

PENGARUH BAHAN AMANDEMEN TERHADAP KESUBURAN LUMPUR TAILING TAMBANG EMAS YANG DIGUNAKAN SEBAGAI MEDIUM TUMBUH TANAMAN JAGUNG

INTISARI

Kobalt adalah logam berat, yang seringkali merupakan salah satu bahan pencemar dalam limbah berbahaya. Untuk meminimalkan kandungan logam berat hingga batas yang aman salah satunya dilakukan adalah melalui pengolahan limbah menggunakan proses adsorpsi oleh pupuk kandang, arang tempurung kelapa, batu gamping, dan mikorisa.

Penelitian dilakukan dengan tujuan untuk melihat pengaruh bahan amandemen terhadap immobilisasi logam berat kobalt dan menentukan kombinasi perlakuan dalam menetralisasi limbah untuk pertumbuhan tanaman jagung.

Percobaan disusun dalam rancangan acak kelompok non faktorial, dengan menggunakan 17 model perlakuan pada media tanam. Model ($TK_0A_0M_0$) merupakan kontrol yang berupa lumpur tailing tambang emas, $TK_0A_0M_1$ ($4,98 \cdot 10^{-5}$ ton/ha M_1); $K_1A_0M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_2A_0M_1$ ($5,61 \cdot 10^{-8}$ ton/ha K_2 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_3A_0M_1$ ($6,23 \cdot 10^{-8}$ ton/ha K_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0A_1M_1$ ($9,36 \cdot 10^{-8}$ ton/ha A_1 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0A_2M_1$ ($10,53 \cdot 10^{-8}$ ton/ha A_2 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0A_3M_1$ ($11,7 \cdot 10^{-8}$ ton/ha A_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0G_1M_1$ ($4,94 \cdot 10^{-8}$ ton/ha G_1 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0G_2M_1$ ($5,56 \cdot 10^{-8}$ ton/ha G_2 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_0G_3M_1$ ($6,17 \cdot 10^{-8}$ ton/ha G_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1A_1M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $9,36 \cdot 10^{-8}$ ton/ha A_1 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1A_2M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $10,53 \cdot 10^{-8}$ ton/ha A_2 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1A_3M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $11,70 \cdot 10^{-8}$ ton/ha A_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1G_1M_1$ ($4,94 \cdot 10^{-8}$ ton/ha K_1 : $4,94 \cdot 10^{-8}$ ton/ha G_1 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1G_2M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $5,56 \cdot 10^{-8}$ ton/ha G_2 : $4,98 \cdot 10^{-5}$ ton/ha M_1); $TK_1G_3M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $6,17 \cdot 10^{-8}$ ton/ha G_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1). Parameter yang diamati adalah pH tanah, kapasitas menukar kation, C-organik, bahan organik, tekstur, berat volume, berat jenis dan porositas tanah, sedangkan pada tanaman tinggi tanaman, berat basah dan berat kering tanaman. Data diolah dengan analisis sidik ragam, dilanjutkan dengan uji jarak berganda Duncan dan uji korelasi antar parameter.

Hasil penelitian menunjukkan bahwa pemberian pupuk kandang sapi, arang tempurung, batu gamping dan mikorisa dapat meningkatkan pertumbuhan tanaman, dan immobilisasi logam berat kobalt. Kombinasi perlakuan pupuk kandang - arang tempurung kelapa - mikorisa $TK_1A_3M_1$ ($4,98 \cdot 10^{-8}$ ton/ha K_1 : $11,70 \cdot 10^{-8}$ ton/ha A_3 : $4,98 \cdot 10^{-5}$ ton/ha M_1) lebih baik mengadsorpsi logam berat kobalt dan pertumbuhan tanaman.

Kata kunci : limbah tailing, bahan amandemen, immobilisasi, kobalt, tanaman jagung.

EFFECT OF AMENDMENT MATERIALS ON THE FERTILITY OF GOLD MINE TAILING MUD GROWTH MEDIUM MAIZE

ABSTRACT

Cobalt is a heavy metal, which often is one of the pollutants in hazardous waste. To minimize the content of heavy metals to a safe threshold, one of the steps taken was through the sewage treatment process of adsorption by using manure, coconut shell charcoal, limestone, and mycorrhiza.

The research was done with the purpose of seeing the influence of the amendment materials to wordt the immobility of the cobalt heavy metal and determine the combination of treatments in neutralizing the waste materials for the growth of corn crops.

The experiments were arranged in non-factorial randomized block design, using 17 models of treatment in the planting medium. Model (TK0A0M0) is a form of control that gold mine tailings slurry, TK₀A₀M₁ (4,98. 10⁻⁵ tons / ha M1); K¹A⁰M¹ (4,98.10⁻⁸ tons / ha K1: 4,98. 10⁻⁵ tons / ha M1); TK₂A₀M₁ (5,61.10⁻⁸ tons / ha K2 :4,98.10⁻⁵ tons / ha M1); TK³A⁰M¹ (.10⁻⁸ 6.23 tons / ha K3: 4,98.10⁻⁵ tons / ha M1); TK₀A₁M₁ (9,36.10⁻⁸ tons / ha A1: 4,98.10⁻⁵ tons / ha M1); TK₀A₂M₁ (10,53. 10⁻⁸ tons / ha A2: 4,98. 10⁻⁵ tons / ha M1); TK₀A₃M₁ (11,7.10⁻⁸ tons / ha A3: 4,98.10⁻⁵ tons / ha M1); TK0G1M1 (4,94.10⁻⁸ tons / ha G1: 4,98. 10⁻⁵ tons / ha M1); TK₀G₂M₁ (5,56.10⁻⁸ tons / ha G2: 4, 98.10⁻⁵ tons / ha M1); TK0G3M1 (6,17.10⁻⁸ tons / ha G3: 4,98.10⁻⁵ tons / ha M1); TK₁A₁M₁ (4,98.10⁻⁸ tons / ha K1: 9,36 .10⁻⁸ tons / ha A1: 4,98.10⁻⁵ tons / ha M1); TK₁A₂M₁ (4,98.10⁻⁸ tons / ha K1: 10,53.10⁻⁸ tons / ha A2: 4,98.10⁻⁵ton / ha M1); TK₁A₃M₁ (4,98.10⁻⁸ tons / ha K1: 11,70.10⁻⁸ tons / ha A3: 4,98.10⁻⁵ tons / ha M1); TK₁G₁M₁ (4,94.10⁻⁸ tons / ha K1: 4,94.10⁻⁸ tons / ha G1: 4,98.10⁻⁵ tons / ha M1); TK₁G₂M₁ (4,98.10⁻⁸ tons / ha K1: 5,56.10⁻⁸ tons / ha G2: 4,98. 10⁻⁵ tons / ha M1); TK₁G₃M₁ (4,98.10⁻⁸ tons / ha K1: 6,17. 10⁻⁸ tons / ha G3: 4,98. 10⁻⁵ tons / ha M1).The parameters being observed were soil pH, cation exchange capacity, organic C, organic matter, texture, weight, volume, specific gravity and porosity of the soil, whereasfor the plants the parameters were the height of plants, the wet weight of the dry weight and plants. Data processed by analysis of variance, followed by Duncan's multiple range test and test the correlation between the parameters.

The results showed that the administration of cow manure, charcoal, limestone and mycorrhiza can enhance plant growth, and immobilization of heavy metals cobalt. Combination treatment of manure - coconut shell charcoal - TK₁A₃M₁ mycorrhiza (4,98.10⁻⁸ tons / ha K1: 11,70.10⁻⁸ton / ha A3: 4,98.10⁻⁵ tons / ha M1 better adsorbs heavy metals cobalt and plant growth.

Keywords: tailing waste materials, amendment materials, immobilization, kobalt, corn crops.



UNIVERSITAS
GADJAH MADA

**PENGARUH BAHAN AMANDEMEN TERHADAP KESUBURAN LUMPUR TAILING TAMBANG EMAS
YANG DIGUNAKAN SEBAGAI
MEDIUM TUMBUH TANAMAN JAGUNG**

Ernyy Hunila, Prof.Dr. Ir. Bambang Djadmo Kertonegoro, M.Sc.,
Universitas Gadjah Mada, 2012 | Diunduh dari <http://etd.repository.ugm.ac.id/>

