

Soil Carbon Dynamics of Rice Stubble Incorporation in the North

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Abstract

Soil carbon dynamics of rice stubble incorporation in the northern part of Thailand which field experiment was conducted at land development station in Chiang Rai Province, where the soil series is the Hang Dong series (Hd) during 2008 to 2010. Design of experiment of Randomized complete block design with 4 replications. There are 3 soil managements of (1) rice stubble taking out (2) rice stubble incorporation and (3) rice stubble burning were tested. The objectives of this study were to study the effect of soil management on the amount of methane and carbon dioxide emissions, soil properties changing and proper management for mitigation of greenhouse gas emission from paddy field. Results showed that rice stubble incorporation was shown the highest rate of methane emissions which 142.69 mg per square meter per hour was greater than those of rice stubble taking out and rice stubble burning were 134.58 and 126.91 mg per square meter per hour respectively. For carbon dioxide emissions found that the rice stubble incorporation was shown the highest rate of carbon dioxide emissions which 7,694.83 mg per square meter per hour was greater than those of rice stubble taking out and rice stubble burning were 7,694.83 and 6,821.66 mg per square meter per hour respectively. The amount of carbon sequestration in soil showed that rice stubble incorporation gave the highest rate which was 612.87 kg per rai greater than those of rice stubble taking out and rice stubble burning were 608.49 and 601.15 kg per rai respectively. Soil properties such as soil pH level, organic matter and available phosphorus were increase. The rice stubble incorporation should be the most appropriate method for global warming mitigation, since it was the highest amount of carbon sequestration in soil which totally of 612.87 kg per rai and gave the highest yield of Kao Dok Mali 105 was 703 kg per rai greater than those rice stubble burning and rice stubble taking out were 694 and 679 kg per rai respectively.

Kew words : Rice, Kao Dok Mali 105 (Thai Hom Mali Rice), Carbon Dynamic, Carbon Dioxide, Methane, Chiang Rai Province