GREEN MANURE AS AN EFFECTIVE NUTRIENT SOURCE FOR WETLAND RICE

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An incubation experiment was conducted to study the decomposition of green manures under submerged conditions. The used soil was an Aquult, having very low concentrations of all nutrients (iron toxic soil), and the green manures were Glyricidia (Glyricidia maculata) and Ipil-Ipil (Leucaena leucocephala), incorporated at rates equivalent to 3.6 and 9 T/ha.

Electro-chemical analyses of soil solutions were done every 5 days during the first month and every 7 days during the second month. Besides, most important soil parameters were measured at 0.15, 30 and 60 days after submergence.

There was a highly significant increase of K, Mg, Ca, Mn and soluble NH_4^+ concentrations in soil solution with the incorporation of Glyricidia as well as Leucaena. Among these nutrients the increase of K was remarkable (21.19ppm with the highest level of Ipil-Ipil as compared to 4.2ppm in the control). In overall, the performance of Ipil-Ipil was better compared to Glyricidia. There was no significant decrease in redox potential comparative to the control with the incorporation of different green manures and their respective levels, probably to the low C/N ratio. This suggests that green manure application does not aggravate the accumulation of toxic products resulting from an enhanced reduction. Although there was an increase of the Fe concentration with the incorporation of green manures, there would not probably be any adverse effects because this could be suppressed by a sufficient supply of nutrients as suggested by Ottow et al. It can be concluded that green manures have a high potential to be utilized as an excellent source of nutrients for the highly weathered rice soils of the low country wet zone.

References:

Ottow, J.C.G., Benkiser, G., and Watanabe. I (1983): Multiple nutritional soil stress as the prerequisite for iron toxicity of wetland rice (Oryza sativa L.) Trop. Agric: (Trinidad) Vol: 60, NO:2, April: 102-105