

INTISARI

Penelitian ini bertujuan untuk mengetahui mineralisasi Karbon dan Nitrogen (NH_4^+ dan NO_3^-) tanah Andisol yang dikelola dengan sistem pertanian organik, konvensional dan konvensional yang diberi biochar di lereng Merbabu. Penelitian dilaksanakan pada bulan Maret sampai Juli 2022 pada ketiga sistem pengelolaan lahan di Desa Batur, Kecamatan Getasan, Kabupaten Semarang, dengan lapisan 0-20 cm dan 20-40 cm. Parameter yang diukur melingkupi sifat fisika, dan kimia. Sifat fisik-kimia tanah yang dianalisis meliputi tekstur, berat volume, pH- H_2O , pH-NaF, bahan organik, KPK, N-total, C/N, C-termineralisasi, N-termineralisasi. Hasil penelitian menunjukkan bahwa ada interaksi pada pengelolaan lahan tanah terhadap berat volume, pH, C/N, N-total, C-organik, C-mineralisasi dan N mineralisasi. Pada lapisan tanah 0-20 cm dan 20-40 cm menunjukkan interaksi terhadap berat volume, pH dan tidak ada interaksi antara pengelolaan lahan dan lapisan tanah terhadap KPK. Laju mineralisasi diamati selama 70 hari dengan periode pengamatan inkubasi 14, 28, 42,56, 70 minggu. Hasil penelitian menunjukkan bahwa mineralisasi Karbon dan Nitrogen pada tanah Andisol sistem pertanian organik, konvensional, dan konvensional yang diberi biochar, laju mineralisasi Karbon makin menurun seiring dengan pertambahan waktu inkubasi, sedangkan laju mineralisasi nitrogen cenderung tidak stabil dengan nilai tertinggi ada pada minggu inkubasi ke-70. Mineralisasi Karbon tertinggi ada pada pertanian biochar dan mineralisasi nitrogen cenderung tidak stabil pada ketiga sistem pertanian.

Kata kunci: C-Mineralisasi, N-Mineralisasi, Biochar, Pertanian Konvensional, Pertanian Organik

ABSTRAK

The purpose of this research is to determine of mineralization of karbon and nitrogen (NH_4^+ and NO_3^-) in Andisol soils on the slopes of Merbabu that have been farmed using organik, konvensional, and konvensional with biochar farming techniques. The research was carried out among the March until July 2022 using two depths of 0–20 cm and 20–40 cm from the three land management systems in Batur Village, Getasan District, Semarang Regency. Both chemical and physical characteristics are analyzed. The soil was examined for its texture, bulk weight, pH- H_2O , pH- NaF , organik matter, KPK, N-total, C/N, C-mineralized, and N-mineralized parameters. The results revealed that the soil management treatment had an interaction with volume weight, pH, C/N, N-total, C-organik, C-mineralization, and N mineralization. There is no correlation between land use and soil depth on the KPK, although there is an interaction with volume weight and pH in treating soil depth. the rate of mineralization was observed for 70 days, with time of incubation of 14, 28, 42,56, 70 days. The results indicated that organik, konvensional, and konvensional with biochar agricultural systems resulted in karbon and nitrogen mineralization in Andisol soil. While the rate of nitrogen mineralization tends to be unstable, with the highest values occurring between the eighth and tenth weeks of incubation, the rate of karbon mineralization tends to decrease with increasing incubation duration. In all three farming systems, nitrogen mineralization is often unstable, while karbon mineralization is highest in biochar farming.

Keywords: C-Mineralization, N-Mineralization, Biochar, Konvensional Agriculture, Organik Agriculture