

NO-TILLAGE IMPACT ON HYDRO-PHYSICAL PROPERTIES OF THE SOIL ON CORN CROP

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Abstract

Water content is essential for all soil processes. It functions as a transfer medium for nutrients in the soil solution, as well as a source of water needed for plant growth and development. The practice of no-tillage, compared to conventional tillage, has a positive influence on the continuity of the soil pore system, with direct effects on water and air circulation. The present scientific research investigates the dynamics of hydro-physical properties in tillage systems practiced in the experimental field of the Soil Management Department in Ezăreni Farm, Iasi University for Life Sciences, Romania. It is geomorphologically located on the transition Coast of Iasi, in a plateau area, with a cambic chernozem soil, with clay-loam texture. Soil samples were collected from the reference plots in undisturbed natural settlement, using 100 cm³ metal cylinders to determine the hydraulic conductivity. Soil samples were also taken at a depth of 0-90 cm for gravimetric moisture determination and WatchDog sensors (SM100) were placed at a depth of 10-30 cm at the beginning of the growing season for volumetric moisture measurement. In the field, the infiltration rate of water into the soil was determined using the double ring infiltrometer. The results confirm that the no-tillage system conserves more water in the soil, has higher saturated hydraulic conductivity values, from 0.196 at 30-40 cm depth to 1.209 (cm/s x 10⁻²) at 20-30 cm depth, and the infiltration rate determined in the field is 4% higher compared to the conventional system.

Key words: soil moisture, infiltration rate, saturated hydraulic conductivity