

ABSTRACT

The conversion of agricultural land has become one of the main challenges in maintaining food availability. To address this limitation, hydroponic farming technology has been developed as a more efficient alternative in land and resource utilization, particularly water. Strawberries, which often face challenges in nutrient absorption in conventional farming systems, require a more controlled irrigation system to support optimal growth. This study designs and implements a hydroponic system based on an ultrasonic sensor to measure the nutrient solution level. The system is controlled by an Arduino microcontroller to automate the water pump operation based on sensor data. Thus, the water supply can be adjusted automatically according to the plant's needs without requiring manual adjustments. Testing was conducted in a controlled environment to evaluate the system's performance in maintaining water level balance in the hydroponic medium. Based on the test results, the system detects real-time changes in nutrient solution levels and regulates the water supply according to predetermined parameters. This study provides an overview of the application of sensor technology in improving water management efficiency in hydroponic farming.

Keywords: Water level, Monitoring, Hydroponics, Ultrasonic Sensor, Arduino Uno