

Soil organic matter and related soil properties in forest, grassland and cultivated land use types

Abstract

The pattern of soil organic carbon storage is influenced by land use and landscape topo-sequence. The variations in soil carbon and land use also impact soil properties, such as bulk density, pH and soil water. The aim of this study was to determine the effects of selected land uses (forest, grassland and cropland) located in Universiti Malaysia Sabah Campus and soil depth on the soil organic matter, soil carbon and related soil properties. Soil samples from 0 to 15, 15 to 30 and 30 to 45 cm soil depths were collected for organic matter, carbon and pH analysis, and from 0 to 5 and 5 to 10 cm soil depths for soil water and bulk density determination for the cropland, forest and grassland land use types. There were significant differences in organic matter and carbon in forest, grassland and cropland for the three soil depths studied. Organic matter content at the 0 to 15 cm depth of forest, cropland and grassland were estimated at 2.27, 2.07 and 0.83%, respectively. The organic matter content in all land use types decreased land used decreased significantly with soil depth. The top 5 cm of the grassland at sampling time contained 33.2 and 48.53% more soil water than the forest and cropland, respectively. Soil bulk density in cropland soils was higher than for forest and the latter was higher than in grassland. The different land uses and soil depth accounted for the variations of soil carbon stocks. Soil pH was significantly lower in the forest soil.