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EXAMINATION OF THE EFFECT OF BIOCHAR ON SOIL RESISTIVITY AND POLARISATION

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Geophysical methods, namely electromagnetics, electrical resistivity, (spectral) induced polarisation and magnetic resonance are successfully applied for soil studies. These measurements are minimal invasive and able to bridge the gap between small and bigger scales. Biochar addition to soil changes hydraulic conductivity significantly, but additionally resistivity and polarisation of the soil are changed markedly. These changes have been studied in laboratory scale (samples of some cm size). The more biochar is added the lower the resistivity and the higher are the induced polarisation effect. To study these effects on larger scale different lysimeters (r=15cm/ h=81cm) are filled with soil with different amounts of biochar added. These lysimeters are irrigated and the water percolation through the lysimeters is observed by time lapse ERT. The method enables to visualise the percolation process. The resolution of preferential flow paths is challenging due to the limited resolution of the ERT method. However, the design of the lysimeters on scales and with ceramic bottom layer and suction, enable the detection of any out flowing water. These studies serve as first test for the possible application of geophysical measurements on field scale in order to study the physical effect of biochar amendment with regard to water retention and preferential flow.