KANDUNGAN ASAM ORGANIK ALIFATIK DAN KETERSEDIAAN FOSFAT TANAH DI RHIZOSFER TANAMAN JAGUNG MANIS (*Zea mays L. Saccharata*) SETELAH APLIKASI PUPUK KANDANG AYAM PADA ULTISOL

SKRIPSI

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Abstrak

Senyawa organik eksudat akar tanaman berperan dalam mendetoksifikasi kation logam beracun seperti Al^{3+} dan untuk meningkatkan mobilitas hara berkelarutan rendah seperti P pada Ultisol. Untuk mendetoksifikasi Al, akar tanaman jagung manis dapat melepaskan eksudat asam organik, terutama asam oksalat, asam sitrat dan sedikit malat. Tujuan penelitian adalah untuk mengkaji pengaruh pupuk kandang ayam terhadap kandungan asam organik alifatik dan ketersediaan fosfat tanah serta hasil jagung manis. Metode yang digunakan dalam penelitian adalah Rancangan Acak Kelompok (RAK), terdiri dari 4 perlakuan (yaitu 0, 2, 4, dan 6 ton/ha pupuk kandang ayam) dengan 3 kali ulangan. Parameter yang dianalisis adalah nilai pH, Al-dd, C-organik, P- tersedia, P-total, kandungan asam organik alifatik (oksalat, sitrat dan malat), serta pertumbuhan dan hasil jagung manis. Hasil terbaik ditunjukkan oleh perlakuan 6 ton/ha pupuk kandang ayam. Meningkatkan pH tanah (5.47), kadar C-organik (3.31%), kadar P-tersedia (30.04ppm), kadar P-total (83.61 mg P_2O_5/100g), kandungan asam oksalat (17,08ppm) dan asam sitrat (24,22ppm), dan menurunkan Al-dd (0,15 me/100g). Kandungan asam malat (6,44ppm) tertinggi diperoleh pada perlakuan 4 ton/ha. Berdasarkan hasil penelitian, disarankan memberikan dosis 6 ton/ha pupuk kandang ayam untuk hasil Jagung Manis pada Ultisol di Kelurahan Limau Manis Selatan, Kecamatan Pauh, Kota Padang.

Kata Kunci : *Asam Organik Alifatik, Jagung Manis, Pupuk Kandang Ayam, Rhizosfer, Ultisol*

ALIPHATIC ORGANIC ACID CONTENT AND SOIL PHOSPHATE AVAILABILITY IN THE RHIZOSPHERE OF SWEET CORN (*Zea mays L. Saccharata*) AFTER APPLICATION OF CHICKEN MANURE ON ULTISOL

Abstract

Organic compounds derived from exudate of plant roots play a role in detoxifying toxic metal cations such as Al^{3+} and increasing the mobility of low soluble nutrients especially P in Ultisols. To detoxify Al, sweet corn plant roots can release organic acid exudates, especially oxalic acid, citric acid and a little malic. The objective of the study was to assess the effect of chicken manure on aliphatic organic acid content and soil phosphate availability as well as sweet corn yields. The method used in the study was Randomized Block Design (RBD), consisting of 4 treatments (0, 2, 4, and 6 tons/ha of chicken manure) with 3 replicates. The parameters analyzed were soil pH, Al-exchangeable, organic-C, available-P, total-P, aliphatic organic acid content (oxalic, citric and malic), and sweet corn growth and yield. The best results were shown by application (6 tons/ha of chicken manure). It increased soil pH into 5.47, Al- exchangeable into 0.15 me/100g, organic-C content into 3.31%, available-P into 30.04 ppm, P-total into 83.61 mg P_2O_5/100g, oxalic acid content into 17.08 ppm and citric acid into 24.22 ppm, and decrease Al-exchangeable into 0,15 me/100g. The highest malic acid content (6.44ppm) was obtained in the 4 tons/ha treatment. Based on the research results, it was recommended to apply 6 tons/ha of chicken manure for increasing sweet corn yield at Ultisol in Limau Manis Selatan Village, Pauh Sub-district, Padang City.

Keywords : *Aliphatic Organic Acid, Chicken Manure, Rhisozphere, Sweet Corn, Ultisol*