Effect of application of phosphorus fertilizer in calcareous soils containing different amounts of native phosphorus on yield and micronutrients uptake of cucumber

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Abstract

Phosphorus (P) is an essential element for plant growth and it is responsible for various functions in the plant. That is why it has been dubbed as the key of plant life. However, its excessive consumption disturbs uptake of micronutrients and reduces plant performance. To investigate the effect of application of P, in calcareous soils containing different amounts of native P, on growth and uptake of micronutrients in cucumber, a greenhouse experiment was carried out as a factorial in a completely randomized design with three replications, at University of Jiroft, Iran. Treatments consisted of five levels of native P (11, 28, 51, 78 and 97.1 mg P/kg soil) and two levels of P fertilizer (0 and 20 mg/kg). Leaf dry weight and concentration of P, Fe, Zn Cu and total uptake of these nutrients by leaves were measured after 6 weeks of plant growth. Results showed that the highest dry weight was related to P fertilizer use, which, as compared to no P-fertilizer application, showed an increase of about 14.61%. Also, treatments which used P fertilizer had the highest concentration of P, and the higher cucumber yield could be justified by P application. On the other hand, micronutrient elements such as Fe, Zn and Cu reached their highest amount in treatments with no use of P fertilizer. However, in case of using P fertilizer, the concentration of these micronutrients in plants was reduced by 25, 16 and 30.41 percent, respectively.

Keywords: Greenhous cucumber, Balanced nutrition, Macronutrients, Micronutrients.

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