

Changes in soil organic carbon under continuous farming

ABSTRACT

Cultivating a land without proper crop management may lead to diminished organic carbon. Thus, this study assesses the effects of long-term farming (2014 to 2018) on soil OC. This study was conducted in Share Farm II, Universiti Putra Malaysia Bintulu Sarawak Campus on a selected area that practiced crop rotation. Soil samples have been collected according to grid sampling techniques by beds row and inter-row, and are analysed for soil pH, OM, TOC, and total N. The results show a trend in the alleviation of soil acidity with 2018 > 2016 > 2014, however, there is a diminished of TOC as the year of cultivation increases from 3.42% to 1.87%. The results show insufficient crop residue that returns to the soil system which has been subjected to flash flood and poultry manure application. In return, C retention ability was reduced, which further limit OM capability to supply nutrients upon decomposition. The correlation analysis has revealed that different types of crop residue such as grass clippings that have been applied in 2016 may be another reason for the insufficient N availability (0.44%). Therefore, the quantity and quality of residues may affect the decomposition rate and provide a lower C/N ratio, which significantly affects the soil pH, total N, and other nutrients that are essential for crop uptake.

Keyword: Organic carbon; Soil texture; C/N ratio; Manure; Continuous cultivation