Effects of different Fe levels from Fe-nano-chelate and Fe-EDDHA sources on growth and some nutrients concentrations in cowpea in a calcareous soil

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Abstract

To evaluate the effects of different levels of iron (Fe) (from Fe-nano-chelate and Fe-EDDHA sources) on growth parameters, concentration and absorption of Fe and some nutrients in cowpea (*Vigna unguiculata*) in a calcareous soil, a greenhouse experiment was conducted based on completely randomized design with three replications. Treatments consisted of four levels of Fe (0, 0.135, 0.270 and 0.405 mg Fe per kg soil as Fe-nano-chelate or Fe-EDDHA). The studied soil (Fine-loamy, carbonatic, thermic, Typic Calcixerepts) had a loam texture with low available Fe content. Results showed that application of both Fe fertilizers increased shoot dry-matter yield, root dry matter yield, number of pods per plant, weight of pods and seeds per plant, grain weight per pot, shoot Fe concentration and Fe uptake by cowpea as compared to control treatment. Some of the evaluated growth parameters at all levels of Fe from Fe-nano-chelate source were higher than the Fe-EDDHA source and some were the same and had no significant difference. Application of both Fe-nano-chelate and Fe-EDDHA decreased phosphorus and manganese concentrations in shoots as compared to control treatment. Concentration of zinc and cooper in shoots was not significantly affected by the Fe level. In conclusion, lower rates of Fe-nano-chelate were required, as compared to Fe-EDDHA, to alleviate iron deficiency in cowpea grown in calcareous soils.

Keywords: Growth parameters, Nano-fertilizers, Essential Nutrient.

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