

Effect of reactive phosphate rock and its NKMg fertilisers under two placement methods on oil palm yield

ABSTRACT

Studies on the efficiency of phosphate (P) through exploitation of integrated approach on P sources, organic matter and placement methods for mature oil palm in Malaysia are rather limited. A field trial was conducted to evaluate the reactivity of P, its NKMg fertiliser under two placement methods i.e frond heap (FH) or broadcasted at the edge of weeded circle (EWC) on oil palm yield on inland sedentary Rengam series soils (Typic Paleudult). The trial was laid out on an 1992 DxP Felda oil palm planting located at Muadzam Shah, east of Pahang state with high yield potential at 30 tonnes per hectare per year. Two types of reactive phosphate fertilisers namely Senegal Phosphate Rock (low reactive) and Tunisia Phosphate Rock (high reactive) were evaluated in this trial, including a control treatment without phosphate fertiliser. The phosphate rocks (PR) fertilisers were tested at two rates i.e 0.50 kg P₂O₅ per palm per year and 1.0 kg P₂O₅ per palm per year. The mineral fertilisers (P or NKMg) were applied at frond heap (FH) or broadcasted at the edge of the weeded circle. Results over six years showed that palm without phosphate and grown under good rainfall distribution, maintained high yield at 28.6 tonnes per hectare per year. In contrast, there was a decrease in foliar, rachis and depleted soil P fertility over time in the plot without PR resulting in reduced overall FFB yield on an average by almost 1.5 tonnes per hectare or 5.3 per cent as compared to those plots with PR at 30.1 tonnes per hectare per year. Therefore, it is vital to continue applying PR to sustain high yields. The trial also showed that applying reactive PR at low rate (0.5 kg P₂O₅/palm/year) and integrating with other mineral nutrients NKMg at the frond heap enabled to obtain high yields. Overall, performance of high reactive PR is more superior than the low reactive PR.

Keyword: Phosphate; Placement; Oil palm