

RINGKASAN

Jagung manis merupakan komoditas pangan yang banyak dibudidayakan untuk konsumsi langsung maupun bahan baku industri makanan di Indonesia. Upaya peningkatan hasil memerlukan pemupukan. Penelitian ini bertujuan untuk; 1) mengetahui perbedaan kualitas kompos kotoran kambing dan kotoran sapi, dengan penggunaan bioaktivator M-21, kotoran kambing, dan kotoran sapi; 2) mengetahui pengaruh aplikasi kompos tersebut dengan dua jenis bioaktivator alami pada dosis pupuk N, P, K berbeda yang diberikan terhadap hasil jagung manis.

Penelitian dilaksanakan pada bulan Agustus 2024 hingga April 2025, dalam dua tahapan dengan menggunakan RAK (Rancangan Acak Kelompok) dua faktor. Tahap pertama menggunakan dua faktor, yaitu jenis kotoran (A_1 = Kotoran kambing, A_2 = Kotoran sapi), dan jenis bioaktivator (B_1 = Bioaktivator M-21, B_2 = Bioaktivator kotoran kambing, B_3 = Bioaktivator kotoran sapi). Kedua faktor dikombinasikan menjadi 6 perlakuan dan 3 ulangan. Tahap kedua menggunakan faktor dosis pupuk N, P, K (P_1 = Dosis N, P, K 0%, P_2 = Dosis N, P, K 50%, dan P_3 = Dosis N, P, K 100%) dan jenis kompos + bioaktivator (O_1 = Kompos kotoran kambing + bioaktivator kotoran kambing, O_2 = Kompos kotoran sapi + bioaktivator kotoran kambing, O_3 = Kompos kotoran kambing + bioaktivator kotoran sapi, dan O_4 = Kompos kotoran sapi + bioaktivator kotoran sapi), menghasilkan 12 kombinasi perlakuan dengan 3 ulangan. Variabel yang diukur yaitu suhu, kualitas kimia (N-total, P-total, K-total, pH, C-organik, rasio C/N, Pb, dan Cd), kualitas fisik kompos (kadar air, ukuran partikel), serta hasil jagung manis (jumlah biji per tongkol, jumlah baris per tongkol, panjang tongkol, diameter tongkol, bobot tongkol berkelobot, dan bobot tongkol tanpa kelobot).

Hasil penelitian menunjukkan bahwa pengomposan kotoran kambing dan sapi dengan bioaktivator M-21 maupun bioaktivator alami menghasilkan kompos yang memenuhi standar Peraturan Kementerian Pertanian No.261 Tahun 2019. Bioaktivator alami dari kotoran sapi dan kambing dapat dijadikan pengganti bioaktivator pabrikan M-21 karena pada analisis sifat fisik dan kimia pada kompos akhir berbeda tidak nyata. Kompos menunjukkan hasil berbeda nyata terhadap ukuran partikel (selisih 4,48%) dan P_2O_5 (selisih 67,26%) antara kotoran kambing dan kotoran sapi. Pupuk sintetis dengan kompos menunjukkan hasil yang berbeda nyata terhadap bobot dengan kelobot, bobot tanpa kelobot, dan diameter tongkol. Aplikasi dosis N, P, K 100% meningkatkan bobot tongkol tanpa kelobot sebesar 43,09% dibandingkan dosis N, P, K 0%. Aplikasi pupuk dosis N, P, K 50% dan 100% menunjukkan hasil setara dengan peningkatan 34,77% (dosis N, P, K 50%) dan 39,06% (dosis N, P, K 100%) dibandingkan dosis N, P, K 0%.

SUMMARY

Sweet corn is one of the most widely cultivated food commodities in Indonesia, both for direct consumption and as a raw material for the food industry. Efforts to increase its yield require proper fertilization. This study aimed to: (1) determine the differences in compost quality derived from goat and cow manure using M-21, goat manure, and cow manure as bioactivators; and (2) examine the effect of compost application with two types of natural bioactivators at different N, P, K fertilizer doses on sweet corn yield.

The research was conducted from August 2024 to April 2025 in two stages using a two-factor Randomized Block Design (RBD). The first stage consisted of two factors: type of manure (A1 = goat manure, A2 = cow manure), and type of bioactivator (B1 = M-21, B2 = goat manure bioactivator, B3 = cow manure bioactivator), resulting in 6 treatment combinations with 3 replications. The second stage used N, P, K fertilizer doses (P1 = 0%, P2 = 50%, P3 = 100%) and types of compost + bioactivator (O1 = goat manure compost + goat manure bioactivator, O2 = cow manure compost + goat manure bioactivator, O3 = goat manure compost + cow manure bioactivator, O4 = cow manure compost + cow manure bioactivator), producing 12 treatment combinations with 3 replications. Variables measured included temperature, compost chemical quality (total N, total P, total K, pH, organic C, C/N ratio, Pb, and Cd), physical quality (moisture content, particle size), and sweet corn yield (number of kernels per cob, number of rows per cob, cob length, cob diameter, fresh cob weight with husk, and fresh cob weight without husk).

The results showed that composting goat and cow manure with either M-21 or natural bioactivators produced compost that met the Indonesian Ministry of Agriculture Regulation No. 261 of 2019. Natural bioactivators derived from goat and cow manure can serve as substitutes for the commercial bioactivator M-21, as no significant differences were observed in the physical and chemical properties of the final compost. Significant differences were found in particle size (4.48%) and P2O5 content (67.26%) between goat and cow manure compost. The combination of compost with synthetic fertilizers showed significant effects on cob weight with husk, cob weight without husk, and cob diameter. The application of 100% N, P, K dose increased cob weight without husk by 43.09% compared to 0% N, P, K dose. Furthermore, the application of 50% and 100% N, P, K doses produced comparable results, with increases of 34.77% (50% dose) and 39.06% (100% dose) compared to 0% N, P, K dose.