ABSTRAK

DINAMIKA KELIMPAHAN *Azotobacter* DAN BAKTERI PELARUT FOSFAT PADA TANAH ULTISOL PERTANAMAN NANAS PT GREAT GIANT PINEAPPLE, LAMPUNG TENGAH DENGAN VARIASI KEDALAMAN BAJAK DAN JENIS KOMPOS

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Penurunan angka produksi nanas Kabupaten Lampung Tengah terjadi pada tahun 2023, dimana penurunan mencapai 16,4% dari angka produksi nanas tahun 2022 (8,6 juta kuintal). Penurunan angka produksi nanas tersebut berasal dari PT Great Giant Pineapple (PT GGP), dengan masalah akumulasi polimer serasah tanaman nanas (bahan penyusun kompos) pada lahan ultisol. Salah satu solusi yang muncul yaitu rekayasa kompos dengan penambahan *biochar*, *vermicompost*, dan *Liquid Organic Biofertilizer* (LOB), disertai dengan variasi pembajakan lahan. Tujuan penelitian ini adalah mengetahui dinamika kelimpahan *Azotobacter* dan bakteri pelarut fosfat (BPF) pada tanah ultisol pertanaman nanas PT GGP yang dipengaruhi kedalaman bajak, jenis kompos, dan interaksi keduanya. Rancangan penelitian ini adalah *Split Plot Design*. *Main plot* berupa kedalaman bajak (2 taraf) dan *sub plot* berupa jenis kompos (4 taraf). Setiap perlakuan dibuat 3 ulangan. Variabel utama penelitian yaitu kelimpahan *Azotobacter* dan BPF (*log* CFU g^{-1}), yang diketahui melalui metode *Total Plate Count* (TPC). Variabel pendukung penelitian yaitu suhu (^{o}C), kadar air (%), pH, dan C-organik tanah (%). Analisis data menggunakan ANOVA (α 5%), uji Tukey's HSD (α 5%), uji Pearson R (α 1%), dan *Principal Component Analysis* (PCA). Hasil penelitian menunjukkan kelimpahan *Azotobacter* sampel pra-tanam (PT) serta BPF sampel 3 bulan setelah tanam (BST) berbeda signifikan antar kedalaman bajak, dengan perlakuan bajak dalam (± 40 cm) + cacahan halus serasah nanas (L1) sebagai perlakuan terbaik. Kelimpahan *Azotobacter* sampel PT serta BPF sampel 3 BST berbeda signifikan antar jenis kompos, dengan perlakuan kompos premium GGP + LOB (P3) sebagai perlakuan terbaik. Kelimpahan *Azotobacter* sampel PT berbeda signifikan antar interaksi kedalaman bajak – jenis kompos, dengan interaksi L1P3 sebagai interaksi terbaik. Hasil penelitian tidak bertentangan dengan hipotesis penelitian yang diajukan.

Kata kunci: *Azotobacter*, bakteri pelarut fosfat (BPF), jenis kompos, kedalaman bajak, ultisol

ABSTRACT

THE DYNAMICS OF *Azotobacter* AND PHOSPHATE SOLUBILIZING BACTERIA ABUNDANCE IN PINEAPPLE PLANTATION ULTISOL OF PT GREAT GIANT PINEAPPLE, LAMPUNG TENGAH WITH VARYING PLOWING DEPTH AND COMPOST MIXTURE

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The decline in pineapple production in Lampung Tengah regency occurred in 2023, where the decline reached 16.4% of the pineapple production in 2022 (8.6 million quintals). The decline in pineapple production came from PT Great Giant Pineapple (PT GGP), with the problem of accumulation of pineapple plant litter polymers (compost ingredients) on ultisol land. The solution that emerged was compost-mixture changing by adding biochar, vermicompost and Liquid Organic Biofertilizer (LOB), accompanied by variations in land plowing. This research aimed to determine the dynamics of *Azotobacter* and phosphate solubilizing bacteria (PSB) abundance in the ultisol soil of PT GGP's pineapple plantations which were influenced by plowing depth, compost mixture and interaction between them. The design of this research was Split Plot. The main plot was the plowing depth (2 levels) and the sub plot was the compost mixture (4 levels). Three replications were made for each treatment. The main variables were the abundance of *Azotobacter* and PSB (*log* CFU g^{-1}), which were determined using the Total Plate Count (TPC) method. The supporting variables were the temperature (^{o}C), water content (%), pH and soil organic carbon (%). Data analysis included ANOVA (α 5%), Tukey's HSD Test (α 5%), Pearson R Test (α 5%) and Principal Component Analysis (PCA). The results showed that the abundance of *Azotobacter* in pre-planting (PT) sample along with PSB in 3 months after planting (BST) sample differed significantly between plowing depths, with the deep plowing (± 40 cm) + finely chopped pineapple litter (L1) as the best. The abundance of *Azotobacter* in PT sample along with BPF in 3 BST sample differed significantly between compost mixtures, with the GGP's premium compost + LOB (P3) as the best. The abundance of *Azotobacter* in PT sample differed significantly between factor interactions (plowing depth-compost mixture), with the L1P3 interaction as the best. There is no conflict between all results and the research hypothesis.

Keywords: *Azotobacter*, compost mixture, phosphate solubilizing bacteria (PSB), plowing depth, ultisol