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# Sustainable Cities: Viability of a Hybrid Aeroponic/Nutrient Film Technique System for Cultivation of Tomatoes

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**Abstract :** Growing environmental and sustainability concerns have driven continual modernization of horticultural practices, especially for urban farming. Controlled environment and soilless production methods are increasing in popularity because of their efficient resource use and intensive cropping capabilities. However, some popular substrates used for hydroponic cultivation, particularly rock wool, represent a large environmental burden in regard to their manufacture and disposal. Substrate-less hydroponic systems are effective in producing short cropping cycle plants such as lettuce or herbs, but less information is available for the production of plants with larger root-systems and longer cropping times. Here, we investigated the viability of a hybrid aeroponic/nutrient film technique (AP/NFT) system for the cultivation of greenhouse tomatoes (Solanum lycopersicum ‘Panovy’). The plants grown in the AP/NFT system had a more compact phenotype, accumulated more Na<sup>+</sup> and less P and S than the rock wool grown counterparts. Due to forced irrigation interruptions, we propose that the differences observed were cofounded by the differing severity of water-stress for plants with and without substrate. They may also be caused by a higher root zone temperature predominant in plants exposed to AP/NFT. However, leaf area, stem diameter, and number of trusses did not differ significantly. The same was found for leaf pigments and plant photosynthetic efficiency. Overall, the AP/NFT system appears to be viable for the production of greenhouse tomato, enabling the environment to be relieved by way of lessening rock wool usage.

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