

Effects of aged biochar and repeated biochar application on soil microbial diversity

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There is a knowledge gap on the effects of aged biochar and repeated biochar application on soil microbial diversity. The aim of this study was to determine the effects of long-term and repeated biochar application on microbial diversities in a pasture soil. The treatments included B9 – aged biochar at the rate of 10 t ha⁻¹, applied 9 years prior to sample collection; B1 – newly applied biochar at the rate of 10 t ha⁻¹ applied 1 year prior to sample collection; B9+1 – repeated biochar application at the rate of 10 (9 years old) +10 t ha⁻¹ (1 year old) mixed one year prior to sample collection when aged biochar was in the soil for eight years; and B0 – control. The soil samples were collected in October 2015. Next Generation Sequencing of bacterial 16S rRNA genes targeting V1-V3 and V3-V4 regions using Illumina MiSeq platform was undertaken to investigate soil microbial diversity. The B1 and B9+1 significantly changed the soil bacterial community structure compared to B9 and B0. Significant responses in the relative abundance of phyla were detected for most of phyla in the B1 compared to the other treatments. Soil microbial community composition was well explained by soil pH, electrical conductance (EC), water soluble organic carbon (C), water soluble total nitrogen (N) and microbial biomass N (MBN).