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THE EFFECT OF PHOSPHOGYPSUM, MANURE AND MINERAL FERTILIZERS ON THE COMPOSITION OF THE ABSORBED BASES OF IRRIGATED BALD MEADOW SOILS

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Abstract: *Studies have been conducted on the effect of changes in the composition of the bases in the soil absorption complex due to the application of phosphogypsum, manure and mineral fertilizers in the conditions of irrigated bald meadow soils of Surkhandarya region. The results of the study showed that taking into account the reclamation condition of the soil, it was possible to improve the reclamation condition of the soil by applying 30 t / ha of cattle manure, 2 and 4 t / ha FG on the background of mineral fertilizers.In this experiment, a significant decrease in sodium cation in TSK was observed in the variants using N250 P175 K125 + 30 t / ha fertilizer + 2 and 4 t / ha FG, and the coagulation of peptized soil colloids led to an increase in the efficiency of improved applied mineral fertilizers.*

Keywords: *Soil, organic fertilizer, phosphogypsum, mineral fertilizer, TSK, absorption capacity, peptization, coagulation.*

Relevance of the topic. The presence of varying degrees of salinity in irrigated agriculture limits the ability to increase soil fertility and the yield of cotton and other crops. This process is intensifying from year to year, and this has a major impact on the decline in the effectiveness of mineral fertilizers in cotton cultivation.

Processes such as compaction, salinization, salinization, humus and nutrient depletion of soils used in agriculture are taking place, and as a result, increasing the norms of mineral fertilizers is also not yielding the expected results. [1; 2;3;4;5;6;7].

Many different substances are used to restore the properties of the soil - gypsum, glauconite, zeolite, FG, ferrous sulfate, pyrite, pyrite slag. These are calcium-containing and mainly sulfate-based substances. Sulfate has a positive effect on the mineral part of the soil and softens it. 150 million tons of FG are produced worldwide in the production of phosphate fertilizers using sulfuric acid technology [8;9;10;11;12;13;14].

Under the influence of different levels of salinity of soils in the irrigated lands of the country, the yield of agricultural crops is reduced by 40-60%, and poor quality products are obtained.

In a set of measures aimed at increasing the fertility of saline soils, it is important to choose the right amount and form of fertilizer applied to agricultural crops. It is very difficult to meet the demand of the population and industry for agricultural products without scientifically developing the main sectors of the agricultural economy of the country. After all, cotton growing is the basis of our agricultural economy, the golden ring of our economic relations with other countries. Therefore, special attention should be paid to increasing the yield of this crop [15;16;17;18;19].

The fertility, reclamation condition and agrochemical properties of soils, as well as the high efficiency of mineral fertilizers used in crops also depend on the composition and proportion of cations in the soil absorption complex. In gray soils with optimal ameliorative condition, fertility and agrochemical properties, the share of calcium cation in the soil absorption complex (TSK) is 70-80%, magnesium cation - 10-12%, potassium and sodium cations - 5-7% [20;21;22;23].

As the proportion of sodium cation in the TSK exceeds 10%, soil properties and reclamation deteriorate, and productivity begins to decline. This leads to negative consequences. Against this background, the effectiveness of mineral fertilizers also decreases [24;25;26;27;28;29;30].

Therefore, it is important to study the agrochemical properties of soils with a high content of sodium cations in TSK, to determine the effect of sodium cations on them and the role of various measures to improve the reclamation of these soils, as well as to determine the agrochemical properties of soils.

The purpose of the study. To determine the effect of phosphogypsum on the reclamation status and agrochemical properties of irrigated bald meadow soils in the conditions of Surkhandarya region.

Research style. In order to study these issues, laboratory and field experimental studies in bald meadow soils, which are widespread in Surkhandarya region and have a high content of sodium cations, are used in the following generally accepted methods: UzPITI "Methods of conducting field experiments" (1981, 2007), "Methods of conducting field experiments in the middle zone" (1973), Methods were carried out on the basis of agrochemical, agrophysical and microbiological research methods in cotton fields (1963). Standard methods were used in agrochemical analysis.

Research results. The amount and proportion of sodium cations in the absorption complex and aqueous absorption of irrigated bald-grass soils are relatively high. This negatively affects the agrophysical, agrochemical and microbiological properties of the soil,

as well as water and air regimes. This situation can be seen in the control option where no fertilizer was applied. The application of mineral fertilizers did not significantly affect the amount and proportion of sodium cations in the soil absorption complex. However, against the background of control and against the background of mineral and organic fertilizers, the application of phosphogypsum in the amount of 2 and 4 t / ha had a significant impact on the amount and proportion of sodium cation in the soil absorption complex (TSK).

For example, the application of phosphogypsum in the norm of 2 and 4 t / ha against the background of the control variant increases the amount of sodium cation in the TSK in the 0-30 cm layer from the controlled 2.39 mg* eq / 100 g of soil to 1.57 and 1.61 mg * eq / 100 g of soil and 30 In a layer of -50 cm, the amount of 2.07 mg * eq / 100 g in the soil was reliably reduced to 1.35 and 1.33 mg* eq / 100 g in the soil.

The use of manure against the background of the control option also reduced the amount of sodium cation absorbed in the TSK, i.e., the manure showed ameliorant properties. Application of phosphogypsum in combination with semi-rotten cattle manure had a stronger effect on soil reclamation. At the same time, the absorbed sodium cation in the TSK was further reduced in both studied soil layers. This reduction occurs due to both manure and phosphogypsum. Application of manure at 30 t / ha against the background of mineral fertilizers also had a positive effect on the composition of the soil absorption complex.

As a result, the amount and share of sodium cations in the soil absorption complex is significantly reduced. Application of phosphogypsum in the amount of 2 and 4 tons per hectare against the background of mineral fertilizers had a positive effect on the soil absorption complex and significantly reduced the amount and percentage of sodium. A similar situation was observed when mineral and organic fertilizers and phosphogypsum were used together. In this case, it was noted that the amount and percentage of absorbed sodium in the TSK was minimal. Phosphogypsum, semi-decomposed cattle manure, and mineral fertilizers increased the amount and proportion of calcium cations in the soil absorption complex when applied separately and together in different variants.

This is due to the fact that the calcium cation contained in mineral and organic fertilizers as well as phosphogypsum displaces the sodium cation in the barren soil TSK. An increase in the amount and proportion of calcium cation and a decrease in the proportion of sodium cation have a positive effect on soil reclamation. The combined use of mineral and organic fertilizers and phosphogypsum had the strongest effect on the increase in the amount of absorbed calcium cation in the TSK. The proportion and amount of calcium cation in these variants was the highest in the experiment.

Conclusions. Thus, the control option of phosphogypsum, application of mineral fertilizers and manure fund in irrigated barren soils has a positive effect on the composition

of TSK, thereby increasing the amount and share of calciu cation in TSK and decreasing the amount and share of sodium cation. Application of phosphogypsum on the background of manure further enhances its ameliorant properties and optimizes the soil on the content of TSK cations. In addition, FG improves the quality of organic fertilizers, prevents the loss of nitrogen in the form of ammonia, increases the activity of the microflora, reduces the number of helminths, reduces the mineralization of organic matter in manure and soil, increases the utilization rate of applied mineral fertilizers, ie efficiency. It is advisable to mix FG and organic matter directly in the soil.

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