

RINGKASAN

Respon pertumbuhan tanaman cabai sangat dipengaruhi oleh kondisi kesehatan tanah, meliputi ketersediaan hara dan aktivitas mikroorganisme. Pada lahan rendah produksi, seperti di Desa Gandatapa, Banyumas, produktivitas panen sering menurun akibat degradasi tanah, ketidakseimbangan hara, dan tingginya penggunaan pupuk kimia. Salah satu solusi yang dapat diterapkan adalah penggunaan pupuk organik hayati C631 yang mengandung mikro-dekomposer serta unsur hara makro dan mikro.

Penelitian dilakukan menggunakan Rancangan Acak Lengkap (RAL) dengan empat perlakuan: tanpa pupuk, pupuk kimia, dan dua dosis pupuk C631 (setara 2 ton/ha dan 4 ton/ha), masing-masing dengan tiga ulangan. Variabel bebas terdiri atas pupuk organik hayati C631 dan variabel terikat terdiri atas pertumbuhan tanaman cabai dengan parameter yang diamati terdiri atas tinggi tanaman, luas daun, diameter batang, dan bobot kering, serta kandungan C organik dan N total tanah sebagai data pendukung. Pengamatan dilakukan setiap 10 hari selama 60 hari setelah tanam. Analisis data dilakukan menggunakan PERMANOVA.

Hasil penelitian menunjukkan bahwa pupuk organik hayati C631 berpengaruh nyata terhadap pertumbuhan cabai rawit dan kondisi lingkungan tanah. Pemberian dosis 4 ton/ha mampu menghasilkan pertumbuhan setara dengan pupuk kimia, sekaligus memperbaiki pH tanah, menurunkan nilai EC, meningkatkan kadar air, menjaga stabilitas C-organik, serta meningkatkan kandungan N-total. Dosis 2 ton/ha juga memberikan respon positif terhadap pertumbuhan, meskipun tidak seoptimal dosis 4 ton/ha. Secara keseluruhan, pupuk organik hayati C631 terbukti mampu meningkatkan pertumbuhan cabai pada tanah rendah produksi melalui perbaikan tinggi tanaman, diameter batang, luas daun, dan bobot kering, dengan dosis terbaik yaitu 4 ton/ha.

Kata kunci: *cabai rawit, lahan rendah produksi, pupuk organik hayati, pertumbuhan tanaman, sifat kimia tanah.*

SUMMARY

The growth response of chili plants is greatly influenced by soil health conditions, including nutrient availability and microorganism activity. In low-yielding areas, such as Gandatapa Village, Banyumas, chili productivity often declines due to soil degradation, nutrient imbalance, and high use of chemical fertilizers. One solution that can be applied is the use of C631 bio-organic fertilizer, which contains micro-decomposers as well as macro and micro nutrients.

The study was conducted using a completely randomized design (CRD) with four treatments: no fertilizer, chemical fertilizer, and two doses of C631 fertilizer (equivalent to 2 tons/ha and 4 tons/ha), each with three replicates. The independent variable consisted of C631 bio-organic fertilizer and the dependent variable consisted of chili plant growth with observed parameters consisting of plant height, leaf area, stem diameter, and dry weight, as well as organic C and total N content of the soil as supporting data. Observations were made every 10 days for 60 days after planting. Data analysis was performed using PERMANOVA.

The results showed that C631 bio-organic fertilizer had a significant effect on chili growth and soil conditions. The 4 tons/ha dose produced growth equivalent to chemical fertilizer, while also improving soil pH, lowering EC values, increasing water content, maintaining organic C stability, and increasing total N content. A dose of 2 tons/ha also produced a positive response on growth, although not as optimal as the 4 tons/ha dose. Overall, the C631 bio-organic fertilizer was proven to enhance chili growth in low-yielding soils by improving plant height, stem diameter, leaf area, and dry weight, with the optimal dose being 4 tons/ha.

Keywords: *organic bio-fertilizer, chili peppers, soil chemical properties, plant growth, low-yield land.*