173B

Soil organic matter and wet aggregate stability in a Low Country Wet Zone Ultisol as affected by land use

S D Wanniarachchi* and H A P A Shyamalee

Department of Agricultural Chemistry, Faculty of Agriculture, University of Ruhuna, Kamburupitiya

The accumulation of organic matter due to decomposition of plant residues is a characteristic feature of terrestrial ecosystems, and studies on the status of soil organic matter (SOM) will enable us to develop land management practices that sustain or increase SOM levels and soil productivity. Soil aggregation is a good measure of structure of a soil and water stability of aggregates in many soils is shown to depend on SOM. The objective of this research was to assess the impact of land use/ management on the soil organic matter and wet aggregate stability in an Ultisol. Soil samples for the study were taken form an Ultisol in the Matara district managed under six contrasting land use types *viz*. planted forest (woodlot), forage grass, legume, coconut, cinnamon and vegetable. Random soil samples were taken from the 0-15 cm depth.

Soil samples were analyzed for total organic carbon and bulk density was determined in the field. Soil wet aggregate stability (measured as Mean Weight Diameter or MWD) and aggregate distribution was determined using the wet-sieving technique. Land management/ use had a significant overall effect on the soil organic carbon and carbon sequestration in soil. Highest soil organic carbon content (1.73%) was found in the planted forest site while the lowest value (0.83%) was found in the vegetable field. Grass and legume fields contained significantly ($P<0.05$) higher soil organic C levels compared to cinnamon and vegetable fields while the values for grass and legume fields were almost similar. Highest MWD was observed from planted forest site and the value was significantly different from all other fields. Of the other land use types, the vegetable field had the lowest MWD and while there were no significant differences among fields used for cultivation, grass field had a significantly higher MWD than the vegetable field. The planted forest had 48% of its aggregates in the >2000 µm class while the vegetable field had only 11% its aggregates in that class. There was a significant positive correlation between total organic carbon levels and wet aggregate stability in soil indicating the need to adopt land management practices, which sustain and improve soil organic matter levels.

* sudaswan@sltnet.lk Tel: 041 2292813