

Worakarn Yodchompoo 2010: Effects of Basal Application of Combined Cattle Manure Compost and Chemical Fertilizer on Growth and Yield of Khao Dawk Mali 105 Rice Variety in Roi Et, Phimai and Satuk Soil Series. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Arunsiri Kumlung, D.Agr. 167 pages.

The effects of cattle manure compost applied with chemical fertilizer as a basal fertilizer on growth and yield of Khao Dawk Mali 105 rice in 2 growing seasons were examined. The field experiments were arranged in a randomized complete block design consisting of 4 replications and 8 treatments, namely: T1, control (no fertilizer); T2, 16-16-8 fertilizer at the rate 25 kg/rai; T3, cattle manure compost at the rate 75 kg/rai; T4 and T5, 75 kg/rai of cattle manure compost plus 16-16-8 at the rates 6.25 and 12.50 kg/rai, respectively; and T6-T8 were resembled T3-T5 but with 150 kg/rai application of cattle manure compost in the first growing season. Doubling rates of cattle manure compost application were applied in the second growing season as i.e., T3-T5 at 150 kg/rai and T6-T8 at 300 kg/rai. The experiments were conducted in rainfed farmers' paddy fields belonging to 3 soil series, Roi Et ; Satuk and Phimai.

The results revealed that the grain yields in the first and second cropping season of control plants grown in Roi Et soil series were 130.48 and 170.11 kg/rai, in Phimai soil series were 357.89 and 354.39 kg/rai, and in Satuk soil series were 82.67 and 286.05 kg/rai, respectively. In Roi Et soil series, the fertilized treatment provided better growth of rice plants and more grain yields than the control. In addition, in the second cropping season of the Roi Et soil series, the more cattle manure compost applied (300 kg/rai of cattle manure compost fortified with 6.25 or 12.50 kg/rai of chemical fertilizer) the higher yields obtained which were even higher than the ones obtained from sole chemical fertilizer. Whilst, in Phimai and Satuk soil series, the findings revealed that all fertilizer applied treatments provided better growth of the rice plants comparing to the control. However, there were no significant differences in grain yields of all treatments including control. In Roi Et soil series, the value of nutrient (nitrogen or potassium) harvest index of all fertilized treatments in the second season found to be higher than control, whereas no difference of these values in Phimai and Satuk soil series of both growing seasons. Furthermore, the values of macronutrient use efficiency in 150 kg/rai of cattle manure compost or combined with 12.50 kg/rai of chemical fertilizer treatment were higher than chemical fertilizer in Roi Et soil series. Also got the same result of the efficiency in 150 kg/rai of cattle manure compost in Phimai and Satuk soil series as Roi Et soil series, the supplemented chemical fertilizer only 6.25 kg/rai produced higher value than chemical fertilizer treatment.

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Student's signature

Thesis Advisor's signature