RINGKASAN

Tingginya permintaan pasar akan berbagai jenis kacang di Indonesia belum dapat terpenuhi, sementara produksi kacang nasional terus mengalami penurunan setiap tahunnya. Oleh karena itu, perlu adanya solusi untuk meningkatkan hasil produksi tanaman kacang serta dapat menjaga ekosistem lingkungan pertanian. Solusi yang dapat dilakukan adalah dengan pemberian biochar. Biochar merupakan arang hayati dari pembakaran tidak sempurna sehingga menyisakan unsur hara yang menyuburkan tanah. Tujuan dari kegiatan penelitian ini adalah untuk mengetahui pengaruh pemberian biochar terhadap karakter fisiologi serta hasil produksi tanaman kacang kedelai, kacang hijau, dan kacang merah.

Penelitian dilaksanakan pada Desember 2023 hingga April 2024. Kegiatan penelitian dilakukan di Desa Singasari Karanglewas, Laboratorium Kebun Percobaan, Laboratorium Agronomi dan Hortikultura, dan Laboratorium Agroekologi Fakultas Pertanian Universitas Jenderal Soedirman. Penelitian menggunakan Rancangan Acak Kelompok (RAK). Kombinasi perlakuan pada penelitian ini yaitu perlakuan biochar dengan berbagai dosis yaitu tanpa aplikasi biochar, aplikasi 10 t/ha, dan aplikasi 20 t/ha dan variasi aneka tanaman kacang yaitu tanaman kacang kedelai, kacang hijau, dan kacang merah. Variabel yang diamati yaitu kerapatan stomata (unit/mm^2), luas daun (cm^2), kehijauan daun, kandungan klorofil (mg/g), bobot kering tajuk vegetatif (g), bobot akar vegetatif (g), bobot tajuk generatif (g), jumlah polong per tanaman, jumlah biji per tanaman, bobot biji per tanaman (g), bobot 100 biji (g), dan indeks panen (%).

Hasil penelitian menunjukan bahwa pemberian biochar dosis 10 t/ha meningkatkan bobot kering akar fase vegetatif akhir. Penggunaan jenis tanaman berbeda meningkatkan hasil tanaman kacang kedelai terhadap jumlah dan kerapatan stomata, luas daun, bobot kering tajuk vegetatif, bobot kering akar vegetatif, jumlah polong per tanaman, jumlah biji per tanaman, bobot biji per tanaman, bobot 100 biji, dan indeks panen. Terjadi interaksi antara jenis tanaman dengan dosis biochar terhadap bobot kering akar fase vegetatif akhir, dengan perlakuan jenis tanaman kedelai dan dosis biochar 10t/ha hasil tertinggi.

SUMMARY

The demand for peanuts in Indonesia has not been met, while national peanut production continues to decline yearly. Therefore, solutions are needed to increase peanut crop yields and maintain the agricultural ecosystem. One solution is the application of biochar. Biochar is a biological charcoal produced by incomplete combustion, leaving nutrients that enrich the soil. The purpose of this research is to determine the effect of biochar application on the physiological characteristics and production yields of soybean, mung bean, and red bean plants.

The research was conducted from December 2023 to April 2024. The research activities took place in Singasari Kawaranglewas Village, at the Experiment Garden Laboratory, the Agronomy and Horticulture Laboratory, and the Agroecology Laboratory of the Faculty of Agriculture, Jenderal Soedirman University. The study used a Randomized Block Design (RBD). The treatment combinations in this study were biochar treatments with various doses, namely without biochar application, application of 10 t/ha, and application of 20 t/ha, and variations of different types of leguminous plants, namely soybean, mung bean, and red bean plants. The observed variables included the number and density of stomata (units/mm²), leaf area (cm²), leaf greenness, chlorophyll content (mg), dry weight of vegetative shoots (g), root dry weight (g), generative shoot weight (g), number of pods per plant, number of seeds per plant, seed weight per plant (g), weight of 100 seeds (g), and harvest index (%).

The research results showed that the application of biochar at a dose of 10 t/ha increased the dry root weight at the late vegetative phase. The use of different plant species increased the yield of soybean plants concerning the number and density of stomata, leaf area, vegetative shoot dry weight, vegetative root dry weight, number of pods per plant, number of seeds per plant, seed weight per plant, weight of 100 seeds, and harvest index. There was an interaction between plant species and biochar dose on dry root weight at the late vegetative phase, with the highest result obtained from the treatment of soybean plants and a biochar dose of 10 t/ha.