# Growth and Productivity of Tomato and Cucumber as Affected by Intermittent Flowing Solution in NFT

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**Abstract**. The influence of intermittent flowing solution on the growth and yield of tomato *Lycopersicon esculentum* Mill, cv. Dombito and cucumber *Cucumis sativus* cv. Dina grown hydroponically in nutrient film technique (NFT) was studied. Seedlings of tomato and cucumber were transplanted at the fifth leaf stage to NFT gullies. The day and night temperatures of the greenhouse were 23° and 19°C, respectively. Two solution circulation treatments were tested, 10 minutes on, 5 minutes off (T1) and 10 minutes on , 10 minutes off (T2). Vegetative growth of the plants was measured three times during the experiment, 30, 82 and 152 days after transplanting for tomato and 21, 78 and 92 days after transplanting for cucumber. Circulation treatments did not affect the vegetative growth of tomato. Vegetative growth of cucumber was slightly higher for T1 plants in the first sample and for T2 plants in the other two samples, but the difference did not reach a significant level. Early and total yield of tomato, as fruit number and weight per plant, was not affected by the circulation of the nutrient solution. Circulation of the nutrient solution for 10 minutes on, 10 minutes off (T2) extended the harvesting period of cucumber for two weeks, which resulted in a significant higher total yield.

## Introduction

The standard method of growing greenhouse vegetables through out the world is in the soil. The greenhouse crops productivity decreases with the time. This reduction caused by several factors including the excessive build up pathogens and environmental and health restrictions in using soil fumigants [1]. The build up of salinity resulted from the heavy use of fertilizer and brackish irrigation water is another factor. These problems induced the change over to hydroponic culture. Van Os [2] reported that 95% of the fruit vegetables crops (Tomato, cucumber, pepper) in Netherlands have changed to hydroponic culture.

Nutrient Film Technique (NFT) is one of the most advance hydroponic system. In NFT the plants are grown in a shallow stream of recirculating solution in which are dissolved all the nutrient required for growth. Since Cooper popularized the practical guidelines for NFT in 1973, the commercial production of vegetables and flowers using NFT has been increased and the cultural practices has been improved.

Root environment is an important factor in plant production using NFT and intermittent flowing solution can be used to control the plant growth. The intermittent flow will repeatedly expose the root to air which would result in better root aeration. When using this technique, the pump are off for much of the time with a saving in pump, solution and in electricity [3]. The intermittent flow also reduces the water consumption and increases the water use efficiency [4 , 5].

Tomato has been grown successfully in NFT and the intermittent flowing solution can be used to restrict the early vigorous vegetative growth [3 , 6]. El-Behairy *et al* [7] correlated the flowing of the nutrient solution with the accumulated radiation at