Geophysical Research Abstracts
Vol. 14, EGU2012-14036, 2012
EGU General Assembly 2012

Bricks in urban soils

T. Nehls (1), S. Rokia (2), B. Mekiffer (1), and G. Wessolek (1)

(1) Technische Universitaet Berlin, Dept. of Ecology, Chair for Soil Conservation, Berlin, Germany (thomas.nehls@tu-berlin.de, ++49 (0)30 31422309), (2) Laboratoire Sols et Environment, INPL, INRA, 2 Avenue de la Foret de Haye, B.P. 172, F-54505 Vandoeuvre-les-Nancy, France

Bricks can be considered as anthropogenic markers since they are regularly found in urban soils worldwide. They are known to fulfill soil functions due to their pore system. The purpose of this study is to investigate abundance and functions of bricks in urban soils, focusing on plant nutrition and contamination aspects.

Three different Berlin urban soils have been studied for their brick contents in the coarse and fine earth fractions by hand sorting. Light and scanning electron microscopy was then employed to investigate the bricks for rooting. Third, CEC, pH, EC, Corg, nutrient storage (XRF) and availability (2:1 extract, ion chromatography, AAS) of bricks and fine earth fractions of the corresponding soil horizons have been investigated.

The fine earth fractions of the investigated soils contain 3 to 5 % of bricks, while the coarse fractions contain up to 50 %. Roots enter brick pores or attach to brick surfaces. Therefore, they can use the water and nutrients stored in bricks. The CEC of bricks is grain size dependent and reaches a maximum of 6 $cmol_c\,kg^{-1}$ for particles smaller than 0.063 mm. This dependency is not explained by a low pore connectivity. Rather, it is the result of the restricted diffusion into the brick pore system due to the short shaking time in the CEC analysis protocol. From the nutrient storage and availabilities we conclude that bricks can better supply plants with K, Mg, Ca and S than the bulk soil at the investigated site. However, in general, the nutrient availability from bricks is rather low compared to agricultural soils, except for Ca and S.

Because of the water and nutrient storage, low contamination status and the possible rooting of bricks, they can be used for amelioration of poor sandy soils and for soil construction.