

## Using scaling factors for evaluating spatial and temporal variability of soil hydraulic properties within one elevation transect

Antonín Nikodem, Radka Kodešová, Ondřej Jakšík, Miroslav Fér, and Aleš Klement

Czech University of Life Sciences Prague, Department of Soil Science and Soil Protection, Prague, Czech Republic  
(kodesova@af.czu.cz)

This study was carried out in Southern Moravia, in the Czech Republic. The original soil unit in the wider area is a Haplic Chernozem developed on loess. The intensive agricultural exploitation in combination with terrain morphology has resulted in a highly diversified soil spatial pattern. Nowadays the original soil unit is preserved only on top of relatively flat parts, and is gradually transformed by water erosion up to Regosols on the steepest slopes, while colluvial soils are formed in terrain depressions and at toe slopes due to sedimentation of previously eroded material. Soils within this area has been intensively investigated during the last several years (e.g. Jakšík et al., 2015; Vašát et al., 2014, 2015a,b). Soil sampling (disturbed and undisturbed 100-cm<sup>3</sup> soil samples) was performed at 5 points of one elevation transect in November 2010 (after wheat sowing) and August 2011 (after wheat harvest). Disturbed soil samples were used to determine basic soil properties (grain size distribution and organic carbon content etc.). Undisturbed soil samples were used to determine the soil water retention curves and the hydraulic conductivity functions using the multiple outflow tests in Tempe cells and a numerical inversion with HYDRUS 1-D. Scaling factors (alpha-h for pressure head, alpha-theta for soil water contents and alpha-k for hydraulic conductivities) were used here to express soil hydraulic properties variability. Evaluated scaling factors reflected position within the elevation transect as well as time of soil sampling. In general large values of alpha-h, lower values of alpha-k and similar values of alpha-theta were obtained in 2010 in comparison to values obtained in 2011, which indicates development of soil structure during the vegetation season.

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