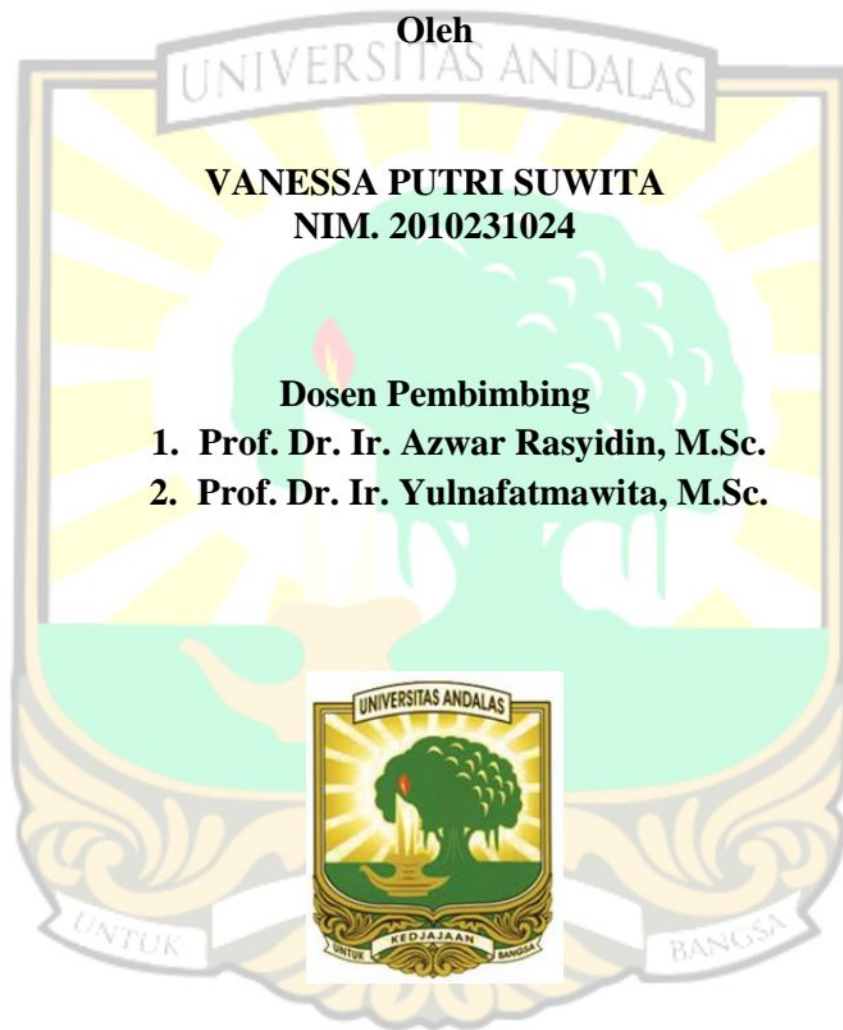


**PENGARUH PEMBERIAN PUPUK ORGANIK TERHADAP
EMISI KARBONDIOKSIDA (CO₂) PADA ULTISOL YANG
DITANAMI JAGUNG MANIS (*Zea mays saccharata* L.)**

SKRIPSI



**FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2024**

PENGARUH PEMBERIAN PUPUK ORGANIK TERHADAP EMISI KARBONDIOKSIDA (CO₂) PADA ULTISOL YANG DITANAMI JAGUNG MANIS (*Zea mays saccharata* L.)

Abstrak

Emisi karbondioksida (CO₂) merupakan penyebab utama gas rumah kaca yang dapat mengakibatkan pemanasan global. Salah satu aktivitas yang mengakibatkan emisi CO₂ adalah aktivitas pertanian berupa pemberian pupuk organik. Penelitian ini bertujuan untuk mengukur besarnya emisi CO₂ dari aplikasi beberapa dosis pupuk organik dari kompos kotoran sapi (KKS) pada Ultisol yang ditanami jagung manis (*Zea mays saccharata* L.). Penelitian ini telah dilaksanakan pada bulan Januari hingga Juni 2024 di Komplek Cimpago Permai Kapalo Koto, Kecamatan Pauh, Kota Padang dan di Laboratorium Departemen Ilmu Tanah dan Sumberdaya Lahan, Fakultas Pertanian, Universitas Andalas. Penelitian ini dilakukan dengan menggunakan metode Rancangan Acak Kelompok (RAK) yang terdiri dari 5 perlakuan dan 3 kelompok. Perlakuan yang diberikan adalah kompos kotoran sapi (KKS) dengan 5 dosis yaitu kontrol (0 ton/ha), 5 ton/ha, 10 ton/ha, 15 ton/ha dan 20 ton/ha. Parameter yang dianalisis yaitu BV, TRP, pH H₂O, pH KCl, C-organik tanah, pengukuran emisi CO₂, tinggi tanaman, dan berat basah tongkol jagung manis. Hasil penelitian menunjukkan bahwa perlakuan 15 ton/ha KKS memberikan hasil yang optimal pada pengamatan tanah dan tanaman, dengan BV 0,89 g/cm³; TRP 65,93%; pH H₂O 5,48; pH KCl 5,42; C-organik setelah inkubasi KKS 0,94%; C-organik setelah panen 1,69%; tinggi tanaman 256,57 cm; dan bobot basah tongkol jagung manis 375,43 g/tanaman. Disamping itu, nilai emisi CO₂ pada perlakuan 15 ton/ha KKS (278,96 ton CO₂/ha/tahun) lebih rendah dibandingkan perlakuan 20 ton KKS/ha dengan produksi yang sama. Berdasarkan hal ini dapat disimpulkan bahwa pemberian kompos kotoran sapi (KKS) mengakibatkan peningkatan emisi CO₂, namun mampu memperbaiki kesuburan Ultisol.

Kata Kunci: Emisi CO₂, Jagung Manis, Kompos Kotoran Sapi (KKS), Ultisol.

EFFECT OF ORGANIC FERTILIZER APPLICATION ON CARBON DIOXIDE (CO₂) EMISSION AT ULTISOL PLANTED WITH SWEET CORN (*Zea mays saccharata* L.)

Abstract

Carbon dioxide (CO₂) is the main source of greenhouse gases that can lead to global warming. One of the activities that results in CO₂ emission is agricultural activity one to organic fertilizer application. This study was aimed measure the amount of CO₂ emission after application of several doses of organic fertilizer derived form of cow manure compost (CMC) on Ultisol planted with sweet corn (*Zea mays saccharata* L.). This research was conducted from January to June 2024 at the Cimpago Permai Kapalo Koto Complex, Pauh District, Padang City, and at the Soil Laboratory, Faculty of Agriculture, Andalas University. The experiment was designed based on randomized block design (RBD) with 5 treatments and 3 replications. The treatments were cow manure compost (CMC) at different doses: control (0 t/ha), 5 t/ha, 10 t/ha, 15 t/ha and 20 t/ha. The parameters analysed included bulk density (BD), total pore space (TPS), pH in H₂O, pH in KCl, soil organic carbon, CO₂ emission measurements, plant height, and fresh weight of corn cobs. The results showed that the treatment with 15 t/ha CMC performed optimal results for soil and plant data, with the value of BD was 0,89 g/cm³; TPS was 65,93%; pH in H₂O was 5,48; pH in KCl of 5,42; organic carbon after CMC incubation was 0,94%; organic carbon after harvest was 1,69%; plant height was 256,57 cm, and fresh weight of sweet corn cobs was 375,43 g/plant. In addition, the increase in CO₂ emission as 15 tonnes/ha CMC (278,96 tonnes CO₂/ha/year) was lower than those of the other treatments. Therefore, it can be concluded that the application of cow manure compost (CMC) increased CO₂ emission, but it was able to improve Ultisol fertility and sweet corn yield.

Keywords: CO₂ Emission, Cow Manure Compost (CMC), Ultisol, Sweet Corn.

