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Medium and Strong Salty Soils the Role of Microorganisms in Increasing Productivity

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Abstract: In Bukhara region, the soil is irrigated, moderately saline, and in some places strongly saline. The mechanical composition of the soil is medium to light sandy soil, which is suitable for cotton growing. This article discusses the role of microorganisms in increasing the fertility of moderately and strongly saline soils.

Key words: Medium and strongly saline soils, microorganisms, cotton.

In Bukhara region, the soil is irrigated, moderately saline, and in some places strongly saline. The mechanical composition of the soil is medium to light sandy soil, which is suitable for cotton growing. Along with cotton, these farms grow alfalfa, corn and wheat. However, the main crops are cotton and wheat. It is known that the types and activities of microorganisms in the soil are very diverse. To determine this, the first experiments were carried out in the laboratory on a sample of strongly saline soil of the farm. [1-3]

The composition of the biofertilizer used in the experiment consisted of micro and macro green algae and high plant residues. In particular, organic matter - 50-60%, humus - 22-27%, nitrogen - 10-12%, phosphorus - 5-7%, potassium - 1.8-2.1%, protein - 35-40%, 17 copper, zinc and others from amino acids and trace elements. The salts are as follows: (in% of dry matter) - sulfates - 2.0-3.0; chlorides - 0.1-0.2. Initially, quantitative indicators of living microorganisms in highly saline soils are determined. To do this, 1g of microorganisms in the soil for 20 days; that is, the amount of ammonifiers was 1.6 million cells, oligonitrophiles - 2.9 million cells, fungi - 8000 thousand cells. [4-7]

In determining the amount of microorganisms, Bukhara - 6 varieties of seeds in a volume of 1 ml 10-15 mln. The cell was soaked in a suspension of green microflora of protective cotton and planted in the strongly saline soil described above. Then, in 8 to 9 days, the amount of ammonifiers in the soil ranges from 1 million 600 thousand to 3 million 100 thousand in the first sample; the amount of oligonitrophils from the initial 2 million 900 thousand to 4 million 100 thousand; fungi first - from 8 thousand to 12 thousand; green algae - from 210,000 to 400,000. The number of ammonifiers for experiments in three variants is from 1 million 600 thousand to 3 million 800 thousand when the seeds are sown in a suspension of green microflora and mineral fertilizers (NPK - 50%) are added; oligonitrophiles - from 2 million 900 thousand to 1 million 200 thousand; fungi - from 8 thousand to 14 thousand; green algae - from 200,000 to 950,000. [8-9]

Experiments have shown that the growth and development of microorganisms, the activity of soil enzymes is low due to the high content of sulfate and chloride ions in strongly saline soils. To study the effect of green algae on the growth, development and yield of cotton varieties Bukhara-6, as well as the composition of microorganisms, enzymatic activity, further experiments are carried out on moderately saline irrigated soil.

The salinity of the average saline soil was found to be as follows. (in% of dry matter): sulfate - 1.0-2.0; chloride-sulfate-0.03-0.1.

The growth of microorganisms and green algae (chlorella) in irrigated soil is monitored for 20 days.

The experimental variant was found to contain 3,800,000 amonifiers, 6,700,000 oligonitrophiles, 20,000 fungi and 5,000 green algae in 1 g of soil. When green micro-algae were applied to the soil, the number of cells in the heart organisms increased 1.6-1.9 times. In particular, the number of amonifiers increased from 3 million 800 thousand to 5 million 800 thousand, oligonitrophiles from 6 million 700 thousand to 8 million 420 thousand, fungi from 20 thousand to 175 thousand, green algae from 457 thousand to 589 thousand. Subsequently, a decrease in the number of cells of the above organisms was observed. [10-11]

When mineral fertilizers and green algae were applied to the soil, the growth and development of bacteria was observed in comparison with variants I and II. For the remaining days of the experiment, a decrease in the number of cells was observed. Studies have shown that in 6-8 days, the number of amonifiers increased to 7,160,000, the number of oligonyrophiles to 15,570,000, fungi from 20,000 to 275,000, and green algae from 400,000 to 573,000. In general, the number of microorganisms in moderately saline soils and the growth and development of cotton were observed at a high stage.

Catalase enzyme activity was shown on days 7 and 15 of the soil samples given green micro-algae and mineral fertilizers. during the day, catalase activity was found to increase by 2.16. As this process continued, activity was observed to be 4.01 over 15 days. In an experiment using a green microwave suspension, it was found that the catalase activity increased by 3.2 ml / mg O2, and in 15 days this figure rose to 4.95. In combination with the suspension of green algae in the soil, it was observed that the catalase activity in the soil decreased slightly when 50% mineral fertilizers were added.

This means that the activity of catalase, the main representative of the enzymes involved in the oxidation and reduction process in the soil, is directly related to the composition of the substances processed by the seed and applied to the soil.

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