

**REKAYASA PENGOLAHAN TANAH ASAM MELALUI  
PEMBERIAN KOMBINASI KAPUR DAN KOMPOS  
DAERAH REKLAMASI BENDILI PT KALTIM PRIMA COAL  
(KPC), KECAMATAN SANGATTA UTARA, KABUPATEN  
KUTAI TIMUR, PROVINSI KALIMANTAN TIMUR**

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**INTISARI**

Kegiatan reklamasi pascatambang seringkali mengalami kendala, salah satunya adalah rendahnya kualitas tanah yang menghambat pertumbuhan tanaman reklamasi. Kondisi ini terjadi akibat proses perombakan lahan sepanjang kegiatan pertambangan. Penelitian ini dilakukan di Daerah Reklamasi Bendili, PT Kaltim Prima Coal yang memiliki area tandus dengan kondisi tanah asam dari jenis tanah asal berupa ultisol. Tujuan penelitian ini untuk mengetahui kualitas tanah asam (pH, Fe, Al<sup>3+</sup>, dan kejenuhan aluminium) di daerah penelitian, lalu melakukan percobaan skala laboratorium untuk mengetahui pengaruh kombinasi kapur dan kompos serta pelindian air hujan terhadap perubahan karakteristik tanah tersebut, sehingga dapat diketahui pengolahan tanah terbaik yang dapat diaplikasikan dengan sistem *potting* berdasarkan efisiensi peningkatan pH, penurunan Fe, Al<sup>3+</sup>, dan kejenuhan aluminium tanah.

Jenis penelitian yang dilakukan yakni penelitian kuantitatif secara eksperimen. Lalu, pengumpulan data dilakukan dengan pengumpulan data sekunder, survei dan pemetaan, uji laboratorium, dan eksperimen pelindian tanah. Lalu, data yang didapat dianalisis menggunakan metode analisis statistik deskriptif dan analisis deskriptif. Percobaan pengolahan tanah dilakukan dengan membuat 9 perlakuan kombinasi kapur dan kompos dengan 3 (tiga) kali pengulangan sehingga terdapat 27 unit percobaan yang disertai pelindian tanah. Pemberian kapur dan kompos diberi waktu inkubasi selama 14 hari dan dilanjutkan pelindian tanah dengan air hujan selama 28 hari.

Hasil penelitian menunjukkan bahwa karakteristik tanah asam area tandus di daerah penelitian memiliki pH 4,53 (asam), kadar Fe 11.637,67 ppm, Al<sup>3+</sup> 3 meq/100 g, kejenuhan aluminium 57,55 %. Pemberian kapur dan kompos disertai dengan pelindian tanah menunjukkan hasil terbaik pada perlakuan I (kapur 0,5 kg dan kompos 1 kg). Nilai pH meningkat dengan efisiensi tertinggi 8,51% dan pH akhir tertinggi 5,05. Lalu, menurunkan Al<sup>3+</sup> dengan efisiensi tertinggi 57,06% dan nilai terendah 0,73 meq/100g, serta penurunan kejenuhan aluminium memiliki efisiensi tertinggi 63,13% dengan nilai terendah 13,42%. Namun, pemberian kapur dan kompos tidak signifikan menurunkan kadar besi (Fe) karena lebih dipengaruhi oleh pelindian. Rekomendasi arahan pengelolaan yang diberikan yakni pemberian kapur 0,5 kg dan kompos 1 kg pada setiap titik penanaman pohon. Lalu, penanaman *cover crop* berupa akar wangi (*Vetivera zizaniodes*) dengan sistem *potting* 20 cm x 20 cm x 20 cm dengan jarak 15 cm x 80 cm. Lalu, penanaman tanaman pionir trembesi (*Samanea saman*) dan jarak pagar (*Jatropha curcas*), serta tanaman lokal meranti (*Shorea leprosula*) melalui sistem *potting* 30 cm x 30 cm x 30 cm dengan jarak tanam 3 m x 4 m. Lubang resapan biopori ditambahkan di lahan landai untuk mengurangi aliran limpasan dan meningkatkan kapasitas infiltrasi untuk pelindian tanah.

**Kata kunci : Reklamasi, tanah asam, ultisol, pelindian tanah, kompos, kapur**

**ENGINEERING THE TREATMENT OF ACID SOIL THROUGH  
A COMBINATION OF LIME AND COMPOST IN THE BENDILI  
RECLAMATION AREA PT KALTIM PRIMA COAL (KPC),  
NORTH SANGATTA DISTRICT, EAST KUTAI REGENCY, EAST  
KALIMANTAN PROVINCE**

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**ABSTRACT**

*Reclamation activities in post-mining areas often face challenges, one of which is the low quality of soil that hinders the growth of reclamation plants. This condition arises due to the land disruption processes throughout mining activities. This research was conducted in the Reclamation Area of Bendili, PT Kaltim Prima Coal, which had barren land with acidic soil originating from ultisol soil. The aim of this study was to determine the quality of acidic soil (pH, Fe, Al<sup>3+</sup>, and aluminum saturation) in the research area. Subsequently, laboratory-scale experiments were carried out to assess the impact of a combination of lime and compost, as well as rainwater leaching, on changes in soil characteristics. This research seeks to identify the best soil management practices that can be applied using a potting system based on the efficiency of increasing pH, reducing Fe, Al<sup>3+</sup>, and soil aluminum saturation.*

*The type of research conducted is quantitative research experimentally. Then, data collection was carried out by collecting secondary data, surveys and mapping, laboratory tests, and soil leaching experiments. Then, the data obtained were analyzed using descriptive statistical analysis methods and descriptive analysis. The soil processing experiment was carried out by making 9 combination treatments of lime and compost with 3 (three) repetitions so that there were 27 experimental units accompanied by soil leaching. The application of lime and compost was given an incubation of 14 days and continued with the leaching with rainwater for 28 days.*

*The results of the research show that the characteristics of the acid soil in the barren area have a pH value of 4.53 (acid), Fe content of 11,637.67 ppm, Al<sup>3+</sup> 3 meq/100 g, aluminum saturation of 57.55%. The application of lime and compost accompanied by soil leaching showed the best results in treatment I (0.5 kg lime and 1 kg compost). The pH value increased with the highest efficiency of 8.51% and the highest final pH of 5.05. Then, reducing Al<sup>3+</sup> with the highest efficiency of 57.06% and the lowest value of 0.73 meq/100gram, and reducing aluminum saturation has the highest efficiency of 63.13% with the lowest value of 13.42%. However, the application of lime and compost did not significantly reduce iron (Fe) levels because it was more influenced by the leaching process. The recommended management guidance includes the application of 0.5 kg of lime and 1 kg of compost at each tree planting point. Subsequently, cover crops, such as Vetiver (*Vetivera zizaniodes*), should be planted using a 20 cm x 20 cm x 20 cm potting system with a spacing of 15 cm x 80 cm. Furthermore, pioneer plants like *Samanea saman* and *Jatropha curcas*, along with local trees such as *Shorea leprosula*, should be planted using a 30 cm x 30 cm x 30 cm potting system with a spacing of 3 m x 4 m. Biopore infiltration holes should be added to gently sloping land to reduce runoff and enhance soil leaching capacity.*

**Keywords: Reclamation, acid soil, ultisol, leaching soil, compost, lime**