

International Agrophysics

Polish Journal of Soil Science

Acta Agrophysica

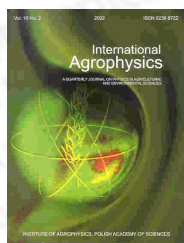
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International Agrophysics

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International Agrophysics

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

ISSN: 0236-8722

vol. 22, nr. 3 (2008)

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Guelph permeameter measurements of the topsoil and upper subsoil hydraulic conductivity for characterising the structural state of arable lands

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vol. 11 (1997), nr. 3, pp. 159-171

abstract An attempt at characterising the soil structure dynamics by repeated borehole infiltration measurements was undertaken on 15 measurement sites at two locations. The boreholes were 40 cm deep. Quasisteady discharges were determined at four different water levels. The resulting field-saturated hydraulic conductivities (Kf) show distinct dependence upon soil texture. Kf does not depend much upon depth when measured after a prolonged period of natural settling of the topsoil. At other instants, the upper topsoil appears to be more permeable due to either tillage operations or the surface micro-cracks caused by drying. Man-induced subsoil compaction is detectable on sandy loam and loamy sand sites. The favourable effect of subsoiling stabilized by liming has been proved. There is a weak negative correlation between log A^{ft} and the initial soil moisture content. It is envisaged that the results can be used as inputs to the simulation models of crop growth and soil water and nutrient regime, e.g., when these models are applied to investigate various functions and roles of soil structure.

keywords structure, borehole infiltration, simulation models

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