

## Efficiency of dolomite and kieserite as magnesium fertilizers on two Coconut growing soils

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For the magnesium deficiency, commonly found in Sri Lankan coconut lands, two kinds of magnesium fertilizers are recommended: dolomite for prevention and kieserite for correction. As kieserite is an expensive fertilizer, a study was needed to compare the efficiency of the two fertilizers. The objective of the present study was to determine the change in equilibrium activity ratio (EAR) and buffer capacity (BC) of magnesium with the application of two different levels of each of the above two fertilizers. EAR has been proposed as a measure of the intensity factor of a particular nutrient while the BC indicates the ability of soils to maintain the intensity of a particular nutrient in the soil solution. Two types of soils were selected for the study; Madampe and Boralu series. The soils were incubated with 6 treatments which consisted of 2 levels of Dolomite (D1 & D2), Kieserite (K1 & K2) and dolomite: Kieserite (1:1) mixtures (K1D1 & K2D2) with a control (0) in 3 replicates. Sampling was done at two weeks interval for a period of 3 months and at monthly intervals for a period of 6 months, Mg activities were measured by equilibrating with standard  $Mg^{2+}$  solutions (20-150 ppm) in 0.002 M  $CaCl_2$  solutions and keeping overnight. The activity ratio was calculated using the formula,  $\sqrt{[Mg]} / \sqrt{[Ca] + \{[K] + [Na]\}}$ . The  $\Delta Q$  values were plotted against activity ratios and the buffer capacity and EAR (AR at  $\Delta Q=0$ ) were obtained from each plot for each soil sample.

The results showed an increase in the equilibrium activity ratio (EAR) values for all treatments in Boralu series in the order of  $0 < D1 < D2 < K1D1 < K1 < K2D2 < K2$  from the second week onwards and the differences were highly significant ( $p < 0.001$ ). Accordingly, the K2 treatment was highly effective in increasing Mg intensity in soil solutions followed by K1. The mixtures K1D1 and K2D2 were found to be less effective compared to K1 and K2. Dolomite seems to be effective to a lesser extent compared to Kieserite. The results obtained for Madampe series showed the order of EAR values as  $0 < D1, D2 < K1D1, K1 < K2D2, K2$  up to the 8<sup>th</sup> week. Beyond the 12<sup>th</sup> week, an increase in EAR was seen in K1D1 and K2D2 while a decreasing trend was observed in K1 and K2. In the 20<sup>th</sup> week the order was  $0 < D1 < K1 < D2 < K2 < K1D1 = K2D2$ . In Madampe series a delayed reaction of dolomite was observed which could be due to high pH (5.0-5.1). The buffer capacities did not show any relationship to treatments applied in both soils. The over all results indicated that kieserite was more efficient than dolomite. However, dolomite also increased the Mg fertility within a short period.

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