

Sirikwan Phoonā 2008: Evaluation of Available Phosphorus in Soil by Chemical Soil Test Methods and Response to Phosphorus Fertilizer of Maize Grown on Ongkharak, Khorat, Li, Pak Chong, Chai Badan and Hin Son Soil Series. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Assistant Professor Chairerk Suwannarat, Dr.agr. 119 pages.

Evaluation of availability of phosphorus from monocalciumphosphate (MCP) and dicalciumphosphate (DCP) in Ongkharak, Khorat, Li, Pak Chong, Chai Badan, and Hin Son Soil Series was carried out with chemical soil test methods and maize growing. The investigation was divided into 2 experiments. The first experiment was conducted in laboratory to examine phosphorus fixation capacity and availability of the two phosphorus fertilizers in soils by extracting with Bray 2 method during incubation for 1, 3, 5, and 7 weeks. The second experiment was set up in greenhouse. The design of the experiment was 6x3 factorial in CRD with four replications. The first factor was the six soil series while the second factor was the three fertilizer treatments (i.e., no phosphorus fertilizer, MCP 100 mg P kg⁻¹ soil and DCP 100 mg P kg⁻¹ soil).

Results from the first experiment showed that phosphorus fixation ability of the soils were in the following order: Kt < Li < Hs < Cd < Pc < Ok, while availability of the phosphorus fertilizers in soils decreased when the incubation period increased. DCP application gave higher available phosphorus than MCP application and no phosphorus fertilizer. The highest amount of available phosphorus (Bray 2 extractable P) was found in Kt soil series, whereas the lowest amount of available phosphorus was found in Ok soil series. The second experiment indicated that the maize did not response to phosphorus fertilizers in Pc but positively responded to both MCP and DCP fertilizers in the other 5 soil series. However, MCP and DCP application gave similar grain dry weight and total P uptake of maize. The study of available phosphorus determination in preplanting soils showed that Bray 2, Mehlich 3, and Olsen extraction methods gave significant correlation between extractable phosphorus and total dry weight and total P uptake. However, Bray 2 method was the most reliable method.

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