

Soil compaction due to agricultural machinery impact

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Abstract

Tillage involves various complex mechanisms of mechanical disturbance of the soil, aimed to advance its physical structure by creating relevant conditions for growing crops. Quality regulation of every specific tillage conception is critical for the soil physical parameters. Thus, the main goal of this work was to review approaches to the analysis of the quality of soil cultivation techniques. Relationships have been established between the basic operating parameters of the mechanization applied and the consequent particle size spreading of the soil. Supplementary, statistical indices of the distribution pattern of soil particles, based on higher-order dimensionless statistical parameters were estimated. The observed mass distributions of soil aggregates was the result of extremely complex and superimposed influences of soil type, field conditions, crop structure, equipment used, etc. At this stage, an accurate forecast of the impact of soil tillage techniques on the changes in composition and size distribution of soil aggregates based on mathematical modelling is very difficult. Further research will be continued to include wider range of soil types, agricultural mechanization systems and their operational regimes.

Graphical abstract

