

ABSTRACT

Ultisol soils are characterized by unfavorable physical properties, including weak soil structure, low organic matter content, high bulk density, slow permeability, and low water-holding capacity. Given the importance of soil physical characteristics, efforts to improve them are essential, one of which is through the application of organic amendments such as chicken manure compost and coconut shell biochar. This study aimed to evaluate the effects of different compositions of chicken manure compost and coconut shell biochar on selected physical properties of Ultisol and peanut (*Arachis hypogaea*) yield. The experiment was conducted in Simpang Sungai Duren Village, Jambi Luar Kota District, Jambi Province. A Randomized Block Design (RBD) was employed with six treatments and four replications, resulting in 24 experimental plots. Each plot measured 2 m × 3 m, with a planting spacing of 20 cm × 40 cm. The treatments were as follows: (K0) control (no amendment), (K1) 0 tons/ha chicken manure compost + 10 tons/ha coconut shell biochar, (K2) 5 tons/ha chicken manure compost + 10 tons/ha coconut shell biochar, (K3) 10 tons/ha chicken manure compost + 0 tons/ha coconut shell biochar, (K4) 10 tons/ha chicken manure compost + 5 tons/ha coconut shell biochar, and (K5) 10 tons/ha chicken manure compost + 10 tons/ha coconut shell biochar. The observed soil parameters included organic matter content, bulk density, total porosity, permeability, and moisture content, while the plant parameters included plant height and peanut yield. The results indicated that treatment K5 showed the greatest improvement in soil organic matter, reduction in bulk density, and increases in total porosity, permeability, and moisture content. However, the best-performing treatment was not necessarily the most optimal for improving Ultisol physical properties. Treatment K4 was identified as the optimal combination for enhancing Ultisol physical characteristics. Furthermore, treatment K5 produced the highest peanut yield of 3,54 tons/ha compared to the control (K0).

Keywords: Chicken Manure Compost, Coconut Shell Biochar, Soil Physical Properties, Ultisol, Peanut.

ABSTRAK

Ultisol memiliki kendala terkait sifat fisik tanah yang kurang baik, diantaranya yaitu struktur tanah yang kurang mantap, bahan organik rendah, kepadatan tinggi, permeabilitas lambat dan daya pegang air rendah. Mengingat pentingnya sifat fisika tanah, maka perlu adanya upaya dalam memperbaikinya dengan cara pemberian bahan organik berupa kompos kotoran ayam dan *biochar* tempurung kelapa. Penelitian ini bertujuan untuk meneliti pengaruh komposisi kompos kotoran ayam dengan *biochar* tempurung kelapa terhadap beberapa sifat fisik Ultisol dan hasil kacang tanah (*Arachis hypogaea*). Penelitian ini dilaksanakan di Desa Simpang Sungai Duren, Kecamatan Jambi Luar Kota, Provinsi Jambi. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) dengan 6 perlakuan dan 4 ulangan, sehingga terdapat 24 petak percobaan. Ukuran petak percobaan yaitu 2 m × 3 m dengan jarak tanam 20 cm x 40 cm. Komposisi pada penelitian ini yaitu (K0) kontrol/tanpa perlakuan, (K1) kompos kotoran ayam 0 ton/ha dan *biochar* tempurung kelapa 10 ton/ha, (K2) kompos kotoran ayam 5 ton/ha dan *biochar* tempurung kelapa 10 ton/ha, (K3) kompos kotoran ayam 10 ton/ha dan *biochar* tempurung kelapa 0 ton/ha, (K4) kompos kotoran ayam 10 ton/ha dan *biochar*

tempurung kelapa 5 ton/ha, (K5) kompos kotoran ayam 10 ton/ha dan *biochar* tempurung kelapa 10 ton/ha. Parameter tanah yang diamati yaitu bahan organik, berat volume, total ruang pori, permeabilitas dan kadar air, sedangkan parameter tanaman yang diamati yaitu tinggi tanaman dan hasil kacang tanah. Hasil penelitian menunjukkan bahwa komposisi K5 merupakan komposisi terbaik dalam meningkatkan bahan organik tanah, menurunkan berat volume tanah, meningkatkan total ruang pori, meningkatkan permeabilitas dan kadar air, namun komposisi terbaik belum tentu merupakan komposisi optimal dalam memperbaiki sifat fisik Ultisol. Komposisi K4 merupakan komposisi optimal dalam memperbaiki sifat fisik Ultisol. Komposisi K5 merupakan komposisi terbaik dalam meningkatkan hasil kacang tanah sebesar 3,54 ton/ha dibandingkan K0 (tanpa perlakuan).

Kata Kunci : Kompos Kotoran Ayam, *Biochar* Tempurung Kelapa, Sifat Fisik, Ultisol, Kacang Tanah.