

Effect of Two Different Biochars on Germination and Seedlings Growth of Salad, Cress and Barley

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Abstract : The application of biochar to soils is becoming more and more common. Its application which is generally reported to improve the physical, chemical, and biological properties of soils, has an indirect effect on soil health and increased crop yields. However, many of the previous results are highly variable and dependent mainly on the initial soil properties, biochar characteristics, and production conditions. In this study, two biochars which are biochar II (BC II) derived from a blend of paper sludge and wheat husks and biochar 005 (BC 005) derived from sewage sludge with a KCl additive, are used, and the physical and chemical properties of BC II are characterized. To determine the potential impact of salt stress and toxic and volatile substances, the second part of this study focused on the effect biochars have on germination of salad (*Lactuca sativa* L.), barley (*Hordeum vulgare*), and cress (*Lepidium sativum*) respectively. Our results indicate that Biochar II showed some unique properties compared to the soil, such as high EC, high content of K, Na, Mg, and low content of heavy metals. Concerning salad and barley germination test, no negative effect of BC II and BC 005 was observed. However, a negative effect of BC 005 at 8% level was revealed. The test of the effect of volatile substances on germination of cress revealed a positive effect of BC II, while a negative effect was observed for BC 005. Moreover, the water holding capacities of biochar-sand mixtures increased with increasing biochar application. Collectively, BC II could be safely used for agriculture and could provide the potential for a better plant growth.

Keywords : biochar, phytotoxic tests, seedlings growth, water holding capacity

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