



A method to evaluate the compaction effect on soil structure

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A method allowing the evaluation of the effect of the compaction on soil structure is proposed. It is based on soil moisture measurements via TDR method (Time Domain Reflectometry). The investigation of the hydrodynamic variation of soil moisture indicated two types of compaction: 1) Compaction by load traffic implying change in structure: decrease of structure in the top 0.10 m layer and increase of microporosity at 0.30 – 0.40 m. Consequently, no flow occurred downward. In this case, TDR measurements show a poor continuity of pores between top and subsoil; this observation was confirmed by the measurements of density, macroporosity, and dye infiltration experiments. 2) Compaction by intensive stock trample or pugging in which micropores are reduced whereas macropores are well developed and are resistant to the vertical compression in compacted soil and therefore dominated the water flow. Moreover, in reconstructed soils, micropores provide the totality of flow, as demonstrated by the modeling results. In fact, macropores are not yet developed in these young soils. Moreover, the results of our investigations are discussed in relation to the recent research in the soil compaction domain.