RINGKASAN

Ubi jalar (*Ipomoea batatas* L.) merupakan salah satu sumber karbohidrat utama di Indonesia setelah beras, jagung, dan ubi kayu, serta memiliki nilai gizi tinggi karena mengandung pati, vitamin, dan mineral penting. Di Kabupaten Banyumas, produktivitas ubi jalar selama periode 2020–2024 cenderung stabil meskipun produksi dan luas panen berfluktuasi, yang menunjukkan masih rendahnya hasil di tingkat petani dibanding potensi hasil riset. Upaya peningkatan hasil dapat dilakukan melalui penerapan pupuk organik dan biochar sebagai pembenah tanah untuk memperbaiki struktur, meningkatkan ketersediaan hara, serta mendukung pertumbuhan tanaman. Penelitian ini bertujuan untuk mengetahui pengaruh aplikasi pupuk organik dan biochar plus terhadap karakter fisiologi dan hasil ubi jalar kuning, dengan tujuan mendukung peningkatan produktivitas berkelanjutan sekaligus mengurangi ketergantungan terhadap pupuk kimia sintetis. Hasil penelitian diharapkan dapat menjadi dasar pengembangan teknologi budidaya ubi jalar berkelanjutan yang ramah lingkungan dan efisien dalam penggunaan hara.

Penelitian ini dilakukan di Desa Bobosan (Kecamatan Purwokerto Utara, Kabupaten Banyumas), Desa Piasa Kulon (Kecamatan Somagede, Kabupaten Banyumas), Balai Benih Padi dan Palawija Dinas Pertanian Tanaman Pangan, Bojongsari, Kecamatan Kembaran, Kabupaten Banyumas, Laboratorium Agroekologi, serta Laboratorium Agronomi dan Hortikultura Fakultas Pertanian Universitas Jenderal Soedirman terhitung dari bulan September 2024 hingga Juli 2025. Rancangan yang digunakan yaitu rancangan acak kelompok (RAK) faktorial dengan dua faktor perlakuan. Faktor pertama yaitu perlakuan pupuk organik (O), yang terdiri atas O1 = tanpa pupuk organik, O1 = pupuk organik kambing, O2 = pupuk organik sapi. Faktor kedua yaitu perlakuan *biochar plus*, yang terdiri atas B1 = *biochar*, B2 = *biochar plus* POC, dan B3 = *biochar plus azolla*. Analisis data yang dilakukan menggunakan analisis keragamannya dengan Uji F dan apabila berbeda nyata dilanjutkan dengan *Duncan's Multiple Range Test* (DMRT).

Hasil penelitian menunjukkan bahwa aplikasi pupuk organik menunjukkan menunjukkan hasil yang setara terhadap karakter fisiologi maupun hasil ubi jalar kuning. Pada aplikasi *biochar plus* memberikan pengaruh yang setara terhadap beberapa variabel fisiologi dan hasil tanaman. Namun, pada perlakuan aplikasi *biochar plus azolla* memberikan hasil terbaik pada panjang ubi jalar kuning yaitu meningkat sebesar 19,5% dari perlakuan lainnya.

SUMMARY

Sweet potato (Ipomoea batatas L.) is one of the main sources of carbohydrates in Indonesia after rice, corn, and cassava, and has high nutritional value because it contains starch, vitamins, and essential minerals. In Banyumas Regency, sweet potato productivity during the 2020–2024 period tended to be stable even though production and harvested area fluctuated, which indicates that yields at the farmer level are still low compared to potential research results. Efforts to increase yields can be made through the application of organic fertilizers and biochar as soil conditioners to improve structure, increase nutrient availability, and support plant growth. This study aims to determine the effect of organic fertilizer and biochar plus application on the physiological characteristics and yield of yellow sweet potatoes, with the aim of supporting sustainable productivity increases while reducing dependence on synthetic chemical fertilizers. The results of this study are expected to form the basis for the development of sustainable sweet potato cultivation technology that is environmentally friendly and efficient in nutrient use.

This research was conducted in Bobosan Village (North Purwokerto District, Banyumas Regency), Piasa Kulon Village (Somagede District, Banyumas Regency), Rice and Secondary Crops Seed Center of the Food Crops Agriculture Service, Bojongsari, Kembaran District, Banyumas Regency, Agroecology Laboratory, and Agronomy and Horticulture Laboratory, Faculty of Agriculture, Jenderal Soedirman University from September 2024 to July 2025. The design used was a factorial randomized block design (RAK) with two treatment factors. The first factor was organic fertilizer treatment (O), which consisted of O1 = without organic fertilizer, O1 = goat organic fertilizer, O2 = cow organic fertilizer. The second factor was treatment biochar plus, which consists of B1 =biochar, B2 =biochar plus POC, give B3 =biochar plus azolla. Data analysis was carried out using diversity analysis with the F test and if there was a significant difference, it was continued with Duncan's Multiple Range Test (DMRT).

The results of the study showed that the application of organic fertilizer showed equivalent results on the physiological characteristics and yield of yellow sweet potatoes. Biochar plus provide an equal influence on several physiological variables and crop yields. However, in the application treatment biochar plus azolla gave the best results on the length of yellow sweet potatoes, namely an increase of 19.5% from other treatments.