

RINGKASAN

Kentang (*Solanum tuberosum L*) merupakan salah satu tanaman yang penting di Indonesia karena banyak mengandung gizi dan dapat dikonsumsi sebagai pengganti bahan pokok. Produksi kentang di Indonesia tahun 2020 produksi kentang mengalami penurunan. Salah satu penyebab menurunnya produksi kentang di Indonesia yaitu kurangnya ketersediaan benih kentang bermutu dan harga benih yang mahal. Budidaya kentang di dataran tinggi dapat menyebabkan terjadinya erosi tanah. Penanaman kentang di dataran rendah menjadi salah satu solusi, akan tetapi di dataran rendah mempunyai suhu yang sangat tinggi tidak sesuai dengan kebutuhan pertumbuhan tanaman kentang. Penggunaan teknologi aeroponik dengan *zone cooling* di daerah perakaran merupakan solusi untuk meningkatkan produksi benih kentang.

Aeroponik merupakan sistem budidaya tanaman di udara tanpa menggunakan media tanah. Kelebihan sistem aeroponik yaitu mampu mengoptimalkan aerasi akar, hemat air, sirkulasi udara yang baik. Sistem aeroponik dengan suhu *zone cooling* di daerah perakaran dapat menghasilkan benih kentang mencapai 14 umbi/tanaman. Teknologi ini perlu dikaji lebih lanjut dengan memperkuat informasi pengaruh suhu pendinginan terhadap pertumbuhan dan hasil benih kentang. Penelitian ini bertujuan untuk: 1) Mengetahui pengaruh variasi pengendalian suhu *zone cooling* terhadap hasil pertumbuhan dan benih kentang pada produksi benih kentang sistem aeroponik di dataran rendah. 2) Mengetahui pengaruh asal bibit varietas terhadap hasil pertumbuhan dan benih kentang pada produksi benih kentang sistem aeroponik di dataran rendah.

Penelitian dilakukan di *Greenhouse* tipe *semi Arch* yang berukuran panjang 13 meter, lebar 10 meter, dan tinggi 2,5 meter. Penelitian ini terdapat dua faktor: Faktor pertama perlakuan suhu *zone cooling* (T), terdiri dari: 1) suhu 10°C siang malam, 2) suhu 10°C siang dan 8°C malam. Faktor kedua asal bibit varietas Tedjo Mz (B), terdiri dari: 1) stek tunas, 2) stek akar, 3) umbi. Variabel pengamatan pertumbuhan tanaman kentang yaitu: 1) tinggi tanaman, 2) jumlah daun, 3) jumlah umbi. Variabel pengamatan iklim mikro yaitu: 1) suhu udara, 2) Kelembaban relatif, 3) radiasi matahari. Data pertumbuhan tanaman kentang dianalisis dengan uji ANOVA dan uji *Kruskall-Wallis* di lanjutkan dengan uji *Duncan Multiple Range Test* (DMRT) 5% dan data iklim mikro dianalisis dengan grafik.

Hasil penelitian menunjukkan bahwa perlakuan suhu dengan *zone cooling* suhu siang malam sangat berpengaruh nyata terhadap pertumbuhan dan hasil umbi tanaman kentang. Tinggi tanaman tertinggi diperoleh pada perlakuan *zone cooling* 10°C siang malam dengan tinggi tanaman rata-rata 44,412 cm. Jumlah daun tertinggi diperoleh pada perlakuan *zone cooling* 10°C siang malam dengan jumlah daun rata-rata 67, 493 daun. Jumlah umbi tertinggi di peroleh pada perlakuan *zone cooling* 10°C siang malam dengan jumlah umbi rata-rata 44,54 umbi/box. Perlakuan asal bibit varietas Tedjo Mz tidak berpengaruh nyata terhadap pertumbuhan dan hasil umbi kentang.

SUMMARY

Potatoes (*Solanum tuberosum L*) are one of the important crops in Indonesia because they contain many nutrients and can be consumed as a substitute for staple foods. Potato production in Indonesia in 2020 saw a decline in potato production. One of the causes of the decline in potato production in Indonesia is the lack of availability of quality potato seeds and the high price of seeds. Potato cultivation in the highlands can cause soil erosion. Planting potatoes in the lowlands is one solution, however in the lowlands the very high temperatures are not in accordance with the growth needs of potato plants. The use of aeroponic technology with zone cooling in the root area is a solution to increase potato seed production.

Aeroponics is a system of cultivating plants in the air without using soil. The advantages of the aeroponic system are that it can optimize root aeration, save water, and have good air circulation. An aeroponic system with zone cooling temperatures in the root area can produce up to 14 tubers of potato seeds/plant. This technology needs to be studied further by strengthening information on the effect of cooling temperatures on the growth and yield of potato seeds. This research aims to: 1) Find out the effect of variations in cooling zone temperature control on the growth and yield of potato seeds in aeroponic system potato seed production in the lowlands. 2) Knowing the effect of the origin of seed varieties on growth and potato seed results in aeroponic system potato seed production in the lowlands.

The research was carried out in a semi-arch type greenhouse measuring 13 meters long, 10 meters wide and 2.5 meters high. There are two factors in this research: The first factor is zone cooling (T) temperature treatment, consisting of: 1) a temperature of 10oC day and night, 2) a temperature of 10oC during the day and 8oC at night. The second factor in the origin of seeds of the Tedjo Mz (B) variety consists of: 1) shoot cuttings, 2) root cuttings, 3) tubers. Variables for observing potato plant growth are: 1) plant height, 2) number of leaves, 3) number of tubers. Microclimate observation variables are: 1) air temperature, 2) relative humidity, 3) solar radiation. Potato plant growth data were analyzed using the ANOVA test and the Kruskal-Wallis test followed by the Duncan Multiple Range Test (DMRT) 5% and microclimate data were analyzed graphically.

The research results showed that temperature treatment with zone cooling day and night temperatures had a significant effect on the growth and yield of potato tubers. The highest plant height was obtained in the zone cooling temperature treatment of 10oC day and night with an average plant height of 44.412 cm. The highest number of leaves was obtained in the zone cooling treatment with a temperature of 10oC day and night with an average number of 67,493 leaves. The highest number of tubers was obtained in the zone cooling treatment with a temperature of 10oC day and night with an average number of tubers of 44.54 tubers/box. The seed treatment of the Tedjo Mz variety had no significant effect on the growth and yield of potato tubers.