TERRACOTTA TUBES AS GREENHOUSE COOLING SYSTEM IN THE VERTICAL FARMING SYSTEM OF LETTUCE (*Lactuca sativa L.*)

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ABSTRACT

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Regulating the temperature inside the greenhouse is suitable for obtaining desired range for plant growth and development. This study designed and fabricated a terracotta tube greenhouse cooling system for a vertical farming system of lettuce, evaluated the cooling system's performance by monitoring the relative humidity and temperature within the greenhouse, assessed the growth and yield performance of Romaine and Loose leaf variety of Lettuce (*Lactuca sativa L*) in the system. Terracotta tube cooling system is installed in one of the greenhouses and compared to an outside environment and one with just greenhouse conditions. The outside environment, relative humidity and temperature is monitored every 30 minutes from 6 am to 6 pm to assess the effectiveness of the terracotta cooling system. The results showed that there is a rise in relative humidity and drop of temperature in the greenhouse with a terracotta cooling system compared to the conventional greenhouse and the outside environment. The growth of lettuce under two different environments as a result of experiment showed significant difference between the crops in terms of plant's leaf length, leaf width, number of leaves, and plant weight and no significant difference in terms of plant height.

Keywords: terracotta; cooling system; relative humidity; temperature; lettuce.

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