

**PENGARUH BIOCHAR TANDAN KOSONG KELAPA SAWIT
(TKKS) TERHADAP KANDUNGAN BAHAN ORGANIK DAN
BEBERAPA SIFAT FISIKA TANAH PADA LAPISAN SUB SOIL
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The Effect of Oil Palm Empty Fruit Bunches (OPEFB) Biochar on The Organic Matter Content and Some Soil Physical Properties of Ultisol Sub Soil

ABSTRACT

A research on improvement of land productivity was conducted addition of soil ameliorants into the sub soil layer. One type of soil ameliorants is biochar derived from oil palm empty fruit bunches (OPEFB). The aim of the study was to determine the effect of OPEFB biochar application on the organic matter content and some soil physical properties of Ultisol sub soil. This research was conducted at the Greenhouse at the Faculty of Agriculture, the Laboratory of the Soil Department and the Laboratory of the Bogor Soil Research Institute. This research consisted of 6 treatments (A= 0 ton/Ha , B= 5 ton/Ha , C= 10 ton/Ha , D= 15 ton/Ha , E= 20 ton/Ha , F= 25 ton/Ha) with 3 replicates. The experimental units were allocated in glasshouse based on Completely Randomized Design (CRD). Parameters analyzed were soil organic matter, bulk density (BD), total soil pore (TSP) and soil pF. The data resulted was analyzed, tabulated, and compared using the table criteria of soil physical properties. The results showed that the organic matter content increased by 0.16% by increasing the biochar dose, although they were still at the same criteria. The bulk density (BD) value decreased by 0.04 g cm⁻³ (moderate criteria). The value of total soil pore (TSP) increased up to 3.41% (moderate criteria). Rapid Drainage Pore (RDP) with varying values of 18.4%, respectively; 21.27%; 16.24% ; 19.27 % ; 20.1% ; and 15.75% (high criteria). Slow drainage pore (SDP) increased successively 3, 27 % ; 5.75% ; 6.59% ; 4.63% ; 5.28%; 5.96 % (very low to low criteria). The value of plant available water (PAW) content varied successively 15.74%; 12.58 % ; 13.71% ; 13.55 % ; 12.15%; and 14.24% (high to low criteria) by the Soil Research Institute.

Keywords: Sub Soil, OPEFB, Ultisol, Biochar, Soil physical characteristics, groundwater characteristics.

Pengaruh Biochar Tandan Kosong Kelapa Sawit (TKKS) terhadap Kandungan Bahan Organik dan Beberapa Sifat Fisika Tanah pada Lapisan Sub Soil Ultisol

ABSTRAK

Penelitian ini mengenai upaya memperbaiki dan meningkatkan produktivitas lahan melalui perbaikan lapisan sub soil dengan penambahan bahan pembenah tanah. Salah satu pembenah tanah yaitu *biochar* tandan kosong kelapa sawit (TKKS). Tujuan penelitian adalah mengkaji pengaruh pemberian *biochar* TKKS terhadap kandungan bahan organik dan beberapa sifat fisika tanah pada lapisan *sub soil* Ultisol. Penelitian ini dilakukan di Rumah Kaca Fakultas Pertanian, Laboratorium Jurusan Tanah dan Laboratorium Balai Penelitian Tanah Bogor. Pelaksanaan penelitian ini dengan metode Rancangan Acak Lengkap (RAL) dengan 6 perlakuan takaran *biochar* yang berbeda (A= 0 ton/Ha , B= 5 ton/Ha , C= 10 ton/Ha , D= 15 ton/Ha , E= 20 ton/Ha , F= 25 ton/Ha) dan 3 ulangan sehingga terdapat 18 satuan percobaan. Parameter yang diamati adalah bahan organik tanah, berat volume (BV), total ruang pori (TRP) dan karakteristik air tanah. Hasil penelitian menunjukkan kandungan bahan organik meningkat sebesar 0,16 % seiring dengan bertambahnya dosis *biochar*, meskipun masih dengan kriteria yang sama yaitu sangat rendah. Nilai berat volume (BV) menurun hingga $0,04 \text{ g cm}^{-3}$ dengan kriteria sedang. Nilai total ruang pori (TRP) mengalami peningkatan hingga 3,41 % volume dengan kriteria sedang. Pori drainase cepat (PDC) dengan nilai bervariasi berturut-turut 18,4 % ; 21,27 % ; 16,24 % ; 19,27 % ; 20,1 % ; dan 15,75 % volume dengan kriteria tinggi. Pori drainase lambat (PDL) mengalami peningkatan secara berturut-turut 3,27 % ; 5,75% ; 6,59% ; 4,63% ; 5,28% ; 5,96 % volume dengan kriteria sangat rendah sampai rendah. Serta nilai kadar air tersedia yang bervariasi secara berturut-turut 15,74 % ; 12,58 % ; 13,71 % ; 13,55 % ; 12,15 % ; dan 14,24 % volume dengan kriteria tinggi hingga rendah.

Kata kunci: Sub soil, TKKS, Ultisol, Biochar, Sifat fisika tanah, karakteristik air tanah