

A Review of Biochar Effects on Soil Physical, Chemical, and Biological Properties

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Abstract

Human agricultural and industrial activities have led to the increasing production of wastes with adverse effects on the environment due to their improper disposal. One solution to reduce pressure on the environment is to plan for appropriate uses of waste materials. Biochar is a carbonaceous material produced in a process called 'Pyrolysis' which involves incomplete combustion of biomass and wastes in media with no or limited supply of oxygen. Biochar enjoys long-term persistence in soil and the process is mainly used for waste management, climate change mitigation, energy production, and soil amelioration. The unique properties of biochar make it especially useful for soil application as it contributes to soil amelioration. It is capable of affecting such soil physical properties as soil structure, bulk density, and hydraulic conductivity, or such soil chemical properties as pH, cation and anion exchange capacity, and organic content while it also improves such soil biological properties as microbial population, activity, and diversity as well as enzyme activity, all of which ultimately lead to enhanced plant yield. Although most reports have focused on the useful effects of biochar on soil, some have also investigated its negative effects.

Keywords: Biochar, Pyrolysis, Soil properties, Plant yield.

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