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THE EFFECT OF FACTORS ON THE NUMERICAL INDICATIONS OF MICROORGANISMS IN IRRIGATED LIGHT COLORED GRAY AND BARRIOUS SOILS

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Abstract:

This article describes the effect of various factors on the number of microorganisms in light gray and barren soils irrigated in agriculture.

Keywords: pale gray soil, barren soil, microorganism, biopreparation, ammonifiers, nitrifiers, nitrogen-assimilating bacteria, fungi, actinomycetes.

INTRODUCTION

Our country has a very long history and has been known as a well-known country for its high agricultural culture and the quality level of agricultural products grown all over the world. For long periods, the irrigated soils did not lose their fertility, and as a result of the proper organization of the farming system, the fertility of the land was well preserved, and the yield was perfectly increased from year to year. But, by the middle of the XX century, especially during the last 45-50 years, due to the continuous cultivation of cotton, the ecological balance in the soil was lost, and one of the main reasons was the continuous blind use of chemical agents. In addition, in order to obtain a higher yield from the main crop, the soil was lost its natural state due to the use of toxic chemicals such as mineral fertilizers and various pesticides, without taking into account the living organisms in the soil and their activity, that is, the soil's vitality.

It should be noted that the role of microorganisms in fertilizing the soil, which supplies the raw materials necessary for human life, is extremely important. The activity of microorganisms, especially bacteria, fungi, actinomycetes and green algae, is of great importance in increasing soil fertility and productivity, and in the formation of mineral and organic substances necessary for plants.

RESEARCH RESULTS. In agriculture, the quantity and quality of products grown on irrigated lands are closely related to the ecological conditions of the soil. In those times, various harmful chemicals were used from seed planting to production. In addition to these, 2 per hectare3 kg resin, 25-30 kg of sulfur, 15-20 kg pesticide, 20-25 kg of magnesium chlorate, 250-300 kgpure nitrogen mineral fertilizer, 200 kg of phosphorus,100 kg cotton crops were grown using potash fertilizers.

Based on the above considerations, the task of solving the problem of scientific and practical solution to the specific characteristics of the changes in microbiological, biochemical processes, physico-mechanical and agrochemical properties of the soil due to the continuous use of various chemical agents as a result of the assimilation and irrigation of the irrigated pale gray and barren soils in the following years stands

The widespread use of biological methods, biopreparations and biofertilizers in cotton cultivation, especially in cotton fields in areas where light-colored gray and barren soils are spread, is the main factor for restoring and increasing its organic matter, increasing soil fertility, productivity and its biocenoses, and sharply reducing the level of salinity.

In pale gray and barren soils, the only environment that negatively affects the growth of soil microorganisms is the lack of organic matter in the soil. Therefore, they carry out their activity only in the surface layers of the soil. In particular, the growth of azotobacteria in saline soils depends on the composition of salts. Microbiological tests carried out on soils showed that microbiological processes in irrigated soils continue throughout the vegetation period of plants.

It was concluded that the growth of soil microorganisms also depends on the amount of salts in the soil and its movement of anions and cations. At the same time, it should be noted that the activity of microorganisms decreases due to the washing of salt. It was found that the activity of microorganisms increased when manure was applied to saline soils. According to the researches of M.U.Abdujalolova (1973) and M.U.Abdujalolova, S.K.Sachko, Nguyen Thanh Fung (1973) it was shown that the growth and development of microflora in barren, gray brown and desert sand soils of the Karshi desert zone is very slow. At the same time, it was concluded that azotobacteria are not found in these soils, and the activity of nitrifying bacteria is very low. A significant increase in biological activity in the following years was also proved during our research, which is suitable for barren soil among the soils of the desert zone.

Scientific research has confirmed that the growth of microorganisms in barren soils: ammonifiers, nitrifiers and nitrogen-assimilating bacteria is closely related to the age of the developed soil, the period of development, and the rates of applied mineral and organic fertilizers.

Bacillus mesentericus and oligonitrophils are the predominant bacteria in barren desert soils. The dominant fungi belong to the genus Penicillum and Aspergillus. It was determined that the source of growth and development of microorganisms is specific to the surface layer of the soil.30 cmshowed that the development of microorganisms in the depth decreases sharply, their active development period corresponds to the spring and autumn months, and their development is less in the summer months.

M.U. Abdujalolova (1974) from the soils of the irrigated Karshi desert, 100 cm 86.5% of the growth of bacteria in the depth, 10% of which are actinomycetes, and 3.5% are fungi.

As a result of the next 50 years of exploitation and irrigated farming, these figures are 84.5%; It was 12.5% and 3%. It is reasonable to associate the fact that there was no significant change with the fact that various harmful chemicals such as fentiuram, tigam, formalin, bronitak, etc. have been used from the time of seed planting to the time of production.

A group of azotobacteria is considered a unique "indicator" in the soils of the desert zone. Their amount is very low in these soils, and in some soils they are not found at all. Soil salinity causes the loss of the nitrogen group. It is very difficult for azotobacteria to grow in soils that have been repeatedly washed with saline. Nevertheless, it was observed that the amount of azotobacteria increased in the soil given ammonium sulfate salt.

It has been found that the amount of microorganisms in desert zone soils, like in all other soils, decreases with increasing depth of soil layers. Bacillus mesentericus, Bacillus idosus, oligonitrophils, fungi belonging to the genus Penicillum can be indicated as the dominant microorganisms in the studied soils.

Since the soil of the Kara desert is one of the geographical areas that have been relatively little studied in this regard, the study was conducted as a result of comparing the total amount of soil microorganisms, physiological groups, changes in the ecological environment to a certain extent and taking into account the negative sources of anthropogenic factors that have occurred in recent years.

According to the results of the research, we can see that the indicator is much less when compared with the amount of rotting bacteria of light gray and barren soils. As mentioned above, light-colored gray and barren soils are considered to be used for cultivation. That is why the study and analysis of the processes that led to the change in the natural ratio of physiological groups of bacteria under the influence of mineral fertilizers applied to these soils for several years took a special place in our research (Table 1).

Table 1

Quantitative indicators of microorganisms in irrigated pale gray and barren soils

Soil cross-sections	Depth, cm	The amount of microorganisms averaged over the seasons (1000 cells per 1 g of soil).				
		Ammonifiers	Mineral nitrogen assimilating bacteria	Bacteria that grow in a nitrogen-free environment	Actinomi cytes	fungus s
Irrigated light gray soils						
K-3	0-30 30-60	2740±7.51 2350±6.07	2512±6.94 787±1.15	1583±2.89 1196±2.77	173±0.57 104±0.49	9±0.001 0.5±0.001
K-4	0-30 30-60	2200±5.20 1720±2.03	350±0.58 375±0.87	873±1.30 1100±2.02	127±0.578 117±0.556	3.4±0.167 3.75±0.72
K-6	0-30 30-60	1900±2.31 1833±2.20	3500±8.09 3458±7.80	612±1.15 416±0.57	195±0.739 113±0.374	6.13±0.592 3.35±0.020
Irrigated barren soils						
K-8	0-30 30-60	4100±7.51 2950±4.91	835±4.62 1125±3.69	1927±2.89 750±2.60	209±3.97 125±2.48	7.7±4.046 5.3±1.676
K-11	0-30 30-60	4800±8.09 3823±5.55	1912±4.50 300±5.20	750±3.46 471±2.77	192±4.62 171±2.89	6.3±2.196 6.0±2.312
K-13	0-30 30-60	2458±5.03 2600±6.36	1650±5.78 750±3.52	750±2.25 1300±6.94	206±3.87 75±2.89	11.0±3.121 6.2±2.369

In these studied soils, no significant difference was observed between soil types, as the total amount of actinomycetes and fungi was very low compared to bacteria.

Determining the amount and species composition of the above-mentioned soil microorganisms was studied in research, tillage of soils (0-30 cm) and arable (30-60 cm) were taken and analyzed in layers.

When the amount of microorganisms was compared, it was observed that almost all soil samples were slightly more in the upper arable layers. As mentioned above, the decrease in the number of microorganisms as the soil layers deepen has been observed in the research works of almost all microbiologists.

The amount of micro-organisms in the lower layers of the soil is relatively low, mainly observed in protected soils, and there are opinions that it may occur as a result of the low amount of humus in the upper layer or as a result of this layer being dehydrated and overheated [Thornton, 1956].

SUMMARY. In general, comparing the quantitative changes of microorganisms in different types of soil in terms of biogenic elements, physical and chemical indicators, it was found that there is a certain regularity among them. In

particular, the total amount of microorganisms in irrigated pale gray soils is around .3-6.3 million. that is, it was found to be much more compared to other studied soil types.

Quantitative relationship between soil microorganisms and humus has been emphasized by many researchers. For example, E.G. Wuchrer et al. (1976, a, b) showed that other biogenic elements, except humus, can be directly related to the amount of nitrogen and phosphorus in this soil, quantitatively, the abundance of microorganisms in this soil compared to brown soil.

When comparing the amount of microorganisms of barren soils with the amount of brown soil, it can be clearly seen that the number of microorganisms increases depending on the biogenic elements and changes in the physical and chemical parameters of the soil.

If we compare all the parameters of the examined soil groups, we can see that there is a significant difference in the composition of biogenic elements, although there is not much difference in the amount of microorganisms between light gray soils and barren soils. Although this difference is not obvious, the amount of biogenic elements is much less in barren soils compared to pale gray soils, but it can be noticed that the total amount of microorganisms is almost the same. So the quantitative change of microorganisms is affected by the sum of soil factors. In particular, when comparing the differences between the mechanical composition of the soil and the impregnated bases, as indicated above, the described problem becomes much clearer. In fact, the fraction of particles with small diameter in terms of mechanical composition is more in these barren soils, which, in turn, may have created conditions for the micro-organisms to increase slightly in terms of quantity.

In these studied soils, no significant difference was observed between soil types, as the total amount of actinomycetes and fungi was very low compared to bacteria.

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