

Ryo Aditya. 200311100042. Rancang Bangun Rakit Apung Otomatis dan Pengaruh Warna Naungan terhadap Pertumbuhan Tanaman Selada Butterhead (*Lactuca sativa var capitata* L.). Dibawah Bimbingan: Choirul Umam, S.TP., M.T dan Ir. Sinar Suryawati, M.Si

ABSTRAK

Salah satu jenis selada yang populer saat ini adalah butterhead lettuce (*Lactuca sativa var capitata* L.), yang diminati karena penampilannya yang menarik dan berdaun lembut. Meskipun luas panen sayur semusim di Jawa Timur menurun dari tahun 2021 ke 2022, budidaya hidroponik masih menjadi solusi dalam pemanfaatan lahan. Hidroponik rakit apung sering digunakan karena kesederhanaannya dan biaya rendah. Kendala pemantauan ketinggian air pada sistem ini dapat diatasi dengan sistem penginderaan berbasis mikrokontroler. Diperlukan juga upaya untuk meningkatkan produktivitas selada, termasuk melalui rekayasa mikroklimat. Penelitian ini bertujuan untuk mengetahui pengaruh warna naungan plastik dan merancang rakit apung otomatis terhadap pertumbuhan selada butterhead. Penelitian dilakukan di Kebun Percobaan dan Laboratorium Bioteknologi Universitas Trunojoyo Madura dari Oktober 2023 hingga Januari 2024 menggunakan Rancangan Acak Lengkap (RAL) Nonfaktorial. Perlakuan warna naungan plastik terdiri dari putih, ungu, biru, kuning, oranye, dan merah. Variabel tanaman meliputi tinggi tanaman, jumlah daun, lebar tajuk, bobot basah, dan bobot kering. Variabel alat meliputi akurasi sensor, kinerja aktuator, panel surya, IoT, dan alat keseluruhan. Data dianalisis menggunakan ANOVA dengan taraf 5%, dilanjutkan dengan DMRT jika terdapat pengaruh. Warna naungan berpengaruh signifikan terhadap semua parameter tanaman. Warna putih unggul dalam tinggi tanaman, jumlah daun, dan lebar tajuk, meski bentuk tanaman kurang optimal. Warna merah memberikan hasil panen terbaik dan bentuk tanaman optimal. Rakit apung otomatis dirancang dengan baik, sensor bekerja akurat, dan aktuator merespon nilai sensor sesuai ketentuan kelembaban 80% dan ketinggian air 15 cm. Energi dari panel surya dapat mencukupi kebutuhan alat.

Kata Kunci: Hidroponik, Selada Butterhead, Warna Naungan

Ryo Aditya. 200311100042. Design of an Automatic Floating Raft and the Effect of Shade Colour on the Growth of Butterhead Lettuce Plants (*Lactuca sativa var capitata* L.). Supervised: Choirul Umam, S.TP., M.T and Ir. Sinar Suryawati, M.Si.

ABSTRACT

One of the popular types of lettuce today is butterhead lettuce (*Lactuca sativa var capitata* L.), which is in demand due to its attractive appearance and soft leaves. Although the harvest area of seasonal vegetables in East Java decreased from 2021 to 2022, hydroponic cultivation is still a solution in land utilization. Floating raft hydroponics is often used due to its simplicity and low cost. The constraints of water level monitoring in this system can be overcome with a microcontroller-based sensing system. Efforts are also needed to increase lettuce productivity, including through microclimate engineering. This study aims to determine the effect of plastic shade color and design an automatic floating raft on the growth of butterhead lettuce. The research was conducted in the Experimental Garden and Biotechnology Laboratory of Trunojoyo University Madura from October 2023 to January 2024 using a Nonfactorial Completely Randomized Design (CRD). The color treatment of plastic shade consists of white, purple, blue, yellow, orange, and red. Plant variables include plant height, number of leaves, crown width, wet weight, and dry weight. Tool variables include sensor accuracy, actuator performance, solar panel, IoT, and overall tool. Data were analyzed using ANOVA at the 5% level, followed by DMRT if there was an effect. Shade color had a significant effect on all plant parameters. White color excelled in plant height, number of leaves, and crown width, although plant shape was less than optimal. Red color gave the best yield and optimal plant shape. The automatic floating raft was well designed, the sensors worked accurately, and the actuators responded to the sensor values as required by 80% humidity and 15 cm water level. Energy from solar panels can meet the needs of the device.

Keywords: Butterhead Lettuce, Hydroponics, Shade Color.