

Hydroponic grow automation with Arduino Uno R3

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Abstract: Hydroponics is a technique with no restrictions on soil, crops grown under hydroponic cultivation are more tolerant to salinity, allowing the use of more saline or brackish waters. Hydroponic cultivation depends on an automation system that controls the circulation of the nutrient solution, in most systems a timer is used, which allows a fixed time adjustment that turns the system on and off. However, during the day and night, variations in temperature and humidity occur, which can cause temporary wilting of the plants, the fixed intervals are not variable throughout the day. Therefore, the objective of this research was to develop a system for automation for hydroponic cultivation with Arduino in response to variations in temperature and air humidity. For that, curly

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lettuce cv. Moana under different salinity levels in an NFT (Nutrient Film Technique) hydroponic system. The design was in randomized blocks (DBC), with six blocks BL1, BL2, BL3, BL4, BL5, five treatments (1.5; 2.0; 2.5; 3.0 and 3.5) dS m^{-1} and four replications, in a factorial scheme of $5 \times 5 \times 4$. Climatic data, air temperature and air humidity, and morphological data of the plant number of leaves and stem diameter were evaluated. Regarding salinity, there was a significant difference at the level of 5% of probability for the number of leaves and stem diameter between treatments, where the levels of 1.5 and 2.0 dS m^{-1} presented higher averages. Therefore, it was concluded that the proposed automation system is a viable alternative in the electrical conductivity levels of the solution 1.5 and 2.0 dS m^{-1} .

Keywords: Lettuce. Cultivation. Nutrients. Schedule.