

Soil carbon dynamics in various tillage managements of corn in East and Northeast of Thailand

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Abstract

The objective of this study was to investigate the effect of tillage practices on the carbon dioxide emission and carbon sequestration in the soils under maize cultivation. A randomized complete block design (RCBD) with 5 replications was employed. There were 3 treatments including: 1) no tillage 2) conservation tillage and 3) conventional tillage. The study sites were the East and the Northeast, Thailand. The result of this study found that carbon dioxide-C (CO₂-C) emission rate in all treatments in both the East and Northeast, were not significant. However, we also found the trend of CO₂ emission in conventional and conservation tillage treatments had higher than no tillage. The CO₂ emission of the East in the conventional tillage, tillage conservation and no tillage were 4.93, 4.68 and 4.21 ton C rai⁻¹, respectively as well as the Northeast were 4.08, 5.07 and 4.27 ton C rai⁻¹, respectively

On the another hand, the carbon sequestration in the soil under maize cultivation found that the carbon sequestration of the East in the conventional tillage, tillage conservation and no tillage were 0.0660, 0.0645 and 0.0638 ton C rai⁻¹, respectively as well as the Northeast were 0.266, 0.277 and 0.276 ton C rai⁻¹, respectively. In addition, the net CO₂ emission by comparing the CO₂ emission and the carbon sequestration found that the both region had the net CO₂ emission rate in conventional and conservation tillage treatments had higher than no tillage. The average net CO₂ emission of the East in the conventional tillage, tillage conservation and no tillage valued of 4.1421, 4.6119 and 4.8627 ton C rai⁻¹, respectively as well as the Northeast valued of 3.994, 4.8030 and 4.8040 ton C rai⁻¹, respectively.

Key words: Soil carbon dynamics, tillage managements, corn