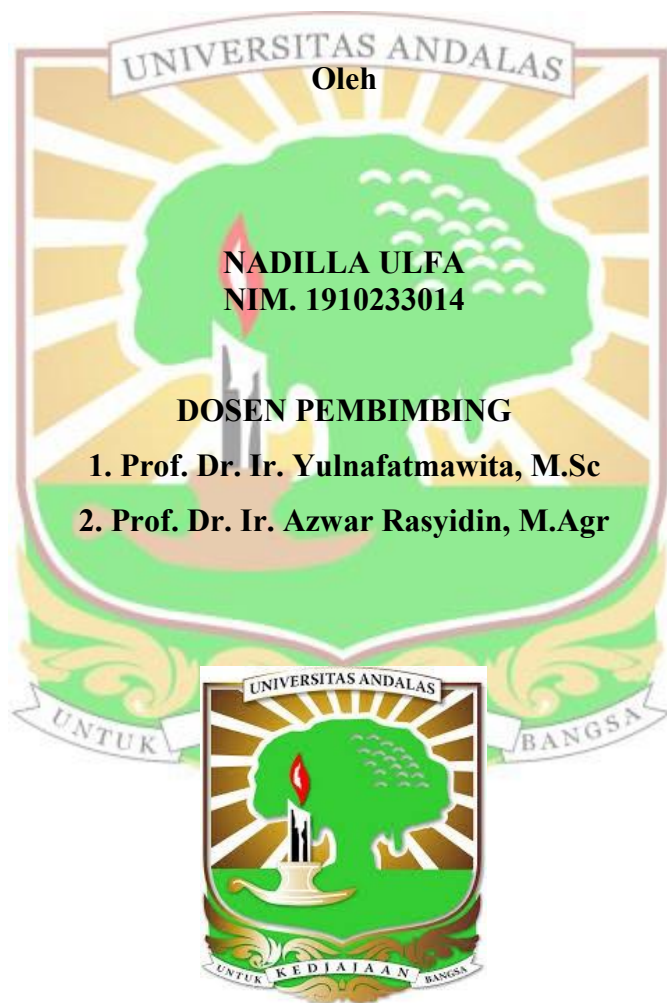


**KAJIAN SIFAT FISIKA TANAH DAN EMISI GAS
KARBONDIOKSIDA (CO₂) PADA BEBERAPA UMUR
TANAMAN KELAPA SAWIT (*Elaeis guineensis* jacq.) RAKYAT
DI NAGARI LADANG PANJANG KECAMATAN TIGO
NAGARI KABUPATEN PASAMAN**

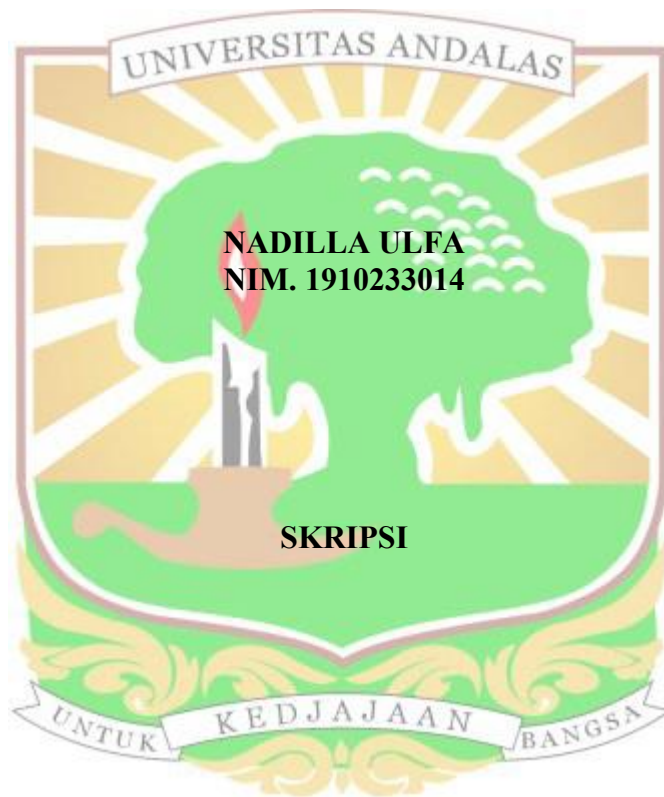
SKRIPSI



**FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2023**

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Oleh



**Sebagai salah satu syarat untuk memperoleh gelar
Sarjana Pertanian**

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**KAJIAN SIFAT FISIKA TANAH DAN EMISI GAS
KARBONDIOKSIDA (CO₂) PADA BEBERAPA UMUR TANAMAN
KELAPA SAWIT (*Elaeis guineensis jacq.*) RAKYAT DI NAGARI
LADANG PANJANG KECAMATAN TIGO NAGARI
KABUPATEN PASAMAN**

ABSTRAK

Kondisi fisika suatu lahan merupakan faktor penting dalam budidaya tanaman. Peningkatan umur tanaman dapat mempengaruhi sifat fisika tanah dan emisi gas karbondioksida akibat perbedaan luasan tajuk dan volume akar tanaman. Penelitian ini bertujuan untuk mengkaji sifat fisika tanah dan emisi gas CO₂ yang dilepaskan oleh tanah di kebun kelapa sawit rakyat pada umur tanaman yang berbeda. Penelitian ini telah dilaksanakan pada bulan Desember 2022 – Mei 2023 di Nagari Ladang Panjang, Kecamatan Tigo Nagari, Kabupaten Pasaman dan di Laboratorium Departemen Ilmu Tanah dan Sumberdaya Lahan, Fakultas Pertanian, Universitas Andalas. Penelitian ini menggunakan metoda survey, dimana sampel tanah diambil berdasarkan kelompok umur tanaman (5, 10, 15, 20, dan 25 tahun) kelapa sawit. Parameter yang dianalisis yaitu tekstur tanah, BV, TRP, permeabilitas, stabilitas agregat tanah, bahan organik, dan emisi CO₂ dari tanah. Hasil penelitian menunjukkan bahwa tekstur tanah di wilayah penelitian didominasi oleh liat. Kandungan bahan organik meningkat dari sangat rendah hingga sedang, stabilitas agregat dari tidak mantap hingga mantap, permeabilitas dari agak rendah hingga agak cepat dengan bertambahnya umur tanaman. Sedangkan nilai BV dan TRP tergolong sedang untuk semua umur tanaman. Emisi gas CO₂ berkorelasi positif dengan bahan organik tanah ($r = 0,657$), % liat ($r = 0.657$), dan stabilitas agregat ($r = 0.561$), serta berkorelasi negatif dengan % pasir ($r = -0,721$). Dapat disimpulkan bahwa peningkatan umur tanaman kelapa sawit dapat memperbaiki sifat fisika tanah dan mengurangi emisi CO₂.

Kata Kunci : *Emisi Gas CO₂, Kelapa Sawit, Nagari Ladang Panjang, Sifat Fisika Tanah, Umur Tanaman,*

STUDY ON SOIL PHYSICAL PROPERTIES AND CARBONDIOXIDE (CO₂) EMISSIONS AT SOME AGES OF OIL PALM (*Elaeis guineensis jacq.*) PLANTATION OF LOCAL SOCIETY IN NAGARI LADANG PANJANG, PASAMAN REGENCY

ABSTRACT

The physical condition of a land is an important factor for cultivating crops. Increasing plant age can affect soil physical properties and carbon dioxide gas emissions due to differences in canopy area and plant root volume. This research was aimed to examine the physical properties of the soil and CO₂ gas emissions released by the soil in smallholder oil palm plantations at different plant ages. This research was carried out in December 2022 – May 2023 in Nagari Ladang Panjang, Tigo Nagari District, Pasaman Regency and at the Laboratory of the Department of Soil Science and Land Resources, Faculty of Agriculture, Andalas University. This research employed a survey method, then soil samples were taken by using purposive sampling based on the age groups (5, 10, 15, 20 and 25 years) of oil palm plants. The parameters analyzed were soil texture, BD, TSP, permeability, soil aggregate stability, organic matter, and CO₂ emissions from the soil. The results showed that the soil texture in the research area was dominated by clay. The soil organic matter content increased from very low to moderate, aggregate stability from not stable to stable, permeability from quite low to quite fast by increasing plant age. Meanwhile, the soil BD and TRP values were moderate for all plant ages. The value of CO₂ gas emissions were positively correlated with soil organic matter ($r = 0.657$), % clay ($r = 0.657$), and aggregate stability ($r = 0.561$), and negatively correlated with % sand ($r = -0.721$). It could be concluded that increasing the age of oil palm plants could improve soil physical properties and reduce CO₂ emissions.

Keywords: *CO₂ Gas Emission, Nagari Ladang Panjang, Oil Palm, Plant Age, Soil Physical Properties,*