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PROBLEMS OF FEEDING COTTON AND OTHER CROPS WITH PHOSPHORUS IN UZBEKISTAN

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ABSTRACT
The effectiveness of using phosphate compounds in agriculture in the Khorezm region of Uzbekistan, the effect of salinity on cotton productivity, and the role of salt-resistant microorganisms in increasing the efficiency of using phosphate compounds have been shown.

Keyword: Cotton microorganism, mobilization, soil, fertilizer, yield, salinity

In the cultivation of cotton, which is one of the main crops in Uzbek conditions, it is very important to use mineral fertilizers efficiently and to determine their effective types. In farming, the coefficient of use of phosphorus fertilizers is only 10-20%, and this indicator changes depending on the chemical absorption capacity of the soil. This leads to a lot of waste of phosphorous natural raw materials, soil pollution with various heavy metals contained in fertilizers together with the use of mineral fertilizers [1]

Phosphorus deficiency during seed germination negatively affects the growth process and cotton development. As a result, ripening of cotton is much longer, yield is reduced by 15-25%. Therefore, in the cultivation of abundant cotton crops, it is necessary to apply phosphorus fertilizer in such a time and in such a way that cotton should be fully supplied with phosphorus nutrients during the entire growing season [1.2].

It should be noted that phosphoric acid moves very slowly in the soil. At the same time, during the hot summer, the top layer of the soil is often dry. Accordingly, the plant cannot use it well even when phosphorus is given between the rows of cotton, at a depth of 3-4 cm.

10-20% of the total phosphorus reserves in the soil are suitable for plant nutrition, 50-60% are very poorly soluble in water, and 20-40% are practically unusable by plants [3.4].

The amount of water-insoluble phosphorus in the soil depends on the parent rock that forms the soil, the rate of biological turnover of substances, and the direction of the soil formation process. Compounds of phosphorus in soil can be simple and complex acidic salts, alkaline elements and organic compounds [6].

When fertilizing with phosphorus fertilizers, the phosphorus regime of the soil is improved. However, the coefficient of use of phosphorus fertilizers by plants remains low [5].

This is explained by the high content of calcium and magnesium carbonate in the soil of Central Asia. High carbonation of the soil, neutral or weakly alkaline reaction allows any phosphorus compounds to pass into an insoluble form [7;8;9;10;11].

Initially, monocalcium phosphate is converted into diphosphate calcium, and both compounds are easily absorbed by plants. Dicalcium phosphate turns into tricalcium phosphate very slowly. Phosphates of the hydroxylapatite type, which are difficult to dissolve in water, gradually turn into carbonapatite (A. Ergashev, D. Sattarov, A. Koziev, 1991).

The transition of phosphate compounds to a water-soluble state is of little importance. Because they go back to a form that is difficult to dissolve in water.

In addition, a certain amount of carbon dioxide is formed in the soil and they help phosphates to be easily absorbed by plants. It has been found that applied phosphorous mineral fertilizers become insoluble in water in larger amounts on newly developed lands than on old irrigated lands (Zglinskaya, 1992).

Methods of dissolving water-insoluble phosphates in water have been developed under the conditions of Uzbek soils by increasing the activity of soil microorganisms with the use of decayed substances of varying degrees (Z. Askarova, 1994)

Microbiological decomposition of mineral and organic phosphate substances and their transfer to a form easily assimilated by plants has been thoroughly studied in the conditions of black soils, and E.nimipressuralis 32-3 strain was found to be highly effective in this process in Ukrainian soils. It has been found that it breaks down carbohydrates to form organic acid and produces enzymes (phosphatase) that break down organic phosphorus compounds, and biologically active substances (v indolylacetic acid) [3, 4, 5, 8].

The drug phosphoerythrin was developed and patented on the basis of E.nimipressuralis 32-3 strain, which mobilizes phosphorus in the conditions of Ukrainian soils. This preparation was developed for the conditions of irrigated soils of black and dark chestnut. With the use of the drug, a 6% higher yield of Boresfen variety of corn and a 16% higher yield of Glitsky rape variety was achieved. The effect of wheat on the Odessky variety was studied for four years and it was determined that the average yield increased by 7%. As a result of inoculation of the seeds of vegetable plants with the help of bacteria, their growth and development are accelerated. Phytomass increased by 30% and cabbage yield increased by 25% when seedlings of Shans variety of tomato were processed [11].

The reserves of mobile phosphorus in the soil are one of the main factors determining the productivity of agricultural crops. An increase in the amount of heavy metals and nitrate compounds (Cb, Zn, Pb) in the soil leads to a double reduction of microorganisms involved in the mobilization of mineral phosphates [6]. In order to increase the coefficient of use of phosphorus fertilizers by crops and soil fertility in agriculture, it is necessary to study the dynamics of phosphates in the soil, their mobilization, the effect on productivity, and the application of technologies based on this.

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