

# THE INFLUENCE OF SOIL SALINIZATION ON THE FORMATION OF HUMUS STATE AND AGROCHEMICAL PROPERTIES OF MEADOW SOILS OF THE BUKHARA OASIS

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**Annotation.** The article provides data on the influence of the degree and type of salinization of meadow soils of the Bukhara oasis on the content and supply of humus, as well as nutrients. It is noted that soda salinization and increased sodium content, increasing the concentration of soil solution and pH of the medium, worsens the formation of humus and nutrients.

**Keywords:** degree and type of salinization, humus, nutrients, content, humification, meadow soil

The high content of water-soluble salts in the soil changes the environment and greatly affects the processes occurring in the soil. This changes the direction and speed of microbiological, chemical and agrochemical, as well as physical processes. Therefore, an increased concentration of water-soluble salts greatly affects the formation of humus, agrochemical and other properties of the soil (1, 2). Since many processes occurring in the soil are carried out and controlled by microorganisms that are sensitive to the high content and presence of certain types of salts. In addition, depending on the presence of a particular cation, certain chemical reactions can occur. Therefore, the study of the content and salt composition of the soil and their effect on the humus and agrochemical properties of the soil is relevant.

To study the degree and type of salinization of the meadow soils of the Bukhara oasis and their influence on the formation of humus and agrochemical state, an expeditionary study was carried out, where soil sections differing in relief, granulometric and mechanical composition, degree and type of salinization and agrophone were taken. Soil sections were described from genetic horizons. Humus was determined by the Tyurin method, the content of water-soluble salts in the aqueous extract by the dry residue and the electrical conductivity of the aqueous solution. Concentrations of carbonate and bicarbonate of ions, chlorine, sulfates, calcium, magnesium, sodium and potassium in aqueous extract according to generally accepted methods. The content of gross forms of nitrogen, phosphorus and potassium in one hinged according to Maltseva and Gritsenko, ammonium nitrogen - with Nessler reagent, nitrate nitrogen - according to Grandval-Lyazh, mobile phosphorus - according to Machigin, exchange potassium - according to Protasov, pH-potentiometrically. The mechanical composition is according to Kaczynski.

The results of the study show that many meadow soils of the Bukhara oasis are saline with varying degrees. The composition of salts is dominated by chlorides and sulfates, from cations calcium and magnesium. With an increase in the degree of salinity, the reclamation state of the soil deteriorates, which is expressed in the agrophysical, agrochemical and microbiological properties of the soil. In highly saline soils,

there is a visual lack of structure, dispersion and the formation of a soil crust. Salinization significantly affects the content and supply of humus. With an increase in the concentration of water-soluble salts, i.e. the degree of salinization, the content and supply of humus decreases significantly, which negatively affects the fertility of the soil. The humus state is especially strongly negatively affected by high concentrations of carbonates and bicarbonates, chlorides, magnesium and sodium. With a high concentration of carbonates, bicarbonates, magnesium and sodium, not only the concentration and osmotic pressure of the soil solution increases, but also the reaction of the soil medium (pH) towards alkalinity, which was observed in the meadow soils of the Bukhara oasis. The worst condition for the formation and accumulation of humus is observed in meadow soils by soda salinities and with an increased content of sodium cation. This is due to the good solubility of humus substances in an alkaline environment and deterioration of the activity of the humus formation process in conditions of high alkalinity of the soil. Since, under these conditions, the activity of microorganisms involved in the process of humification of plant and other organic residues decreases. Therefore, in highly saline meadow soils, the content and reserve of humus was the smallest, and unsalted and slightly saline meadow soils were the highest. The sulfate content had the least negative effect on the content and reserve of humus. The high calcium content in the water extract has a positive effect on the processes of formation and accumulation of humus, which is reflected in the relatively high content and reserve of humus in such meadow soils of the Bukhara oasis. Chlorides and sulfates reduce the alkalinity of the soil, therefore, with their high content, even relative to you, the concentration of sodium cannot create a high alkalinity index, but worsens the physical properties of the soil.

The increased content of water-soluble salts had a negative effect on the content of nitrogen and phosphorus. With increasing salinity, the gross content of nitrogen and phosphorus, ammonium and nitrate nitrogen and mobile phosphorus decreases. The content of gross and exchange potassium, in most cases, was greater in saline soils. Salinization most of all affected the nitrogen regime of meadow soils of the Bukhara oasis and contributed to a decrease in the content of gross and mineral nitrogen.

Thus, salinization, its degree and chemistry significantly affects the content and supply of humus, as well as nutrients and determines the activity of the processes of humification and nutrient cycling.

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