RINGKASAN

Indonesia merupakan salah satu negara yang memiliki potensi pengembangan pertanian yang sangat luas yaitu 8,19 juta Ha. Salah satu jenis tanaman pertanian yang potensial yaitu aren. Budidaya tanaman aren sampai saat ini belum dilakukan secara intensif karena kebanyakan tanaman aren tumbuh secara alami tanpa ada tindakan khusus dalam pembudidayaannya. Tujuan dari penelitian ini untuk mengetahui pengaruh pemberian biochar dengan dosis yang berbeda terhadap pertumbuhan bibit aren, mengetahui pengaruh pemberian pupuk N-P-K dengan dosis yang berbeda terhadap pertumbuhan bibit aren, mengetahui interaksi pemberian biochar dan pupuk N-P-K dengan dosis yang berbeda terhadap pertumbuhan bibit tanaman aren. Perlakuan biochar dan pupuk N-P-K diharapkan dapat berpengaruh nyata terhadap pertumbuhan tanaman aren.

Penelitian ini dilaksanakan di *experimental farm* dan laboratorium agronomi dan hortikultura Fakultas Pertanian, Universitas Jenderal Soedirman, Karangwangkal, Purwokerto Utara. Penelitian ini dilaksanakan Juli sampai dengan Desember 2023. Rancangan yang digunakan yaitu rancangan *Split Plot Design* dengan dua faktor. Faktor pertama adalah biochar yang terdiri dari B0 = 0 g biochar, B1= 200 g biochar, B2= 400 g biochar. Faktor kedua adalah perlakuan pupuk N-P-K yang terdiri dari P0 = tanpa pupuk N-P-K, P1= 31,25 g pupuk N,P,K dengan perbandingan 2:2:1 (12,5 g Urea, 12,5 g TSP, dan 6,25 g KCl), P2 = 62,5 g pupuk N-P-K dengan perbandingan 2:2:1 (25 g Urea, 25 g TSP, dan 12,5 g KCl). Faktor-faktor tersebut dikombinasikan dan didapatkan 9 perlakuan. Setiap perlakuan dilakukan sebanyak 3 ulangan.

Pengamatan morfologi tanaman aren yang dilakukan yaitu tinggi bibit, jumlah pelepah daun, jumlah daun, luas daun, diameter batang, bobot daun basah, bobot daun kering, bobot tanaman basah, bobot tanaman kering, panjang akar, bobot akar basah, bobot akar kering. Pengamatan fisiologi tanaman aren yang diamati yaitu kehijauan daun, kerapatan stomata, lebar bukaan stomata, kandungan klorofil total, kadar air relatif daun. Data pendukung yaitu suhu, kelembapan, intensitas cahaya, dan pH. Data hasil pengamatan dianalisis dengan sidik ragam dan dilanjutkan *Duncan Multiple Range Test* (DMRT) taraf beda nyata 5%. Hasil penelitian menunjukkan pemberian biochar 200 g memberikan pengaruh nyata pada variabel tinggi bibit, luas daun, bobot daun basah, bobot daun kering, panjang akar, kehijauan daun, kerapatan stomata. Pemberian pupuk N-P-K 31,25 g memberikan pengaruh nyata dan variabel tinggi bibit, jumlah daun, diameter batang, luas daun, bobot daun basah, bobot daun kering, bobot tanaman kering, bobot akar basah, bobot akar kering, kehijauan daun, kerapatan stomata, lebar bukaan stomata, kandungan klorofil total, kadar air relatif daun. Terdapat interaksi pemberian biochar 200 g dan pupuk N-P-K 31,25 g terhadap variabel tinggi bibit, jumlah daun, diameter batang, jumlah pelepah daun, luas daun, bobot daun basah, bobot daun kering, bobot tanaman basah, bobot tanaman kering, panjang akar, bobot akar basah, bobot akar kering, kehijauan daun, kerapatan stomata.

SUMMARY

Indonesia is a country that has very extensive agricultural development potential, namely 8.19 million Ha. One type of potential agricultural plant is sugar palm. Until now, sugar palm cultivation has not been carried out intensively because most sugar palm plants grow naturally without any special measures in their cultivation. The aim of this research is to determine the effect of giving biochar at different doses on the growth of sugar palm seedlings, to find out the effect of giving N-P-K fertilizer at different doses on the growth of sugar palm seedlings, to find out the interaction of giving biochar and N-P-K fertilizer at different doses on the growth of sugar palm plant seeds. It is hoped that the biochar and N-P-K fertilizer treatment will have a significant effect on the growth of sugar palm plants.

This research was carried out at the experimental farm and agronomy and horticulture laboratory, Faculty of Agriculture, Jenderal Soedirman University, Karangwangkal, North Purwokerto. This research was carried out from July to December 2023. The design used was a Split Plot Design with two factors. The first factor is biochar which consists of B0 = 0 g biochar, B1 = 200 g biochar, B2 = 400 g biochar. The second factor is the N-P-K fertilizer treatment which consists of P0 = without N-P-K fertilizer, P1 = 31.25 g of N,P,K fertilizer with a ratio of 2:2:1 (12.5 g Urea, 12.5 g TSP, and 6, 25 g KCl), P2 = 62.5 g N-P-K fertilizer with a ratio of 2:2:1 (25 g Urea, 25 g TSP, and 12.5 g KCl). These factors were combined and 9 treatments were obtained. Each treatment was carried out in 3 repetitions.

Morphological observations of sugar palm plants were carried out, namely seed height, number of leaf midribs, number of leaves, leaf area, stem diameter, wet leaf weight, dry leaf weight, wet plant weight, dry plant weight, root length, wet root weight, dry root weight. Observations on the physiology of sugar palm plants were leaf greenness, stomata density, stomatal opening width, total chlorophyll content, relative leaf water content. Supporting data is temperature, humidity, light intensity and pH. The observation data was analyzed using variance and continued with the Duncan Multiple Range Test (DMRT) with a significant difference level of 5%. The results of the research showed that giving 200 g of biochar had a real influence on the variables of seedling height, leaf area, wet leaf weight, dry leaf weight, root length, leaf greenness, and stomata density. Providing 31.25 g of N-P-K fertilizer had a real and variable effect on seed height, number of leaves, stem diameter, leaf area, wet leaf weight, dry leaf weight, dry plant weight, wet root weight, dry root weight, leaf greenness, stomata density, stomatal opening width, total chlorophyll content, relative leaf water content. There is an interaction between giving 200 g biochar and 31.25 g N-P-K fertilizer on the variables of seed height, number of leaves, stem diameter, number of leaf midribs, leaf area, wet leaf weight, dry leaf weight, wet plant weight, dry plant weight, root length, wet root weight, dry root weight, leaf greenness, stomata density.