ABSTRACT

THE EFFECT OF WATER CONTENT AND NPK FERTILIZER ADDTION ON PHYSICAL CHARACTERISTICS OF PELLET COMPOST FERTILIZER

BY

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Making pellets from organic fertilizer is one way to facilitate the use of compost. Organic fertilizer pellets make it easy to handle, pack, store, and transport. This study aims to determine the effect of water content and NPK fertilizer addition (to the raw materials when producing the pellet) on the physical characteristics of the organic fertilizer pellets produced. This research was conducted in February 2021 - June 2021 at the Agricultural Equipment and Machinery Resources Laboratory (DAMP), the Water and Land Resources Engineering Laboratory (RSDAL) and the Bioprocess and Post Harvest Engineering Laboratory (RBPP), Agricultural Engineering Department, Faculty of Agriculture, University of Lampung. In this study, completely randomized design (CRD) (in factorial arrangement) consisted of 2 factors, namely the water content factor, consisting of 3 levels and the NPK fertilizer factor consisting of 3 levels.

Each treatment was repeated 3 times to obtain 27 experimental units. The parameters observed in this study were density test, solubility test, hygroscopicity test, compressive strength test, vibration resistance test, impact resistance test and pH. The result of this research showed that the water content was significant at the level α=0,05 against the results of solubility test, compressive strength testing, vibration resistance testing and pH testing. The addition of NPK fertilizer was significant at the level α=0,05 (P<5%) on the results of solubility test, impact resistance testing and pH testing. The interaction effect of water content and the addition of NPK fertilizer is significant at level α=0,05 (P<5%) toward on the results of bulk density testing, particle density testing, compressive strength testing, impact resistance testing and pH value testing.

The result revealed that the moderate moisture content (20%-25%) and the addition of NPK fertilizer by 3% to the raw materials when producing the compost pellet, was the best treatment combination in term of the pellet charachteristics.

Key words : Pellet organic fertilizer, moisture content, NPK fertilizer, fortification

ABSTRAK

PENGARUH KADAR AIR DAN PENAMBAHAN PUPUK NPK TERHADAP KARAKTERISTIK FISIK PUPUK KOMPOS PELET

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Pembuatan pelet dari pupuk organik merupakan salah satu cara untuk memudahkan penggunaan pupuk kompos. Pupuk organik pelet memudahkan dalam penanganan, pengemasan, penyimpanan, dan transportasi. Penelitian ini bertujuan untuk mengetahui pengaruh kadar air dan penambahan pupuk NPK (terhadap bahan baku pembuatan pelet) terhadap sifat fisik pupuk organik pelet yang dihasilkan. Penelitian ini dilaksanakan pada bulan Februari 2021 - Juni 2021 di Laboratorium Daya Alat dan Mesin Pertanian (DAMP), Laboratorium Rekayasa Sumberdaya Air dan Lahan (RSDAL) dan Laboratorium Rekayasa Bioproses dan Pasca Panen (RBPP), Jurusan Teknik Pertanian, Fakultas Pertanian, Universitas Lampung. Pada penelitian ini, Rancangan Acak Lengkap (RAL) (dalam susunan faktorial) terdiri dari 2 faktor yaitu faktor kadar air, terdiri dari 3 taraf dan faktor pupuk NPK terdiri dari 3 taraf.

Setiap perlakuan dilakukan 3 kali ulangan sehingga diperoleh 27 unit percobaan. Parameter yang diamati pada penelitian ini yaitu uji massa jenis, uji kelarutan, uji higrokopisitas, uji kuat tekan, uji ketahanan getar, uji ketahanan bentur dan uji pH. Hasil penelitian menunjukkan kadar air nyata pada taraf α=0,05 terhadap hasil pengujian kelarutan, pengujian kuat tekan, pengujian ketahanan getar dan pengujian pH. Penambahan pupuk NPK nyata pada taraf α=0,05 (P>5%) terhadap hasil pengujian kelarutan, pengujian ketahanan benturan dan pengujian pH. Pengaruh interaksi kadar air dan penambahan pupuk NPK nyata pada taraf α=0,05 (P>5%) terhadap hasil pengujian massa jenis curah, pengujian massa jenis partikel, pengujian kuat tekan, pengujian ketahanan benturan dan pengujian nilai pH.

Hasil penelitian menunjukkan bahwa perlakuan kadar air sedang (20%-25%) dan penambahan pupuk NPK sebesar 3% pada bahan baku pembuatan pelet kompos merupakan kombinasi perlakuan yang paling baik ditinjau dari karakteristik pelet.

Kata kunci : Pupuk organik pelet, kadar air, pupuk NPK.