

Maneerat Moungsri 2008: Effects of Rice Straw and Rice Hull in Combination with Nitrogen Phosphorus and Potassium Fertilizer on Yield of Rice Grown on Phimai and Roi Et Soil Series.
Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science.
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The effects of rice straw and rice hull in combination with nitrogen (N) phosphorus (P) and potassium (K) fertilizer on yield of rice grown on Phimai and Roi Et paddy soil series were studied. The investigation was divided into two parts. The first part was the chemical analysis of the two paddy soil series (Phimai soil series, Roi Et soil series), rice straw and rice hull conducted in laboratory. The second part was carried out in greenhouse consisted of two experiments. The first experiment was to study the effects of rice straw and rice hull in combination with nitrogen phosphorus and potassium fertilizer on yield of rice grown on Phimai soil series. The second experiment was identical to the first one but rice was grown on Roi Et soil series. Both experiments were done similarly using the Completely Randomized Design with 3 replicatoin. The treatments of both experiments consisted of the control (without fertilizer), application of NPK fertilizer, rice straw at the rate of 0.75, 1.5 and 3.0 g kg⁻¹ soil in combination with NPK fertilizer, and rice hull at the rate of 0.75, 1.5, 3.0 and 4.5 g kg⁻¹ soil in combination with NPK fertilizer.

The laboratory analysis indicated that Phimai soil series had sandy clay loam in texture with strongly acid pH 5.2, low contents of organic matter, available P and available K. Roi Et soil series had sandy loam in texture with neutral pH 6.8, low contents of organic matter, available P and available K. Rice straw pH was acidic, contained low contents of N and P and rather high K and Si content. Rice hull pH was acidic, contained low contents of N, P and K but high Si content. The greenhouse experiments showed that growth, yield and nutrient uptake of rice plant grown on Phimai soil series without fertilizer were the lowest. Application of rice hull in combination with NPK fertilizer increased nutrient absorption and rice yield better than with NPK alone, especially at the rate of 1.5 g kg⁻¹ soil. Yield of rice plant grown on the soil amended with rice straw in combination with NPK fertilizer tended to be higher than that of rice plant grown on the soil amended with only NPK fertilizer. Growth, yield and nutrient uptake of rice plant grown on Roi Et soil series without fertilizer were the lowest. Growth, yield and nutrient uptake of rice plant grown on the soil amended with rice straw and rice hull in combination with NPK tended to be higher than those of the rice plant grown on the soil amended with only NPK fertilizer.

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Thesis Advisor's signature

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