

PHOSPHORUS MANAGEMENT IN WHEAT-RICE ROTATION THROUGH INTEGRATED USE OF FERTILIZERS

I. Effect of rate of P application on yield and P-uptake by wheat and rice grown in pots

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ABSTRACT

Phosphorus nutrition of wheat-rice rotation system requires efficient management for economic utilization of costly phosphate fertilizers. A pot culture experiment was conducted to study the effect of integrated use of organic waste and chemical fertilizer on P-uptake and yield of wheat and rice grown in rotation. Phosphorus was applied @ 50 and 100 mg kg⁻¹ either as chemical fertilizer, single super phosphate (SSP) alone or after integrating with organic wastes; filter cake (FC) and poultry litter (PL), in 2:1 P ratio. The results showed that application of P at either rate significantly increased grain and straw yields of wheat as well as of rice over control. Integrated use of fertilizers at each rate produced grain yields similar to those of the chemical fertilizer alone. Higher rate of P application increased P-uptake but reduced P-fertilizer efficiency (PFE) over the lower rate in both the crops. However, compared to other combinations, integrated use of PL and SSP at 50 mg P kg⁻¹ rate gave relatively higher PFE in both wheat (17%) and rice (11%) over the chemical fertilizer alone and therefore proved a more suitable substitute for the expensive phosphate fertilizer.

Key Words: Phosphorus management, integrated use, wheat-rice rotation