B-55: Selectively mined Eppawala rock phosphate as a potential fertilizer for rice

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Eppawala Rock Phosphate (ERP) has been used as phosphorus (P) fertilizer for long-term crops. Hitherto, ERP was not used as a fertilizer for annual crops because of its low solubility. However, recent studies have shown that primary apatite crystals separated from the ERP (selectively mined rock phosphate -SERP) have a higher P content.

Seven field experiments were conducted in different agro- ecological zones of Sri Lanka to compare the agronomical effectiveness of SERP and triple super phosphate (TSP) on rice. Three levels of P(O, 12.5) and 25 kg of P/ha) were tested. The rice variety (BG 94/1) used in the trial was the same as that used by the farmer. Procedures recommended by the Dept. of Agriculture were followed in all the practices.

All experiments showed a significant response to TSP application. The yield of rice grown on TSP-treated plots was significantly higher than that grown on SERP-treated plots in all trials. In 2 of the 7 experiments, SERP performed better than the control (which had no P). The most promising results with direct application of ground primary apatite crystals were obtained on acid soils (pH 4 to 5). Absence of any response to SERP application in 5 of the 7 trials is due to higher pH and possibly due to insufficient dose of application. In many fertilizer experiments with rock phosphate, the levels of application are much higher, usually exceeding 100 kg of P/ha. Although the response to SERP was significant only in 2 instances, the yield from all SERP-treated plots was higher than from the control.

Three yield experiments were conducted to determine the residual effect of SERP fertilizer. The yields from previous SERP- treated plots were significantly higher than the TSP-treated plots and control in 2 trials. The available P content of the soils in all plots was monitored during the experiments. P content increased at least 3 fold (from 9.5 to 32 ppm) for Maha to Yala seasons for the SERP (25 kg P/ha) treated plots. This trend may continue to strengthen itself in the following seasons, as SERP continues to release phosphate.

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