

Intisari

Penelitian ini bertujuan untuk mengetahui perlakuan terbaik untuk perbaikan sifat fisika tanah dan produktivitas tanaman jagung dari kombinasi biochar sekam padi, kompos bubur sampah, dan pupuk kimia serta mengetahui faktor yang mempengaruhinya. Penelitian ini telah dilaksanakan pada bulan November 2024 – Mei 2025 di Rawalo Banyumas dan Laboratorium Departemen Tanah Fakultas Pertanian UGM. Penelitian ini dilakukan menggunakan metode RAKL faktor tunggal 8 perlakuan (K0-K7) dan 3 ulangan berdasarkan tata letak percobaan yang telah dibuat. Analisis data dilakukan dengan Anova dan uji lanjut Duncan pada taraf 5%. Analisis parameter yaitu sifat fisika tanah dan produktivitas tanaman jagung serta sifat kimia tanah untuk menunjang hasil penelitian. Hasil penelitian menunjukkan bahwa perlakuan memberikan pengaruh berbeda nyata pada pengujian berat volume, stabilitas agregat, kadar lengas, pori drainase cepat, pori drainase lambat, air drainase, air tersedia, permeabilitas, pH H₂O, C-organik, bahan organik, tinggi tanaman, diameter batang, berat tongkol, jumlah biji, dan selisih berat segar dengan berat kering akar dan tajuk. Perlakuan kombinasi biochar sekam padi, kompos bubur sampah, dan pupuk kimia (K7) menjadi perlakuan terbaik dengan berpengaruh nyata meningkatkan stabilitas agregat, kadar lengas, pori drainase cepat, permeabilitas, tinggi tanaman, diameter batang, berat tongkol, diameter tongkol, selisih berat segar dengan berat kering akar, dan keliling tongkol serta menurunkan berat volume tanah.

Kata Kunci: Biochar, kompos, sifat fisika tanah, jagung.

Abstract

This study aims to determine the most effective treatment for improving soil physical properties and maize productivity using combinations of rice-husk biochar, household-waste compost, and inorganic fertilizer, and to determine the factors influencing those improvements. The experiment was conducted from November 2024 to May 2025 in Rawalo, Banyumas, and at the Soil Science Laboratory, Faculty of Agriculture, UGM, employing a single-factor Randomized Complete Block Design with eight treatments (K0–K7) and three replications. Data were analyzed using ANOVA followed by Duncan’s Multiple Range Test (5%). Measured parameters covered soil physical properties and maize productivity, with soil chemical properties assessed as supporting indicators. The treatments produced significant effects on bulk density, aggregate stability, soil moisture (water content/retention), rapid-drainage pores, slow-drainage pores, drainable water, available water, permeability, soil pH (H₂O), soil organic carbon, soil organic matter, plant height, stem diameter, ear weight, grain number, and the fresh–dry weight differences of roots and shoots. The combined treatment of biochar + compost + inorganic fertilizer (K7) was the best performer, significantly increasing aggregate stability, soil moisture/retention, rapid-drainage pores, permeability, plant height, stem diameter, ear weight, ear diameter and circumference, and fresh–dry weight differences of shoots and roots, while reducing soil bulk density.

Keywords: Biochar, compost, soil physical properties, maize.