



Temporal Variability of Physical Properties on an Aquic Argiudoll under no Tillage

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Practices for the implementation and development of crops affect soil properties and processes in space and time with consequences for the accumulation and movement of water, nutrients and pollutants, which affects plant growth. The aim of this study was to determine the temporal variability of soil physical properties and its link with the infiltration process, on an Aquic Argiudoll of the Argentine Pampas under no-till cultivation. Sampling was performed during six dates in the INTA EEA Paraná (Entre Ríos, Argentina), in the course of the succession of wheat/ soybean-corn. In each of those dates, rain simulations were performed under covered and uncovered soil. From these results it was determined the saturated hydraulic conductivity (Ks), the runoff coefficient (EC), the accumulated rainfall up to ponding (Tp), the accumulated rainfall to reach the steady state infiltration rate (TI) and the decline slope of the infiltration rate (Pd). Also we determine: the initial soil water content (HI), bulk density (Dap), volume occupied by pores larger than 50 μm (> 50), volume occupied by pores between 10 and 50 μm (10-50), soil physical quality index (S) and structural stability (CDMP). On three dates HI was approximately 11%, two were between 22 and 27% and in the remaining time HI was 36%. Despite these variations we don't observed significant changes in most soil physical properties associated with the structure and pore size. However, we could prove significant differences between dates in Ks and EC, both on bare and cover soil. At the same time, differences in these parameters between coverage degrees were significant only in two dates. The HI affected the variability of Ks results. Also Ks ratio between covered and uncovered soil improved with HI increment, except for HI equal to 36%. We found highly significant linkage between Ks, CE and Pd with HI. This study reveals the importance of the temporal dynamics of water movement in this Aquic Argiudoll, although other soil physical variables are relatively more stabilized.