

RESEARCH ON THE ACTION OF MINERALIZED WATER ON THE CHARACTERISTICS OF ORDINARY CHERNOZEM

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Abstract

The agro-industrial complex of the Republic of Moldova operates in risky conditions. Due to its geographical location, the territory of the republic falls within the area with insufficient and unstable humidity. The annual amount of atmospheric precipitation varies between 380 and 550 mm. Long-term research has established that the main limiting natural factor in obtaining high and stable harvests is the low level of accessibility of plants to accessible water. In the conditions of the republic one of the most effective measures to optimize the soil moisture regime is irrigation. Obviously, it does not exclude the application of agrotechnical processes for storing water in the soil. Soil irrigation as a method of improving water regime has been known since ancient times, but so far there are a number of complicated problems related to the reaction of some soil types to changes in water regime and water quality used for irrigation. Thus, the irrigation of chernozems with mineralized water (> 3000 mg/l) does not cause essential changes in the soil adsorbent complex and does not lead to its secondary salinization. The works carried out aimed at testing and assessing the effectiveness of methods to prevent and combat soil degradation during irrigation. The results of the researches highlight the following: the use of good quality water in the irrigation of chernozems has as a consequence the weak decalcification of the plowed layer, the reduction of the hydrostability of the structure and its compaction; irrigation of chernozemic soils with surface and deep (alkaline) water leads to secondary alkalization and solonization, degradation of the structure, peptization of fine clay, secondary compaction and reduction of water permeability; the degrading effect of chernozems irrigation with water of poor quality can be mitigated by applying organo-calcium amendments or treating the water used with soluble calcium compounds. The experimental polygon from Cozești commune, Singerei district, is located on a straight slope with a south-eastern exposure, with a slope of 2%. The soil is presented by ordinary chernozem strongly deep humic clay-loam. It is irrigated for 9 years. The water used is deep water with an unfavorable chemical composition and a strongly alkaline reaction. The evolution of secondary pedological processes and changes in physical and chemical properties in irrigated soils were established by the method of "pair profiles" (irrigated soil and non-irrigated soil). This method is widely used in pedo-ameliorative study and is considered feasible in the quantitative determination of soil characteristics.

Key words: ordinary chernozem, chemical composition, irrigation water, quality indicators