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Identifying cost-effective techniques for commercially growing *Eruca sativa* plants using the Nutrient Film Technique (NFT)

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Nutrient Film Technique (NFT) is a technique used in hydroponics which uses a very shallow stream (film) of water containing all nutrients needed for plant growth to circulate between the growing channels and nutrient solution tank. Commercial growers use water from various sources (such as city water, well water, and rainwater) to create the nutrient solution, which is then treated using the Reverse Osmosis (RO) method. This method is quite costly and requires some technical knowledge. This study was primarily concerned with identifying a cost-effective method of treating water used to create the nutrient solution. The study site is in Ja-ela, Sri Lanka, and the water was obtained from the city water supply, with temperatures ranging from 30°C to 35°C. *Eruca sativa* plants (n = 160) were grown in two vertical NFT hydroponic systems. Water in the system – 01 was treated using RO filters before making the nutrient solution while water in the system – 02 was allowed to remain in an open tank for 24 hours with an air stone before making the nutrient solution. The same environmental conditions were provided to both systems. The pH range in the nutrient solution was kept between 5.5 and 6.5, electrical conductivity was kept between 1.4 ms and 1.6 ms and the temperature was kept around 27°C. Cooling pads and other simple methods were used to keep this temperature stable. The plants were harvested after 45 days and the weight was measured. The total weight of *Eruca sativa* plants in the system – 01 was 7.56 kg and the total weight of *Eruca sativa* plants grown in the system - 02 was 7.51kg. According to the measurements taken from this study, the city water treatment method without RO filters was identified as a cost-effective technique for commercially growing *Eruca sativa* plants using the nutrient film technique. Although the pH and EC values in the nutrient solution were kept constant, they could not be used for more than two weeks and the nutrient solution must be discharged once every two weeks. Therefore, more research is needed to identify cost-effective, environmentally friendly wastewater treatment methods for treating the wastewater discharge from the hydroponic system and to improve the effectiveness of nutrient film techniques.

Keywords: Hydroponic, Nutrient film technique (NFT), Nutrient solution, Reverse osmosis (RO)

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