

ABSTRAK

RANCANG BANGUN ALAT MONITORING KONDISI SEKITAR PERTUMBUHAN JAMUR TIRAM MENGGUNAKAN SENSOR SUHU DAN KELEMBAPAN

(Indra Juliansyah: 2025:XI + 44 + Lampiran)

Budidaya jamur tiram memerlukan pengendalian suhu dan kelembapan yang akurat, namun metode pemantauan manual sering kali tidak efektif sehingga berisiko menyebabkan penurunan kualitas bahkan kegagalan panen. Urgensi penelitian ini terletak pada perlunya sistem otomatis yang mampu memantau dan mengendalikan kondisi lingkungan secara real-time untuk meningkatkan efisiensi dan keberhasilan budidaya. Penelitian ini bertujuan merancang alat monitoring otomatis berbasis mikrokontroler ESP32 dengan **sensor** DHT22 dan soil moisture untuk memantau suhu, kelembapan udara, serta kelembapan media tanam, yang terintegrasi dengan kipas DC, pompa air, dan notifikasi Telegram. Metode meliputi perancangan perangkat keras, pemrograman sistem, serta pengujian kinerja alat. Hasil pengujian menunjukkan bahwa alat mampu menjaga suhu dan kelembapan dalam rentang optimal serta memberikan informasi real-time melalui tampilan OLED dan Telegram, sehingga mendukung efektivitas budidaya jamur tiram.

Kata kunci: Jamur tiram, monitoring otomatis, ESP32, DHT22, soil moisture, IoT, Telegram, Suhu dan Kelembapan.

ABSTRACT

DESIGN OF AN OYSTER MUSHROOM GROWTH MONITORING DEVICE USING TEMPERATURE AND HUMIDITY SENSORS

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Oyster mushroom cultivation requires precise control of temperature and humidity; however, manual monitoring is often ineffective, leading to decreased quality and potential crop failure. The urgency of this research lies in the need for an automated system capable of monitoring and controlling environmental conditions in real-time to improve efficiency and cultivation success. This study aims to design an automatic monitoring device based on the ESP32 microcontroller integrated with DHT22 and soil moisture sensors to monitor temperature, air humidity, and substrate moisture, as well as control a DC fan, water pump, and provide Telegram notifications. The method includes hardware design, system programming, and performance testing. The results show that the device can maintain temperature and humidity within optimal ranges and deliver real-time information through an OLED display and Telegram, thereby supporting the effectiveness of oyster mushroom cultivation.

Keywords: Oyster mushroom, automatic monitoring, ESP32, DHT22, soil moisture, IoT, Telegram, Temperature and Humidity.