

RINGKASAN

Ubi jalar merupakan komoditas pangan penting yang berperan dalam ketahanan pangan serta memiliki potensi besar karena kandungannya. Permintaan ubi jalar terus meningkat, namun produksi masih terbatas akibat penurunan luas lahan. Di Kabupaten Banyumas, produksi ubi jalar cenderung menurun dari tahun 2019–2023, dipengaruhi oleh kerusakan lahan pertanian akibat penggunaan bahan kimia berlebih. Upaya peningkatan produktivitas dilakukan dengan penggunaan pupuk organik (pupuk kandang, kompos, azolla) dan biochar yang mampu memperbaiki kesuburan tanah, meningkatkan ketersediaan hara, memperbaiki struktur tanah, serta membantu pengendalian hama dan penyakit. Penelitian ini bertujuan untuk mengetahui pengaruh aplikasi pupuk organik terhadap karakter fisiologi dan hasil ubi jalar ungu, mengetahui pengaruh aplikasi *biochar plus* terhadap karakter fisiologi dan hasil ubi jalar ungu, mengetahui pengaruh aplikasi pupuk organik dan *biochar plus* terhadap karakter fisiologi & hasil ubi jalar ungu.

Penelitian ini dilaksanakan di Desa Bobosan, Kecamatan Purwokerto Utara, Kabupaten Banyumas, Balai Benih Padi dan Palawija, Desa Bojongsari, Kecamatan Kembaran, Kabupaten Banyumas, Laboratorium Agronomi dan Hortikultura, Fakultas Pertanian, Universitas Jenderal Soedirman. Waktu penelitian dimulai pada bulan September 2024 sampai dengan bulan Agustus 2025. Rancangan Acak Kelompok (RAK) faktorial yang terdiri atas dua faktor kombinasi perlakuan. Faktor pertama adalah perlakuan pupuk organik (O), yaitu O1 = tanpa pupuk organik; O2 = pupuk organik sapi; O3 = pupuk organik kambing. Faktor kedua adalah perlakuan biochar (B), yaitu B1 = biochar; B2 = *biochar plus* POC; B3 = *biochar plus* azolla. Berdasarkan kedua faktor tersebut, didapat kombinasi perlakuan sebanyak 9 perlakuan. Setiap perlakuan masing-masing diulang sebanyak 3 kali, sehingga secara keseluruhan menghasilkan 27 unit percobaan.

Variabel yang diamati yaitu kerapatan stomata, lebar bukaan stomata, kadar klorofil daun, Total Padatan Terlarut, jumlah ubi, bobot ubi, diameter ubi, panjang ubi, indeks panen, suhu, kelembaban, intensitas cahaya, dan curah hujan. Data hasil pengamatan dianalisis secara statistik dengan uji F dengan taraf kepercayaan 95% untuk mengetahui pengaruh perlakuan. Apabila hasil analisis yang dilakukan menunjukkan adanya perbedaan yang nyata, maka analisis dilanjutkan dengan uji *Duncan's Multiple Range Test* (DMRT) dengan taraf kepercayaan 95%.

Hasil penelitian menunjukkan bahwa pupuk organik kambing dan pupuk organik sapi belum mampu meningkatkan karakter fisiologi dan hasil ubi jalar ungu, Aplikasi *biochar plus* POC mampu meningkatkan hasil yaitu jumlah ubi sebesar 31,95%, sementara itu aplikasi biochar dan *biochar plus* azolla belum mampu meningkatkan karakter fisiologi dan hasil tanaman ubi jalar ungu. Namun demikian, aplikasi pupuk organik sapi dan *biochar plus* POC mampu meningkatkan kadar klorofil daun a, b, dan klorofil total secara berturut-turut sebesar 81,8%, 122,7%, dan 72,2%. Hasil penelitian menunjukkan bahwa bobot ubi per tanaman yang dihasilkan memiliki bobot rata-rata di golongan *Grade A* dan *B* sesuai standar mutu SNI yang menjadi indikator mutu ubi yang baik.

SUMMARY

Sweet potatoes are an important food commodity that plays a role in food security and has great potential due to their nutritional content. Demand for sweet potatoes continues to rise, but production remains limited due to reduced farmland areas.. In Banyumas District, sweet potato production has been declining from 2019 to 2023, influenced by soil degradation caused by excessive chemical use. Efforts to enhance productivity include the use of organic fertilizers (manure, compost, azolla) and biochar, which improve soil fertility, enhance nutrient availability, improve soil structure, and aid in pest and disease control. This study aims to determine the effect of organic fertilizer application on the physiological characteristics and yield of purple sweet potatoes, to determine the effect of biochar plus application on the physiological characteristics and yield of purple sweet potatoes, and to determine the effect of organic fertilizer and biochar plus application on the physiological characteristics and yield of purple sweet potatoes.

This study will be conducted in the following areas: Bobosan Village, Purwokerto Utara Subdistrict, Banyumas Regency; Rice and Crops Seed Center, Bojongsari Village, Kembaran Subdistrict, Banyumas Regency; Agronomy & Horticultural Laboratory, Faculty of Agriculture, and Research Laboratory Jenderal Soedirman University. The study period will run from September 2024 to August 2025. A factorial Randomized Block Design (RBD) consisting of two treatment combination factors. The first factor is organic fertilizer treatment (P); P0 = no organic fertilizer; P1 = cow organic fertilizer; P2 = goat organic fertilizer. The second factor is biochar treatment (B), where B1 = biochar; B2 = biochar plus leachate; B3 = biochar plus azolla. Based on these two factors, nine treatment combinations were obtained. Each treatment was repeated three times, resulting in a total of 27 experimental units.

The variables observed were stomatal density, stomatal opening width, leaf chlorophyll content, Total Dissolved Solids, number of tubers, tuber weight, tuber diameter, tuber length, harvest index, temperature, humidity, light intensity, and rainfall. The observational data were statistically analyzed using an F-test at a 95% confidence level to determine the effect of the treatment. If the analysis results indicated significant differences, the analysis was continued with Duncan's Multiple Range Test (DMRT) at a 95% confidence level.

The results of the study indicate that goat manure and cow manure organic fertilizers have not been able to improve the physiological characteristics and yield of purple sweet potatoes. The application of biochar plus POC was able to increase the yield, specifically the number of tubers, by 31.95%. Meanwhile, the application of biochar and biochar plus azolla has not been able to improve the physiological characteristics and yield of purple sweet potatoes. However, the application of cow organic fertilizer and biochar plus POC was able to increase the levels of leaf chlorophyll a, b, and total chlorophyll by 81.8%, 122.7%, and 72.2%, respectively. The results showed that the weight of tubers per plant produced had an average weight in Grade A and B according to SNI quality standards, which is an indicator of good tuber quality.