Geophysical Research Abstracts,
Vol. 10, EGU2008-A-07508, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-07508
EGU General Assembly 2008

Effects of surface heterogeneity on preferential flow in water repellent sandy soils

K. J. Bell (1), G. S. McGrath (1) and **C. Hinz** (1)

School of Earth and Geographical Sciences, The University of Western Australia
(christoph.hinz@uwa.edu.au, +61 8 6488 3466)

This study aimed to determine the extent to which heterogeneity of soil surfaces contributes to preferential flow in sandy soils at Marbelup Brook on the south coast of Western Australia. Dye tracer experiments were conducted on a soil under pasture and a soil under a Tasmanian Bluegum (Eucalyptus globulus) plantation. Dye patterns were investigated with soil sampling from within the dyed water areas and from the non-dyed soil matrix. Soil samples were analysed for soil moisture, water repellence, hydraulic conductivity and texture. Prior to the application of dye tracer soil surface plots of one mˆ2 were tested for water repellence at 100 sampling locations at a 10 cm grid using the molarity of ethanol test. Preferential flow patterns were characterised by determining maximum water and dye penetration depths, average wetting front depth, presence of fingers and others. It was found that water repellence is linked to the extent of preferential flow. Higher water repellence of the soil profile correlates positively with the variability of soil surface water repellence. Variability of water repellence is linked indirectly with irregular infiltration patterns and preferential flow. Coefficient of variations of water repellence correlated well with coefficient of variation of wetting front irregularities. Higher resolution measurements for water repellence and microtopography of the soils surface may be necessary to reveal direct links between water repellence and the location of preferential flow paths.