

Effect of Open Burning on Soil Carbon Stock in Sugarcane Plantation in Thailand

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Abstract : Open burning of sugarcane fields is recognized to have a negative impact on soil by degrading its properties, especially soil organic carbon (SOC) content. Better understating the effect of open burning on soil carbon dynamics is crucial for documenting the carbon sequestration capacity of agricultural soils. In this study, experiments to investigate soil carbon stocks under burned and unburned sugarcane plantation systems in Thailand were conducted. The results showed that cultivation fields without open burning during 5 consecutive years enabled to increase the SOC content at a rate of 1.37 Mg ha⁻¹y⁻¹. Also it was found that sugarcane fields burning led to about 15% reduction of the total carbon stock in the 0-30 cm soil layer. The overall increase in SOC under unburned practice is mainly due to the large input of organic material through the use of sugarcane residues.

Keywords : soil organic carbon, soil inorganic carbon, carbon sequestration, open burning, sugarcane

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