

ABSTRAK

Jagung merupakan salah satu komoditas penting di Indonesia yang menghadapi tantangan peningkatan produktivitas, terutama pada lahan-lahan suboptimal seperti tanah ultisol yang memiliki sifat fisik dan kimia yang kurang mendukung pertumbuhan tanaman optimal. Ultisol, dengan karakteristik pH rendah, kejenuhan aluminium tinggi, dan kapasitas tukar kation rendah, memerlukan adanya pembenah tanah untuk meningkatkan produktivitasnya. Aplikasi bahan organik seperti kasgot, hasil biokonversi limbah oleh larva *Black Soldier Fly*, diketahui dapat memperbaiki sifat fisik, kimia, dan biologi tanah.

Metode penelitian dilakukan secara eksperimental yang terdiri dari dua tahapan. Tahapan pertama yaitu isolasi, identifikasi, dan pengujian bakteri pelarut fosfat (BPF). Tahapan kedua yaitu penanaman jagung manis dan aplikasi kasgot serta BPF. Penanaman dilakukan dengan rancangan acak kelompok faktorial (RAK) yang terdiri dari 9 kombinasi perlakuan, tiga ulangan, sehingga didapatkan 27 unit percobaan. Penelitian dilaksanakan di lahan pertanian, laboratorium agronomi dan hortikultura, dan laboratorium tanah, Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian dilaksanakan selama 6 bulan.

Hasil isolasi didapatkan 9 isolat bakteri, dengan 5 isolat yang teridentifikasi memiliki kemampuan melarutkan fosfat, yakni 1S, 1P, 2P, 2R, dan 5R. Isolasi diidentifikasi berdasarkan karakteristik morfologi dan biokimia, serta dilakukan uji kelarutan fosfat secara kualitatif, kuantitatif, dan uji kandungan IAA. Hasil identifikasi berdasarkan karakteristik morfologi dan biokimia, diduga bakteri tersebut berasal dari genus Enterobakter, Bacillus, dan Pseudomonas. Hasil aplikasi perlakuan kasgot dan BPF menunjukkan bahwa kombinasi kasgot dan BPF belum mampu meningkatkan pertumbuhan dan hasil tanaman jagung manis. Namun, perlakuan kasgot sendiri dapat meningkatkan tinggi tanaman, jumlah daun, luas daun, LAB, bobot tongkol berkelobot, bobot tongkol tanpa kelobot, dan serapan P tanaman lebih baik dibandingkan dengan kontrol. Pemberian BPF sendiri belum mampu untuk meningkatkan pertumbuhan dan hasil tanaman jagung secara nyata.

Kata kunci: Jagung manis, kasgot, bakteri pelarut fosfat, Ultisol, serapan fosfat.

ABSTRACT

Corn is a significant commodity in Indonesia, but it faces challenges in increasing productivity, especially on suboptimal lands like Ultisol soils. These soils have physical and chemical properties that do not support optimal plant growth, including low pH, high aluminum saturation, and low cation exchange capacity. To increase productivity, soil conditioners are needed. One such soil conditioner is kasgot, which is a result of waste bioconversion by Black Soldier Fly larvae and is known to improve the physical, chemical, and biological properties of the soil.

The research method consisted of two stages. The first stage involved the isolation, identification, and testing of phosphate-solubilizing bacteria (PSB). The second stage involved planting sweet corn and applying kasgot and BPF. Planting was carried out using a factorial randomized block design (RBD) consisting of 9 treatment combinations, with three replications, resulting in 27 experimental units. The research was conducted on agricultural land, agronomy and horticulture laboratories, and soil laboratories at the Faculty of Agriculture, Jenderal Soedirman University, and lasted for 6 months.

The isolation process resulted 9 bacterial isolates, with 5 isolates identified as having the ability to dissolve phosphate (1S, 1P, 2P, 2R, and 5R). The identification was based on morphological and biochemical characteristics, as well as qualitative and quantitative phosphate solubility tests, and IAA content tests. Based on their characteristics, it is suspected that the bacteria come from the Enterobacter, Bacillus, and Pseudomonas genera. The results of the kasgot and BPF treatments showed that their combination did not increase the growth and yield of sweet corn plants significantly. However, the kasgot treatment led to an increase in plant height, number of leaves, leaf area, LAB, weight of cobs with husks, weight of cobs without husks, and improved plant P absorption compared to the control. On the other hand, the provision of BPF alone did not significantly increase the growth and yield of corn plants.

Keywords: *Kasgot, phosphate absorption, phosphate solubilizing bacteria, sweet corn, Ultisol.*