

The Potential Effect of Biochar Application on Microbial Activities and Availability of Mineral Nitrogen in Arable Soil Stressed by Drought

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Abstract : Application of biochar to arable soils represents a new approach to restore soil health and quality. Many studies reported the positive effect of biochar application on soil fertility and development of soil microbial community. Moreover biochar may affect the soil water retention, but this effect has not been sufficiently described yet. Therefore this study deals with the influence of biochar application on: microbial activities in soil, availability of mineral nitrogen in soil for microorganisms, mineral nitrogen retention and plant production. To demonstrate the effect of biochar addition on the above parameters, the pot experiment was realized. As a model crop, *Lactuca sativa* L. was used and cultivated from December 10th 2014 till March 22th 2015 in climate chamber in thoroughly homogenized arable soil with and without addition of biochar. Five variants of experiment (V1-V5) with different regime of irrigation were prepared. Variants V1-V2 were fertilized by mineral nitrogen, V3-V4 by biochar and V5 was a control. The significant differences were found only in plant production and mineral nitrogen retention. The highest content of mineral nitrogen in soil was detected in V1 and V2, about 250 % in comparison with the other variants. The positive effect of biochar application on soil fertility, mineral nitrogen availability was not found. On the other hand results of plant production indicate the possible positive effect of biochar application on soil water retention.

Keywords : arable soil, biochar, drought, mineral nitrogen

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