

## **Assessment of the availability of phosphate to corn (*Zea mays* L) using $^{32}\text{P}$ isotope dilution technique**

### **ABSTRACT**

This study investigate the effectiveness of two phosphate rocks (PRs), an unreactive phosphate rock from China (CPR) and a reactive phosphate rock from North Carolina, USA (NCPR) compared to triple superphosphate (TSP), a highly water-soluble phosphate fertilizer. These fertilizers were tested using three crops of corn (*Zea mays* L) grown consecutively on a Serdang series soil (Typic Paleudult).  $^{32}\text{P}$  isotope dilution technique was used to access their P availability. The rate of P used was 100 kg P ha<sup>-1</sup>, applied once at the beginning of the experiment. NCPR was as efficient as TSP in providing P to the first crop, while CPR showed the lowest percentage of utilization. In the second crop, NCPR was the superior source of P. However, in the third crop all three sources showed very poor percentages of utilization. The total amount of P taken up by the three crops of corn was 13.65, 18.04 and 8.56 kg ha<sup>-1</sup> from TSP, NCPR and CPR respectively. Thus this study suggests that NCPR is an effective source of P for corn and can be used as a substitute for the water-soluble phosphate fertilizers. CPR is not a suitable phosphate source.

**Keyword:** Phosphate rock; Isotope dilution; Specific activity; Relative availability