THE IMPACT OF MAGNETIC UNITS ON THE PERFORMANCE OF AEROPONIC AND NFT SYSTEMS FOR STRAWBERRY AND LETTUCE

By

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THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Sciences
(Agricultural Engineering)

Department of Agricultural Engineering
Faculty of Agriculture
Cairo University
EGYPT

2020

Format reviewer **Vice Dean of Graduate studies**

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Title of Thesis: The impact of magnetic units on the performance of aeroponic and NFT systems for strawberry and lettuce
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Department: Agricultural Engineering **Branch:** Agricultural Engineering
Approval: 12/ 2 /2020

ABSTRACT

Scarcity water became the risk that threat world, so new technologies have been developed to make crop production possible in areas which are not suitable to traditional farming system due to different factors such as fresh water scarcity, undesirable climatic conditions and problematic soil condition. The aims of this study were 1- Designing and installation the most widely used soilless culture systems (hydroponic systems. 2- Developing a magnetic treatment unit with different magnetic flux densities. 3- Checking the effect of coupling soilless culture systems with magnetic units on nutrient solution characteristics, water productivity and production of strawberry and lettuce. 4- Achieving the highest water productivity, high quality yield, increasing water quality and area unit use efficiency by vertical expanding of soilless culture systems. Three hydroponic (Tower aeroponic, Pyramidal aeroponic and NFT) systems and three levels of magnetic units (magnetized water level 1; MWL1 = 3800 gauss, magnetized water level 2; MWL2 = 5250 gauss, magnetized water level 3; MWL3 = 6300 gauss, and regular water was represented as a control) were tested. There were an increase in TDS and a decrease in pH of nutrient solution through seasons of strawberry and lettuce with increasing the magnetic level as the time passes the irrigation period.

For strawberry, the maximum yield recorded by tower aeroponic system with magnetic water level 3 (MWL3) for both growing seasons, respectively. The maximum water productivity was registered under tower aeroponic system irrigated with MWL3 for the first season and the second season, respectively. Increased magnetic intensity led in lower water consumption in all hydroponic systems compared to control (regular water).

For lettuce, the maximum yield was for both seasons were recorded with NFT system under MWL3. Maximum water productivity was recorded with the integration of NFT system with MWL3 and Tower system with MWL3 in both seasons, respectively. In addition, leaf performance curves and lettuce yield and quality were increased with the integration of NFT system with MWL3 compared to others.

Keywords: Hydroponics, NFT, Tower, Pyramidal, Magnetic water, Strawberry, Lettuce.

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