Performance of Tomatoes in a newly formulated hydroponics solution

A S N Jayalath[2], J A Liyanage[1]*, K D N Weerasinghe[2] and B M J Siriwijaya[2]

[1] *Department of Chemistry, University of Kelaniya, Kelaniya*

[2] *Department of Agriculture Engineering, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya*

Hydroponics or soilless culture is a technology for growing plants in nutrient solution even though a number of hydroponics fertilizer mixtures are available. There exists a need to develop low cost solutions for specific crops as the crop demand for nutrients differs from one plant to another. Thus, a new hydroponics fertilizer mixture was formulated and its suitability checked for green house tomatoes.

Tomato variety Thilina was grown in a protected house, using three hydroponics solutions; Albert solution, Phostrogen solution and newly formulated solution. Aggregate hydroponic system was used to grow tomato plants in coir dust filled polythene bags. The design of the experiment was completely randomized design (CRD) with five replicates. Environmental factors, electrical conductivity (EC), pH of the solution, phonological observations and yield parameters were measured to asses the performance of tomato plants in three solutions.

Growth of the tomato plant and number of flowers per plant were not significantly different in the three treatments. It was revealed that when tomato was grown in the new solution, it helps to increase the fruit flower ratio 2 times, number of fruits per plant by 1.8 times, number of medium sized fruits by 5.14 and the yield by 2.3 times compared to the Albert Solution. It was also noted that abortion rate of flowers was decreased by 0.8 times when tomato is grown in the new solution.

New solution also helped to increase the dry matter content of tomato fruit by 1.13 times compared to Albert solution but there was no significant difference on quality parameters of fruits such as Brix value, acid value and ascorbic acid content among three treatments. Therefore, the new solution appeared to be a more appropriate hydroponics nutrient solution, which helps to get an average yield 2.3 times higher than the Albert solution with a considerably high dry matter content for tomato.

* janitha@kln.ac.lk

Tel: 011 2914486