

Tippawan Duangpapeng 2012: Effects of Tillage and Sugarcane Harvesting Residuals Management on Growth, Yield and Carbon Sequestration of First Latoon Sugarcane (*Saccharum officinarum* L.) Plantation. Master of Science (Soil Science and Management Technology), Major Field: Soil Science and Management Technology, Department of Soil Science. Thesis Advisor: Mr. Suphachai Amkha, Ph.D. 72 pages.

The study of non-tillage and tillage with non-burning and burning sugarcane harvesting residue affect on growth, yield and carbon sequestration in soil and plant. The experimental was 2x2 Factorial in Completely Randomized Design consists of 2 factors 4 replications, the major factor is tillage system (T) consisting of non-tillage (T0), and tillage (T1), minor factor is sugarcane harvesting residue management (B) consists of non-burning (B0), and burning (B1). The result showed combination of non-tillage and non-burning of sugarcane residue treatment were maximum plant high and yield than the other treatment, but non significant. However, the accumulation of plant nutrients was high and significant different ($p < 0.05$). Soil analysis during crop growing was that soil carbon content, soil organic carbon content, total carbon in soil, total nitrogen, total phosphorus, bulk density and carbon-dioxide emission were not significant. Nevertheless, the carbon emission rate was observed from treatment of tillage and burning sugarcane harvesting residue treatment at 14.43-11.45 mg CO₂ g⁻¹ dry soil. Non-tillage and non-burning of sugarcane harvesting residue treatment resulted higher soil carbon sequestration of biomass than that of tillage treatment 65.50 kg rai⁻¹. Tillage and burning sugarcane harvesting residue treatment were lower soil carbon sequestration of biomass than that of tillage treatment 54.90 kg rai⁻¹. Finally, it was found that tillage and non-tillage with sugarcane harvesting residue management significantly affected carbon sequestration in plants.

Student's signature

Thesis Advisor's signature