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KEY WORD: METHANE EMISSION/GREENHOUSE GAS/LOWLAND RICE FIELD/UPLAND RICE FIELD
RAWIWAN KANCHANASUNTORN : EFFECTS OF LOWLAND RICE FIELDS AND UPLAND RICE FIELDS ON METHANE EMISSION IN CHIANG MAI PROVINCE. THESIS ADVISOR : ASST. PROF. ORAWAN SIRIRATPIRIYA, Ph.D., PRISSANA HANWIRIYAPAN, 160 PP. ISBN 974-584-480-2

Asian rice fields were indicated to be the major sources of methane emission which have been increased greenhouse gas in the atmosphere. The quantitative analysis of the methane emission in lowland and upland rice fields as well as factors affecting on production of methane were investigated. Randomized Complete Block Design with three replications for four rice varieties and two cultural practices was conducted in Chiang Mai' Province. The variety of rice were RD 23 and RD 6 for lowland rice fields, R 258 and SIEWMAEJAN for upland rice fields. Methane gas emitted by rice fields were collected six times per day during 6 a.m. to 10 p.m. within four growth stages of tillering, booting, grain filling and maturation by using a closed chamber which had 0.5mx0.5mx1.0m volume sizes and 5 collecting gas points. Gas Chromatography (Flame Ioization Detector, FID) was the technique for analyzed methane gas.

The results indicated that the total amounts of methane emission from lowland rice fields were higher than that from upland rice fields over the cultivation periods. The total amounts of methane emission from lowland rice fields of rice variety RD 23 and RD 6 were 19.91 and 21.89 g/m^2 respectively and that from upland rice fields of rice variety R 258 and SIEWMAEJAN were 5.29 and 5.13 g/m^2.

Rice plant was main route for methane gas emission from lowland rice fields of both varieties. The methane emission rate was increased following by the growth stages of rice plant. The methane emission rate was highest in grain filling stages of rice plant. Factors affecting the methane emission rate were the number of rice plant per tillage, growth stage of rice plant, reduction condition of soil, and soil pH which were highly significant influenced on methane production in soil. The methane emission rate was varied daily and changed following by air and soil temperature especially in booting and grain filling stage of rice plant.

For upland rice fields, the rice plant and rice variety was not affected on methane emission as well as the soil reduction condition and soil pH were not sinificantly influenced on methane production in soil. The methane emission rate was varied daily but was not changed following by air and soil temperature.

Estimation the share of the amount of methane emission from Thailand' s rice fields base on rice varieties RD 23 and RD 6 on lowland rice fields, R 258 and SIEWMAEJAN on upland rice fields were 0.74-6.89, 0.49-7.39, 0.37-0.74, and 0.39-0.98 million tons/year, respectively.