FINAL PROJECT SESSION

STUDY MAJOR PLANT NUTRIENT CONTENT IN PALM OIL MILL EFFLUENT DIGESTATE (POMED) AND ITS SUITABILITY AS BIO-ORGANIC FERTILIZER

By:

ARYATI PUTRI MAHARANI
2010941006

Supervisor 1:

Dr. Eng. ZULKARNAINI

Supervisor 2:

Prof Madya Dr. SHAHRUL ISMAIL

DEPARTMENT OF ENVIRONMENTAL ENGINEERING
FACULTY OF ENGINEERING – ANDALAS UNIVERSITY
PADANG

2024

ABSTRACT

This study aims to analyze the nutrient content of Nitrogen (N) in Fish Amino Acid (FAA) and Potassium (K) in Boiler Ash (BA) and analyze content of Nitrogen (N), Phosphorus (P), and Potassium (K) after the addition bio-activators to obtain fertilizers with suitable content for plants fruits and seeds with an NPK ratio of 2:1:4. This research was conducted using Palm Oil Mill Effluent Digestate (POMED). The addition of FAA and BA bio-activators. Nitrogen parameter analysis with CHNS-O analyzer and Phosphorus (P) and Potassium (K) heavy metal content analysis using Inductively Coupled Plasma (ICP). The analysis results obtained were compared with the Standards and Industrial Research Institute of Malaysia (SIRIM) and Indonesian National Standards (SNI) 2803:2010. The fertilizer content suitable for application to plants. The results of the analysis Nitrogen (N) content in FAA amounted to 6.10%, and Potassium (K) content in BA to 40%. Before the addition of the bio-activators, the concentration of Nitrogen (N), was 2.13%, Phosphorus (P) 2.0%, and Potassium (K) 1.0%. After the addition of FAA and BA bio-activators, NPK concentration was 18.53%, 12.2%, and 42.5%, and then a ratio of 2:1:4 from concentration.

Keywords: Boiler Ash, Fish Amino Acid, Nitrogen, Palm Oil, Palm Oil Mill Effluent Digestate (POMED), Phosphorus, Potassium.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis kandungan unsur hara Nitrogen (N) pada *Fish Amino Acid* (FAA) dan Kalium (K) pada Abu Boiler serta menganalisis kandungan Nitrogen (N), Fosfor (P), dan Kalium (K) setelah penambahan bioaktivator untuk mendapatkan pupuk dengan kandungan yang sesuai untuk tanaman buah dan biji dengan perbandingan NPK 2:1:4. Penelitian ini dilakukan dengan menggunakan limbah cair pabrik kelapa sawit *Palm Oil Mill Effluent Digestate* (POMED). Penambahan bioaktivator FAA dan Abu Boiler. Analisis parameter Nitrogen dengan CHNS-O analyzer dan analisis kandungan logam berat Fosfor (P) dan Kalium (K) dengan menggunakan *Inductively Coupled Plasma* (ICP). Hasil analisis yang diperoleh dibandingkan dengan *Standar dan Institut Riset Industri Malaysia* (SIRIM) dan Standar Nasional Indonesia (SNI) 2803:2010. Kandungan pupuk yang sesuai untuk diaplikasikan pada tanaman. Hasil analisis kandungan Nitrogen (N) pada FAA sebesar 6,10%, dan kandungan Kalium (K) pada Boiler Ash sebesar 40%. Sebelum penambahan bioaktivator, konsentrasi Nitrogen (N) adalah 2,13%, Fosfor (P) 2,0%, dan Kalium (K) 1,0%. Setelah penambahan bioaktivator FAA dan Boiler Ash, konsentrasi NPK menjadi 18,53%, 12,2%, dan 42,5%, dengan perbandingan konsentrasi 2:1:4.

Kata kunci: Abu Boiler, Asam Amino Ikan, Nitrogen, Kelapa Sawit, Palm Oil Mill Effluent Digestate (POMED), Fosfor, Kalium.