

USE OF PHOSPHOROUS SOLUBILIZING BACTERIA WITH *EPPAWALA* ROCK PHOSPHATE TO ASSESS THE POSSIBILITY OF REPLACING TRIPLE SUPER PHOSPHATE IN MAIZE CULTIVATION

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This study evaluated the effectiveness of using *Streptomyces naganishii*, a phosphorus-solubilizing bacteria (PSB), with *Eppawala* Rock Phosphate (ERP) as a potential replacement for Triple Super Phosphate (TSP) in maize cultivation. The experiment was conducted at the Sustainable Agriculture Research and Development Center, *Makandura*. The design of the field experiment was a randomized complete block design (RCBD) with nine treatments and three replicates. Treatments included T1 as a control (100% DOA recommendation + Compost 10 t ha⁻¹, T2 (70% DOA recommendation + Compost 10 t ha⁻¹), T3 (70% DOA without TSP + Compost 10 t ha⁻¹), T4 (T3 + ERP 0.2 t ha⁻¹), T5 (T4 + bio fertilizer PSB), T6 (T3 + PSB), T7 (Compost 20 t ha⁻¹ + ERP + PSB), T8 (Compost 20 t ha⁻¹ + PSB), and T9 (no fertilizer). Results indicated that T2 achieved the highest seed yield at 10.3 t ha⁻¹, followed by T5 with 9.95 t ha⁻¹, significantly surpassing ($p < 0.05$) the control, which reported 9.8 t ha⁻¹. This indicates that ERP combined with PSB could provide a viable alternative to TSP for optimizing seed yield. Treatment 5 demonstrated a considerable increment in root volume and cob girth, highlighting the beneficial effects of ERP and PSB on nutrient uptake. Treatments with PSB and ERP reported high postharvest phosphorus availability, indicating long-term soil health benefits. The study concludes that ERP combined with *Streptomyces naganishii* offers an effective substitute for TSP, reducing reliance on imported fertilizers and supporting sustainable maize production in phosphorus-limited soils.

Keywords: Biofertilizer, Crop yield improvement, Maize productivity, Sustainable Agriculture