

# Efficacy of a Phosphate Bio-mineral Fertilizer Varied with P Concentration and P Solubility

**SALMABI ASSAINAR<sup>1,2</sup>, LYNETTE ABBOTT<sup>1,2</sup>, PAUL STORER<sup>3</sup>, KADAMBOT SIDDIQUE<sup>1,2</sup>, ZAKARIA SOLAIMAN<sup>1,2</sup>**

<sup>1</sup>UWA School of Agriculture and Environment, The University of Western Australia, Perth WA 6009, Australia

<sup>2</sup>The UWA Institute of Agriculture, The University of Western Australia, Perth WA 6009, Australia

<sup>3</sup>Troforte Innovations Pty Ltd, Wangara, WA 6065, Australia

Bio-mineral fertilizers are gaining increasing attention in cropping systems. Phosphorus (P) use efficiency for wheat (*Triticum aestivum* L.) from bio-mineral fertilizers is not well studied. We investigated the efficiency of a bio-mineral fertilizer (rock mineral fertilizer inoculated with a multispecies microbial inoculant and augmented with different phosphorus sources of varying concentration) under both glasshouse and field conditions. The P was incorporated into the bio-mineral fertilizer at six levels (0, 1.5, 3.0, 6.0, 9.0 and 12.0% P) as rock phosphate (RP), and triple superphosphate (TSP). In the glasshouse experiment, shoot dry weight of wheat increased significantly with application of the bio-mineral fertilizer augmented with both RP and TSP at tillering and maturity. Grain yield per plant was significantly higher with 3.0, 6.0 and 9.0 % P applied as RP, but it was only higher with 6.0% P applied as TSP. In the field experiment, shoot dry weight at tillering was higher for applications of 6 and 12% P as RP and 3 and 9% P as TSP compared to control. The highest grain yield was observed for 3 and 6% P applied as either RP and TSP. Overall, utilization of the mineral fertilizer, even when augmented with the lowest level of P (1.5 to 3.0%) in conjunction with the multispecies microbial inoculant, was more effective than the mineral fertilizer alone for wheat under the glasshouse and field conditions.