ABSTRACT

Ultisol is a soil order in dry land and has experienced a decline in fertility or damage. Ultisol has an acid pH value ranging between 4.8-5.4, P-available value ranging from 0.73-4.08 ppm which is relatively low, Al-dd value ranging between 0.55-4.72 me/100g and the content Low organic C ranges from 0.13%-1.12%. Acid soil makes it difficult for most nutrients to dissolve in water and affects the development of microorganisms in the soil. Increasing soil pH can reduce exchangeable Al in the soil. Low P content in the soil can affect plant root development, disrupt the photosynthesis process and reduce plant production. Efforts that can be made to improve the quality of Ultisol are by providing organic materials. One of the organic materials that has potential is palm oil mill sludge. This research was carried out using a Randomized Block Design (RBD) with 6 treatments and 4 replications so that there were 24 experimental plots. The treatments used are, K0 (without sludge compost), K1 (5 tons/ha of sludge compost), K2 (10 tons/ha of sludge compost), K3 (15 tons/ha of sludge compost), K4 (20 tons/ha of sludge compost) and K5 (25 tons/ha of sludge compost). The soil parameters observed were C-organic, pH, P-available and Al-dd while the plant parameters observed were plant height and plant production. The research data were analyzed using variance at a confidence level of 95% (α = 5%) then continued with the Duncan's Multiple Range Test (DMRT). The results of the research showed that the provision of sludge compost was not able to increase soil pH, available P and organic C in Ultisol soil, however, the provision of sludge compost was able to reduce the Al-dd content in Ultisol soil. Providing sludge compost can increase plant height and peanut production, with a dose of 5 tonnes/ha (K1) having the highest average increase in peanut growth and yield in Ultisol.

Keywords: C-organic, pH, Al-dd, P-available, Yield, Compost

INTISARI

Ultisol merupakan ordo tanah di lahan kering dan telah mengalami kemunduran kesuburan atau kerusakan. Ultisol memiliki nilai pH masam berkisar antara 4,8-5,4, nilai P-tersedia berkisar 0,73-4,08 ppm yang tergolong rendah, nilai Al-dd berkisar antara 0,55-4,72 me/100g dan kandungan C-organik yang rendah berkisar antara 0,13% - 1,12%. Tanah masam menyebabkan kebanyakan unsur hara sulit larut dalam air dan mempengaruhi perkembangan mikroorganisme di dalam tanah. Peningkatan pH tanah mampu menurunkan Al tertukar dalam tanah. Rendahnya kandungan P dalam tanah dapat mempengaruhi perkembangan akar tanaman, proses fotosintesis terganggu dan menurunkan produksi tanaman. Upaya yang dapat dilakukan untuk memperbaiki kualitas Ultisol adalah dengan pemberian bahan organik. Salah satu bahan organik yang cukup potensial adalah lumpur padat (*sludge*) pabrik kelapa sawit. Penelitian ini dilakukan dengan menggunakan Rancangan Acak Kelompok (RAK) dengan 6 perlakuan dan 4 ulangan sehingga teerdapat 24 petak percobaan. Perlakuan yang digunakan yaitu, K_0 (tanpa pemberian kompos *sludge*), K_1 (5 ton/ha kompos *sludge*), K_2 (10 ton/ha kompos *sludge*), K_3 (15 ton/ha kompos *sludge*), K_4 (20 ton/ha kompos *sludge*) dan K_5 (25 ton/ha kompos *sludge*). Parameter tanah yang diamati adalah C-organik, pH, P-tersedia dan Al-dd sedangan parameter tanaman yang diamati adalah tinggi tanaman dan produksi tanaman. Data hasil penelitian dianalisis menggunakan sidik ragam pada taraf kepercayaan 95% (α = 5%) kemudian dilanjutkan dengan uji Duncan Multiple Range Test (DMRT). Hasil penelitian menunjukkan pemberian kompos *sludge* yang diberikan belum mampu meningkatkan pH tanah, P-tersedia dan C-organik pada tanah Ultisol, namun pemberian kompos *sludge* mampu menurunkan kandungan Al-dd pada tanah Ultisol. Pemberian kompos *sludge* mampu meningkatkan tinggi tanaman dan hasil produksi tanaman kacang tanah, dengan dosis 5 ton/ha (K1) memiliki rata-rata tertinggi dalam meningkatkan pertumbuhan dan hasil kacang tanah pada Ultisol.

Kata kunci: C-organik, pH, Al-dd, P-tersedia, Hasil, Kompos