DESIGN OF IOT BASED HYDROPONIC PLANT BREEDING

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ABSTRACT

Modern agriculture has adopted the latest science and technology to increase the efficiency and effectiveness of agricultural processes while reducing the use of natural resources. One of the latest developments in agricultural practice is plant breeding using the hydroponic method, where plants are grown without using soil, but by utilizing water and nutrients provided in a controlled manner. The advantages of hydroponics include a cleaner nursery area, faster plant growth, and no need to manually water the plants because it uses water as a growing medium. In the current technological era, many people are looking for more efficient and automated ways of doing work, including in the agricultural sector. To make it easier for farmers to check plant seeds regularly, an IoT-based hydroponic plant nursery design is proposed. In this system, an ultrasonic sensor will be used to monitor the length of the stem of the plant seed and a TDS sensor to measure the level of nutrient solution given to the plant. This system will enable accurate monitoring and measurement automatically, so that farmers can easily obtain information about the development of plant seeds and their nutritional needs. By applying IoT technology to hydroponic plant breeding, it is hoped that agriculture can become more efficient, productive and sustainable. It is hoped that the combination of modern agricultural practices and advanced technology can be a solution to increase agricultural yields and meet food needs that continue to increase along with human population growth. Through research and testing results, the success rate for ultrasonic sensor readings reached 88.87%, with an average TDS sensor error rate of 0.29% for Ppm readings. Testing the tool with various scenarios shows a success rate of 90%. In testing the entire tool with monitoring on the Blynk platform, the system achieved a 100% success rate. This shows that the proposed plant nursery system can function well and provide accurate information to farmers.

***Keywords**: Hydroponics, chili, TDS sensor, Ultrasonic sensor, Blynk*