

VALUE ADDITION TO *EPPAWALA* ROCK PHOSPHATE BY IMPROVING THE SOLUBILITY TO USE AS AN ALTERNATIVE TO IMPORTED TRIPLE SUPER PHOSPHATE

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Phosphorus is one of the most essential nutrients for plant growth. The *Eppawala* Rock Phosphate (ERP) deposit is a locally available rich Phosphorus source, but the low solubility of ERP has limited its use as a Phosphorus fertilizer for annual crops. This study aimed to investigate the effect of three solubilizing agents, namely pyrite containing soil (PS), vinasse (VS), and pineapple waste (PW), on the solubility of ERP compared to the control treatment (ERP with distilled water only). Solubilizing agents were mixed with ERP in different ratios on a fresh weight basis (5:1, 5:1.5, and 5:2) and kept at room temperature for 8 weeks as an incubation test. The experimental design was a completely randomized design with three replicates. Samples were taken at two-week intervals and analysed for pH, Electrical Conductivity (EC), and available Phosphorus. Data were analysed using the ANOVA procedure, and mean separation was performed using the LSD test in RStudio. The treatments with PS and PW showed an increasing trend in pH from 3.2 to 5.1 and 4.3 to 7.6, respectively, during incubation the period. The treatments with PS showed a decrease in EC from 1674 to 442 $\mu\text{S cm}^{-1}$. However, no significant change in EC was observed in the PW and VS treatments. The available phosphorus content increased only in the PW and PS treatments. The PW1 (5:1) and PW2 (5:1.5) treatments recorded significantly higher ($p < 0.05$) available phosphorus contents of $1171.67 \pm 18.92 \text{ mg kg}^{-1}$ and $1132.33 \pm 4.48 \text{ mg kg}^{-1}$ respectively. This represented an increment of 31% and 27% compared to the control. Overall, it can be concluded that there is a potential to increase the solubility of ERP by adding Pineapple waste. However, further field investigations are needed before making solid recommendations.

Keywords: Available phosphorus, Pineapple waste, Pyrite soil, Vinasse