EFFECT OF APPLICATION OF DIFFERENT RATE OF DOLOMITE ON SOIL AVAILABLE PHOSPHORUS STATUS IN TEA GROWING SOILS

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ABSTRACT

Phosphorus is the fascinating plant nutrient to tea *(Camellia sinensis L.)*, influencing growth, yield and quality. For any given soil, both the amount of labile phosphate in the soil and the concentration of phosphate in soil solution are reached a minimum value at about pH 5.5 and increased rapidly as the pH increased or decreased from this value. Phosphate deficiency is a concern, and a problem, in most tea soils. Although tea *(Camellia sinensis L.)* exclusively prefer to grow in acid soils but in very acidic nature is detrimental effect to the available phosphorus in soil. Because in very low pH induce the available Al in soil that fix the soil phosphorus and convert into unavailable form. Dolomite is soil amendment which used to mitigate the soil acidity and also it provides some essential nutrient Ca and Mg itself.

This present investigation is to identify "Effect of Application of Different Rate of Dolomite on Soil Available Phosphorus Status in Tea Growing Soils", described in this book is a part of this trail which started in 2009 in the Field No 17 New Division, Midlands Estate Rattota. It is located in Central Province, Matale District of Sri Lanka (Latitude: 7°31'4.44" Longitude: 80°43'23.87"). Trail was laid out in Randomized Complete Block Design consisting of five treatments in different rate of Dolomite (kg/ha/pruning cycle) namely T1 (Absolutely control), T2 (1000), T3 (2000), T4 (3000), T5 (4000). Soil chemical properties at 0-15cm and 15-30cm of depths and mother leaf nutrient content were studied. The data generated from the study was analyzed by using Analysis of Variance (ANOVA) in SAS statistical package. Treatment means were compared at probability $p < 0.05$ using LSD.

This study shown there was no significant difference in soil pH among different rate of dolomite applied at 0-15cm depth. But increasing trend was observed with increasing dolomite rates. Application of increasing rate of Dolomite increased soil available phosphorus *(Borex extratable)* in which highest average mean value of phosphorus (13.67mg/kg) was observed in treatment with 3000kg dolomite/ha/pruning cycle at 0-15cm of depth, while 17.0mg/kg of average mean was value observed in treatment with 4000kg Dolomite/ha/pruning cycle. Soil exchangeable Al, Ca and D.T.P.A extractable Mn were not changed. But soil available Fe was significantly declined according to the dolomite rate. The highest average mean value of Fe was obtained in control. Highest average mean value of soil exchangeable Mg (101.33mg/kg) was observed in highest dolomite applied plots at 0-15cm depth and highest K (130.67mg/kg) was recorded in the treatment with 2000kg/ha/pruning cycle. When considering made tea yield, significant difference was observed among treatments. Highest yield (1423kg/ha) was observed in 2000 kg/ha/pruning cycle dolomite applied plots compared with other treatments. P content in mother leaf as well as other nutrients (Ca, Mg, K, N) trace element Fe and leaf Al content had no effect. Manganese content in mother leaf changed significantly, highest average mean value was obtained in control. The results obtained from this study indicated that increasing rate of Dolomite application influencing phosphorus availability as well as the made tea yield even there was no significant effect on pH that is due to different rate of dolomite because of buffering capacity of Ukwella soil series.

Key words: Phosphorus, Acidity, Dolomite, Tea (*Camellia sinensis* L.).

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