EFFECT OF DIFFERENT SUBSTRATES ON FRUIT YIELD AND QUALITY OF CHERRY TOMATO GROWN IN A CLOSED SOILLESS SYSTEM

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Abstract
In soilless culture, the cost of the culture medium is an important component in total production cost. The possibility of using different materials, which are locally available and less costly than those imported, could reduce the production cost. The aim of this research was to determine the effects of different growth substrates (available in region as sand and zeolite or imported as perlite) on fruit yield and quality of cherry tomato (*Lycopersicum esculentum Mill Cv. Supersweet-100 VF*) grown in closed soilless system under PE covered greenhouse with evaporative cooling system at the farm of Arabian Gulf University, Bahrain. Plants were grown in concrete troughs filled with six substrates (zeolite (Z), perlite (P), and mixtures (on volume basis) of perlite:sand (P:S, 2:1), (Z:P, 1:1), (Z:S, 1:1) and (Z:P:S, 1:1:1). Plants were fertilized by nutrient solution via drip irrigation system. Differences in fruit yield and quality were observed among the six substrates used, with the highest performance obtained by zeolite alone. Analysis of fruits indicated that K, Cu, Zn and Fe concentrations and fiber contents were higher in Z medium followed by Z:S, 1:1 medium, while protein contents and the concentrations of P, N and Mn were not affected by substrates. The best substrate for cultivation of cherry tomato is the zeolite which is probably related to its high water holding capacity and cation exchange capacity. The results suggest that addition of sand to zeolite resulted in similar fruit yield or quality to that planted on perlite. This finding is of much interest and cost effective to areas where zeolite is less available and sand is available abundantly like in countries of Arabian Peninsula.

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