

Komniya Sintupachee 2010: Effects of Some Sources of Iron and Zinc on Growth and Yield of Groundnut Grown on Calcareous Soils. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Jongruk Chanchareunsook, D.Agr. 83 pages.

This work was conducted to study the effect of some sources of iron (Fe) and zinc (Zn) on growth and yield of groundnut grown on calcareous soils. Three pot experiments were carried out under greenhouse conditions. The design of all experiments were Completely Randomized Design (CRD) with 3 replications. In the first experiment, effects of Fe-DTPA and Fe-EDDHA on growth yield and total Fe uptake of groundnut, Kalasin 1 cultivar, grown on Lop Buri series, calcareous soil, was studied. The treatments consisted of the control (without iron fertilizer) and the application of Fe at the rate of 1.0 and 3.0 mg Fe kg<sup>-1</sup> soil as Fe-DTPA and Fe-EDDHA. In the second experiment, effect of zinc sulfate (ZnSO<sub>4</sub>) and zinc EDTA (Zn-EDTA) on growth, dry matter yield and total Zn uptake of Kalasin 1 cultivar, grown on Chai Badan series, calcareous soil was elucidated, The treatments consisted of the control (without zinc fertilizer) and the application of Zn at the rate of 0.5, 1 and 3 mg Zn kg<sup>-1</sup> soil as ZnSO<sub>4</sub> and Zn-EDTA. In the third experiment, effect of ZnSO<sub>4</sub> and Zn-EDTA on growth, dry matter yield and total Zn uptake of groundnut, Khon Kaen 4 cultivar, grown on Chai Badan series, calcareous soil was studied. The treatments were similar to the second experiment.

The results of the first experiment showed that groundnut (Kalasin 1 cultivar) grown on the calcareous Lop Buri soil series was deficient in Fe. Application of Fe-DTPA and Fe-EDDHA significantly increased growth and yield of the groundnut as compared to the control. The effectiveness of Fe-EDDHA in increasing growth and yield of the groundnut was higher than that of Fe-DTPA. Yield of the groundnut grown on the soil amended with Fe-DTPA at the rate of 3 mg Fe kg<sup>-1</sup> soil were similar to those of the groundnut grown on the soil amended with Fe-EDDHA at the rate of 1 mg Fe kg<sup>-1</sup> soil. Application of Fe-EDDHA significantly increased total Fe uptake of the groundnut as compared to that of the control. The effectiveness of Fe-EDDHA in increasing availability of Fe in the soil to the groundnut was higher than that of Fe-DTPA. The results of the second and the third experiment were rather similar. Groundnut, either Kalasin 1 cultivar or Khon Kaen 4 cultivar, grown on the calcareous Chai Badan soil series were deficient in Zn. Application of ZnSO<sub>4</sub> and Zn-EDTA increased growth, dry matter yield and total Zn uptake of the groundnuts as compared with the controls. The effectiveness of Zn-EDTA in increasing growth dry matter yield and total Zn uptake of the groundnuts was higher than that of ZnSO<sub>4</sub>. Therefore, application of Fe-EDDHA to groundnut grown on the calcareous soil, Lop Buri series and application of Zn-EDTA to groundnut grown on the calcareous soil, Chai Badan series were recommended.

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