



## Ensuring Ecological Sustainability of Agro-Cenoses Through the Use of Organic Fertilizers and Biological Preparations

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**Annotation.** The combined use of organic fertilizers and Rizokom-1 biopreparation in ensuring the ecological stability of the cotton agrocenosis showed an increase in the number of beneficial microorganisms living in the soil. Experiments were carried out in 2019-2021 in the conditions of irrigated typical gray soils of Kashkadarya region.

**Key words:** Agrocenosis, cotton, Rhizokom-1, microorganism, organic fertilizers, ecological stability, biopreparation.

Providing the population with ecologically clean food products is one of the important issues in all developed countries of the world. The lack of irrigated land, the high demand and needs of the population require the use of low-cost, ecologically harmless organic fertilizers. Examples of the widespread use of organic fertilizers today include late fall and summer green manures, various organic wastes, livestock manures, and other components of organic origin. Research methods. Biometric, phenological, ecological and statistical analysis methods were used in the field experiments. The statistical analysis of the obtained results was carried out using the Microsoft Excel computer program according to the methods of B.A.Dospekhov (1985).

Field experiments were conducted in the conditions of typical gray soils of Kashkadarya region. Field experiments were conducted in 6 variants and 4 repetitions.

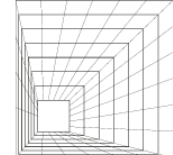
In field experiments, N250P175K125 is compared to the background (control) option, Fon+Rhizocom-1, Fon+siderate - 10 t/ha, Fon+siderate+Rhizocom-1, Fon+fertilizer - 10 t/ha, Fon+fertilizer+Rhizocom-1 options were explored. The length of each plot is 30 m, the width is 7.2 m, the area of one plot is 216 m<sup>2</sup>, and the area to be taken into account is 108 m<sup>2</sup>.

In the field experiments, 70% of phosphorus fertilizers and 50% of potassium fertilizers were used in the main fertilization, 50 kg of nitrogen fertilizers were applied in 2-3 leaves and the rest was divided into two equal parts, 50% of potassium was added during tillering, and the remaining 30% of phosphorus was mixed during flowering.

Rye was used as a siderate in field experiments.

Practical results of the research. The agro-technological basis for the formation of a stable ecological environment in the cotton phytocenosis for agro-ecosystems suitable for the soil-climatic conditions of the Kashkadarya oasis was developed. As a result of the combination of organic fertilizers and biological preparations, the effect on the ecological condition of the soil, its protection and the productivity of crops was scientifically based, its economic efficiency was determined, and for the first time recommendations suitable for the region were developed. Soil fertility is the main factor in obtaining high and quality crops from agricultural crops. Microbiological processes and microorganisms in the soil are of great importance in increasing the soil fertility and in the transformation of substances necessary for the plant into a form that can be assimilated.

According to data, soil microorganisms include bacteria, actinomycetes and fungi, about 70% of them are bacteria, about 27-30% are actinomycetes, and about 1-3% are fungi [N. Tillakhodjaeva, 2007. p. 7].



Siderates increase the number of soil microorganisms, enrich their composition and help to increase the biological activity of the soil, which in turn has a positive effect on the productivity of agricultural crops and the profitability of the field [N. Kholmonov, T. Ortikov, 2012. p. 54-55].

Microbiological activity of the soil is one of the important parameters determining its productivity. Among the factors affecting the microbiological activity of the soil is the use of mineral and organic fertilizers [K. Shadramova et al., 2011. p. 64-65, M. Rakhimov et al., 2015. p. 143-145].

If the agrophysical, water, water-physical properties of the soil are in moderation, the activity of microorganisms in it is activated, as a result, soil fertility increases. Therefore, it is very important to know soil microflora and biology, to influence them through various agrotechnological activities. In particular, the use of siderates in the field of short-row cotton-cereal rotation in the fields freed from grain in the summer and cotton in the fall affects not only the agrophysical properties of the soil, but also all the life processes occurring in the plant and the microbiological activity of the soil, and therefore its study is one of the urgent issues.

T. Djikov, Z. Kilichev [2010. 51-54-b.] In the experiments, the number of bacteria in meadow soil is 3.2-12.8 million soils in the agricultosis, in May and in May, in May, in June-July, in June-July, the number of June-July, Under the influence of organic fertilizers, the indicators were determined to increase. The number of bacteria in the spring, at the beginning of the growth of the growth of the growth, which lasted by the end of the growing season. The use of organic fertilizers has led to an increase in the number of bacteria. Increasing the dose of organic fertilizers to 20 t to 40 c has increased the number of bacteria.

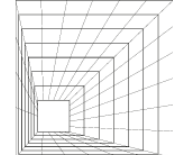
As a result of irrigated typical gray lands of Kashkadarya region, meat-Pepton, the impact of organic fertilizers in the initial number of bacteria were the maximum level of bacteria. By the end of the growing season, this effect decreased. The amount of bacteria in the context of the experimental fields is close to each other in all agrocentenots after the sidition, and on average in three years, 1 g of soil was 12.4-25 million. formed grain. In this case, it was found that the number of bacteria in the soil, which left sidatat in the earth. For example, during the experimental years, an average of 12.4-13.5 mln. If the availability of a piece of bacteria is established, these figures in the rye planted as Siderat are sown as Siderat were 18.8-29 million. It was found that the grains were.

Also, the amount of bacteria in the soil of the experimental field in the agrocentenoses where siderates were used increased from the initial amount at the end of the growing season by 1.2-13.2 million in three years. it was determined based on the analysis that there was less grain. In the experimental field, the amount of bacteria in the rye agrocentenosis was the highest (25.6-31.8 and 18.4-18.7 million units per 1 g of soil) in both periods (at the beginning and end of cotton vegetation). Another taxonomic group of microorganisms is actinomycetes.

They also affect microbiological processes in the soil. The number of actinomycetes growing on starch ammonia agar (KAA) was also found to have a seasonal pattern. During the growth period, the number of actinomycetes increased, and by the end of the growth period, their amount reached the highest value. This can be related to temperature, humidity and cotton root development and activity. A high amount of organic mass in the soil had a positive effect on the number of actinomycetes.

Actinomycetes are abundant in soils where the metabolism of organic matter in the formation of humus, as well as the mineralization of humus, takes place. Actinomycetes develop well both when mineral fertilizers are used and in organic fertilizers (manure, green manure) [N. Kholmonov, T. Ortikov, 2012. p. 54-55].

At the beginning of cotton vegetation, N250P175K125 – background (control) in 1 g of soil of agrocentenosis averaged 39.2 million in three years. if there were any bacteria, this indicator was



67.3 and 68.0 million in agroecosystems where sideration was used. formed a piece. The amount of bacteria in the soil of the experimental field increased by almost 2 times compared to the N250P175K125 - background (control) agroecosystem with an increase in the biomass of siderates in the soil, that is, with an increase in soil moisture.

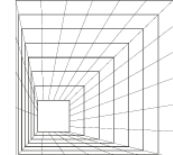
In the third year of the experiment, at the end of the season, the number of actinomycetes in the background (control) agroecosystem N250P175K125 was 32.7 million. units, and in experimental agroecosystems their number is 55.2-59.4 million. it was found that it constituted a grain. It was also noted that the amount of actinomycetes in the agroecosystems where the biological preparation Rizokom-1 was used was significantly higher than in the agroecosystems where N250P175K125 - background (control) and organic fertilizers (siderate and manure) were used. Another important soil microorganism is fungi. They actively participate in the course of important processes in the soil, including decomposition of organic substances, humification. The number of fungi growing in the environment of Chapek changed according to the amount of organic mass in the soil, the change of season, and the period of cotton growth. At the beginning of vegetation, the amount of fungi in N250P175K125 - background (control) agroecosystem averaged 36,000 pieces. With the increase of the biomass accumulated in the soil, it was observed that the amount of fungi in the soil increased by 0.8-1.3 thousand units compared to the background (control) agroecosystems N250P175K125. At the end of the growing season, the amount of fungi in N250P175K125 - background (control) agroecosystem was 38,000 pieces, and it was found that it was more in agroecosystems where organic fertilizers (siderate and manure) and biological preparations were used.

Therefore, it was observed that organic fertilizers (siderate and manure) had a positive effect on the soil microflora, due to which the biomass of siderates rotted and decomposed in the soil quickly and in a short period of time. As a result, the soil fertility improved radically and the ecological stability of the soil improved.

**Conclusions.** Thus, organic fertilizers (siderate and manure) and biological preparations increase the number of microorganisms in the soil, increase its microbiological activity, ensure high soil fertility, and have a positive effect on the development and yield of cotton grown under such conditions.

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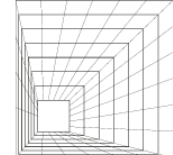


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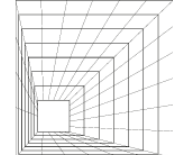




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