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**Respons Pertumbuhan Bibit Stek Kakao Plagiotrop (Plagiotropic Cacao Clonal) terhadap Perbedaan Jenis
Pupuk N dan Aplikasi Biochar**
Hanif Naufal Ariq, Dr. Ir. Endang Sulistyaningsih, M.Sc.; Prof. Dr. Ir. Benito Heru Purwanto, M.P., M.Agr.Sc.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

INTISARI

Perbanyakan vegetatif kakao (*Theobroma cacao* L.) melalui stek samping atau PCC (*Plagiotrop Cacao Clonal*) sering terkendala oleh pertumbuhan dan perkembangan yang cukup lama untuk siap dipindah tanam di lapangan. Bibit stek PCC memiliki perakaran yang kurang kuat karena sistem perakaran PCC menyerupai perakaran serabut atau perakaran semu, pembentukan tunas kurang optimal dibandingkan jenis kakao klonal lainnya, serta pertumbuhan bibit yang perlu pengoptimalan lebih lanjut. Perlu adanya pengoptimalan melalui ketersediaan unsur hara dan kondisi media tanam melalui aplikasi nitrogen dan biochar. Penelitian ini bertujuan untuk mengetahui respon pertumbuhan bibit PCC hingga siap salur terhadap perbedaan jenis pupuk N dengan penambahan biochar. Penelitian dilakukan pada lahan percobaan Pusat Penelitian Kopi dan Kakao di Kecamatan Kaliwining, Kabupaten Jember pada bulan April hingga September 2025. Percobaan menggunakan Rancangan Acak Kelompok Lengkap dengan 3 blok sebagai ulangan, 2 aras pupuk N, serta 4 aras dosis biochar dari tempurung kelapa (0; 2,5; 5; 7,5 ton/ha). Objek yang digunakan merupakan bibit PCC yang sudah berumur 2 bulan dengan klon MCC 02. Hasil penelitian menunjukan pemberian sumber nitrogen dalam bentuk ZA secara mandiri memberikan repons pertumbuhan lebih unggul dibandingkan urea. Interaksi kedua perlakuan, di mana perlakuan ZA + biochar 7,5 ton/ha memberikan paling unggul dibandingkan perlakuan lainnya. Hal tersebut dibuktikan dengan bibit perlakuan ZA+biochar 7,5 ton/ha menghasilkan tinggi bibit tertinggi, serta didukung dengan menghasilkan nilai tertinggi pada variabel bobot kering akar, volume akar, luas permukaan akar, serta rasio akar tajuk.

Kata kunci : Kakao Klonal Plagiotrop , pupuk nitrogen, biochar, pembibitan

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ABSTRACT

Vegetative propagation of cocoa (*Theobroma cacao* L.) through plagiotropic stem cuttings, known as Plagiotropic Cocoa Clonal (PCC), is often constrained by the relatively long period required for seedlings to reach the transplanting stage in the field. PCC seedlings generally exhibit weak root development due to a fibrous or pseudo-root system, sub optimal shoot formation compared with other clonal cocoa propagation methods, and overall growth that requires further improvement. Therefore, optimizing nutrient availability and improving the growing medium through nitrogen fertilization and biochar application are considered essential to enhance seedling growth. This study aimed to evaluate the growth response of PCC seedlings to different nitrogen fertilizer sources combined with biochar application until they reached transplanting quality. The experiment was conducted at the experimental field of the Indonesian Coffee and Cocoa Research Institute (ICCRI), Kaliwining District, Jember Regency, from April to September 2025. A Randomized Complete Block Design (RCBD) was employed with three replications, consisting of two nitrogen fertilizer sources and four rates of coconut shell biochar (0, 2.5, 5.0, and 7.5 ton/ha). Two-month-old PCC seedlings of the MCC 02 clone were used as the experimental material. The results showed that ammonium sulfate (ZA), as a nitrogen source, independently produced superior growth responses compared with urea. A significant interaction between nitrogen fertilizer source and biochar application was observed, with the combination of ammonium sulfate (ZA) and biochar at 7,5 ton/ha exhibiting the best overall performance among all treatment combinations. This treatment resulted in the greatest seedling height and was further characterized by the highest values of root dry weight, root volume, root surface area, and root-to-shoot ratio.

Keywords: Plagiotropic Clonal Cacao, nitrogen fertilizer, biochar, nursery