

## RINGKASAN

Tanaman aren (*Arrenga pinnata Merr*) merupakan tanaman hutan yang sangat berpotensi di Indonesia karena tanaman ini merupakan sumber daya alam yang dikenal di kawasan tropika, disebabkan oleh manfaatnya yang beraneka ragam. Tanaman aren memiliki potensi besar sebagai pilihan tanaman untuk mengatasi degradasi lahan dan memulihkan lahan yang rusak. Tanaman aren sebagai tanaman perkebunan yang berpotensi untuk bahan pangan yang dimanfaatkan niranya untuk dijadikan sebagai bahan baku gula dan nonpangan sebagai bahan baku bietanol perlu dikembangkan. Penelitian ini dilakukan dengan tujuan untuk mengetahui pengaruh aplikasi biochar dan pupuk N-P-K terhadap pertumbuhan bibit tanaman aren dan mengetahui pengaruh aplikasi biochar dan pupuk N-P-K terhadap sifat kimia tanah pada bibit tanaman aren. Aplikasi biochar dan pupuk N-P-K diharapkan dapat berpengaruh nyata terhadap sifat kimia tanah dan pertumbuhan bibit tanaman aren.

Penelitian ini dilakukan di lahan percobaan Universitas Jenderal Soedirman. Analisis sifat kimia tanah akan dilaksanakan di Laboratorium Tanah dan Sumberdaya Lahan Fakultas Pertanian Unsoed, Laboratorium Agronomi dan Hortikultura Fakultas Pertanian Unsoed, dan Laboratorium Perlindungan Tanaman Fakultas Pertanian Unsoed. Penelitian dilakukan pada bulan Juli 2023 sampai dengan Mei 2024. Metode yang digunakan dalam penelitian ini menggunakan Rancangan Petak Terbagi (*Split Plot design*) dengan biochar sebagai *main plot* dan pupuk N-P-K sebagai sub plot terdiri dari 9 kombinasi perlakuan dengan setiap kombinasi perlakuan terdapat 2 unit tanaman. Faktor yang dicoba dalam penelitian yaitu perlakuan biochar (B0 = tanpa biochar, B1 = 200 g/tanaman, B2 = 400 g/tanaman) dan pupuk N-P-K (P0 = tanpa pupuk N-P-K, P1 = 31,5 g pupuk N-P-K (12,5 g Urea, 12,5 g TSP, dan 6,25 g KCl)/tanaman, P2 = 62,5 g pupuk N-P-K (25 g Urea, 25 g TSP, dan 12,5 g KCl)/tanaman). Setiap kombinasi perlakuan diulang sebanyak 3 kali sehingga diperoleh 54 unit tanaman.

Variabel pengukuran sifat kimia tanah yang dilakukan yaitu pH H<sub>2</sub>O, pH KCl, C-Organik tanah, N-total, P-total, K-total, dan KTK tanah. Variabel pengukuran pertumbuhan yang diamati yaitu tinggi dan diameter batang tanaman. Data pendukung yaitu suhu, kelembapan, dan intensitas cahaya. Data hasil pengamatan dianalisis dengan sidik ragam dan dilanjutkan *Duncan Multiple Range Test* (DMRT) taraf beda nyata 5%. Hasil penelitian menunjukkan pengaplikasian biochar dan pupuk N-P-K dengan dosis yang berbeda pada bibit tanaman aren memberikan pengaruh nyata terhadap variabel sifat kimia tanah meliputi pH H<sub>2</sub>O, P-total tanah, dan K-total tanah. Sedangkan pada variabel pH KCl, N-total tanah, C-organik tanah, dan KTK tanah pengaplikasian biochar dan pupuk N-P-K dengan dosis yang berbeda pada bibit tanaman aren tidak berpengaruh nyata. Sedangkan pada variabel pertumbuhan pengaplikasian biochar dan pupuk N-P-K dengan dosis berbeda pada bibit tanaman aren memberikan pengaruh nyata terhadap rata-rata tinggi dan diameter batang tanaman.

## SUMMARY

*Sugar palm (Arrenga pinnata Merr) is a forest plant that has great potential in Indonesia because this plant is a natural resource known in tropical areas, due to its diverse benefits. Sugar palm has great potential as a choice plant to overcome land degradation and restore damaged land. Sugar palm as a plantation plant that has the potential for food ingredients whose sap is used as raw material for sugar and non-food as raw material for bioethanol needs to be developed. This study was conducted with the aim of determining the effect of biochar and N-P-K fertilizer applications on the growth of sugar palm seedlings and determining the effect of biochar and N-P-K fertilizer applications on the chemical properties of soil in sugar palm seedlings. The application of biochar and N-P-K fertilizer is expected to have a significant effect on the chemical properties of the soil and the growth of sugar palm seedlings.*

*This research was conducted at the experimental field of Jenderal Soedirman University. Analysis of soil chemical properties will be carried out at the Soil and Land Resources Laboratory of the Faculty of Agriculture, Unsoed, the Agronomy and Horticulture Laboratory of the Faculty of Agriculture, Unsoed, and the Plant Protection Laboratory of the Faculty of Agriculture, Unsoed. The research was conducted from July 2023 to May 2024. The method used in this study used a Split Plot Design with biochar as the main plot and N-P-K fertilizer as a subplot consisting of 9 treatment combinations with each treatment combination containing 2 plant units. The factors tested in the study were biochar treatment (B0 = without biochar, B1 = 200 g/plant, B2 = 400 g/plant) and N-P-K fertilizer (P0 = without N-P-K fertilizer, P1 = 31.5 g N-P-K fertilizer (12.5 g Urea, 12.5 g TSP, and 6.25 g KCl)/plant, P2 = 62.5 g N-P-K fertilizer (25 g Urea, 25 g TSP, and 12.5 g KCl)/plant). Each treatment combination was repeated 3 times to obtain 54 plant units.*

*The variables of soil chemical properties measurement conducted were pH H<sub>2</sub>O, pH KCl, soil C-Organic, N-total, P-total, K-total, and soil CEC. The variables of growth stem measurement observed were plant height and diameter. Supporting data were temperature, humidity, and light intensity. The observation data were analyzed by analysis of variance and continued with Duncan Multiple Range Test (DMRT) with a significant difference level of 5%. The results showed that the application of biochar and N-P-K fertilizer with different doses to sugar palm seedlings had a significant effect on the variables of soil chemical properties including pH H<sub>2</sub>O, soil P-total, and soil K-total. While on the variables of pH KCl, soil N-total, soil C-organic, and soil CEC, the application of biochar and N-P-K fertilizer with different doses to plant seedlings did not have a significant effect. While on the growth variable, the application of biochar and N-P-K fertilizer with different doses to sugar palm seedlings had a significant effect on the average height and diameter of the plant stem.*