INFLUENCE OF TILLAGE SYSTEMS AND COVER CROPS ON SOIL PHYSICO-CHEMICAL PROPERTIES

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Abstract

Tillage systems influence all soil properties and have different effects on plant growth and development. Adopting conservation farming practices brings benefits by improving soil quality, reducing soil erosion and can have synergistic effects on crop productivity over time. Cover crops are one of the most effective methods of improving the quality of agricultural soils, retaining soil moisture and combating nutrient pollution. Studies have been carried out from 2022 to 2023 to determine the influence of different tillage systems and cover crops on soil quality indicators. The research was carried out in an experimental polygon belonging to the Ezăreni Didactic Station, occupying an area of 0.50 ha, where in autumn 2022, autumn forage pea crop was sown in conventional and no-tillage system. In order to determine the moisture regime, immediately after sowing and during the whole growing period, soil samples were taken from 0-90 cm depth from both tillage systems. In terms of bulk density, it increased steadily over the 0-40 cm soil profile in both tillage systems. Penetration resistance was determined using the Eijkelkamp penetrologist in both tillage systems, with soil samples taken from three points in each system. The highest values were obtained in the conventional system at a depth of 25-30 cm. Phosphorus and mobile potassium were determined by the Egner-Rhiem-Domingo method, and the resulting values on the 0-40 depth of mobile phosphorus (17-53 ppm) place the soil in the medium and good category of the assurance status of this element in both tillage systems. Also, the values obtained for mobile potassium (184-259 ppm) in both tillage systems place the soil in the good and very good category of mobile potassium status. The nitrogen index was calculated according to the humus content and the degree of saturation in the bases, and the recorded values place the soil in a good supply of nitrogen content in both the conventional and no-tillage systems.

Key words: moisture, bulk density, phosphorus, potassium, nitrogen index