

The Role of Grain and Legume Crops in Increasing Soil Fertility in the Republic of Karakalpakstan

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Abstract: *The article was scientifically analyzed a large number of nutrients in the treated layers of soil (0-30 cm) at maturity effect of soy, according to the study systems of cotton and soybean in rotation of crops on the territory of the Aral sea in the Republic of Karakalpakstan. The increase in the amount of humus by 0.002%, -NH₄ by 0.7 mg/kg and N-NO by 0.3 mg/kg at the end of the season relative to the primary agrochemical indicators of soils was scientifically justified.*

Keywords: sunflower, corn, sesame, rice, soy, mineral fertilizers, standards, development

1. Introduction

Maintaining and increasing the productivity of irrigated lands is one of the main problems for all regions of the country. This is due to the fact that today in our irrigated soils such negative processes as salinization, erosion, pollution, humus and nutrient depletion are developing.

After gaining independence, the first President Islam Karimov personally paid special attention to the radical reform of agriculture to meet the demand of the population for grain and grain products. Proof of this is the decision of the Cabinet of Ministers No. 413 of 1997 and No. 344 of 1998 and the establishment of a research institute of grain and legumes on irrigated lands and its branches in each region.

In addition, in order to further increase the volume of food production in the country and increase their variety and on this basis to fully meet the demand for food, increase incomes and living standards of the rural population, the President signed a decree on October 20, 2008. The Decree "On measures to optimize and increase their production" has played an important role in meeting the needs of the population in food products, increasing rural incomes and welfare.

In the section on modernization and accelerated development of agriculture (3.3) of the Action Strategy on five priority areas of development of the Republic of Uzbekistan for 2017-2021:

- Further improvement of the reclamation of irrigated lands, development of a network of land reclamation and irrigation facilities, introduction of intensive methods of agricultural production, first of all, modern agrotechnologies that save water and resources, use of high-yielding agricultural machinery;
- Expansion of research work on the creation and introduction into production of new selection varieties of agricultural crops resistant to diseases and pests, adapted to local climatic and environmental conditions, as well as high-yielding animal breeds;
- Particular attention is paid to taking systematic measures to mitigate the negative impact of global climate change

and the drying up of the Aral Sea on agricultural development and livelihoods.

To this end, our main goal is to scientifically and practically substantiate the impact of optimal fertilizer rates on cotton yields after past grain and legume crops planted to increase soil fertility in the Aral Sea region of the Republic of Karakalpakstan.

In the conditions of the Republic of Karakalpakstan, the considered northern region has not sufficiently substantiated the timing of the use of mineral fertilizers and the norms for the care of crops in the crop rotation system. Therefore, it remains relevant to determine the direction of change of processes in soils (agrochemical, agrophysical and reclamation) in this region.

It is especially considered an important task to develop acceptable standards for the use of mineral fertilizers for obtaining a high cotton crop sown after the main sowing crops, for example, like sunflower, corn, sesame seeds, rice, soybeans, etc. Because, in any soil and climatic conditions, crop rotation and agricultural production technology do not only affects the agrophysical qualities of soils, but also all other qualities, for example, as agrochemical and meliorative [4,5,6].

Therefore, we set ourselves the goal of scientifically substantiating the effect of acceptable mineral fertilizers on cotton fertility after sowing leguminous crops sown to increase soil fertility in the Republic of Karakalpakstan in the Aral Sea region. That is, an experiment was conducted on an acceptable, fertilizing system of cotton sown one year after sowing crops such as winter wheat, corn, sesame and soybeans in the meadow alluvial soils of the region.

2. Methods of Research

Research methods were performed by conducting field experiments. The experiment, phenological observations, sampling from soils and plants were carried out on the basis of the methods of "Field experiment methods" (Dospekhov, 1985), "Method of the State variety of crop testing" (1964) and "Field experiment methods" (2007)....

Volume 9 Issue 10, October 2020

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The degree of which the problem has been studied. Z.Tursunkhodjaev (1972), N.Kashkarov (1979) in the systems of crop rotation 3: 7, 2: 6, 2: 4, 1: 4: 1: 4, 2: 4: 1: 3, etc. in different soil and climatic conditions of the republic.), N.Khalilov, P.Bobomirzaev, (2002), X.Atabaeva, O.Qodirxodjaev (2006), D.Yormatova, X.Xushvaqtova (2008), M.Amanova, A.Rustamov (2010), T.Azizov, I.Anarbaev and others (2010, 2016) Sh.Nurmatov and others (2012), B.Izbasarov (2016), M.Amanova, L.Allanazarova (2017), R.Sidikov and others (2017), A.Amanov and others (2017) have conducted a number of scientific studies on various factors by a number of brilliant scientists and have given the necessary practical recommendations for production.

3. Basic Results

In the proved experiment were planted varieties of wheat "Krasnodar-99", soy "Orzu", sesame "Karshiga" and podsolnukha "KK-60".

In order to determine the effect of sowing crops on humus and the active form of NPC in the soil composition, in the experiments we analyzed the amount of exchange potassium and active phosphorus, humus, nitrate and ammonium nitrogen in the soil layers according to the options before sowing and at the end of the period of validity of these crops.

Agrochemical analyzes of samples taken from the soil before the experiment show that in the depth of 0-30 cm soil layers (treated) humus is 0.797%, N-NH₄ -10.2 mg / kg, N-NO₃ - 7.3 mg / kg, active P₂O₅-28 mg / kg and exchange K₂O esa -118 mg / kg.

The obtained agrochemical analysis shows that the degree of provision with nutrients in the soils of the experiments is considered low.

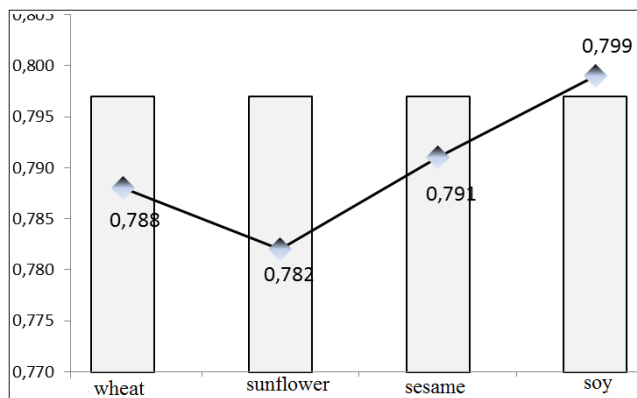


Figure 1: Amount of humus% in soil at the end of the validity period of legumes and oil crops

The types of crops sown in experimental experiments (winter crops, sunflower, sesame and soybeans) were cultivated by agricultural technology in production conditions, after harvesting, in each culture variant, the amount of humus, nitrate and ammonium nitrogen, active phosphorus and exchange potassium for comparison with the source data from samples of soil layers 0-30cm.

In the variant of sowing wheat at soil depths (cultivated) of 0-30 cm, the amount of humus is 0.788%, N-NH₄ -10.2 mg / kg, N-NO₃-7.3 mg / kg.

That is, in relative analyzes before sowing (2018 -2019) in soil layers 0-30 cm (cultivated) in the variant of sowing winter wheat, the amount of humus was 0.009%, and the amount of N-NH₄ decreased by 0.4 mg / kg, N-NO₃ - 0.2 mg / kg.

But the highest decrease in nutrients was observed in the variant of sowing corn; according to the initial data, in the soil layers of 0-30 cm, humus was 0.782%, -NH₄ -8.7 mg / kg, N-NO₃ - 6.8 mg / kg.

This shows that in maize, the absorption of nutrients from the soil is higher compared to other crops.

According to the initial data, in the variant of sowing sesame seeds in the soil layers, the amount of nutrients is reduced, but the form of nitrogen is increased by 0.2 mg / kg compared to the initial amount. This situation is characterized by a change in the form of nitrogen.

In the variant of soybean sowing, the above analyzes are observed. That is, at the end of the validity period, in the soil layers of 0-30 cm, the highest amount of nutrients is observed (the amount of humus is 0.799%, N-NH₄ -10.9 mg / kg, N-NO₃ -7.6 mg / kg).

These figures show that, relative to the initial data, the amount of humus increases by 0.002%, and N-NH₄ by 0.7 mg / kg, N-NO₃ by 0.3 mg / kg.

We will comment on such a state that this type of culture, in comparison with other species, not only preserves nutrients in the soil, but with the use of suitable agricultural techniques can affect the increase in soil fertility.

4. Findings

- 1) Agrochemical analyzes of samples taken from the soil before the experiment show that in the depth of 0-30 cm soil layers (treated) humus is 0.797%, N-NH₄ -10.2 mg / kg, N-NO₃ - 7.3 mg / kg, active P₂O₅-28 mg / kg and exchange K₂O is -118 mg / kg.
- 2) In the variant of sowing wheat at soil depths (cultivated) 0-30 cm, the amount of humus is 0.788%, N-NH₄ -10.2 mg / kg, N-NO₃-7.3 mg / kg.
- 3) In the variant of sowing sesame seeds in the soil layers, the amount of nutrients is reduced, but the form of nitrogen is increased by 0.2 mg / kg compared to the initial amount.
- 4) In the option of soybean sowing at the end of the validity period, in the soil layers 0-30cm the highest amount of nutrients is observed (the amount of humus is 0.799%, N-NH₄ -10.9 mg / kg, N-NO₃ -7.6 mg / kg).

References

- [1] Методы агрохимических, агрофизических и микробиологических исследований в поливных хлопковых районах. Ташкент, 1963. -439 с.

- [2] Методика Госсортоиспытания сельскохозяйственных культур. –М.: Колос, 1964. – 184 с.
- [3] Методы агрохимических анализов почв и растений Средней Азии. Издание 5-е, Ташкент, 1977.
- [4] Турсунходжаев З.С. Научные основы севооборотов на землях Голодной степи. Из. “Узбекистан”, Ташкент, 1972.
- [5] Расулов А. После промежуточной культуры. // ж. Сельское хозяйство Узбекистана. Ташкент 1987 г., №2. стр. 18.
- [6] Реймов Н.Б. Приемы вовышения плодородия почвы и продуктивности хлопковых севооборотов на засоленных почвах Каракалпакистана. Автореферат диссертации канд. с.-х.наук: 06.01.01. Ташкент, 1993.