

International Agrophysics

Polish Journal of Soil Science

Acta Agrophysica

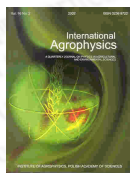
Instytut Agrofizyki

International Agrophysics

General information

Issues

Search



International Agrophysics

publisher: Institute of Agrophysics
Polish Academy of Sciences
Lublin, Poland

ISSN: 0236-8722

vol. 22, nr. 3 (2008)

[previous paper](#) [back to paper's list](#) [next paper](#)

Field scale heterogeneity of soil structural properties in a moraine landscape of north-eastern germany

[\(get PDF\)](#) S. Koszinski¹, O. Wendroth¹, J. Lehfeldt²¹ Center for Agricultural Landscape and Land Use Research e. V. (ZALF)² Institute for Soil Landscape Research, Eberswalder Str. 84, D-15374 Miincheberg, Germany³ Institute for Land Use Systems and Landscape Ecology, Eberswalder Str. 84, D-15374 Miincheberg, Germany
vol. 9 (1995), nr. 3, pp. 201-210

abstract Spatial variability of soil structure complicates interpretation of investigations on soil physical properties and their influence on crop growth. Especially, for pleistocene sandy and sandy-loamy soils, small scale heterogeneity and the range over which observations give reliable estimates on the state of soil properties have to be considered. The aim of this study was to investigate the variability structure of various soil physical and morphological parameter in a field soil. In an Albic Luvisol under conventional tillage located in Miincheberg, Germany, numbers and pore area fraction of macropores >200 μm were determined for samples taken from the topsoil layer (15 cm average soil depth), a layer compacted by wheel traffic (30 cm) and the subsoil (55 cm). For macropore determinations polished blocks of soil samples were used, stabilized with polyester resin (stained by fluoresceine). In the same layers, soil texture, saturated hydraulic conductivity, air permeability, dry bulk density and rootability were investigated for samples from 25 profiles in a 4 ha block within a 60 ha field. In the subsoil, clay content, total carbon content, dry bulk density and rootability were autocorrelated over a distance of about 25 to 50 m. Whereas soil structural parameters, such as numbers and area of macropores as well as permeability properties varied randomly even over the shortest distance sampled (10 cm). For the topsoil and the plough pan, variability appeared to be unstructured in case of hydraulic conductivity, air permeability, dry bulk density, rootability and number and area of macropores. Considering the short distances between the sample cores (10 cm) taken in the same soil profile, structural variation was identified in the topsoil.

keywords spatial variability, soil structure, soil physical properties

Instytut Agrofizyki PAN
ul. Doświadczalna 4
20-290 Lubline-mail: sekretariat@ipan.lublin.pl
tel.: +48817445061
fax.: +48817445067