

ABSTRAK

Tanaman jagung merupakan salah satu tanaman pangan yang banyak dibudidayakan petani. Untuk pertumbuhan tanaman jagung yang optimal dibutuhkan pengolahan lahan yang tepat. Faktor penting yang memengaruhi kualitas tanah untuk tanaman jagung yaitu kondisi pH tanah, suhu, dan kelembaban tanah. Akan tetapi permasalahan yang sering dihadapi petani adalah kesulitan dalam memonitoring kondisi tanah. Oleh sebab itu dalam tugas akhir ini dirancang sebuah alat berbasis *Internet of Things (IoT)* yang dapat memonitoring kondisi pH tanah, suhu, dan kelembaban tanah pada tanaman jagung secara otomatis. Sistem monitoring pH tanah, suhu, dan kelembaban tanah pada tanaman jagung menggunakan sensor pH tanah, sensor DS18B20 dan sensor YL-69 dengan mikrokontroler WeMos D1 R2 untuk pengolahan data dan pengiriman data ke platform ANTARES. Sistem juga dirancang dapat memberikan notifikasi apabila kondisi pH tanah, suhu, dan kelembaban tanah tidak sesuai dengan kondisi ideal untuk tanaman jagung.

Pengujian sistem dilakukan pada dua kondisi tanah, yaitu tanah selama persiapan tanam (sebelum dilakukan penanaman tanaman jagung) dan tanah setelah tanaman jagung tumbuh. Untuk pengujian pada tahap persiapan tanah, dilakukan pada tanah gambut. Pengujian dilakukan selama inkubasi tanah. Hasil penelitian menunjukkan bahwa kinerja alat ini mampu mengukur pH tanah, suhu, dan kelembaban tanah pada tanaman jagung dengan error berturut-turut sebesar 2,3075%, 1,9205%, dan 2,0925%, dan tingkat akurasi alat berturut-turut sebesar 97,4425%, 98,9725%, dan 97,9075%.

Kata kunci: tanaman jagung, pH tanah, suhu, kelembaban tanah, WeMos D1 R2, ANTARES, IoT

ABSTRACT

Corn is one of the most widely cultivated food crops by farmers. Proper land management is required for optimal corn plant growth. Important factors that affect soil quality of corn plants are soil pH, temperature, and soil moisture conditions. However, the problem that is often faced by farmers is the difficulty in monitoring soil conditions. Therefore, in this final project, an Internet of Things (IoT) based tool is designed that can monitor soil pH, temperature, and soil moisture conditions in corn plants automatically. The monitoring system for soil pH, temperature, and soil moisture in corn plants uses soil pH sensor, DS18B20 sensor, and YL-69 sensor with WeMos D1 R2 microcontroller for data processing and data sensing to the ANTARES platform. The system is also designed to provide notification when conditions of soil pH, temperature or soil moisture do not match the ideal conditions for corn plants.

System testing was carried out on two soil conditions: soil during planting preparation (before planting corn) and soil after growing corn. Testing for the soil preparation stage was carried out on peat soil. Tests were carried out during soil incubation. The results showed that the performance of this tool was able to measure soil pH, temperature and soil moisture in corn plant with successive error of 2.3075%, 1.9205%, and 2.0925%, and the accuracy of the instrument was respectively 97.4425%, 98.9725% and 97.9075%.

Keywords: *corn plant, soil pH, temperature, soil moisture, WeMos D1 R2, ANTARES, IoT*