

**PENERAPAN MODEL *LOGISTIC* UNTUK MEMPREDIKSI LAJU
PERTUMBUHAN TANAMAN CABAI RAWIT (*Capsicum frutescens* L.)
SKALA *GREENHOUSE* MENGGUNAKAN TANAH PASIR DENGAN
AMANDEMEN BIOCHAR DAN PUPUK KANDANG**

INTISARI

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Biochar dan pupuk kandang merupakan amandemen organik pembenah tanah yang mampu meningkatkan laju pertumbuhan tanaman. Pertumbuhan tanaman dapat dimodelkan dengan model *Logistic*. Penelitian ini merupakan skala laboratorium dari pengaplikasian amandemen biochar dan pupuk kandang pada tanah pasir. Penelitian dilaksanakan di dalam sebuah *greenhouse* dengan komoditas tanaman cabai rawit. Penelitian ini bertujuan untuk mengetahui pengaruh pengaplikasian biochar dan pupuk kandang terhadap pertumbuhan tanaman cabai rawit (*Capsicum frutescens* L.) di tanah pasir serta menerapkan dan memvalidasi model *Logistic* untuk memprediksi laju pertumbuhan. Rancangan penelitian menggunakan Rancangan Blok Acak Lengkap dengan empat perlakuan yaitu P (kontrol), PB (pasir, biochar), PBK1 (pasir, biochar, pupuk kandang dengan dosis 5 ton/ha), dan PBK2 (pasir, biochar, pupuk kandang dengan dosis 10 ton/ha) sebanyak lima ulangan. Pengambilan sampel tanah dilakukan di lahan pantai Bantul - DIY. Pengamatan yang dilakukan meliputi tinggi, jumlah daun dan cabang, berat segar dan kering tanaman, dan panjang akar. Analisis laboratorium yang dilakukan meliputi tekstur tanah, berat volume, berat jenis, dan porositas, serta analisis kimia tanah awal. Setelah diperoleh data pengamatan, dilakukan uji homogenitas data, dan diperoleh nilai homogen pada tinggi dan jumlah cabang, lalu dimodelkan sehingga diperoleh nilai laju pertumbuhan dan nilai koefisien determinasi (R^2) untuk validasi model *Logistic*. Hasil penelitian menunjukkan PBK2 memberikan hasil yang paling optimal untuk pertumbuhan tinggi, jumlah daun, jumlah cabang, berat segar, berat kering, dan panjang akar tanaman cabai rawit. Hasil pemodelan tinggi memperoleh laju pertumbuhan tertinggi pada PB (0,077) dan terendah pada P (0,072); dan R^2 tertinggi pada PB (0,969) dan terendah pada PBK1 (0,943). Hasil pemodelan jumlah cabang memperoleh laju pertumbuhan tertinggi pada PB (0,026) dan terendah pada PBK2 (0,021); dan R^2 tertinggi pada PBK1 (0,879) dan terendah pada PBK2 (0,553).

Kata kunci: biochar, pupuk kandang, tanah pasir, model *Logistic*, *Capsicum frutescens* L.

**APPLICATION OF LOGISTIC MODEL TO PREDICT GROWTH RATE OF
CAYENNE PEPPER (*Capsicum frutescens* L.) UNDER GREENHOUSE SCALE
BY USING SANDY SOIL WITH THE AMANDMENT OF BIOCHAR AND
MANURE**

ABSTRACT

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Biochar and manure are organic soil amendments that can increase the rate of plant growth. Plant growth can be modeled by Logistic Model. This research was a laboratory scale of the application of biochar and manure amendments on sandy soil. The study was conducted in a greenhouse with cayenne pepper commodities. This study aimed to determine the effect of the application of biochar and manure on the growth of cayenne pepper (*Capsicum frutescens* L.) in sandy soils as well as applying and validating the Logistic Model to predict growth rates. Randomized Completely Block Design (RCBD) was used in this study with four different treatments namely P (control), PB (sand, biochar), PBK1 (sand, biochar, manure at a dose of 5 tons/ha), and PBK2 (sand, biochar, manure at a dose of 10 ton/ha) of five replications. Soil sampling was carried out in the Bantul coastal area - DIY. Plant height, number of leaves and branches, fresh and dry weight of plants, and root length were measured during experiment. Soil texture, volume weight, specific gravity, and porosity, as well as initial soil chemical analysis were analyzed in the laboratory. After observing the data, a homogeneity test was carried out, and a homogeneous value was obtained at the height and number of branches, then it was modeled so as to obtain the value of the growth rate and the coefficient of determination (R^2) for the validation of the Logistic Model. The results showed that PBK2 resulted the most optimum growth for plant height, the number of leaves, the number of branches, fresh weight, dry weight, and root length of cayenne pepper. In addition, the highest growth rate was PB (0,077) and the lowest was P (0,072); while the highest R^2 for plant height modeling was found at PB (0,969) and the lowest at PBK1 (0,943). Number of branches modeling was obtained the highest growth rate in PB (0,026) and the lowest in PBK2 (0,021); and the highest R^2 in PBK1 (0,879) and lowest in PBK2 (0,553).

Keywords: biochar, manure, sandy soil, Logistic Model, *Capsicum frutescens* L.