



Effects of soil compaction and shearing processes on soil structure following passage of a tracked heavy machine

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The main objective of this study was to evaluate the effect of soil deformation by compaction and shearing processes on soil structure due to a tracked heavy machine (scrapedozer) during a golf course construction. Two parcels of dry soil and two of wet soil were selected for the experiments to investigate the spatial variability of the effect of soil deformation on soil structure. In dry soil, a clear homogeneous distribution of soil compaction (reduction of micropores domain) was found; whereas, in wet soil, a tendency of an heterogeneous distribution of compaction appeared. In dry soil, shearing process was more pronounced in terms of magnitude and frequency compared to wet soil. In fact, existing microcracks due to shrinkage initiated the formation of larger and deeper cracks and contributed to the formation of a wide zone of loosened material (increase of mesopores volume) around those voids. This observation was confirmed by the pore volume distribution and the irrigation experiments. The resulted vertically oriented cracks confirmed this result as well.