

INTISARI

Perubahan sifat fisik Vertisol yang mengembang dan mengerut dapat menjadi permasalahan dalam aktivitas pertanian terutama dalam pengelolaan tanah dan ketersediaan air, sehingga perlu adanya bahan pembenah tanah seperti bahan organik. Bahan organik yang diaplikasikan ke tanah dapat berupa *biochar* dan pupuk kandang. Penelitian ini bertujuan untuk mengetahui pengaruh dari *biochar* sekam padi dan pupuk kandang sapi terhadap sifat fisik Vertisol dan hubungan sifat fisik tanah dengan sifat kembang kerut tanah. Percobaan disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) faktorial 4×4 dengan 3 ulangan percobaan. Faktor pertama yaitu penambahan *biochar* sekam padi (A) dengan 4 aras perlakuan yaitu 0% *biochar* sekam padi (A_0), 10% *biochar* sekam padi (A_1), 20% *biochar* sekam padi (A_2), dan 30% *biochar* sekam padi (A_3). Faktor kedua merupakan penambahan pupuk kandang sapi (B) dengan 4 aras perlakuan yaitu 0% pupuk kandang (B_0), 5% pupuk kandang (B_1), 10% pupuk kandang (B_2), dan 15% pupuk kandang (B_3). Persen penambahan *biochar* sekam padi dan pupuk kandang sapi merupakan persen dari berat tanah yaitu 5 kg. Hasil yang diperoleh dengan perlakuan *biochar* sekam padi dan pupuk kandang sapi berpengaruh meningkatkan sebaran pori tanah, stabilitas agregat, dan C-organik tanah. Kombinasi keduanya berpengaruh pada peningkatan porositas, persentase agregat < 2 mm, permeabilitas tanah, serta menurunkan bobot volume. Pada analisis regresi *stepwise backward* diperoleh hasil bobot volume berpengaruh paling kuat terhadap *COLE* dengan pengaruh 80,59%.

Kata kunci : Vertisol, *biochar* sekam padi, pupuk kandang sapi, *COLE*

ABSTRACT

The shrinking and swelling properties of Vertisols is a problem in agricultural activities, especially in the soil management and water availability, therefore it is necessary to improve the soil quality by added organic material. The organic materials were used in the form of *biochar* and manure. This research aim was to determine the effect of rice husk *biochar* and cow manure on the physical properties of Vertisols and the relationship between soil physical properties and swelling shrinkage properties. The experiments were arranged in a 4 x 4 factorial of Randomized Complete Block Design (RCBD) with three experimental replications. The first factor were the addition of rice husk *biochar* (A) with four levels of treatment, such as 0% weight of rice husk *biochar* (A₀), 10% weight of rice husk *biochar* (A₁), 20% weight of rice husk *biochar* (A₂), and 30% weight of rice husk *biochar* (A₃). The second factor were the addition of cow manure (B) with four treatment methods, such as 0% weight of manure (B₀), 5% weight of manure (B₁), 10% weight of manure (B₂), and 15% weight of manure (B₃). The percentage of addition of rice husk *biochar* and cow manure were determined from the percentage of the soil weight 5 kg. The result showed, rice husk *biochar* and cow manure affected improvement of soil pore distribution, aggregate stability, and soil organic carbon (SOC). In this research, the addition of a combination between rice husk *biochar* and cow manure were proven to increase soil porosity, percentage of < 2 mm aggregate, and soil permeability, and reduced soil bulk density. Stepwise backward analysis regression shows that bulk density have the strongest influence on the *COLE* 80,59%.

Keywords : Vertisols, rice husk *biochar*, cow manure, *COLE*