

RINGKASAN

Di Indonesia, benih kentang pada umumnya dibudidayakan di dataran tinggi secara konvensional yang berpotensi mengakibatkan kerusakan lingkungan. Sistem fertigasi sumbu berpeluang digunakan untuk budidaya tanaman terutama pembenihan kentang yang ramah lingkungan. Namun, pembenihan kentang menggunakan sistem tersebut masih jarang diteliti dan diterapkan. Dinamika air tanah mampu melihat kemampuan tanah dalam menyimpan air, sedangkan dinamika nutrisi tanah menunjukkan ketersediaan jumlah unsur hara makro dalam tanah. Oleh karena itu, penelitian mengenai pembenihan kentang menggunakan sistem fertigasi sumbu dengan melihat dinamika air dan nutrisi tanahnya sangat diperlukan untuk mengetahui kondisi tanahnya dalam segi air tanah dan unsur haranya. Penelitian ini bertujuan untuk mengetahui dinamika air dan nutrisi tanah pada sistem fertigasi sumbu bagi pembenihan kentang dengan variasi media tanam dan dosis pupuk organik.

Metode penelitian ini meliputi waktu dan tempat penelitian, alat dan bahan, rancangan percobaan, variabel pengukuran, dan analisis data. Penelitian ini dilakukan di Desa Serang, Kecamatan Karangreja, Kabupaten Purbalingga dan Laboratorium Terpadu 1 *Integrated Academic Building* Universitas Jenderal Soedirman. Alat yang digunakan meliputi alat data *logger*, alat ukur iklim, alat ukur sifat fisik tanah, alat ukur larutan nutrisi, *soil nutrient analyzer*, dan alat bertani, sedangkan bahan yang digunakan meliputi benih kentang Granola G1, pupuk kandang ayam, pupuk NPK, media tanam organik, polibag, reservoir, ember, drem, dan kain flannel. Faktor perlakuan pada penelitian ini ada 2, yaitu jenis media tanam (*cocopeat*-tanah, sekam padi bakar-tanah, sekam padi mentah-tanah, dan tanah utuh) dan dosis pupuk organik (140 gr, 210 gr, dan 280 gr), sehingga terdapat 12 kombinasi perlakuan. Variabel pengukuran meliputi pengukuran iklim (kecepatan angin, kelembaban udara, suhu lingkungan, intensitas cahaya, dan curah hujan), dinamika air tanah (kadar air tanah volumetrik, kerapatan tanah, konduktivitas hidrolis tanah jenuh, evapotranspirasi aktual tanaman, dan $\Delta storage$), nutrisi tanah (Nitrogen dan Fosfor tanah), serta kepekatan dan pH larutan nutrisi. Terakhir, analisis data yang digunakan pada penelitian ini adalah analisis deskriptif.

Hasil penelitian menunjukkan bahwa dinamika air tanah yang meliputi kadar air tanah volumetrik, kerapatan tanah, konduktivitas hidrolis tanah jenuh, evapotranspirasi aktual, dan $\Delta storage$ rata-rata memiliki nilai tertinggi pada kombinasi perlakuan TU-PO2. Nilai tertinggi pada masing-masing parameter dinamika air tanah, yaitu $0,34 \text{ cm}^3/\text{cm}^3$ pada TU-PO2; $0,48 \text{ gr}/\text{cm}^3$ pada TU-PO2; $0,0541 \text{ cm}/\text{s}$ pada CPT-PO2; $3,09 \text{ mm}$ pada SMT-PO1; dan $93,33 \text{ mm}$ pada CPT-PO1. Pada dinamika nutrisi tanah, parameter yang meliputi adalah Nitrogen dan Fosfor tersedia tanah dan memiliki nilai tertinggi pada kombinasi perlakuan CPT-PO3. Nilai tertinggi pada masing-masing parameter dinamika nutrisi tanah, yaitu $159,68 \text{ kg}/\text{ha}$ dan $213,58 \text{ kg}/\text{ha}$. Berdasarkan hasil tersebut, kombinasi perlakuan yang paling tepat untuk pembenihan kentang pada dinamika nutrisi tanah adalah tanah utuh dosis pupuk $20 \text{ kg}/\text{ha}$, sedangkan berdasarkan dinamika nutrisi tanahnya terdapat pada *cocopeat*-tanah dosis pupuk $40 \text{ ton}/\text{ha}$.

SUMMARY

In Indonesia, potato seeds are generally cultivated in the highlands conventionally, which has the potential to cause environmental damage. The wick fertigation system has the opportunity to be used for environmentally friendly plant cultivation, especially potato seedlings. However, potato breeding using this system is still rarely researched and implemented. Soil water dynamics can see the soil's ability to store water, while soil nutrient dynamics shows the availability of macro nutrients in the soil. Therefore, research on potato breeding using a wick fertigation system by looking at the dynamics of water and soil nutrients is very necessary to determine the condition of the soil in terms of ground water and nutrients. This research aims to determine the dynamics of water and soil nutrients in the wick fertigation system for potato seedlings with variations in planting media and organic fertilizer doses.

This research method includes research time and place, tools and materials, experimental design, measurement variables, and data analysis. This research was conducted in Serang Village, Karangreja District, Purbalingga Regency and Integrated Laboratory 1 Integrated Academic Building, Jenderal Soedirman University. The tools used include data loggers, climate measuring tools, soil physical properties measuring tools, nutrient solution measuring tools, soil nutrient analyzers, and farming tools, while the materials used include Granola G1 potato seeds, chicken manure, NPK fertilizer, planting media. organic, polybag, reservoir, bucket, drem, and flannel cloth. There were 2 treatment factors in this study, namely the type of planting medium (cocopeat-soil, roasted rice husks-soil, raw rice husks-soil, and whole soil) and the dose of organic fertilizer (140 gr, 210 gr, and 280 gr), so There are 12 treatment combinations. Measurement variables include climate measurements (wind speed, air humidity, environmental temperature, light intensity, and rainfall), soil water dynamics (volumetric soil water content, soil density, saturated soil hydraulic conductivity, actual plant evapotranspiration, and Δ storage), nutrients soil (soil nitrogen and phosphorus), as well as the concentration and pH of the nutrient solution. Lastly, the data analysis used in this research is descriptive analysis.

The research results showed that soil water dynamics including volumetric soil water content, soil density, saturated soil hydraulic conductivity, actual evapotranspiration, and average Δ storage had the highest values in the TU-PO2 treatment combination. The highest value for each groundwater dynamics parameter is 0.34 cm³/cm³ for TU-PO2; 0.48 gr/cm³ in TU-PO2; 0.0541 cm/s at CPT-PO2; 3.09 mm on SMT-PO1; and 93.33 mm at CPT-PO1. In the dynamics of soil nutrition, the parameters include Nitrogen and Phosphorus available in the soil and have the highest values in the CPT-PO3 treatment combination. The highest values for each parameter of soil nutrient dynamics, namely 159.68 kg/ha and 213.58 kg/ha. Based on these results, the most appropriate treatment combination for potato seedlings in terms of soil nutrient dynamics is whole soil with a fertilizer dose of 20 kg/ha, whereas based on soil nutrient dynamics, cocopeat-soil has a fertilizer dose of 40 tons/ha.