APPLICATION OF PALM OIL MILL EFFLUENT ON N, P, AND K NUTRIENTS IN ULTISOL SOIL BELITUNG TIMUR

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ABSTRACT

The expansion of oil palm plantations is accompanied by an increase in the palm oil processing industry in Indonesia and the number of processed palm oil products produced. This causes an increase in the amount of palm oil mill effluent produced. This study aims to determine the quality of effluent and the application of palm oil mill effluent to N, P, and K levels of Ultisol in Belitung Timur. The research was conducted in Block 21 B North Garden, PT Steelindo Wahana Perkasa in April-May 2024. Soil samples were taken at a depth of 0-60 cm and analyzed for pH, C-organic, N-total, C/N ratio, available P, and exchangeable cations (Ca and Mg). The research was conducted using the survey method by collecting data in the field. Data analysis was conducted using quantitative method through laboratory analysis. The sampling method was carried out using purposive random sampling method. The results of the analysis showed that the palm oil mill effluent of PT SWP was in accordance with the characteristics of the waste and safe to apply. In addition, the analysis shows that the soil treated with effluent tends to increase soil pH, C-organic content, N-total, and P available. Laboratory analysis showed high nutrient contents, especially N (120 mg/L), K (1,211 mg/L), Ca (70 mg/L) and Mg (131 mg/L). The application of wastewater has the potential to increase the macronutrients of Ultisol, namely the N-total content from 0.07% to 0.14%, P element from 6.6 mg/kg to 20.24 mg/kg, K element from 3.80 mg/kg to 3.86 mg/kg in Belitung Timur oil palm plantations.

Keywords: *Carbon, Soil Nutrient Availability, Palm Oil Mill Effluent (POME), Macro Nutrients, Ultisol*