THE EVALUATION OF THE INDUCED SOIL COMPACTION AND THE USE OF DIFFERENT AGRICULTURAL EQUIPMENT ON SOME SOIL STRUCTURAL INDICATORS AND ON THE SUNFLOWER CROP YIELD

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Abstract

Soil compaction, induced by the agricultural machinery traffic, has a significant impact on some physical and mechanical properties of the soil and, consequently, on sunflower yields. Since Romania remains the largest producer of sunflower in the European Union, special attention needs to be taken. In 2021, Romania ranked first in the EU both in terms of production and cultivated area, according to data from the statistical office of the European Union, EUROSTAT. In this research, experimental investigations were performed in order to quantify the induced soil compaction perform by simulation of the agricultural traffic through successive „wheel by wheel" crossings on sunflower crop and different systems of machinery used in soil tillage. To this end there where been carried out several experimental plots, with different degrees of compaction corroborated with different systems of machinery used in soil tillage, and the evolution of the following parameters where determined: soil penetration resistance, soil bulk density, the water stable aggregates of the structural elements and the mean weight diameter of these elements. As per findings in this research, the soil compaction performed by a tractor Valtra T-190 before plowing, through one passing and respectively two passes through successive „wheel by wheel" crossings, in order to obtain different graduations of soil compaction and with different systems of agricultural machinery used in soil tillage, had a negative impact on all indices followed in the experimental researches and, therefore, on sunflower seed yields.

Key words: sunflower, soil compaction, systems of agricultural machinery, soil properties