Soil Application of Diatomaceous Earth: Effects on Economic Yield, Nutrition of Phosphorus, Zinc and Iron and Disease Infestation of Rice (*Oryza sativa*) in Inceptisol of India

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Abstract—*This study aimed to evaluate the effect of Si fertilizer on the economic produce of rice considering the nutrition of P, Zn and Fe and disease infestation. For this, a field trial was conducted with different doses of Si through diatomaceous earth (DE) as a Si source along with N, P and K on a popularly grown rice cultivar Swarna Masuri. The results showed a significant increase in grain yield of rice upon Si application with a concomitant improvement of P metabolism. Stimulation in phosphatase activities in soil by the application of Si showed synergism between Si and P in paddy grain (r = 0.91**) and straw (r = 0.90**). Zinc and iron nutrition was hampered by Si application through 600 kg diatomaceous earth ha^{-1} with a decline in their concentrations in the grains by 39.64% and 25.74% respectively and in straw by 21.15% and 27.13% respectively over full standard fertilizer practice (T_2). Almost all the treatments of Si were found to have a significant effect in promoting disease resistance while higher doses of DE had a better effect then lower dose. The investigation concludes that application of diatomaceous earth at 600 kg/ha along with POP increased the grains yield, but DE 600 kg/ha along with ½ POP(T_9) reduces the past and disease infestation of rice.*

Keywords*: Diatomaceous earth, phosphorus, rice, silicon, zinc, iron, disease*