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Editorial

Short-term Soil Moisture Change Regimes and Soil Loss Dynamics

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EDITORIAL

The patterns and controls of SOC storage are critical for our understanding of the biosphere, given the importance of SOC in the soil and the feedback to the atmosphere and the rate of climate change. The capacity to predict and ameliorate the consequences of climate change depends on a clear description of SOC content and controlling of SOC inputs and outputs. We hypothesize that litter source and soil moisture are the major determinant of the abundance of soil microbes that influence the SOC content at any given time. Although soil temperature and the primary particle sizes distribution of the soil are influential in controlling the distribution of SOC, May normally be overruled by the effects of plant type under natural conditions. In these studies the soils of land type Db344 were mapped in some detail. Based on these maps, areas of soil associations were identified and selected for sampling and incubation. Soils in an area of soil association are likely to behave the same to a certain treatment. The Chloroform Fumigation-Extract (CFE) procedure was used for determination of MBC during the soil incubation based on the methods of Anderson and Ingram. Briefly, two 15 g of fresh soil of the incubated soil with known moisture content were weighed into a crucible and put into separate desiccators. In the other desiccator, a 100 mL beaker containing 25 mL of alcohol free chloroform with boiling chips was placed and a vacuum applied. The vacuum was applied to the fumigated soils samples until the chloroform was rapidly boiling, and then sealed and placed in a dark cupboard for 24 h at 25°C. The non-fumigated soil samples were also incubated the same as the fumigated soils in the dark but without a vacuum. The fumigated soil samples were evacuated using a vacuum pump for 5 min with each evacuation lasting at least 2 min.

The interaction between climate change and the global carbon cycle is an important aspect of the global environmental changes. Soil is the largest pool of terrestrial organic carbon in biosphere, storing more Carbon. Therefore, the Soil Organic Carbon (SOC) stock has an irreplaceable function in mitigating climate change as a key component of the biosphere carbon cycle. Meaning that changes in SOC content significantly influence climate change and a slight change in the SOC stocks can have a considerable effects on atmospheric carbon dioxide concentration, contributing to climate warming. Changes of the climate, particularly the temperature and rainfall have more pronounced effects on the resident period of the SOC by accelerating SOC decomposition offsetting a portion of the SOC losses. However, many researches relating the climate change to SOC are biased towards revealing the trends and future projection changes in the SOC and its effects on the environment, ignoring the current climatic scenarios. The climate change is manifested by changes in temperature, precipitation and length of the season In addition to the climatic factors, the quality of soil organic matter should also affect the rate of decomposition. Several studies have indicated that the chemical and biochemical quality of litter affects mass loss during decomposition. Since the soil microbes need N (and other essential elements) as well as C, if there is little N in the residue, decomposition is slow. When immature legumes are ploughed into the soil that had lower dry matter but higher N concentration and low C/N, decomposition was faster. On the other hand, the high cellulose, hemicellulose and lignin contents of legumes ploughed in at a matured age reduced the speed of decomposition. The C/N ratio in plant residues is highly variable and increases with maturity.

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