THE STRUCTURAL STATE OF ORDINARY CHERNOZEM UNDER SOYBEAN CROPS ON AN EROSION-PRONE SLOPE

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The study was carried out on the eroded slopes of agricultural areas in the Rostov region, which is located in the zone of risky farming. Soils are classified as heavy loam ordinary chernozems on a medium-washed loess-like loam. The paper presents the results of a three-year research (2018–2020). The aim of the research was to establish the influence of two tillage systems and two sowing methods on the structural state of the ordinary chernozem when growing soybeans on the eroded slopes. In the field experiment, conventional mouldboard ploughing (control) and chisel tillage (erosion control) on erosion-prone slopes were studied. Also, two sowing methods were studied: wide-row (control) and ordinary row (soil-protected). The assessment of the structural state and water stable aggregation of the chernozem has been carried out. The soil structure coefficients, coefficients of the aggregate water stability as well as the criterion of water stability (ARI criterion) were calculated. The studied soils have good (< 60%) and excellent (< 80%) structural state in terms of the air-dry aggregates proportion and excellent (< 80%) in terms of the water-stable aggregates number. Ordinary chernozems are also characterized by an excellent state in terms of structural coefficient (C_s > 1.5.) and good in terms of water stability (K_{ARI} = 100–500%). When cultivating soybeans on eroded slopes, it is recommended to use chisel tillage with an ordinary row sowing method.

Keywords: soil structure, ordinary chernozems, eroded slopes, tillage, sowing method, soybeans.