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INFLUENCE OF SOME PROPERTIES CONCERNING WATER STABLE AGGREGATES OF SALINE SOILS

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Abstract

According to literature, aggregate stability of soils is influenced by: particle size and soil texture, soil structure, content of Ca²⁺ and Mg²⁺, mineral clay type, soil content of organic matter, soil processing degree. This paper aims to investigate the influence of some physical, microbiological and chemical properties of saline soil concerning water-stable aggregate. The hydro system stability of the aggregates appears in the specialized studies as having a positive correlation with microorganisms activity and thus with their behaviour in the soil. Our data support this theory, since according to our research there is a positive correlation between the percentage of stable aggregates and the amount of microorganisms. In samples from cultivated soil (noted in this paper by S), where the amount of microorganisms is higher, the percentage of water-stable aggregate is higher as well. In samples from uncultivated soil (noted in this paper by M), where the amount of microorganisms is lower, the percentage of water-stable aggregate is lower too. According to research studies and to the specialty literature, sodium is an element with a disruptive role on the stability of the aggregates. Our experimental data has shown that in samples from uncultivated soil (M), where sodium values are much higher, compared to samples from the cultivated soil (S), the percentage of water-stable aggregate is lower than the percentage of water-stable aggregate in the samples from the cultivated soil. Also, our results concerning porosity values ranging between 42.27% (the minimal value) to 49.86% the maximal value, show that these soils can be characterized as having low and very low porosity according to specialized literature. However, it must be taken into account the fact that in clay soils the porosity is very variable, depending on how the soil contracts, swells, disperses, compacts or cracks. In addition, the values describing the water permeability of the soil show that this characteristic for the control soil is small, the permeability coefficient k having values between $1.73 \cdot 10^{-8}$ - $7.19 \cdot 10^{-8}$. For the cultivated soil, the permeability is medium, k having values between $4.97 \cdot 10^{-7}$ - $7.83 \cdot 10^{-8}$. Our data regarding soil physical properties, as well as the data about soil chemical properties that have been analyzed in this study show a weak quality of these soils, which cannot sustain a healthy crop with good economic yield.

Key words: aggregate, saline, soil, water-stable

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