

Influence of Industrial Solid Wastes on Soil-Plant Interactions in Rice under Acid Lateritic Soil

S. Karmakar¹, B. N. Mitra² and B. C. Ghosh²

¹Department of Agronomy, Birsa Agricultural University, Kanke, Ranchi – 834 006, India; ²Department of Agricultural and Food Engineering, Indian Institute of Technology, Kharagpur- 721 302, India

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ABSTRACT

An experiment using three industrial solid wastes *viz.* fly ash (FA), rice husk ash (RHA) and paper factory sludge (PFS) was conducted on wet season rice to study their potentials in augmenting crop yield and soil productivity under acid lateritic soil. The common source of soil amendment (lime) and plant nutrients like farmyard manure (FYM) and chemical fertilizers (CF) were used for comparison and or supplementing nutrient requirement of the crop. There was an increase in growth, yield attributes and yield (up to 110 and 23 per cent over control and CF respectively) of rice under integrated use of PFS or FYM as organic source, FA, RHA or L as soil amendment and CF. In addition, the uptake of N, P, K, Ca, Mg, Mn, Zn, Cu and Co increased under the integrated plant nutrient system. A marginal increase in content of heavy metals *viz.* Se, Cd and Ni in the plant tissue was also noted, although all these remained below the safe limit. Application of these industrial wastes resulted to improve the physico-chemical properties of soil in terms of decrease in bulk density, increase in pH, organic carbon and available nutrients. The radioactivity (Gross α and Gross β) in the treated plant and soil was either below the detection limit or remained under permissible limit. Usage of these wastes saved chemical fertilizers in rice cultivation to the extent of 36.3, 49.7 and 71.0 per cent of recommended N, P and K respectively with an added advantage of minimizing environmental pollution.

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