

International Agrophysics

Polish Journal of Soil Science

Acta Agrophysica

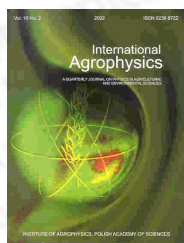
Instytut Agrofizyki

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](#)

Effect of tillage tool geometry on soil structural stiffness

[\(get PDF\)](#) C.I. Ijioma<sup>1</sup>, E. McKyes<sup>2</sup><sup>1</sup> Institute of Erosion Studies, Federal University of Technology, P.M.B. 1526,  
Owerri, Imo State, Nigeria<sup>2</sup> Department of Agricultural Engineering, McGill, University, Ste Anne de Bellevue,  
Quebec, Canada

vol. 9 (1995), nr. 1, pp. 25-36

abstract The concept of structural stiffness signifies the level of resistance a body of agricultural soil develops so as to withstand any form of further deformation from subsequent external loading. In order to verify the significant effects of tillage tool geometry on the soil structural stiffness, field clay loam and sandy loam soil were tilled with a chisel shaped tine at different tillage geometries. Samples of the tilled soils were sheared in a 'uniform strain' direct shear test box to determine the shear strength parameters from which the structural stiffness was calculated. The effects of the width of the tillage blade, the rake angle, the depth of tillage and their interactions on the clay loam and the sandy loam structural stiffnesses were significant at the 5 % level or higher. From this study, it was possible to predict from the structural stiffness concept the shear resistance behaviour of a soil that has been tilled with a tillage tool of known geometry.

keywords tool geometry, soil stiffness and behaviour

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