

Microbiological Effects of Amending Soil with Peanut Hull-Derived Biochar

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Crop and Soil Sciences Seminar

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Room 2401, Miller Plant Sciences Building

Research at The University of Georgia produces bio-energy through the pyrolysis of pelletized peanut hulls. During pyrolysis (heating in the absence of oxygen) not only is bio-energy produced, but also a useful byproduct, biochar, which is a form of charcoal. One promising use of biochar is as a soil amendment. Amazonian Terra Preta soils, which have pre-Columbian anthropogenic charcoal sources, show high nutrient retention, improved crop yields, and improved water retention (Glaser et al., 2002). Recent studies devoted to examining the specific functions of charcoals in soils have conclusively shown that biochar as a soil amendment has the ability to increase water-holding capacity, nutrient retention, pH, and CEC, in addition to sequestering carbon (Gaskin et al., 2007; Glaser et al., 2001; Liang et al., 2006; Oguntunde et al., 2004). To further examine the impact of biochar on specific soil function, the effects of biochar on soil microbial communities will be evaluated in this study. The objective of this research is to analyze the rhizosphere and non-rhizosphere effects of adding peanut hull-derived biochar to Piedmont soils. Rhizosphere is the portion of soil under the influence of plant roots. In a laboratory experiment, basil plants (*Ocimum basilicum*) will be grown in soil with a 10% (w/w) peanut hull-derived biochar amendment. The soil microbial community will be analyzed by six separate methods: 1) Whole Soil FAME (Fatty Acid Methyl Esters), 2) Soil enzymes arylphosphatase and urease, 3) Arbuscular mycorrhizae, 4) Soil respiration, 5) Soil nitrification, and 6) Soil protozoa.

References

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