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Spatial variability of water repellency in pine forest soil

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<https://doi.org/10.17221/11/2008-SWR>

Citation: Orfánus T., Bedrna Z., Lichner L., Hallett P.D., Kňava K., Sebíň M. (2008): Spatial variability of water repellency in pine forest soil. Soil & Water Res., 3: S123-S129.

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The variability of water repellency of pine-forest arenic regosols and its influence on infiltration processes were measured in southwest Slovakia. The water drop penetration time (WDPT) tests of soil water repellency and infiltration tests with a miniature tension infiltrometer (3 mm diameter) were performed. Large differences in infiltration were observed over centimetre spatial resolution, with WDPT tests suggesting water repellency varying from extreme to moderate levels. For soils with severe to extreme water repellency determined with WDPT, steady state infiltration was not reached in tests with the miniature tension infiltrometer, making it impossible to estimate sorptivity. Where sorptivity could be measured, the correlation with WDPT was poor. All results suggest that hydraulic properties of soil change below the centimetre scale resolution of the current study, probably due to a presence of unevenly distributed hydrophobic material.

Keywords:

spatial variability; water repellency; WDPT test; infiltration; sorptivity

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