

RINGKASAN

Di Indonesia, khususnya daerah Jawa Tengah produksi kentang masih relatif rendah. Maka dari itu, diperlukan upaya peningkatan produktivitas kentang. Desa Serang, Kecamatan Karangreja, Kabupaten Purbalingga merupakan salah satu sentra produksi hortikultura termasuk tanaman kentang. Budidaya kentang di Desa Serang umumnya masih dilakukan dengan penggunaan sistem guludan vertikal yang dapat memicu adanya degradasi lahan dan erosi yang tidak terkendalikan. Penggunaan sistem guludan horizontal dan penggunaan panjang guludan 2 meter dengan teknik drainase terbukti cukup efektif dapat mengatasi permasalahan tersebut, namun belum mampu untuk meningkatkan produktivitas tanaman kentang akibat kondisi kesuburan tanah, terutama pada sifat fisik dan kimia tanah yang dapat menurunkan produktivitas lahan dan hasil tanaman. Variasi perlakuan jenis pupuk yang sesuai diyakini dapat mengurangi kondisi kesuburan tanah, namun belum mendapat perhatian yang serius dalam mengatasinya. Penelitian ini bertujuan untuk mengetahui kajian sifat fisik tanah (kadar air tanah, kerapatan isi tanah, dan konduktivitas hidrolis tanah serta kajian nutrisi (N dan P) pada budidaya kentang sistem guludan horizontal dengan teknik drainase tertentu dan variasi perlakuan pupuk.

Penelitian ini dilaksanakan pada bulan Mei-Desember 2019, pada lahan pertanian hortikultura Desa Serang, Purbalingga, Laboratorium Teknik Pengelolaan dan Pengendalian Bio-Lingkungan (TPPBL) dan Laboratorium Ilmu Tanah/Sumber Daya Lahan Fakultas Pertanian Universitas Jenderal Soedirman Purwokerto. Penelitian ini disusun berdasarkan Rancangan Acak lengkap (RAL) yang terdiri dari 4 perlakuan, yaitu 1) pupuk subsidi dengan dosis 125 kg.ha^{-1} , 2) pupuk non subsidi dengan dosis $41,67 \text{ kg.ha}^{-1}$, 3) pupuk non subsidi dengan dosis $83,33 \text{ kg.ha}^{-1}$, 4) pupuk non subsidi dengan dosis 125 kg.ha^{-1} . Analisis data pada penelitian ini menggunakan *Analysis of Variance*, Uji Kruskal-Wallis, dan Uji *Duncan's Multiple Range Test* (DMRT) 5%. Variabel yang diukur antara lain: kadar air tanah, kerapatan isi tanah, konduktivitas hidrolis tanah, N-total dan P-total tanah pada guludan horizontal dengan teknik drainase tertentu dan variasi perlakuan pupuk.

Hasil penelitian menunjukkan bahwa kajian sifat fisik tanah (kadar air tanah, kerapatan isi tanah, dan konduktivitas hidrolis tanah) pada guludan horizontal dengan teknik drainase tertentu dan variasi perlakuan pupuk, nilai kadar air tanah, yaitu sebesar 0,370 %, sedangkan nilai kerapatan isi tanah, dan konduktivitas hidrolis tanah terdapat pada pupuk non subsidi dengan dosis 125 kg.ha^{-1} , masing-masing sebesar $0,538 \text{ g.cm}^{-3}$, dan $0,017 \text{ cm.s}^{-1}$, serta nilai N-total sebesar $3.643,19 \text{ kg.ha}^{-1}$, dengan adanya penggunaan perlakuan variasi jenis pupuk tidak berbeda nyata terhadap pengukuran N-total, sedangkan nilai P-total menunjukkan pengaruh signifikan pada pupuk non subsidi dengan dosis 125 kg.ha^{-1} yaitu sebesar $2.767,88 \text{ kg.ha}^{-1}$.

SUMMARY

In Indonesia, especially in the area of Central Java, potato production is still relatively low. Therefore, efforts are needed to increase potato productivity. Serang Village, Karangreja District, Purbalingga Regency is one of the centers of horticultural production including potato plants. Potato cultivation in Serang Village is generally still carried out with the use of a vertical mound system that can trigger land degradation and uncontrolled erosion. The use of horizontal mound system and the use of 2 m length mound with drainage techniques has proven to be quite effective in overcoming these problems, but has not been able to increase the productivity of potato plants due to soil fertility, especially in the physical and chemical properties of the soil which can reduce land productivity and crop yield. The variation of the appropriate type of fertilizer treatment is believed to reduce the condition of soil fertility, but has not received serious attention in overcoming it. This study aims to determine the study of the physical properties of the soil (soil moisture content, soil density, and soil hydraulic conductivity and nutrition (N and P) studies of potato horizontal mound cultivation with certain drainage techniques and variations in fertilizer treatment.

The research was conducted in May-December 2019, on the horticulture farm in Serang Village, Purbalingga, Laboratory of Bio-Environmental Management and Control Engineering (TPPBL) and Soil/Land Science Laboratory, Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. This study was prepared based on a Completely Randomized Design (CRD) consisting of 4 treatments, namely: 1) subsidized fertilizer with a dose of 125 kg.ha^{-1} , 2) non-subsidized fertilizer with a dose of $41,67 \text{ kg.ha}^{-1}$, 3) non-subsidized fertilizer with a dose of $83,33 \text{ kg.ha}^{-1}$, 4) non-subsidized fertilizer with a dose of 125 kg.ha^{-1} . Data analysis in this study uses Analysis of Variance, Kruskal-Wallis Test, and Duncan's Multiple Range Test (DMRT) Test 5%. The variable were measured in this research such as: volumetric water content, soil content density, soil hydraulic conductivity, N-total and P-total soil in horizontal mound system with certain drainage techniques and variations in fertilizer treatment.

The results showed that the study of the physical properties of the soil (soil water content, soil density, and hydraulic conductivity of the soil) on horizontal mounds with certain drainage techniques and variations in fertilizer treatment, the value of soil water content, amounting to 0.370%, while the value of soil density, and soil hydraulic conductivity found in non-subsidized fertilizer with a dose of 125 kg.ha^{-1} , each of 0.538 g.cm^{-3} , and 0.017 cm.s^{-1} , and a total N-value of $3,643.19 \text{ kg.ha}^{-1}$, with the use of various types of fertilizer treatments were not significantly different from the measurement of N-total, while the P-total value showed a significant effect on non-subsidized fertilizer with a dose of 125 kg.ha^{-1} which was $2,767.88 \text{ kg.ha}^{-1}$.