

RINGKASAN

Tebu merupakan komoditas penting dalam industri gula nasional yang memerlukan bibit berkualitas untuk mencapai pertumbuhan optimal. Keberhasilan pembibitan tebu dipengaruhi oleh kualitas bahan tanam serta kondisi media tumbuh. Posisi mata tunas pada batang tebu menentukan kemampuan perkecambahan dan vigor bibit karena perbedaan kematangan jaringan dan cadangan asimilat. Selain itu, pemanfaatan bahan organik seperti blotong yang diperkaya mikroorganisme fungsional berpotensi meningkatkan kualitas media pembibitan melalui perbaikan sifat fisik, kimia, dan biologis tanah. Penelitian ini bertujuan untuk menguji pengaruh posisi mata tunas terhadap karakter morfologis dan fisiologis bibit tebu, menguji pengaruh macam media tanam terhadap pertumbuhan bibit tebu, serta mengetahui respons bibit tebu terhadap kombinasi posisi mata tunas dan media tanam.

Penelitian dilaksanakan di Desa Bulaksari, Kecamatan Sragi, Kabupaten Pekalongan, serta Laboratorium Agrohorti Universitas Jenderal Soedirman pada bulan Juli hingga Oktober 2025. Penelitian menggunakan Rancangan Acak Kelompok Lengkap (RAKL) faktorial dengan dua faktor dan tiga ulangan. Faktor pertama adalah posisi mata tunas yang terdiri atas mata tunas atas (N1), tengah (N2), dan bawah (N3). Faktor kedua adalah macam media tanam yang terdiri atas tanah (M0), tanah + blotong (M1), tanah + blotong + Bio P60 (M2), dan tanah + blotong + Bio T10 (M3). Variabel yang diamati meliputi karakter morfologi dan fisiologi bibit tebu, antara lain waktu muncul tunas, tinggi bibit, jumlah dan luas daun, kandungan klorofil, karakter stomata, bobot bibit, laju asimilasi bersih, laju pertumbuhan relatif, aktivitas nitrat reduktase, serta karakter sistem perakaran dan diameter batang. Data dianalisis menggunakan analisis ragam (ANOVA) dan dilanjutkan dengan uji DMRT taraf 5%.

Hasil penelitian menunjukkan bahwa posisi mata tunas memengaruhi pertumbuhan morfologis dan fisiologis bibit tebu, di mana mata tunas bagian tengah menghasilkan pertumbuhan bibit terbaik yang ditunjukkan oleh perkembangan tajuk, sistem perakaran, dan bobot yang lebih tinggi. Macam media tanam juga menentukan pertumbuhan bibit tebu, dengan media tanah yang diperkaya blotong dan Bio P60 memberikan pertumbuhan paling baik dibandingkan media lainnya. Respons pertumbuhan bibit tebu dipengaruhi oleh kombinasi posisi mata tunas dan media tanam, di mana penggunaan mata tunas bagian tengah yang ditanam pada media tanah + blotong + Bio P60 menghasilkan pertumbuhan bibit terbaik. Hal ini menunjukkan bahwa keberhasilan pembibitan tebu ditentukan oleh kesesuaian antara kualitas bahan tanam dan kondisi media tumbuh yang mendukung aktivitas fisiologis tanaman sejak fase awal pertumbuhan.

SUMMARY

Sugarcane is an important commodity in the national sugar industry that requires high-quality seeds to achieve optimal growth. The success of sugarcane breeding is influenced by the quality of planting materials and growing conditions. The position of the bud on the sugarcane stalk determines the germination and vigor of the seeds due to differences in tissue maturity and assimilate reserves. In addition, the use of organic materials such as compost enriched with functional microorganisms has the potential to improve the quality of the seedling medium by improving the physical, chemical, and biological properties of the soil. This study aims to examine the effect of bud position on the morphological and physiological characteristics of sugarcane seedlings, examine the effect of planting media types on sugarcane seedling growth, and determine the response of sugarcane seedlings to combinations of bud position and planting media.

The research was conducted in Bulaksari Village, Sragi District, Pekalongan Regency, and the Agrohorti Laboratory of Jenderal Soedirman University from July to October 2025. The research used a complete randomized block design (CRBD) with two factors and three replications. The first factor was the position of the bud, consisting of upper bud (N1), middle bud (N2), and lower bud (N3). The second factor was the type of planting medium, consisting of soil (M0), soil + blotong (M1), soil + blotong + Bio P60 (M2), and soil + blotong + Bio T10 (M3). The variables observed included the morphological and physiological characteristics of sugarcane seedlings, such as bud emergence time, seedling height, number and area of leaves, chlorophyll content, stomatal characteristics, seedling biomass, net assimilation rate, relative growth rate, nitrate reductase activity, as well as root system characteristics and stem diameter. The data were analyzed using analysis of variance (ANOVA) and followed by the DMRT test at the 5% level.

The results of the study indicate that the position of the bud eye affects the morphological and physiological growth of sugarcane seedlings, with the middle bud eye producing the best seedling growth as evidenced by higher crown development, root system, and biomass. The type of planting medium also determines sugarcane seedling growth, with soil enriched with blotong and Bio P60 providing the best growth compared to other media. The growth response of sugarcane seedlings is influenced by the combination of bud position and growing medium, with the use of central buds planted in soil + blotong + Bio P60 medium producing the best seedling growth. These findings indicate that the success of sugarcane propagation is determined by the suitability between the quality of planting materials and growing medium conditions that support plant physiological activity from the early stages of growth.