

ABSTRAK

PENGARUH RESIDU SETELAH 4 MUSIM TANAM APLIKASI BIOCHAR DAN KOTORAN AYAM TERHADAP PERMEABILITAS TANAH DI LAHAN KERING PADA PERTANAMAN JAGUNG MANIS (*Zea mays saccharata* Sturt.)

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Penurunan produktivitas jagung manis di Indonesia salah satunya disebabkan oleh penurunan kualitas tanah. Lahan kering menjadi alternatif yang berpotensi untuk dimanfaatkan, meskipun memiliki banyak kendala seperti rendahnya bahan organik, porositas, dan kapasitas tukar kation. Pemberian bahan organik seperti biochar dan kotoran ayam diketahui mampu memperbaiki sifat fisik tanah, khususnya permeabilitas. Penelitian ini bertujuan untuk menganalisis pengaruh residu setelah empat musim tanam aplikasi biochar dan kotoran ayam terhadap permeabilitas tanah dan produksi jagung manis di lahan kering serta variabel pendukung bulk density, porositas tanah, dan C-organik tanah. Metode penelitian ini menggunakan Rancangan Acak Kelompok (RAK) dengan 4 kelompok dan 4 perlakuan yaitu, B₀ : Kontrol, B₁ : Residu setelah 4 musim tanam aplikasi biochar, B₂ : Residu setelah 4 musim tanam aplikasi kotoran ayam, B₃ : Residu setelah 4 musim tanam aplikasi biochar + kotoran ayam. Analisis permeabilitas di laboratorium menggunakan metode *constant head*. Data yang diperoleh diuji homogenitas ragamnya dengan uji Bartlett dan aditivitasnya dengan uji Tukey. Apabila asumsi terpenuhi rata-rata nilai tengah diuji dengan Uji Beda Nyata Terkecil (BNT) pada taraf 5%. Hasil penelitian menunjukkan bahwa: (1) Residu setelah 4 musim tanam aplikasi biochar (B₁), kotoran ayam (B₂), dan kombinasi keduanya (B₃) mampu meningkatkan nilai permeabilitas tanah dibandingkan perlakuan kontrol (B₀). (2) Residu aplikasi biochar (B₁) dan residu kombinasi antara biochar dan kotoran ayam (B₃) mampu meningkatkan panjang tongkol jagung manis dibandingkan B₀ (kontrol) dan B₂ (residu aplikasi kotoran ayam).

Kata kunci : Biochar, jagung manis, kotoran ayam, lahan kering, permeabilitas tanah.

ABSTRACT

THE EFFECT OF RESIDUE APPLICATION OF BIOCHAR AND CHICKEN MANURE AFTER FOUR GROWING SEASONS ON SOIL PERMEABILITY IN DRY LAND FOR SWEET CORN (*Zea mays saccharata* Sturt.)

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The decline in sweet corn productivity in Indonesia is partly caused by decreasing soil quality. Upland presents a potential alternative for cultivation, although it faces several limitations, such as low organic matter content, porosity, and cation exchange capacity. The application of organic materials like biochar and chicken manure has been shown to improve soil physical properties, particularly soil permeability. This study aimed to analyze the residual effects after four planting seasons of biochar and chicken manure application on soil permeability and sweet corn production in upland, as well as supporting variables including bulk density, soil porosity, and soil organic carbon. This research method used a Randomized Block Design (RBD) with 4 groups and 4 treatments, B_0 = control, B_1 = residue of biochar application, B_2 = residue of chicken manure application, and B_3 = residue of combined biochar and chicken manure application. Soil permeability was analyzed in the laboratory using the constant head method. The data obtained were tested for homogeneity of variance using the Bartlett test and for additivity using the Tukey test. If the assumptions are met, the average mean value is tested using the Least Significant Difference Test (LSD) at the 5% level. The results showed that: (1) Residue applications of biochar (B_1), chicken manure (B_2), and their combination (B_3) increased soil permeability compared to the control (B_0), and (2) Biochar residue (B_1) and the combination of biochar and chicken manure (B_3) significantly increased the length of sweet corn cob compared to B_0 and B_2 .

Keywords : Biochar, sweet corn, chicken manure, upland, soil permeability.