

IMPACT OF SOIL CHEMICAL PROPERTIES ON PHOSPHORUS DYNAMICS IN REDDISH BROWN EARTH AND LOW HUMIC GLEY SOILS AMENDED WITH TRIPLE SUPER PHOSPHATE

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There is a need for a better understanding of the impact of soil characteristics on dynamics of phosphorus (P) with fertilizer application. This research was conducted to study the effects of soil chemical properties on P dynamics with TSP fertilizer applications to Reddish Brown Earth (RBE) and Low Humic Gley soils (LHG). The main objective of this study was to examine the influence of soil chemical properties on pore water P concentration, soil test P, degrees of P saturation (DPS). Dissolved Reactive Phosphorus (DRP) and their interrelationships. Three treatments with three replicates from each soil type were arranged in completely randomized design. Non-fertilized (T1) and TSP fertilized at 30 (T2) and 60 (T3) kg P ha⁻¹ rates from each soil sample were incubated for eight weeks using glass jars under controlled conditions. At two weeks interval, soil samples were analysed for pH, EC and Olsen P (OP). The data were statistically analysed using R software. The mean separation was done using Tukey's HSD test. Results showed that, there was a relationship between OP, DPS and DRP values with added TSP rates. The OP values and DPS values were higher in RBE compared to LHG ($p > 0.05$). DRP concentration was significantly greater in RBE, probably due to higher OP and DPS in RBE soils compared to LHG soils. The DRP of RBE showed no significant differences ($p > 0.05$) across treatments, but it was higher in T3 compared to T2 and the control, T1 ($p > 0.05$). The DRP decreased over the incubation weeks for RBE. Similarly, the DRP of LHG exhibited no significant differences ($p > 0.05$) among the treatments. DRP increased over the incubation weeks for LHG. The pH of each soil type was not significantly different ($p > 0.05$) among the treatments.

Keywords: Degrees of P saturation, Dissolved reactive phosphorus, Soil test P