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Physical and hydric characterization of a red-yellow dystrophic latossolo" under different tillage system and grassland systems

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Introduction The soil compaction of tillage systems are important soil degradation. The traffic of machines and animal trampling, to promote the increasing of soils physics parameters used to available the soil compaction. Some of these parameters are the compaction degree and soil penetration resistance. The limits adopted for these parameters are respectively: 75% and 2MPa for compaction degree and soil penetration resistance.

The objective of this work was to evaluate the degree of compaction and the soil penetration resistance under different tillage systems and grassland systems.

Materials and methods The present study was conducted in Experimental Farm of University of the State of Minas Gerais, Passos in a Red-yellow dystrophic Latossolo. The systems were: No-tillage system (PDM), No-tillage system irrigated (PDMI), conventional planting system (PCM), grass land (PG) and Natural forest (MN). The compaction degree (GC) it was obtained by the relationship between soil bulk density and the maximum soil bulk density (D_{max}) obtained from Proctor Normal test. The studies of soil penetration resistance (RP) were made in undisturbed samples through a pocket penetrometer. Those samples were saturated and the RP determinations were accomplished in different water contents.

Results and discussion The GC values for the different systems were: PDM=71,5%, PDMI=75,1%, PCM=69,7%, PCMI=75,2%, PG=89,2% and MN=72,1%. Using the limit of 75%, it was observed that the systems: PG, PDMI and PCMI, present values higher than critical values. The soil compaction it is already happening. In the grassland, the animal trampling can be increasing the GC values. For the PDMI, the intense traffic of machines and the irrigation, increasing the GC values. In PCMI, although the soil was mobilized, the same effect that PDMI in increasing of GC value was observed. The no-tillage, the irrigation system and traffic of machines to promoted the increasing in GC value. The soil penetration resistance, indicated that the grass land, was the system what presented the higher soil structure modification than other systems (1,92 MPa), followed by the no-tillage irrigated and no-tillage system of 1,91 and 1,88 MPa respectively.

Conclusion We conclude that the handlings PG, PDMI and PCMI, are presenting compaction tendencies and justify the Chizel plow use.

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