USE OF EPPAWALA APATITE IN TEA

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Phosphorus is an important plant nutrient and in tea it takes the third place next to nitrogen and potassium. The concentration of phosphorus in flush (two leaves and a bud, that is used for manufacture of tea) is about 0.20 to 0.25% and thus there is a removal of about 2.0 to 2.5 kg of P for every 1000 kg of made tea removed out from a tea field. The use of P in tea differs according to the age of plants, i.e. nursery plants, immature plants (1 to 4 years) or mature plants. Nursery plants that are raised from cuttings are fertilized with soluble forms of NPK and Mg and in this mixture the phosphate requirements are met by the use of diammonium phosphate. Further the proportion of phosphate in this mixture is also kept high to meet the high demand of P during the early stages of growth. Thus the mixture that is used for nursery plants (T 65) contains 10.9% N, 10.8% P_2O_5, 11.1% K_2O and 3.7% MgO. High percentage of P has been included in this mixture to promote root development of the plants in the early stages.

Immature tea (1-4 years after planting) receive phosphate either as saphosphosphate or as Eppawala apatite. T200, the mixture used during the first two years after planting contains 10.3% N, 6.9% P_2O_5, 7.5% K_2O and 3.0% MgO. During 3rd & 4th years after planting a mixture (T 750) containing 13.7% N, 3.7% P_2O_5, 8.0% K_2O and 1.6% MgO is used. Finally, the mature tea mixture (U 709) contains approximately 28.4% N, 4.72% P_2O_5 and 14.2% K_2O. For mature tea the use of phosphate fertilizers became popular at the end of last century. From several long term experiments conducted on the levels of P, it was concluded that a level of 35-40 kg P_2O_5 per hectare per annum gave maximum yields.

An apatite-bearing deposit was discovered in 1971 by the Geological Survey Department of Sri Lanka at Eppawala and since then investigations were initiated to study the feasibility of using the local material as a source of P for tea in Sri Lanka. The first batch of samples were received in 1972 and extensive investigations were undertaken to compare the two types of phosphate fertilizers. Experiments initiated to compare the chemical characteristics of the two phosphate fertilizers, viz. Eppawala apatite and rock phosphate, showed that the former contained higher total P and water soluble P than latter. Solubility of rock phosphate in citric and malic acids was slightly higher than that of Eppawala apatite. Malic acid extracted more phosphorus from Eppawala apatite than from rock phosphate mixed with acid soil and the release was time dependent. In experiments with young tea, the effect of the two fertilizers on nutrient uptake and dry matter accumulation did not differ significantly. In another study on the performance of two phosphatic fertilizers on tea soils it was reported that at normal levels of P application Eppawala apatite proved to be either comparable or better for tea than rock phosphate.