

## RINGKASAN

Tanaman aren (*Arenga pinnata* Merr.) adalah salah satu keluarga palma yang memiliki potensi nilai ekonomi tinggi. Hampir semua bagian tanaman aren dapat dimanfaatkan dan memiliki nilai ekonomi. Tanaman aren dapat tumbuh baik pada ketinggian 500-800 m dpl bahkan masih dapat dijumpai pada ketinggian 1.400 m dpl. Kebanyakan tanaman aren yang tumbuh di Desa Sunyalangu hanya dimanfaatkan niranya saja oleh masyarakat. Penelitian ini bertujuan untuk mengetahui pengaruh faktor ketinggian tempat, perlakuan pembenah tanah (biochar) serta interaksinya terhadap fisiologi, dan hasil nira tanaman aren. Pada penelitian ini, ketinggian tempat dan perlakuan pembenah tanah (biochar) diharapkan dapat berpengaruh nyata terhadap fisiologi, dan hasil nira tanaman aren di Desa Sunyalangu.

Penelitian dilaksanakan mulai bulan Januari hingga Juni 2024 di areal tempat tumbuhnya tanaman aren yang meliputi daerah aliran sungai dan perbukitan di Dusun Semaya, Desa Sunyalangu, Kecamatan Karanglewas, Kabupaten Banyumas pada ketinggian 350 – 750 m dpl dan analisis dilakukan di Laboratorium Agronomi dan Hortikultura Fakultas Pertanian Universitas Jenderal Soedirman, Laboratorium Tanah dan Sumberdaya Lahan Fakultas Pertanian Universitas Jenderal Soedirman serta Laboratorium Teknologi Pangan Fakultas Pertanian Universitas Jenderal Soedirman. Rancangan yang digunakan yaitu Rancangan *split plot* dengan dua faktor. Faktor pertama adalah berbagai ketinggian tempat yang terdiri atas  $250 < x \leq 450$  mdpl (K0),  $450 < x \leq 650$  mdpl (K1), dan  $> 650$  mdpl (K2). Faktor kedua adalah pemberian pembenah tanah biochar dengan berbagai dosis yang terdiri 0 g/tanaman (B0), 750 g/tanaman (B1), dan 1500 g/tanaman (B2). Faktor-faktor tersebut dikombinasikan dan didapatkan 9 perlakuan. Setiap perlakuan dilakukan dengan 3 ulangan.

Variabel yang diamati berupa karakter fisiologi, dan hasil nira tanaman aren. Variabel fisiologi meliputi kadar klorofil total (mg/g), aktivitas nitrat reduktasi (ANR), serapan N, P, dan K (g/tanaman). Variabel hasil nira tanaman aren meliputi volume produksi nira per hari (liter), kadar gula nira ( $^{\circ}$ brix), kandungan pH nira, kadar gula sukrosa dan reduksi (%), kekentalan nira (mPa/s), dan warna nira. Data hasil pengamatan dianalisis dengan sidik ragam dan dilanjutkan *Duncan's Multiple Range Test* (DMRT) taraf beda nyata 5%. Hasil penelitian menunjukkan bahwa faktor ketinggian tempat berpengaruh nyata terhadap variabel kadar klorofil total, aktivitas *nitrat reduktase*, serapan K, volume nira per hari, kadar gula, dan kekentalan nira. Perlakuan pembenah tanah biochar berpengaruh nyata terhadap variabel volume produksi nira per hari.

## SUMMARY

*The sugar palm plant (Arenga pinnata Merr.) is one of the palm family which has high potential economic value. Almost all parts of the sugar palm plant can be used and have economic value. Sugar palm plants can grow well at an altitude of 500-800 m above sea level and can even be found at an altitude of 1,400 m above sea level. Most of the sugar palm plants that grow in Sunyalangu Village are only used for their sap by the community. This research aims to determine the influence of altitude factors, soil amendment treatment (biochar) and their interactions on the physiology and yield of sugar palm sap. In this research, it is hoped that the altitude and soil amendment treatment (biochar) will have a significant effect on the physiology and sap yield of sugar palm plants in Sunyalangu Village.*

*The research was carried out from January to June 2024 in the area where sugar palm plants grow which includes river basins and hills in Semaya Hamlet, Sunyalangu Village, Karanglewas District, Banyumas Regency at an altitude of 350 - 750 m above sea level and analysis was carried out at the Agronomy and Horticulture Laboratory, Faculty of Agriculture, General Soedirman University, Soil and Land Resources Laboratory, Faculty of Agriculture, General Soedirman University and Food Technology Laboratory, Faculty of Agriculture, General Soedirman University. The design used is a split plot design with two factors. The first factor is various altitudes consisting of  $250 < x \leq 450$  masl (K0),  $450 < x \leq 650$  masl (K1), and  $> 650$  masl (K2). The second factor is the application of biochar soil amendment in various doses consisting of 0 g/plant (B0), 750 g/plant (B1), and 1500 g/plant (B2). These factors were combined and obtained 9 treatments. Each treatment was carried out with 3 repetitions.*

*The variables observed were physiological characters and palm sap yield. Physiological variables include total chlorophyll content (mg/g), nitrate reduction (ANR) activity, N, P and K uptake (g/plant). Sugar palm sap yield variables include sap production volume per day (liters), sap sugar content (°brix), sap pH content, sucrose and reducing sugar content (%), sap viscosity (mPa/s), and sap color. The observation data was analyzed using variance and continued with Duncan's Multiple Range Test (DMRT) with a significant difference level of 5%. The results showed that the altitude factor had a significant effect on total chlorophyll levels, nitrate reductase activity, K uptake, volume of sap per day, sugar content and viscosity of sap. The biochar soil amendment treatment had a significant effect on the volume of sap production per day*