INTISARI

RESPON FRAKSI LABIL KARBON DAN NITROGEN TERHADAP PENGGUNAAN SISTEM PERTANIAN SAYURAN KONVENSIONAL DAN ORGANIK DI TANAH ANDISOL

Fajar Hidayanto
16/407507/PPN/04158

Bahan organik terjerap kuat di area permukaan spesifik bahan amorf, namun karena faktor suhu di daerah tropis menyebabkan laju dekomposisi cenderung tinggi. Penelitian ini bertujuan untuk melihat respon fraksi labil akibat penggunaan sistem pertanian organik dan konvensional, selain itu tujuan lain untuk mengkaji reaktivitas bahan amorf akibat perbedaan penggunaan sistem pertanian sayuran. Sistem pertanian dibedakan menjadi tiga yaitu sistem pertanian organik (O1) berlokasi di Desa Desa Selo Ngisor, sistem pertanian konvensional input bahan organik tinggi (K1) berlokasi di Desa Ngablak dan sistem pertanian konvensional input bahan organik rendah (K2) berada di Desa Batur, Jawa Tengah. Penelitian dilakukan di dua kedalaman, 0–25cm dan 25–50cm. Hasil analisis kimia tanah yang meliputi pH H_2O, C-organik (%), KPK (cmol(+).kg^{-1}), N-total (%), asam humat (%), asam fulvat (%) menunjukkan sistem pertanian O1 tertinggi dibanding K1 dan K2. Sifat fisika yang meliputi berat jenis (g.cm^{-3}) dan berat volume (g.cm^{-3}) tertinggi berada di sistem pertanian K2 namun nilai porositas (%) cenderung rendah. Sistem pertanian O1 mampu meningkatkan kandungan fraksi labil C-POM (*Particulate Organic Matter*), C-BMT (*Biomassa Mikroba Total*), N-POM dan N-BMT, masing-masing sebesar 13%, 85%, 57% dan 59%. Laju mineralisasi C dan N tertinggi pada pertanian O1 dikarenakan tingginya input yang diberikan mampu meningkatkan aktivitas mikroba untuk melakukan dekompoisi bahan organik selain itu faktor kandungan alofan lebih rendah dibanding sistem pertanian lainnya. Kandungan bahan amorf tertinggi di sistem pertanian K2 didukung dengan tingginya nilai pH NaF.

Kata kunci: sistem pertanian, fraksi labil, laju mineralisasi, amorf, alofan

Disetujui oleh,

Pembimbing

Dr. Ir. Benito Heru Purwanto, M.Agr.Sc

Penulis

Fajar Hidayanto

ABSTRACT

RESPONSE OF CARBON AND NITROGEN LABILE FRACTION ON THE USE OF CONVENTIONAL AND ORGANIC VEGETABLE FARMING SYSTEMS IN ANDISOL

Fajar Hidayanto
16/407507/PPN/04158

Organic matter are strongly absorbed in the specific surface area of the amorphous materials, but due to the temperature factor in the tropics causes the rate of decomposition tends to be high. This research aims to see the response of the labile fractions due to the use of organic and conventional farming systems, in addition to the other aims to assess the reactivity of amorphous material due to differences in vegetable farming systems. The farming system is differentiated into three namely organic farming systems (O1) located in Selo Ngisor Village village, a conventional farming system of high organic matter inputs (K1) located in Ngablak Village and conventional farming system of low organic matter input (K2) is located in the village of Batur, Central Java. The study was conducted in two depths, 0 – 25cm and 25 – 50cm. Results of chemical soil analysis which includes the pH of H_2O, SOC (%), CEC (cmol (+). kg^{-1}), N-Total (%), humic acid (%), fulvic acid (%) shows the highest O1 farming system compared to K1 and K2. The physical properties that include the particle density ($g.cm^{-3}$) and bulk density ($g.cm^{-3}$) highest is in the K2 farming system but the value of porosity (%) tend to low. O1 farming system is able to increase the content of the labile fraction C-POM (*Particulate Organic Matter*), C-TMB (*Total Microbial Biomass*), N-POM and N-TBM, respectively at 13%, 85%, 57% and 59%. C and N mineralization rate highest on farminf system O1 because of the high input given the ability to increase microbial activity for the decomposting of organic matter besides the content factor lower allophane than other farming systems. Content of the highest amorphous material in K2 farming system supported by the high value of pH NaF.

Keywords: farming system, labile fraction, mineralization rate, amorphous material, allophane

Approved by,

Thesis supervisor

Dr. Ir. Benito Heru Purwanto, M.Agr.Sc

Author

Fajar Hidayanto