ABSTRAK

Spent bleaching earth memiliki potensi digunakan sebagai perekat pada produksi pupuk NPK. Tujuan penelitian ini adalah (1) mengetahui performa biokemis, pertumbuhan, dan hasil tanaman kedelai yang dipupuk NPK dengan perekat lempung murni 5% + SBE 5% dan NPK dengan perekat lempung murni 5% + DBE 5%; dan (2) menentukan tipe manakah diantara SBE 5% dan DBE 5% yang lebih optimal untuk digunakan sebagai pengganti sebagian komponen perekat lempung murni pada produksi pupuk NPK. Penelitian dilaksanakan di Pusat Inovasi Agroteknologi (PIAT) Universitas Gadjah Mada, Dusun Kalitirto, Kecamatan Prambanan, Kabupaten Sleman, Daerah Istimewa Yogyakarta, pada bulan November 2018 sampai Februari 2019. Rancangan yang digunakan dalam penelitian Rancangan Acak Kelompok Lengkap (RAKL) satu faktor yaitu sumber perekat pada pupuk NPK yakni lempung murni 10%, NPK dengan perekat lempung murni 5% + *Spent Bleaching Earth* (SBE) 5% dan NPK dengan perekat lempung murni 5% + *Deoiled Bleaching Earth* (DBE) 5% dengan 3 ulangan. Pemberian pupuk dilakukan dua kali yaitu saat tanaman berumur 14 HST sebanyak 2 g polibag^{-1} dan umur 35 HST sebanyak 3 g polibag^{-1} pada setiap perlakuan. Hasil penelitian menunjukkan bahwa pemupukan NPK dengan perekat lempung murni 5% + SBE 5% dan pemupukan NPK dengan perekat lempung murni 5% + DBE 5% memberikan hasil yang sama dengan pemupukan NPK dengan perekat lempung murni 10% pada pertumbuhan tanaman seperti tinggi tanaman, diameter tanaman, luas daun, luas permukaan akar, volume akar, berat kering akar, berat kering tajuk dan laju pertumbuhan nisbi, serta hasil tanaman seperti jumlah polong pertanaman, berat biji pertanaman, jumlah biji pertanaman, berat kering biji pertanaman, berat 100 biji dan indeks panen dan aktivitas biokimia tanaman seperti kandungan H_2O_2, SOD, POD, fenolik total, karotenoid, prolin, *reactive electrolyte lakage*, dan malondealdehid.

Kata kunci: *deoiled bleaching earth*, kedelai, NPK, *spent bleaching earth*.

ABSTRACT

Spent bleaching earth haves the potential to be used as filler in NPK fertilizer production. The objectives of this study were (1) to determine the biochemical performance, growth, and yield of soybean plants fertilized by NPK with filler clay mineral 5% + SBE 5% and NPK with filler clay mineral 5% + DBE 5%; and (2) determine which type between the SBE 5% and the DBE 5% is more optimal for use as a partial replacement for clay mineral filler components in NPK fertilizer production. The study was conducted at the Agrotechnology Innovation Center of Gadjah Mada University, Kalitirto Hamlet, Prambanan District, Sleman Regency, Special Region of Yogyakarta, from November 2018 to February 2019. The design used in the Randomized Completed Block Design (RCBD) study was one factor, namely the source filler on NPK fertilizer namely clay mineral 10%, NPK with filler clay mineral 5% + Spent Bleaching Earth (SBE) 5% and NPK with filler clay mineral 5% + Deoiled Bleaching Earth (DBE) 5% with 3 replications. The application of fertilizer is done twice, namely when the plant is 14 DAP as much as 2 g polybag^{-1} and age 35 DAP as much as 3 g polybag^{-1} for each treatment. The results showed that NPK fertilization with filler clay mineral 5% + SBE 5% and NPK fertilization with filler clay mineral 5% + DBE 5% gave the same results as NPK fertilization with filler clay mineral 10% on plant growth such as plant height, diameter plants, leaf area, root surface area, root volume, root dry weight, canopy dry weight and relative growth rate, as well as crop yields such as number of planted pods, planted seed weight, number of planted seeds, dry weight of planted seeds, weight of 100 seeds and harvest index and biochemical activity of plants such as H_2O_2, SOD, POD, total phenolic, carotenoid, proline, reactive electrolyte lakage, and malondealdehyde.

Keywords: deoiled bleaching earth, NPK, soybean, spent bleaching earth,.