



Magnetic Measurements as a Useful Tool for the Evaluation of Spatial Variability of the Arable Horizon Thickness

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In normal practice, the thickness of the arable horizon is determined on the basis of field morphological descriptions, allowing the subjectivity of perception and judgment at the crucial role of experience of the researcher. The subject of special interest are independent analytical and technically relatively simple in design approaches to the diagnosis of the lower boundary of the blended plowing the profiles part. Theoretical premises to use spectrophotometry and magnetometry to arable horizon depth diagnose is based on the concept of regular color and magnetic properties vertical differentiation in a profile of virgin soils. This work is devoted to the comparative assessment of the possibility to objectively and reliably diagnose the lower boundary of the arable horizon in gray forest soils by determining the color characteristics and the magnetic susceptibility of their layer-wise samples. It was shown with arable gray forest soil (Cutanic Luvisols (Anthric)) as example that the magnetic susceptibility profile distribution curves can provide more reliable and objective assessment of the arable horizon thickness spatial variability than the profile curves of the color characteristics in the CIELAB coordinates. Therefore, magnetic measurements can be a useful tool for the tillage erosion estimation in the monitoring of soil characteristics in connection with the development of precision agriculture technologies and the organizing of agricultural field plot experiments.