Effect of acidulated pegmatitic mica on growth and yield of rice and soil solution K, Mg, Ca.

P. I. COORAY,

Institute of Fundamental Studies (I.F.S.), Hantana road, Kandy, Sri Lanka.

T. J. WEERASURIYA

I.F.S., Hantana road, Kandy, Sri Lanka and Department of Geology, University of Peradeniya, Peradeniya, Sri Lanka.

P. DETURCK

Institute of Fundamental Studies (I.F.S.), Hantana road, Kandy, Sri Lanka.

Abstract: Acidulated pegmatitic phlogopite mica, the most promising new silicate mineral based K-Mg fertilizer prepared in Sri Lanka, was tested in a greenhouse experiment. Basal doses of 50 and 200 kg/ha of acidulated mica, as well as a 50/50 split-level (basal-cum -top dressing) dose of 100 kg/ha were applied to the BG-94-1 rice cultivar grown on an Ultisol. Controls without potash fertiliner and with the recommended dose of 50 kg/ha basal Muriate of Potash (MOP, were used. An additional treatment with Mg and K equivalent to that in 200 kg/ha acidulated mica was incorporated using MgNO3 and MOP (9.2 kg/ha) as Mg and K sources.

Rice showed no response to K in this soil, as indicated by similar yield response between control (without K) and the recommended MOP treatment. Only a non-significant increase of 5% in grain weight was obtained at an application rate of 50 kg/ha acidulated mica, as against 50 kg/ha recommended MOP. At 100 kg/ha (50/50 split level), and 200 kg/ha acidulated mica the increases were 10% and 2% (grain weight). Thus limitation of K provisioning to basal application and exclusion of a top dressing at maximum tillering, as recommended, retarded yield in all treatments excepting in the 50/50 split level treatment, indicating inadequate levels of K for successful seeding at low basalonly applications of acidulated mica and MOP. Addition of MgNO3 with basal MOP (9.2 kg/ha) gave increases of 57% in tiller number, 32% in panicle number and 14% in grain weight indicating response to Mg in the early growth stage. Confirmation of Mg response was obtained with an increase of 34% in tiller number at 200 kg/ha acidulated mica compared to 17% at 50 kg/ha. Results suggest that provision of Mg-K from acidulated mica at the early growth stage, combined with K from MOP or acidulated mica at maximum tillering stage, may achieve greater success. However, the ability to achieve similar yields at the same level of application with MOP and acidulated mica (even though the latter contains far less potassium) is of significance to indigenous silicate fertilizer research in Sri Lanka.