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BIOCHAR SURFACE PROPERTIES THROUGH APPLICATION OF AN INNOVATIVE NMR TECHNIQUE: FAST FIELD CYCLING RELAXOMETRY

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Biochar is a carbonaceous material obtained by pyrolysis of biomass feedstocks. It is applied to soils in order to improve fertility and mitigate greenhouse-gases emissions. In fact, from the one hand, biochar changes physical-chemical soil properties, thereby affecting soil fertility. From the other hand, biochar is resistant to chemical and biochemical degradation. For this reason, its use allows carbon sequestration in soils and consequent reduction of carbon dioxide to the atmosphere.

Here, dynamics of water at the liquid-solid interface of water saturated biochars is discussed. Results revealed that water dynamics is affected by the nature of biochar parent biomasses. Moreover, biochar chemical physical properties are affected by conditions for their production.

It was understood that water undergoes to an inner-sphere interaction mechanism with biochar surface through formation of weak unconventional hydrogen bonds.

Recognition of the interaction mechanisms between water and biochar is of paramount importance in order to understand why biochar soil amendments improve soil fertility and crop production.