

INTISARI

Vertisol di Desa Plembutan, Playen, Gunungkidul memiliki kandungan lempung tinggi, pH basa, serta kalsium karbonat tinggi yang menyebabkan fosfor mudah terfiksasi sehingga ketersediaannya rendah bagi tanaman. Penelitian ini bertujuan untuk mengkaji pengaruh pemberian pupuk SP-26 dan bahan pembenah tanah (kalium humat, mikoriza, dan nano silika) terhadap sifat kimia tanah, pertumbuhan, dan serapan fosfor tanaman padi gogo Gamagora (*Oryza sativa L.*). Penelitian dilakukan di rumah kaca dengan menggunakan Rancangan Acak Lengkap (RAL) non-faktorial dengan sembilan kombinasi perlakuan : P0 (kontrol), P1 (pupuk kandang sapi 2 ton/ha), P100 (100% SP-26 150kg/ha), P50 (50% SP-26 75 kg/ha), P50M (P50 + mikoriza 10 g/tanaman), P50H (P50 + kalium humat 10 kg/ha), P50S (P50 + nano silika 3 kg/ha), P50HS (P50 + kalium humat 10 kg/ha + nano silika 3 kg/ha), P50MHS (P50 + kalium humat 10 kg/ha + nano silika 3 kg/ha + mikoriza g/tanaman), masing-masing diulang tiga kali dengan 27 unit percobaan. Hasil penelitian menunjukkan bahwa perlakuan berpengaruh nyata terhadap beberapa sifat kimia tanah, seperti penurunan pH dan meningkatkan kandungan C-Organik serta ketersediaan fosfor secara signifikan. Perlakuan P50HS (SP-26 dosis 50% + kalium humat 10 kg/ha + nano silika 3 kg/ha) memberikan hasil terbaik pada sebagian besar parameter agronomi. Dengan demikian, kombinasi pupuk SP-26 dosis 50% dengan humat dan silika efektif memperbaiki sifat kimia Vertisol, meningkatkan ketersediaan dan serapan fosfor, serta mendukung pertumbuhan padi gogo di Vertisol yang bersifat *calcareous*.

Kata kunci: Padi Gogo, Vertisol, Fosfor, Pupuk SP-26, Kalium Humat, Nano Silika

ABSTRACT

Vertisol soil in Plembutan Village, Playen, Gunungkidul is characterized by high clay content, alkaline pH, and high calcium carbonate, which causes phosphorus to be easily fixed and thus poorly available for plants. This study aimed to examine the effects of SP-26 fertilizer and soil amendments (farmyard manure, potassium humate, mycorrhiza, and nano-silica) on soil chemical properties, growth, and phosphorus uptake of gogo rice (*Oryza sativa* L.). The experiment was conducted in a greenhouse using a Completely Randomized Design (CRD) non-factorial with nine treatment combinations: P0 (control), P1 (farmyard manure 2 tons/ha), P100 (100% SP-26 150 kg/ha), P50 (50% SP-26 75 kg/ha), P50M (P50 + mycorrhiza 10 g/plant), P50H (P50 + potassium humate 150 kg/ha), P50S (P50 + nano-silica 3 kg/ha), P50HS (P50 + potassium humate 150 kg/ha + nano-silica 3 kg/ha), and P50MHS (P50 + potassium humate 150 kg/ha + nano-silica 3 kg/ha + mycorrhiza 10 g/plant), each replicated three times for a total of 27 experimental units. The results showed that treatments significantly affected several soil chemical properties, such as decreasing soil pH and increasing organic C and available phosphorus. The P50HS treatment (50% SP-26 + potassium humate 150 kg/ha + nano silica 3 kg/ha) produced the best results in most agronomic parameters. Thus, the combination of 50% SP-26 with potassium humate and nano-silica is effective in improving the chemical properties of calcareous Vertisol, enhancing phosphorus availability and uptake, and supporting the growth of upland rice on Vertisol soils.

Keywords: Gogo Rice, Vertisol, SP-26 Fertilizer, Phosphorus, Potassium humate, Nano-silica