ABSTRACT

Indoor Hydroponic Farming is an indoor farming system that utilizes light, air temperature and water as its main factors, and in the hydroponic plant planting stage, seeding is the initial stage carried out. Several factors that affect seeding in hydroponic plants are temperature, humidity, oxygen in water, water temperature, pH in water, and nutrient concentration in water. But at this time hydroponic farmers still observe hydroponic plants manually or conventionally, so that plant observation is difficult to do.

In this study, an Indoor Hydroponic Farming System was created that can monitor air and nutrient tanks in indoor hydroponic farming which was implemented in a hydroponic room located in the greentech lab of the Faculty of Applied Sciences (FIT), this project is part of Research and Innovation for Advanced Indonesia (RIIM). In the hydroponic system, to help monitor it, a data logger is used, namely a spreadsheet that collects sensor data such as pH, Tds, Dht22, Do, Ds18B20 and ESP32 microcontroller which is used as the center of data collection.

In the test results by taking data from the Indoor Hydroponic Farming Monitoring System by testing on a hydroponic rack filled with a nutrient solution of 30 ml per 6 gallons of water, with a total capacity (15 liters of water) and a nutrient solution of 15 ml per 6 gallons of water, with a total capacity (15 liters of water), the results of the comparison of DHT22 measurements around the plants on the 30ml nutrient rack and 15ml nutrient rack for an average temperature difference of 0.5 and humidity of 2.7 while DHT22 around the room on the 30ml nutrient rack and 15ml nutrient rack for an average temperature difference of 0.4 and humidity of 0.8, DS18B20 on the 30ml nutrient rack and 15ml nutrient rack for an average water temperatu re difference of 1.3, TDS on the 30ml nutrient rack and 15ml nutrient rack for an average tds difference of 147, pH on the 30ml nutrient rack and 15ml nutrient rack for an average pH difference of 0.1, DO on the nutrient rack 30ml and 15ml nutrient rack for an average difference of 0.4. The comparison results show that 30ml and 15ml nutrients can provide a difference that is not too far apart, meaning they can provide a more optimal nutrient balance and a more stable environmental condition for lettuce plant metabolism. From these results, this system is able to identify hydroponic plants that aim to optimize plant growth.

Keywords: *Hydroponics, Indoor Hydroponic Farming, Monitoring, Sensors, data loggers.*