

INTISARI

Budidaya Padi di lahan suboptimal selalu menjadi kajian penting karena rendahnya produktivitas dibandingkan dengan lahan irigasi. Untuk meningkatkan hasil padi di lahan suboptimal, pemberian bahan pembenah tanah berupa biochar dan pupuk organik dapat dilakukan untuk mempertahankan retensi air di dalam tanah. Secara umum, penelitian ini dilaksanakan di Kawasan Hutan Menggoran, Bleberan, Playen, Gunung Kidul, Daerah Istimewa Yogyakarta pada bulan November 2021-Juni 2022. Rancangan yang digunakan yakni *split plot* dengan pengacakan lingkungan berbasis *randomised complete block design (RCBD)* dengan petak utama yakni bahan pembenah tanah yang terdiri 4 kombinasi meliputi tanpa pembenah tanah, biochar arang sekam (20 ton/ha), pupuk organik (20 ton/ha), dan kombinasi pupuk organik (10 ton/ha) dan biochar (10 ton/ha). Sementara itu, anak petak terdiri dari 12 jenis genotipa padi yakni G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, Inpari 33 dan Inpari 30 Ciherang S1. Hasil penelitian menunjukkan bahwa pemberian bahan pembenah tanah dapat menurunkan kandungan prolin, meningkatkan kadar lengas tanah, kandungan air nisbi, aktivitas nitrat reduktase, klorofil a dan b, kandungan nitrogen, fosfor, dan kalium jaringan serta produktivitas tanaman. Produktivitas tertinggi terjadi pada perlakuan bahan organik dengan genotipa G2 sebesar 5,60 ton per ha. Pada *yield gap analysis*, hasil padi dengan menggunakan pembenah tanah pupuk organik atau biochar mampu meningkatkan hasil padi pada kisaran 0,60-3,50 ton per ha dibandingkan dengan perlakuan tanpa pemberian pembenah tanah. Secara keseluruhan, *kesenjangan hasil mutlak* antara pemberian dan tanpa pembenah tanah (GAP 1) pada semua genotipa berkisar pada 1,50-3,50 ton per ha, biochar + organik dengan tanpa pembenah tanah (GAP 2) berkisar pada 0,60-3,50 ton per ha, biochar dengan tanpa pembenah tanah (GAP 3) sebesar 0,70-2,60 ton per ha.

Kata kunci : Padi, lahan suboptimal, biochar, pupuk organik

ABSTRACT

Rice cultivation in arid land has always been an important study because of the low productivity compared to irrigated land. To increase rice yields, soil amendments in the form of biochar and organic fertilizers can be applied to increase soil fertility and water holding capacity for supporting rice growth. This research was conducted in Playen, Gunung Kidul from November 2021 to June 2022. The design used split plot and randomization based on randomized complete block design. The main plot was soil amendment consisting of 4 combinations, namely no amendment, rice husk biochar (20 tons/ha), organic fertilizer (20 tons/ha), and a combination of organic fertilizer (10 tons/ha) and biochar (10 tons/ha). Meanwhile, the subplot consisted of 12 types of rice genotypes namely G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, Inpari 33 and Inpari 30. The results showed that the application of soil amendments decreased proline but increased soil moisture content, relative water content, nitrate reductase activity, chlorophyll, nitrogen, phosphorus, and potassium and rice yield. The highest productivity was found by the combination of organic amendment and G2 around 5.60 tons/ha. Furthermore, using soil amendments were able to increase the rice yields in the range about 0.60 - 3.50 tons/ha. In addition, the absolute yield gap between organic and no amendment (GAP 1) in all genotypes ranged from 1.50 to 3.50 tons/ha, organic + biochar and no amendment (GAP 2) was from 0.60 to 3.50 tons/ha, biochar with control (GAP 3) was 0.70 - 2.60 tons/ha.

Keywords: Paddy, arid land, biochar, organic amendment