

## Assessment of phosphorus use efficiency and various phosphorus application methods on wheat in calcareous soil

### ABSTRACT

Phosphorus has been recognized as an essential constituent for plants. A field experiment was conducted in calcareous soil to evaluate the phosphorus fertilizer use efficiency (PFUE), P uptake and plant growth yield through different P fertilizer application on wheat crop. The treatments were: T1 (control); T2, 80 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> broadcasting method; T3, 80 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> banding (applied with 1% H<sub>2</sub>SO<sub>4</sub> at the 1st irrigation); T4, 60 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> banding; T5, 60 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> banding (applied with 1% H<sub>2</sub>SO<sub>4</sub> at 1st irrigation); T6, 40 kg banding + 20 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> top dressing (applied with 1% H<sub>2</sub>SO<sub>4</sub> at the 1st irrigation); and T7, 40 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> banding applied with 1% H<sub>2</sub>SO<sub>4</sub> at the 1st irrigation. The result showed that the band plus acid treatment was more effective than broadcasting method of application. There were no significant differences found among the various banding applications. However, significant differences were observed among the various application methods, in terms of PUE, grain nutrient ratio (GNR), P uptake and VCR. Significantly high PFUE (straw 8.52% and grain 17.48%), GNR (13.5%), P uptake (straw 4.21, and grain 8.18 kg ha<sup>-1</sup>) and VCR were found using 40 kg banding + 20 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> top dressing method along with 1% H<sub>2</sub>SO<sub>4</sub>.

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