

PEMANTAUAN TANAMAN BIOMASSA *Gliricidia sepium* KEMITRAAN DI AREAL HKm KTH RANU MAKMUR, PROBOLINGGO

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INTISARI

Pengembangan *Gliricidia sepium* (*G. sepium*) sebagai sumber biomassa pada perhutanan sosial memerlukan dasar empiris untuk menentukan aspek penanaman yang perlu diprioritaskan serta memperkirakan ketersediaan biomassa. Penelitian ini bertujuan memantau perkembangan biomassa atas permukaan (*aboveground biomass*, AGB) *G. sepium* serta menganalisis perbedaannya berdasarkan pola dan bahan tanaman, sekaligus memproyeksikan potensi pasokan pada 2030. Inventarisasi sensus dilakukan pada 40 petak penanaman tahun 2024 seluas 9,8 ha pada September 2025 dan Juli 2026, dengan 38 petak produktif dianalisis. AGB diduga menggunakan persamaan alometrik spesifik *G. sepium* dan dianalisis menggunakan *general linear model* faktorial dua arah. Pertumbuhan diproyeksikan menggunakan model Bruce–Schumacher, sedangkan umur panen operasional ditetapkan berdasarkan perpotongan *mean annual increment* (MAI) dan *current annual increment* (CAI). Bahan tanaman menunjukkan perbedaan AGB yang signifikan pada umur 1 dan 2 tahun, sedangkan pola tanam dan interaksi pola × bahan tidak signifikan. Pada umur 2 tahun, *estimated marginal mean* AGB bibit mencapai 6,108 Mg ha⁻¹ dibandingkan 2,307 Mg ha⁻¹ pada stek. AGB diproyeksikan mencapai 8.108 kg ha⁻¹ pada umur 3 tahun yang ditetapkan sebagai umur panen operasional. Setelah koreksi mortalitas sekitar 3% dan proporsi biomassa termanfaatkan 86,30%, potensi pasokan panen pertama sebesar 6.787 kg ha⁻¹. Penerapannya pada kohort 2024–2027 menghasilkan potensi pasokan kumulatif 811,24 Mg pada 2030. Hasil menunjukkan bahwa bibit dapat diprioritaskan, sedangkan pola tanam tetap diterapkan secara adaptif sesuai kondisi petak.

Kata kunci: biomassa atas permukaan; bahan tanaman; Bruce–Schumacher; MAI–CAI; pasokan bahan baku.

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BIOMASS MONITORING OF *Gliricidia sepium* UNDER A PARTNERSHIP SCHEME IN THE KTH RANU MAKMUR COMMUNITY FOREST, PROBOLINGGO

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ABSTRACT

The development of *Gliricidia sepium* (*G. sepium*) as a biomass source in social forestry requires an empirical basis for identifying priority planting attributes and estimating biomass availability. This study aimed to monitor changes in the aboveground biomass (AGB) of *G. sepium* and analyze differences according to planting pattern and propagation material, while projecting potential biomass supply through 2030. A complete inventory was conducted in 40 parcels established in 2024, covering 9.8 ha, in September 2025 and July 2026, with 38 productive parcels analyzed. AGB was estimated using a species-specific allometric equation and analyzed using a two-way factorial general linear model. Growth was projected using the Bruce–Schumacher model, while the operational harvest age was determined from the intersection of mean annual increment (MAI) and current annual increment (CAI). Propagation material showed significant differences in AGB at ages 1 and 2 years, whereas planting pattern and the pattern × material interaction were not significant. At age 2, the estimated marginal mean AGB of seedlings reached 6.108 Mg ha⁻¹ compared with 2.307 Mg ha⁻¹ for cuttings. AGB was projected to reach 8,108 kg ha⁻¹ at age 3 years, which was designated as the operational harvest age. After correcting for an approximately 3% mortality rate and a usable biomass proportion of 86.30%, the potential first-harvest supply was 6,787 kg ha⁻¹. Application to the 2024–2027 planting cohorts resulted in a cumulative potential biomass supply of 811.24 Mg through 2030. The results indicate that seedlings can be prioritized, while planting patterns may remain adaptive to parcel conditions.

Keywords: aboveground biomass; propagation material; Bruce–Schumacher model; MAI–CAI; biomass supply.

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