Impact of Biochar as Soil Amendment on Produce Yield (Year 1)

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Conventional agricultural practices have resulted in infertile soils, excessive use of pesticides, nutrient run-offs, reduced microbial activities and depleted water resources for soil cultivation. With an estimated global population of 9.8 billion by 2050, the biggest challenge facing humanity is finding innovative solutions to increase food production. Biochar, a solid and stable material rich in carbon, is formed through pyrolysis, a thermochemical conversion process of organic biomass. Due to its unique physical, chemical and biological properties biochar can amend soil fertility and increase crop yield. As a stable material in soil, biochar can help sequester carbon and slow the carbon cycle. The purpose of this experiment was to use biochar as a soil amendment and understand its impact on increased produce yield. Five types of produce were grown using soil (controlled group), soil with compost, and soil with compost and biochar. The dry biomass, root length, plant length and yield of all the produce were measured at the end of the growth season. Biochar outperformed other soils in yield, length and biomass significantly. Using one sample T-test the p value derived proved that biochar had a significant impact as soil amendment in all measures. Two feedstocks, mortality trees in forest and crop residue in farms were used for simulating the amount of carbon dioxide that could be sequestered from the atmosphere. The conversion of crop residue into biochar over 10 years globally would have resulted in the removal of 897 million tons of carbon dioxide from the atmosphere.

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