

Potensi Penggunaan Limbah Cair Sawit untuk Meningkatkan Sifat Kimia dan Fisik Tanah di Area Kebun Kelapa Sawit PT. SMART Tbk

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INTISARI

Hasil produksi dan proses pengolahan PT. SMART Tbk yang tinggi mengakibatkan melimpahnya limbah cair dihasilkan oleh pabrik sehingga menjadi permasalahan. Limbah tersebut berpotensi merusak lingkungan, namun PT. SMART Tbk menggunakan limbah cair tersebut di area kebun kelapa sawit menjadi *land application*. Aktivitas tersebut akan berdampak pada sifat kimia dan fisik tanah, karena karakteristik limbah cair sawit memiliki kandungan organik sangat tinggi, kekeruhan warna, serta bersuhu tinggi. Oleh sebab itu diperlukan mekanisme perhitungan debit, rotasi dan dosis untuk memaksimalkan penggunaan limbah cair sawit. Tujuan penelitian ini untuk mengetahui karakteristik limbah cair sawit PT. SMART Tbk. Sehingga diketahui potensi penggunaan limbah cair sawit untuk meningkatkan sifat kimia dan fisik tanah serta pengaruh terhadap hasil produksi dengan membandingkan area kebun penggunaan pupuk NPK dengan area kebun penggunaan limbah cair sawit kemudian di tentukan arahan teknis pengelolaannya.

Metode penelitian dilakukan dengan survei lapangan dan pengujian laboratorium pada sampel limbah cair sawit dan sampel tanah. Pengambilan sampel melalui teknik *grab sampling*. Pengambilan sampel tanah dilakukan pada kedalaman 0-20 cm, 20-40 cm, 40-60 cm, 60-80 cm, 80-100 cm dan 100-120 cm. Pengujian sampel tanah dilakukan uji sifat kimia tanah meliputi pH, N, P, K, Ca dan Mg serta uji sifat fisik tanah meliputi porositas dan permeabilitas tanah. Data-data yang telah dihasilkan kemudian diolah dan dianalisis secara matematis dengan perhitungan dan analisis deskriptif selanjutnya perolehan data di bandingkan dengan baku mutu PERGUB SUMUT No. 35 Tahun 2007 dan klasifikasi kesuburan tanah oleh pusat penelitian tanah (1983) dalam Teapon dan Hadun (2018).

Hasil penelitian menunjukkan karakteristik limbah cair sawit terdapat parameter yang tidak sesuai baku mutu PERGUB SUMUT No. 35 Tahun 2007 meliputi parameter COD, Minyak dan Lemak, N, P, K, dan Ca. Sifat kimia dan fisik tanah antara area kebun kelapa sawit penggunaan pupuk NPK dengan area kebun penggunaan limbah cair sawit mengalami perbedaan, area kebun penggunaan pupuk NPK termasuk dalam klasifikasi sangat rendah sedangkan area kebun penggunaan limbah cair sawit termasuk dalam klasifikasi sedang. Pada sifat fisik tanah antara kedua lahan memiliki porositas kurang baik dan permeabilitas agak lambat. Hasil produksi kebun penggunaan limbah cair lebih tinggi sebanyak 1.111,76 sedangkan kebun penggunaan pupuk NPK sebanyak 927,59 ton. Pada rekomendasi arahan pengelolaan dilakukan dengan mekanisme perhitungan debit, rotasi dan dosis diharapkan dapat memaksimalkan penggunaan limbah cair sawit.

Kata Kunci: Limbah Cair Sawit, *Land Application*, Sifat Kimia, Sifat Fisik Tanah

Potential Use of Palm Oil Waste to Improve Chemical and Physical Properties of Soil in the Palm Oil Plantation Area of PT. SMART Tbk

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ABSTRACT

The high production and processing results of PT. SMART Tbk result in an abundance of liquid waste produced by the factory, which becomes a problem. The waste has the potential to damage the environment, but PT. SMART Tbk uses the liquid waste in the oil palm plantation area as a land application. This activity will have an impact on the chemical and physical properties of the soil, because the characteristics of oil palm liquid waste have very high organic content, turbid color, and high temperature. Therefore, a mechanism for calculating discharge, rotation and dosage is needed to maximize the use of oil palm liquid waste. The purpose of this study was to determine the characteristics of oil palm liquid waste from PT. SMART Tbk. So that the potential for using oil palm liquid waste to improve the chemical and physical properties of the soil and the effect on production results is known by comparing the area of the plantation using NPK fertilizer with the area of the plantation using oil palm liquid waste, then determining the technical direction for its management.

The research method was carried out by field surveys and laboratory testing on liquid palm oil waste samples and soil samples. Sampling was taken using the grab sampling technique. Soil samples were taken at depths of 0-20 cm, 20-40 cm, 40-60 cm, 60-80 cm, 80-100 cm and 100-120 cm. Soil samples were tested for soil chemical properties including pH, N, P, K, Ca and Mg as well as soil physical properties including soil porosity and permeability. The data that has been generated is then processed and analyzed mathematically with calculations and descriptive analysis, then the data obtained is compared with the quality standards of PERGUB SUMUT NUMBER. 35 of 2007 and soil fertility classification by the Soil Research Center (1983) in Teapon and Hadun (2018).

The results of the research show that the characteristics of liquid palm oil waste have parameters that do not comply with the quality standards of PERGUB NUMUT NUMBER. 35 of 2007 includes the parameters COD, Oil and Fat, N, P, K, and Ca. The chemical and physical properties of the soil between the oil palm plantation area using NPK fertilizer and the plantation area using liquid palm oil waste are different, the plantation area using NPK fertilizer is included in the very low classification while the plantation area using liquid palm oil waste is included in the medium classification. The physical properties of the soil between the two fields have poor porosity and rather slow permeability. The production results of plantations using liquid waste were higher at 1,111.76, while plantations using NPK fertilizer were 927.59 tons. The recommended management direction is carried out using a mechanism for calculating discharge, rotation and dosage, which is expected to maximize the use of liquid palm oil waste.

Keywords: *Palm Oil Waste, Land Application, Chemical Properties, Soil Physical Properties*