B-47: Effect of lime and dolomite application on the nutrient availability for rice grown in an iron toxic soil

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A multiple nutritional soil stress (mainly P, K, Ca and Mg deficiencies) has been recorded with most soils that revealed clear symptoms of iron toxicity. In this study, hypothesis was tested by applying different fertilizer levels together with lime or dolomite as Ca and Mg sources. Susceptible rice variety (BG 34 -8) was planted in plastic pots filled with iron toxic soils. One set of pots was supplied with different levels of NPK fertilizer such as unfertilized, half the level of fertilizer and full level of fertilizer (recommended by the Dept of Agriculture for low country wet zone) with different level (0, 2.5 and 5 tons per hectare) of lime or dolomite. The grain yield, soil chemical properties such as soil active Fe, exchangeable nutrient etc and total plant nutrient content were analysed at the end of the experiment. The dolomite at 2.5 tons per hectare with full dose of fertilizer, gave the highest yield and the lowest Fe content in the plant. The higher K content in the shoots was measured in the plants which had lime or dolomite with full dose of fertilizer treatments or with half dose fertilizer. The dolomite supplies Mg and Ca which are the limiting factors for the yield increment in iron toxic soils. The appearance of iron toxic symptoms may not be due to the high concentration of water soluble iron which was governed by the high % of easily reducible Fe together with pH, but also due to the soil solution imbalances of K, P, Ca and Mg. This may also provide some evidence that the iron toxicity problem can be overcome by correcting the deficiencie of K, P, Ca and Mg.