ABSTRACT

ISOLATION, IDENTIFICATION, AND ENUMERATION OF MYCORRHIZAL SPORES IN THE RHIZOSPHERE OF CORN (*Zea mays* L.) AS A RESULT OF APPLICATION OF BIOCHAR AND CHICKEN MANURE IN THE 3rd GROWING SEASON

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Ultisols have low organic matter and microorganism activity, so it is necessary to improve soil quality by adding biochar and chicken manure. One of the soil microorganisms that exist can increase the efficiency of fertilizer use is Vesicular Arbuscular Mycorrhiza (VAM). This research aims to study the effect of application the biochar and chicken manure on VAM population, diversity, infection and to study the correlation between total-P, available-P, C-organic, pH, temperature, and moisture content with MVA population and infection. The design was used is a non-factorial Randomized Block Design (RBD) with 4 groups and 4 treatments, namely, B_0 = control, B_1 = biochar 5 tons ha^{-1}, B_2 = chicken manure 5 tons ha^{-1}, and B_3 = combination of biochar and manure chicken 5 tons ha^{-1}. The data were analyzed by analysis of variance and continued with the 5% BNT test and a correlation test was performed between soil properties population and VAM infection. The results showed that the VAM population treated with the combination of biochar and chicken manure was higher than the other treatments at 0 days after planting (DAP) and 65 days after planting (DAP), but the diversity and percentage of VAM infections were not affected by the treatment application. There was a positive correlation between available-P, C-organic, pH, and moisture content with the VAM spore population, as well as a positive correlation between available-P to the percent of root infection by VAM. Identification of VAM morphologically in all treatments resulted in 3 genera, namely Glomus, Gigaspora, and Acaulospora.

Keywords: biochar, chicken manure, organic matter, vesicular arbuscular mycorrhiza

ABSTRAK

ISOLASI, IDENTIFIKASI, DAN ENUMERASI SPORA MIKORIZA PADA RHIZOSFER TANAMAN JAGUNG (*Zea mays* L.) AKIBAT APLIKASI BIOCHAR DAN KOTORAN AYAM PADA MUSIM TANAM KE-3

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Tanah Ultisol memiliki karakteristik bahan organik dan aktivitas mikroorganisme yang rendah sehingga perlu adanya peningkatan kualitas tanah dengan pemberian biochar dan kotoran ayam. Salah satu mikroorganisme tanah yang keberadaannya dapat meningkatkan efisiensi penggunaan pupuk adalah Mikoriza Vesikular Arbuskular (MVA). Penelitian ini bertujuan untuk mempelajari pengaruh aplikasi biochar dan kotoran ayam terhadap populasi, keragaman, dan infeksi MVA serta mempelajari korelasi antara P-total, P-tersedia, C-organik, pH, suhu, dan kadar air dengan populasi dan infeksi MVA. Rancangan yang digunakan yaitu Rancangan Acak Kelompok (RAK) non faktorial dengan 4 kelompok dan 4 perlakuan yaitu, B_0 = kontrol, B_1 = biochar 5 ton ha^{-1}, B_2 = kotoran ayam 5 ton ha^{-1}, dan B_3 = kombinasi biochar dan kotoran ayam 5 ton ha^{-1}. Data dianalisis dengan analisis ragam dan dilanjutkan dengan uji BNT 5% dan dilakukan uji korelasi antara sifat tanah dengan populasi dan infeksi MVA. Hasil penelitian menunjukkan bahwa populasi MVA dengan perlakuan kombinasi biochar dan kotoran ayam lebih tinggi dibandingkan dengan perlakuan lainnya pada 0 hari setelah tanam (HST) dan 65 hari setelah tanam (HST), namun keragaman dan persen infeksi MVA tidak dipengaruhi oleh aplikasi perlakuan. Terdapat korelasi positif antara P-tersedia, C-organik, pH, dan kadar air dengan populasi spora MVA, serta korelasi positif antara P-tersedia terhadap persen infeksi akar oleh MVA. Identifikasi MVA secara morfologi pada semua perlakuan diperoleh 3 genus yaitu Glomus, Gigaspora, dan Acaulospora.

Kata kunci : bahan organic, biochar, kotoran ayam, mikoriza vesikular arbuskular