

Rouengrong Moysurin 2010: Responses to Some Iron Sources of Corn and Groundnut Grown on Calcareous Soil. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Associate Professor Jongruk Chanchareonsook, D.Agr. 106 pages.

This experiment studied the responses to some iron sources of corn and groundnut grown on calcareous soil, Takhli series, which was high in pH and low in available iron content. Three experiments were carried out. Factorial of 2 factors, Fe sources and their rates, in Completely Randomized Design with 3 replications were done in all experiments. In the first experiment, responses of corn to $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA fertilizers were studied. Types of iron fertilizer which were $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA and application rates which were 5, 15 and 45 mg Fe kg^{-1} soil, were investigated. The control treatment was without iron fertilizer application. The results showed that corn grown on a calcareous soil, Takhli series, was deficient in iron. Application of iron fertilizer in the form of $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA significantly increased growth and yield of corn over the control. The effectiveness of $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA in the increase of growth, yield and total iron uptake of corn were similar. In the second experiment, responses of groundnut to $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA was elucidated. Types of iron fertilizer which were $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA and application rates which were 2.5, 7.5 and 22.5 mg Fe kg^{-1} soil were investigated. The control treatment was without iron fertilizer application. The results showed that groundnut on a calcareous soil, Takhli series, was deficient in iron. Application of iron fertilizer in the form of $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ and Fe-EDDHA significantly increased growth, dry matter yield and total iron uptake of groundnut over the control. The effectiveness of Fe-EDDHA in the increase of growth and total iron uptake of groundnut was greater than that of $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$. The third experiment, studied the response of groundnut to Fe-DTPA and Fe-EDDHA fertilizers in a calcareous soil, Takhli series. Types of iron fertilizer which were Fe-DTPA and Fe-EDDHA and application rates which were 0.5, 1.0, 2.0 and 3.0 mg Fe kg^{-1} soil were investigated. The control treatment was without iron fertilizer application. The results showed that groundnut on a calcareous soil, Takhli series, was deficient in iron. Application of iron fertilizer either in the form of Fe-DTPA or Fe-EDDHA significantly increased total Fe uptake, growth and yield of groundnut over the control. Application of Fe-EDDHA at the rate of 0.5, 1.0, 2.0 and 3.0 mg Fe kg^{-1} soil increased seed yield of groundnut by 231, 248, 263 and 339-fold, respectively, above the control where as application of Fe-DTPA at the rate of 0.5, 1, 2 and 3 mg Fe kg^{-1} soil increased seed yield of groundnut by 27, 37, 168 and 256-fold, respectively, above the control. The effectiveness of Fe-EDDHA in the increase of growth, yield and total iron uptake of groundnut was higher than that of Fe-DTPA. Finally, application of either $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ or Fe-EDDHA to corn and application of Fe-EDDHA to groundnut grown on the calcareous soil, Takhli series, were recommended.

Student's signature

Thesis Advisor's signature