

PHYSICAL CONDITIONS OF SALINE SOILS WITH MEDIUM AND STRONG DEGREE OF DESERTIFICATION IN VOLGA DELTA

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The physical state of saline soils of various degrees of desertification was assessed within the framework of the research. Regularities of changes in the basic physical properties of the soils have been established. Two typical sites in the hilly landscape of the Volga delta with medium and strong degrees of halomorphic desertification were selected as experimental. The soil cover of the sites was represented by zonal brown arid soil and hydromorphic solonchak; the sites were different in their position in the relief and in water-salt regime. At each site, sampling grids were laid and at the nodes of these grids field measurements were carried out and soil samples were collected. The physical properties of the soils (soil bulk density, soil moisture content, field capacity, structural state, water permeability and penetration resistance) were studied. The salinity and salt content in the samples were also measured. The results of a comparative analysis have shown that differences between the soils of different degrees of desertification were statistically significant for such physical properties as soil moisture, penetration resistance and water permeability, as well as for the salt content in the topsoil. These properties were the most sensitive to the manifestation of desertification processes. A sharp deterioration in the soil physical conditions combined with an increase in the topsoil salt content has been marked when the degree of soil desertification and soil automorphism were increasing. No statistically significant differences were found between the studied soils in their structural state or bulk density. It was established that with an increase in the degree of soil automorphism, a transition of the soil from the medium to the strong degree of desertification was occurring with a sharp deterioration in the soil physical properties that were most sensitive to desertification.

Key words: soil, soil physical properties, soil salinization, desertification, Volga delta