RINGKASAN

Sistem aeroponik mulai dikembangkan untuk produksi benih kentang di dataran tinggi karena dapat menghasilkan benih bermutu dan kontinyu. Air (nutrisi) dan penambahan cahaya merupakan faktor yang mendukung pertumbuhan tanaman kentang aeroponik di dataran tinggi. Namun, informasi kebutuhan air pada sistem aeroponik dengan penambahan pencahayaan belum banyak diteliti, oleh karena itu penelitian ini penting dilakukan. Penelitian bertujuan: 1) mendapatkan informasi kebutuhan air, dan 2) mengetahui pertumbuhan tanaman kentang di dataran tinggi dengan sistem aeroponik.

Penelitian dilaksanakan dari bulan November 2018-Maret 2019 berlokasi di *greenhouse* Perusahaan Benih Difa Banjarnegara. Lokasi berada di ketinggian ± 1663 mdpl. Sistem aeroponik yang digunakan: 1) box kontrol (tanpa lampu LED), dan 2) box dengan lampu LED 10 Watt jarak 110 cm. Tanaman pada masing-masing box berjumlah 125 tanaman. Variabel penelitian yang diamati meliputi pertumbuhan tanaman (tinggi tanaman, jumlah daun, jumlah dan bobot umbi), iklim mikro (suhu, kelembapan, kecepatan angin, intensitas cahaya matahari), dan kehilangan air. Data (iklim mikro dan kebutuhan air tanaman) dianalisis dengan persamaan Penman-Monteith dan grafik (pertumbuhan tanaman).

Hasil penelitian menunjukkan bahwa tanaman kentang aeroponik dengan penambahan lampu LED 10 Watt jarak 110 cm memberikan pertumbuhan dengan hasil lebih tinggi dibandingkan kontrol. Tanaman dengan lampu LED 10 Watt memiliki tinggi rata-rata 45,1 cm/tanaman; jumlah daun 90 helai/tanaman; jumlah umbi 12 umbi/tanaman dan bobot umbi 16,6 gram/tanaman. Tanaman kontrol memiliki tinggi rata-rata 38,4 cm/tanaman; jumlah daun 84 helai/tanaman; jumlah umbi 10 umbi/tanaman dan bobot umbi 18,6 gram/tanaman. Kebutuhan air tanaman pada penambahan lampu LED 4,56 mm/hari sedangkan tanaman kontrol adalah 3,67 mm/hari.

SUMMARY

Aeroponic systems are being developed for the production of potato seeds in the highlands because they can produce quality and continuous seeds. Water (nutrition) and the addition of light are factors that support the growth of aeroponic potato plants in the highlands. However, information on water requirements in aeroponic systems with the addition of lighting has not been widely studied, therefore this research is important to do. The research aims: 1) obtain information on water requirements, and 2) find out the growth of potato plants in the highlands with an aeroponic system.

The study was conducted from November 2018 to March 2019 located in the greenhouse of the Difa Banjarnegara Seed Company. The location is at an altitude of ± 1663 masl. Aeroponic systems used: 1) control box (without LED lights), and 2) box with 10 Watt LED lights 110 cm high. Plants in each box numbered 125 plants. The research variables observed included plant growth (plant height, number of leaves, number and weight of tubers), microclimate (temperature, humidity, wind speed, sunlight intensity), and water losses. Data (micro climate and plant water requirements) were analyzed by the Penman-Monteith equation and graphically (plant growth).

The results showed that aeroponic potato plants with the addition of 10 Watt LED lights 110 cm high gave growth with higher yields than controls. Plants with 10 Watt LED lights have an average height of 45.1 cm/plant; number of leaves of 90 strands/plants; the number of tubers 12 tubers/plant and tuber weight of 16.6 grams/plant. Control plants have an average height of 38.4 cm/plant; number of leaves 84 leaves/plant; the number of tubers is 10 tubers / plant and the tuber weight is 18.6 grams/plant. One-season plant water requirements for the addition of LED lights are 4.56 mm/day while the control plants are 3.67 mm/day.