THE EFFECT OF TILLAGE SYSTEMS ON SOIL COMPACTION OF ARABLE SOILS COMPARED TO FOREST LAND ON THE EZĂRENI PLATEAU, IAȘI COUNTY

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Abstract

Ezăreni Farm is located in Miroslava commune, Iasi County, within a geomorphological area defined by the Iași Ridge, situated between the Central Moldavian Plateau to the west and south, and the Moldavian Plain, specifically the Jijia–Bahlui Plain, to the east.

The soil characteristics reflect the influence of land use and vegetation, with forested areas showing deeper humus and calcium carbonate accumulation horizons compared to arable lands. During winter, wind erosion and increased subsoil compaction reduce the depth of these horizons.

The soils have a predominantly fine texture, with the highest clay content in the AB transition horizon, where humus distribution gradually decreases. Cambic chernozem on the edge of the Ezăreni plateau, developed under forest vegetation, is very loose in the 0–20 cm layer, with bulk density values between 0.97 and 1.09 g/cm³. Increasing compaction and changes in soil texture between 32–160 cm depth confirm the aeolian origin of the upper soil layer. In contrast, the cambic chernozem under arable use is loose in the ploughed layer, moderately compacted in the subsoil, and strongly compacted at 80–100 cm depth. The moderate compaction in the middle part of the soil profile is due to clay illuviation and the prevailing aerohydric regime, which contribute to denser packing of soil aggregates.

Key words: bulk density, compaction, soil texture, wind erosion.