

Charcoal and Selected Beneficial Microorganisms: Plant Trials and SEM Observations

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Pilot studies on various charcoals, from a variety of sources and produced at different pressures and temperatures, suggest that the contribution of charcoal to soil fertility and plant growth is a complex combination of nutrient retention and microbial interaction.

Plant trials with charcoal, established in 2006, included *Pinus radiata*, *Solanum tuberosum*, *Pisum sativum*, *Brassica oleracea*, *Cucumis sativus*, *Lactuca sativa*, *Lycopersicon esculentum*, *Zea mays*, *Trifolium repens*, *Lolium perenne*, *Triticum aestivum*, *Abutilon hybridum*, *Viola tricolor var hortensis*, *V. cornuta*, *Narcissus tazetta*, *Freesia armstrongii* and *Dahlia excelsa*. Charcoals made from various hard and soft-woods, bamboos, bark, corn stover, and mixtures of these, were used with and without selected 'beneficial micro-organism' formulations.

The results of these trials and SEM studies on the charcoals used in these studies, together with the initial results of an SEM study on charcoal micro-organism interactions will be presented and discussed in the context of the structural basis of the influence of charcoal on nutrient retention and soil microbiology.

Field Maize Yield and Yield Determining Factors for Four Years Following Biochar Application on a Colombian Savanna Oxisol

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Biochar, when used as a soil amendment, has repeatedly shown to increase crop productivity. However, the mechanisms that underlie such increases have yet to be explained. This talk will report findings from a four-year field study on an Oxisol of the Oriental savannas of Colombia. Maize was grown each year with optimal fertilization, after a single biochar application in late 2002. Biochar application of 20 Mg ha⁻¹ increased maize yield by 22, 23 and 58% in 2004, 2005, and 2006, respectively. Nutrient contents in biomass and soil, crop root density and soil hydrology data will be presented in order to explain the yield increase and determine the nature of the durable beneficial effects of biochar on crop growth.

Slash and Char as Alternative To Slash and Burn—Soil Charcoal Amendments Maintain Soil Fertility and Establish a Carbon Sink

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