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Influence of Biochar-application on the Drought Stress of Plants

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Abstract

Global warming, increasing desertification of soils, a growing world population and subsequent food shortage force to find innovative solutions for all these threatening problems. The fertile Terra Preta soils of Amazonia contain high amounts of pyrogenic carbon (“Biochar”), humus and phosphorous. Stimulated by these findings an increasing number of Biochar-studies were initiated in the last years predominantly at tropical soils. Thus, the application of Biochar to agricultural soils may be a promising mitigation and adaptation strategy.

To investigate plant-soil interactions and greenhouse gas balances with or without drought stress, a fully replicated pot experiment (pots: 10 cm diameter, 20 cm height) was conducted in a greenhouse. Pots were seeded with the recently discovered drought tolerant cash crop *Chenopodium quinoa*. Three levels of biochar application were used, equivalent to 0, 100 and 200 t*ha⁻¹ ploughed 20 cm deep into the soil.

The ecophysiological plant reaction (such as water relations, water use efficiency, ana-bolism) was studied and the exchange of trace gases between soil and atmosphere.

Application of Biochar increased the water holding capacity (WHC) of the sandy soil and had significant effects on several ecophysiological parameters of quinoa plants. The potential of Biochar for drought-related crop management recommendations will be discussed at the poster.

Keywords: Biochar, drought stress, global change, quinoa