ABSTRACT

Mohamed Abdrabbo Ahmed Abdrabbo. Fertigation Management of Cucumber Plants under Plastic Houses. Unpublished Doctor of Philosophy Thesis. (Vegetable crops). Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2005.

Cucumber (*Cucumis sativus* L. cv. Delta Star F1) plants were grown in white plastic containers filled with sand at different levels of nitrogen, phosphorus and potassium under a typical plastic-covered greenhouse. The experiment was carried out in the Protected Cultivation Experimental Site at Dokki, Giza during the two successive seasons of 2002/2003 and 2003/2004. The main objective of this study was to determine cucumber response and nutrient uptake under different treatments. Twenty seven combinations of nitrogen [90 (N1), 180 (N2) and 270 (N3) mg/l]; phosphorus [15 (P1), 35 (P2) and 70 (P3) mg/l] and potassium [120 (K1), 240 (K2) and 360 (K3) mg/l] were applied in a randomized complete block design with three replicates. Plant leaf samples (4th mature leaf from top) were removed in order to analyze nutrient concentration in cucumber leaves. Harvesting started after four weeks from transplanting and the total yield was accumulated every two weeks in order to find out the relationship between yield from one hand and N, P and K status from the other hand. The results showed that plant height, leaves area, stem diameter and chlorophyll content were increased with increasing nitrogen concentration in the nutrient solution accompanied with (P2K2), (P2K3), (P3K2) or (P3K3). The lowest early and total yields were obtained in N1 accompanied with different combinations of P and K. Meanwhile, N2 gave the highest early yield under different combinations with P and K but without significant differences with N3 treatments up till the 2nd week after beginning of harvest: N3 gave significantly the highest total yield followed

by N2 accompanied with (P2K2), (P2K3), (P3K2) and (P3K3) in comparison with both N2 and N3 treatments with P1, K1 or both of them. Plant analysis revealed that low concentrations of N, P or K in the 4th leaf were proportional to low vegetative growth parameters and total yields.

Keywords:
Cucumis sativus; nitrogen, potassium; phosphorus nutrient dose; nutrient interaction; plant analysis; soilless culture.

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