REACTIVITY OF SELECTIVELY MINED EPPAWALA ROCK PHOSPHATE ON SANDY REGOSOLS

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ABSTRACT

This investigation was conducted at the Agronomy Farm of the Eastern University during the period from May to August 1996. Its main objective was to study the reactivity of Selectively Mined Eappawala Rock Phosphate (SERP) on Sandy Regosols, on relation to the growth and yield of maize.

The experiment compared five levels of rock phosphate (0, 30, 60, 90 and 120 kg SERP/ha) applied in combination with poultry manure plus sulphur, and application of 100 kg TSP/ha with a control treatment where no phosphorus was applied. The investigation was conducted in a Randomized Complete Block Design (RCBD) with four replicates and managed under recommended cultural practices.

Data were collected and measurements made on the concentrations of the major nutrients (N, P and K) in the soil; soil pH; and the biomass and grain yield of the maize crop.

Results have shown that the available soil P concentration in the soil where SERP was applied along with poultry manure plus sulphur dust was higher than in the treatment (T_7) where no SERP was applied. Soluble P values in the treatments where SERP was applied at the rate of 30, 60, 90 and 120 kg/ha were greater by around 50%, 80% 100% and 150% respectively, when compared to the treatment where no SERP was applied. The differences in average soil N and K concentrations between treatments receiving different SERP levels were negligible over the period of experiment.

The data on the major plant characters measured viz grain yield, biomass and leaf area show that grain yield, biomass and leaf area values increased with increasing levels of SERP application from 0 to 120 kg/ha. Increasing levels of SERP from 30, 60, 90 and 120 kg/ha resulted in biomass increases of 29%, 34%, 40% and 75% relative to the treatment where no SERP was applied.

The increase in grain yield was 18%, 11%, 21% and 68% in the treatments receiving 30, 60, 90 and 120 kg SERP/ha respectively, relative to the treatment where no SERP was applied. The higher yields were positively correlated with leaf area and negatively correlated with date to silking and tasselling. These correlations were highly significant.

The difference between the relatively steep response in soil P with increasing SERP levels and the much lesser response in biomass and grain yield is probably due to competition between the maize crop and soil micro organisms for soil nutrients.

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