

ABSTRACT

Hydroponics is one of the water-mediated agricultural cultivation which is currently used as an alternative to land use due to the decreasing number of lands for agriculture every year. One type of system used in hydroponics is the Deep Flow Technique (DFT). Several factors that affect the growth of hydroponic plants are water pH, nutrients in solution, lighting, and water circulation. This study aims to create an automatic system to help plant growth in the DFT hydroponic system that can control the pH level to be within a predetermined limit, adjust the Parts per Million (PPM) in the water solution, and adjust the water level on the DFT hydroponic rack. The results showed that the system was successful in adjusting the pH level to be within the specified limits with a 100% success rate, and successfully adjusted the PPM concentration so that the plants did not lack nutrients. In addition, the system uses 23.29% more power than the Manual Hydroponic System. This study also found that plants in the system grew better with the Absolute Growth Rate (AGR) value which was 23.67% higher for leaf length and 54.64% higher for leaf width compared to the Manual Hydroponic System.

Keywords : Microcontroller, Hydroponics, Deep Flow Technique (DFT)