

ABSTRACT

Ultisol is one of the soil orders that is quite widespread in Indonesia, however Ultisol has constraints on soil physical properties in the form of low organic matter, low aggregate stability which causes the soil to compact, low porosity, slow permeability, and low water holding capacity. The attempt that can be done is by adding organic matter in the form of sawdust biochar and cow dung fertilizer. The purpose of this study was to analyze the effect of giving a mixture of sawdust biochar and cow dung fertilizer on the physical properties of Ultisol and the yield of mung bean plants. This research was conducted at the Teaching and Research Farm and the Soil Science Laboratory of the Faculty of Agriculture, Jambi University for 3 months, from January 2025 to April 2025. This study used a Randomized Complete Block Design with 7 treatments and 4 replications. So there are 28 experimental plots. The treatments are p0: Sawdust biochar 0 tons ha⁻¹ + cow dung fertilizer 0 ton ha⁻¹; p1: Sawdust biochar 5 tons ha⁻¹ + cow dung fertilizer 0 tons ha⁻¹; p2 : Sawdust biochar 5 ton ha⁻¹ + cow dung fertilizer 5 ton ha⁻¹; p3 : Sawdust biochar 5 ton ha⁻¹ + cow dung fertilizer 10 ton ha⁻¹; p4 : Sawdust biochar 10 tons ha⁻¹ + 0 ton ha⁻¹ cow dung fertilizer; p5: Sawdust biochar 10 tons ha⁻¹ + cow dung fertilizer 5 tons ha⁻¹; p6 : Sawdust biochar 10 ton ha⁻¹ + cow dung fertilizer 10 ton ha⁻¹. The observed variables were soil organic matter, bulk density, total pore space, moisture content, percent of aggregates formed, aggregate stability, plant height and crop yield. Data were analyzed by analysis of variance (ANOVA) and continued with DMRT test. The results showed that the application of sawdust biochar and cow dung fertilizer influenced soil moisture content, aggregate stability, and mung bean yield.

Keywords: Sawdust Biochar, Cow Dung, Physical Properties of Soil, Mung Bean

ABSTRAK

Ultisol merupakan salah satu jenis ordo tanah yang cukup tersebar luas di Indonesia, namun Ultisol memiliki kendala pada sifat fisika tanah berupa bahan organik rendah, kemantapan agregat rendah yang menyebabkan tanah memadat, rendahnya total ruang pori, permeabilitas lambat, dan daya pegang air rendah. Upaya yang dapat dilakukan adalah dengan menambahkan bahan organik berupa biochar serbuk gergaji dan pupuk kotoran sapi. Tujuan penelitian ini untuk menganalisis pengaruh pemberian campuran biochar serbuk gergaji dan pupuk kotoran sapi terhadap sifat fisika Ultisol dan hasil tanaman kacang hijau. Penelitian ini dilaksanakan di *Teaching and Research Farm* dan Laboratorium Ilmu Tanah Fakultas Pertanian Universitas Jambi selama 3 bulan, pada bulan Januari sampai bulan April 2025. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) dengan 7 perlakuan dan 4 ulangan. Sehingga terdapat 28 petak percobaan. Adapun perlakuannya yaitu p₀ : Biochar serbuk gergaji 0 ton ha⁻¹ + pupuk kotoran sapi 0 ton ha⁻¹; p₁ : Biochar serbuk gergaji 5 ton ha⁻¹ + pupuk kotoran sapi 0 ton ha⁻¹; p₂ : Biochar serbuk gergaji 5 ton ha⁻¹ + pupuk kotoran sapi 5 ton ha⁻¹; p₃ : Biochar serbuk gergaji 5 ton ha⁻¹ + pupuk kotoran sapi 10 ton ha⁻¹; p₄ : Biochar serbuk

gergaji 10 ton ha⁻¹ + pupuk kotoran sapi 0 ton ha⁻¹; p₅ : Biochar serbuk gergaji 10 ton ha⁻¹ + pupuk kotoran sapi 5 ton ha⁻¹; p₆ : Biochar serbuk gergaji 10 ton ha⁻¹ + pupuk kotoran sapi 10 ton ha⁻¹. Variabel yang diamati adalah bahan organik tanah, berat volume, total ruang pori, kadar air, persen agregat terbentuk, kemantapan agregat, tinggi tanaman dan hasil tanaman. Data dianalisis analisis ragam (ANOVA) dan dilanjutkan dengan uji DMRT. Hasil penelitian menunjukkan bahwa pemberian biochar serbuk gergaji dan pupuk kotoran sapi memberikan pengaruh terhadap kadar air tanah, kemantapan agregat, dan hasil kacang hijau.

Kata kunci: Biochar Serbuk Gergaji, Pupuk Kotoran Sapi, Sifat Fisika Tanah, Kacang Hijau