

## Crop Management Practice Affecting Methane Emission on Flooded Rice—The Effect on Four Major Rice Cultivars Planted on Irrigated Paddy Fields in Central Java, Indonesia



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Field experiment was conducted under tropical condition to understand the mechanism of rice cultivar differences in methane ( $\text{CH}_4$ ) emission. Four rice cultivars were studied. The cultivars are, Memberamo, Cisadane, IR64 and Way Apo Buru. These cultivars were the commonly planted by farmers in flooded rice of Central Java, Indonesia.

The objectives of this study are to determine the effect of rice cultivars on  $\text{CH}_4$  emission from flooded rice and to develop crop management strategies with low emitting rice cultivars while sustaining high yield. The  $\text{CH}_4$  emissions were determined in the wet season of 2001/02 (November-February) using an automated closed chamber technique in an irrigated field condition. Farmyard manure at the rate of  $5 \text{ t ha}^{-1}$  was given to the plots to ensure carbon was not limited. The mean  $\text{CH}_4$  emission was highest in the plot with the variety Cisadane ( $94.8 \text{ kg CH}_4 \text{ ha}^{-1}$ ), and the lowest with the variety IR64 ( $37.7 \text{ kg CH}_4 \text{ ha}^{-1}$ ). While the plots treated with Memberamo and Way Apo Buru variety resulted an intermediate emission at the average of 61.1 and  $58.9 \text{ kg CH}_4 \text{ ha}^{-1}$ , respectively. There was no significant difference between the varieties. The yield of Memberamo, Cisadane, IR64 and Way Apo Buru were 5882, 5764, 5873 and 6065  $\text{kg ha}^{-1}$ , respectively. Plant parameter consists of weight and lengths of root, biomass and tiller number were also determined at 17, 36 and 57 days after transplanting (DAT). Statistical analysis shows that there was no significant difference in the root weight and length among cultivars at 0-10 cm and 10-20 cm depth. However, Cisadane variety gave the highest dry matter weight ( $222 \text{ g hill}^{-1}$ ) at 57 DAT compared to the other varieties ( $175\text{--}190 \text{ g hill}^{-1}$ ). Plant tiller does not show significant differences between the cultivars. This finding provides important information in developing mitigation strategies with the approach of using rice cultivars.



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Crop Management Practices

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