

Naruenatre Kietsermkajorn 2009: Zinc and Magnesium Fertilization for Growing Japanese Cucumber on Basic Soil with High Residual Phosphorus and Potassium. Master of Science (Soil Science), Major Field: Soil Science, Department of Soil Science. Thesis Advisor: Mr. Somchai Anusontpornperm, Ph.D. 105 pages.

A trial to investigate the effectiveness of Mg and Zn fertilizers on yield of Japanese cucumber and the concentration of nutrients in plant tissues was conducted at Huai Luek Royal Project Development Centre, Chiang Mai province. The experiment was in RCBD, which employed 10 treatments of different rates of Mg and Zn fertilizers and their combination such as 1, 2 and 3 g Mg plant⁻¹ wk⁻¹, 0.1, 0.2 and 0.3 g Zn plant⁻¹ wk⁻¹, and a combination of both nutrients at the rates of 1:0.1, 2:0.2 and 3:0.3 g plant⁻¹ wk⁻¹ all along with fertigation, each with four replications.

Results showed that there was no difference in fresh fruit yield of Japanese cucumber in grade 1 among treatments. The control tended to give the highest yield of 2,278 kg rai⁻¹ which was nearly similar to 2,266 kg rai⁻¹ obtained from the treatment applied with 0.3 g Zn plant⁻¹ wk⁻¹. The application of 1 g Mg plant⁻¹ wk⁻¹ gave the highest fresh fruit yield in grade 2 of 2,040 kg rai⁻¹ which was statistically significantly higher than that of other treatments. The total amounts of grade 1 and 3 yields after applying the same amount of Mg was still statistically highest (3,942 kg rai⁻¹) compared to other treatments with the exception of the one applied with 3 g Mg plant⁻¹ wk⁻¹ that gave the yield of 3,136 kg rai⁻¹. It can be noticed that the higher rate the application of Zn, the greater amounts of yield in grade 1 and 2 were potentially gained. There was no difference amount yields in grade U.

Application of Mg and Mg plus Zn at the highest rates significantly induced plant to take up more P (0.6 and 0.7 %, respectively) into leaves than did the control which was similar to K uptake into leaves in all treatments added with Mg and Zn fertilizers. There was no correlation between addition of Mg and Mg uptake. The accumulation of Zn in leaves was tentatively higher when applied Zn fertilizer at the highest rate. Results, however, showed no correlation between nutrients concentration and fresh fruit yield of Japanese cucumber obtained from this study. The use of Mg at the rate of 1 g plant⁻¹ wk⁻¹ clearly increased the fresh yield and should be recommended to local farmer. Considering the yields as affected by Zn application, increase of Zn fertilizer at much higher rates than at the ones used in this experiment or foliar application may help increase fresh fruit yield of Japanese cucumber.

Student's signature

Thesis Advisor's signature