

RINGKASAN

Jagung manis (*Zea mays saccharata* Sturt) merupakan salah satu komoditas pangan bergizi tinggi yang banyak diminati masyarakat. Tingkat produksi jagung manis di Indonesia masih tergolong rendah. Salah satu faktor penyebabnya adalah terbatasnya lahan subur akibat alih fungsi lahan, sehingga budidaya jagung manis banyak dilakukan di lahan marginal seperti tanah Ultisol yang bersifat masam, miskin hara, dan memiliki kesuburan rendah. Pembenahan lahan Ultisol dapat dilakukan dengan penggunaan pupuk anorganik seperti fosfor (SP-36) yang berperan penting dalam fotosintesis dan pembentukan hasil, maupun melalui pemanfaatan pupuk organik kasgot, yaitu kompos hasil dekomposisi larva *Black Soldier Fly* (BSF) yang diperkaya dengan bahan amelioran seperti biochar, zeolit, dan legum. Bahan-bahan ini diketahui dapat meningkatkan ketersediaan hara dan memperbaiki kualitas tanah. Penelitian ini bertujuan untuk (1) menilai pengaruh pemberian pupuk P dan kasgot yang diperkaya dengan biochar, legum, dan zeolit terhadap pertumbuhan serta hasil tanaman jagung manis di tanah Ultisol, dan (2) menentukan dosis optimum yang dapat memaksimalkan pertumbuhan dan hasil tanaman, serta menganalisis interaksi antara dosis fosfor dan kasgot yang diperkaya terhadap pertumbuhan dan hasil jagung manis.

Penelitian dilaksanakan pada bulan Agustus 2024 hingga Februari 2025. Penelitian ini menggunakan Rancangan Acak Kelompok Lengkap (RAKL) dengan 2 faktor dan 3 ulangan. Faktor pertama meliputi P0 = kontrol (tanpa aplikasi P), P1 = 25 kg/ha P₂O₅, P2 = 50 kg/ha P₂O₅, P3 = 75 kg/ha P₂O₅. Faktor kedua meliputi K0 = kontrol (tanpa kasgot), K1 = 10 ton/ha, K2 = 20 ton/ha, K3 = 30 ton/ha. Parameter yang diamati meliputi variabel pertumbuhan (tinggi tanaman, jumlah daun, luas daun, kehijauan daun, dan bobot kering tanaman) serta hasil (bobot, diameter, dan panjang tongkol berkelobot dan tanpa kelobot). Data hasil penelitian dianalisis menggunakan uji ANOVA, jika berpengaruh nyata maka dilanjutkan uji *Duncan's Multiple Range Test* (DMRT) pada taraf kesalahan 5%.

Hasil penelitian menunjukkan bahwa pemberian pupuk kasgot yang diperkaya biochar, legum, dan zeolit mampu meningkatkan pertumbuhan dan hasil jagung manis, namun pemberian pupuk fosfor belum mampu meningkatkan pertumbuhan dan hasil jagung manis di tanah Ultisol. Dosis terbaik pemberian kasgot yang diperkaya biochar, zeolit, dan legum yaitu 20 ton/ha dengan hasil 313,83 g/tanaman, serta tidak terdapat interaksi antara dosis pupuk fosfor dan dosis pupuk kasgot yang diperkaya biochar, zeolit, dan legum terhadap pertumbuhan dan hasil jagung manis di tanah Ultisol.

SUMMARY

Sweet corn (*Zea mays saccharata* Sturt) is one of the highly nutritious food commodities that is widely favored by the public. However, the production level of sweet corn in Indonesia remains relatively low. One of the main contributing factors is the limited availability of fertile land due to land-use conversion, which has led to the cultivation of sweet corn on marginal lands such as Ultisol. Ultisols are characterized by their acidic nature, low nutrient content, and poor fertility. Improvement of Ultisol soils can be achieved through the application of inorganic fertilizers such as phosphorus (SP-36), which plays an important role in photosynthesis and yield formation, as well as through the use of organic fertilizers such as maggot frass—a compost product derived from the decomposition of Black Soldier Fly (BSF) larvae—enriched with ameliorant materials such as biochar, zeolite, and legumes. These materials are known to improve soil quality and increase nutrient availability. This study aimed to: (1) evaluate the effect of phosphorus fertilizer and maggot frass enriched with biochar, legumes, and zeolite on the growth and yield of sweet corn grown in Ultisol soil, and (2) determine the optimum dosage that maximizes plant growth and yield, as well as analyze the interaction between phosphorus fertilizer and enriched maggot frass dosages on the growth and yield of sweet corn.

The research was conducted from August 2024 to February 2025 using a Completely Randomized Block Design (CRBD) with two factors and three replications. The first factor consisted of four phosphorus levels: P0 = control (no P application), P1 = 25 kg/ha P_2O_5 , P2 = 50 kg/ha P_2O_5 , and P3 = 75 kg/ha P_2O_5 . The second factor consisted of four maggot frass levels: K0 = control (no maggot frass), K1 = 10 tons/ha, K2 = 20 tons/ha, and K3 = 30 tons/ha. Observed parameters included growth variables (plant height, number of leaves, leaf area, leaf greenness, and plant dry weight) and yield variables (cob weight, diameter, and length—both with and without husks). The data were analyzed using ANOVA, and when significant effects were detected, the results were further tested using Duncan's Multiple Range Test (DMRT) at a 5% significance level.

The results showed that the application of maggot frass enriched with biochar, legumes, and zeolite significantly improved the growth and yield of sweet corn. However, phosphorus fertilizer application did not significantly enhance sweet corn growth or yield in Ultisol soil. The best treatment was obtained with the application of 20 tons/ha of enriched maggot frass, which produced an average yield of 313.83 g/plant. There was no significant interaction between phosphorus fertilizer and enriched maggot frass dosages on the growth and yield of sweet corn cultivated in Ultisol soil.