



The effect of biochar application on thermal inertia of soil

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In recent times main causes of soil degradation include intensive farming, the shortage of water in the soil or droughts associated with climate and increasing amount of CO₂ in the atmosphere. Reducing the negative effects and rational management of biomass and wastes require effective and economical solutions. One of them can be application of biochar to retain more water, improve the quality and fertility of the soil and modify thermal properties of soil. In his study the effect of biochar, obtained from the wood biomass, on soil thermal inertia was assessed. The thermal inertia of the soil is defined as $C_v \cdot \sqrt{D}$, where C_v is the heat capacity and D is the thermal diffusivity. The experimental plots were: grass covered soil and fallow with addition of 0, 10, 20 and 30 Mg/ha of biochar in each and pure biochar was used for comparison. Addition of biochar resulted in a decrease of the soil heat capacity in dry state and considerable increase in wet state. The results revealed that addition of the biochar into the soil caused considerable reduction of the thermal diffusivity. The reduction of both properties in dry state was mostly due to decrease in both particle density and bulk density of the soil. The observed lowest and highest reduction in the thermal inertia with decreasing water content was obtained for pure biochar and the biochar amended soil, respectively.