning of the season and at the end of the season was 0.760%, and it was observed that the amount of humus increased by 0.10% at the end of the season.

Among the agro-measures that ensure the increase of soil fertility and the yield of winter wheat are crop rotation, planting legumes and oil crops (mung bean, sesame, soybean) as predecessor crops, applying manure in the amount of 20 t/ha, planting mung bean as a siderate.

Conclusion. In order to increase soil fertility and winter wheat yield in the conditions of saline soils of the Central region of the Republic of Karakalpakstan, short-term crop rotation, cotton : grain : grain, planting legumes and leguminous oil crops as a predecessor crop before winter wheat + 20 t/ha of manure + winter wheat, or cotton : grain : grain, mung bean for grain + mung bean for siderate + 20 t/ha manure + winter wheat : winter wheat methods should be used before winter wheat.

REFERENCES

1. Ismailov U.E. Scientific basis of increasing soil fertility. - Nukus. –Bilim. -2004 -186 p.
2. Khalikov B.M., Namozov F.B. Scientific basics of crop rotation. - Tashkent. -2016. - 222 p.
3. Namozov F.B., Iminov A.A. Influence of crop rotation of cotton, winter wheat, repeated and interval crops on soil fertility. // Agroilmjurnali. -2016 -№4 (42) –p. 21-22
4. Saimbetov A. The effect of the use of different composite composts on soil fertility and productivity. Dissertation abstract of PhD in agricultural sciences. - Tashkent. -2018 -45 p.
5. Ismailov D.U. Development of a system of short-term replacement of soil fertility in saline conditions. Dissertation abstract of PhD in agricultural sciences. –Andijan. - 2021 -34 p.
6. Tursunxodjaev Z.S. Scientific basis of crop rotation. - Tashkent. –Fan. -1972. -256 p.
7. Rasulova F.G. Influence of vegetables and repeated crops on soil fertility, cotton and wheat yields in crop rotation systems. Dissertation abstract of PhD in agricultural sciences. - Tashkent. -2019 -44 p.