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**Pengaruh Dosis NPK dan K-Humat Terhadap Sifat Kimia Tanah dan Pertumbuhan Kayu Putih pada Tanah
PascaTambang Batubara.**
Fahreza Reybima Daffa, Dr. Agr. Cahyo Wulandari, S.P., M.P. ; Riska Ayu Purnamasari, S.Si.,M.Agr.Sc., Ph.D.
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INTISARI

Lahan reklamasi pascatambang batubara umumnya mengalami degradasi kualitas yang ditandai dengan tingginya kemasaman dan kadar Al-dd, serta rendahnya kandungan bahan organik, KPK, dan ketersediaan unsur hara, sehingga menghambat pertumbuhan tanaman revegetasi. Penelitian ini bertujuan untuk mengkaji pengaruh aplikasi NPK, kalium humat, dan bokashi terhadap perbaikan sifat kimia tanah dan pertumbuhan kayu putih (*Melaleuca cajuputi* Powell), serta menentukan dosis kombinasi terbaik di area reklamasi PT Bukit Asam Tbk. Penelitian ini disusun menggunakan Rancangan Acak Lengkap (RAL) non-faktorial dengan sembilan kombinasi perlakuan: P0 (kontrol),P100B100 (100% NPK + 100% Bokashi), P100B50 (100% NPK + 50% Bokashi), P25H50B50 (25% NPK + 50% Kalium Humat + 50% Bokashi), P25H100B50 (25% NPK + 100% Kalium Humat + 50% Bokashi), P50H50B50 (50% NPK + 50% Kalium Humat +50% Bokashi), P50H100B50 (50% NPK + 100% Kalium Humat + 50% Bokashi), P100H50B50 (100% NPK + 50% Kalium Humat + 50% Bokashi0, P100H100H50 (100% NPK + 100% Kalium Humat + 50% Bokashi), dengan keterangan P = pupuk NPK (16:16:16) ; H = kalium humat; B = bokashi. Angka pada setiap kode perlakuah merupakan dosis yang digunakan. Dosis NPK (100%) = 187,5 kg/ha ; Dosis BO (100%) = 2 ton/ha ; Dosis KH (100%) = 20 kg/ha.yang masing-masing diulang empat kali. Hasil penelitian menunjukkan bahwa pemberian perlakuan berpengaruh sangat nyata terhadap perbaikan sifat kimia tanah pada fase inkubasi maupun panen. Perlakuan P100H100B50 secara konsisten menghasilkan nilai terbaik pada fase panen, meliputi peningkatan pH (19,15%), C-organik (296,49%), KPK (80,83%), dan N-total (0,185%), serta penurunan Al-dd (78,78%). Kombinasi perlakuan tersebut terbukti paling optimal dalam memperbaiki sifat kimia tanah, meningkatkan serapan nitrogen tanaman, sekaligus mengurangi penggunaan bokashi hingga 50%, sehingga direkomendasikan untuk mendukung keberlanjutan reklamasi lahan pascatambang.

Kata kunci: lahan reklamasi pascatambang batubara, NPK, kalium humat, bokashi, kayu putih, sifat kimia tanah.

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ABSTRACT

Post-coal-mining reclamation land generally suffers from quality degradation, characterized by high acidity and exchangeable aluminum (Al-dd) levels, as well as low organic matter content, cation exchange capacity (CEC), and nutrient availability, which hinder the growth of revegetation plants. This study aimed to examine the effects of NPK, potassium humate, and bokashi application on the improvement of soil chemical properties and the growth of cajuput (Melaleuca cajuputi Powell), and to determine the best combination dose in the reclamation area of PT Bukit Asam Tbk. The study used a non-factorial Completely Randomized Design (CRD) with nine treatment combinations: P0 (control), P100B100 (100% NPK + 100% Bokashi), P100B50 (100% NPK + 50% Bokashi), P25H50B50 (25% NPK + 50% Potassium Humate + 50% Bokashi), P25H100B50 (25% NPK + 100% Potassium Humate + 50% Bokashi), P50H50B50 (50% NPK + 50% Potassium Humate + 50% Bokashi), P50H100B50 (50% NPK + 100% Potassium Humate + 50% Bokashi), P100H50B50 (100% NPK + 50% Potassium Humate + 50% Bokashi), and P100H100B50 (100% NPK + 100% Potassium Humate + 50% Bokashi), where P = NPK fertilizer (16:16:16), H = potassium humate, and B = bokashi. The number in each treatment code represents the dose applied. The 100% doses were NPK = 187.5 kg/ha, bokashi (organic matter) = 2 tons/ha, and potassium humate = 20 kg/ha. Each treatment was replicated four times. The results showed that the treatments had a highly significant effect on the improvement of soil chemical properties in both the incubation and harvest phases. The P100H100B50 treatment consistently produced the best values in the harvest phase, including increases in pH (19.15%), organic C (296.49%), CEC (80.83%), and total N (0,185%), as well as a decrease in Al-dd (78.78%). This treatment combination proved to be the most optimal in improving soil chemical properties and increasing plant nitrogen uptake, while also improving the reduce of bokashi use by up to 50%, and is therefore recommended to support the sustainability of post-mining land reclamation.

Keywords: coal post-mining land, cajuput, potassium humate, NPK fertilizer, bokashi, *Melaleuca cajuputi* Powell, soil chemical properties.