Geophysical Research Abstracts
Vol. 21, EGU2019-13195, 2019
EGU General Assembly 2019

Monitoring of runoff processes during an artificial rainfall on a freshly tilled soil

Tomas Dostal, Jakub Jeřábek, Tailin Li, and David Zumr

Czech Technical University in Prague, Faculty of Civil Engineering, Prague 6, Czech Republic (dostal@fsv.cvut.cz)

Research of water regime on cultivated soils is important for planning of landscape protection measures which help to preserve the water in the landscape. The aim of this contribution is to assess effect of seedbed cultivation and wheel-track compaction on runoff dynamics with a special regard on shallow subsurface processes which haven't been often taken into the account. Two artificial rainfall experiments on two plots with and without wheel-track were undertaken during the measuring campaign. Surface runoff as well as suction pressure (SP) and soil water content (SWC) in the subsoil were measured. Measurements were competed with geophysics and photogrammetry. Results indicated faster runoff response and higher total runoff on the plot with a presence of the wheel-track. SWC indicated fast response to the rainfall in the topsoil and at the interface of topsoil and subsoil. Deeper SWC reacted with delay and stayed constant after the end of the rainfall. Comparison of the recession of SWC on both plots indicated that the presence of wheel-track also affects the subsurface water redistribution after the rainfall. SP reaction was also fast. The delay of the SP reaction was however random over both plots, indicating high effect of surface or subsoil topography. Geophysics indicated predominantly vertical water redistribution after the experiment and effect of the compacted soil bellow wheel-track on water infiltration. The research was supported by projects no. LTC18030, SGS17/173/OHK1/3T/11, Shui 773903 and SGS18/122/OHK1/2T/11.