

RINGKASAN

Jagung (*Zea mays* L.) merupakan tanaman semusim yang termasuk pada family rumput - rumputan (*graminae*) yang memiliki banyak manfaat salah satunya yaitu bahan pangan. Tanaman jagung dapat ditanam pada tanah Humic Ultisol karena jagung memiliki daya adaptasi yang tinggi terhadap tanah. Namun, kondisi tanah Humic Ultisol yang memiliki unsur hara yang terfiksasi oleh mineral menjadikan tanaman jagung menjadi sulit mendapatkan unsur hara. Humic Ultisol memiliki kandungan hara makro yang rendah terutama pada K, Mg, serta Ca. Kandungan hara makro yang rendah ini sesuai dengan analisis tanah awal yang membuktikan bahwa kandungan hara yang rendah diakibatkan oleh pH yang masam. Salah satu upaya untuk meningkatkan kesuburan tanah yaitu dengan dilakukan kombinasi Pupuk Organik Cair dan Pupuk N,P,K. Penelitian ini bertujuan untuk 1) Mengetahui pengaruh berbagai kombinasi pupuk organik cair dan pupuk N,P,K terhadap pertumbuhan dan hasil jagung. 2) Mengetahui pengaruh berbagai kombinasi pupuk organik cair dan pupuk N,P,K terhadap hara makro N,P,K tanah Humic Ultisol.

Penelitian ini dilaksanakan di Desa Kaliori, Kalibagor Kabupaten Banyumas dengan ketinggian tempat pengujian 58 mdpl serta dilaksanakan analisis kimia di laboratorium tanah dan sumber daya lahan Faklutas Pertanian Universitas Jenderal Soedirman. Penelitian ini dilaksanakan mulai bulan Maret sampai dengan bulan November 2024. Bahan penelitian meliputi pupuk organik cair yang telah dirakit pada tahap penelitian sebelumnya, pupuk kandang, tanah Humic Ultisol, pupuk Urea, pupuk KCl, pupuk TSP, benih jagung hibrida P27 dan bahan-bahan kimia untuk analisis tanah. Peralatan yang digunakan antara lain meliputi alat kantong plastik untuk pengambilan sampel tanah, *sprayer*, bor tanah, dan alat alat laboratorium yang digunakan untuk analisis tanah, antara lain timbangan, spektrofotometer, labu kjedahl, labu destilasi, labu erlenmeyer, buret, labu ukur, gelas ukur, pipet ukur, pipet volume, saringan, mortar dan pestle, spatula, pengaduk magnetik, tabung reaksi, dispenser, tabung *digestion*, dan alat sentrifugasi. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) non faktorial dengan 9 perlakuan dan 3 kali ulangan. Penelitian dilakukan pada petak lahan dengan ukuran 2,5 x 10 meter sebanyak 27 petak. Variabel yang diamati meliputi pH H₂O, pH KCl, KTK, C-organik, C/N rasio, N-tersedia, N-total, P-tersedia, P-total, K-tersedia, K-total, tinggi tanaman, jumlah daun, bobot brangkasan tanaman segar, bobot tongkol segar, bobot tongkol tanpa klobot, dan bobot ubinan.

Hasil penelitian ini menunjukkan bahwa pemberian kombinasi Pupuk Organik Cair dan Pupuk N,P,K mampu meningkatkan beberapa sifat kimia tanah, pertumbuhan dan hasil. Pemberian kombinasi pupuk organik cair dan pupuk N,P,K berpengaruh nyata terhadap C/N Rasio meningkat 72,73%, KTK meningkat 34,55%, dan N-total meningkat 165,38%. Pemberian kombinasi Pupuk Organik Cair dan Pupuk N,P,K berpengaruh nyata terhadap tinggi tanaman meningkat 51,98% dan jumlah daun meningkat 10,72%.

SUMMARY

Corn (Zea mays L.) is an annual plant belonging to the grass family (Gramineae) that has numerous benefits, one of which is as a food source. Corn can be cultivated in Humic Ultisol soils due to its high adaptability. However, Humic Ultisol soils contain nutrients that are fixed by minerals, making it difficult for corn plants to obtain essential nutrients. Humic Ultisols have low macro-nutrient content, particularly in K, Mg, and Ca. This low nutrient content aligns with initial soil analysis showing that the deficiency is caused by acidic pH levels. One approach to improve soil fertility is through the combination of Liquid Organic Fertilizer (LOF) and N,P,K fertilizer. This study aims to 1) Examine the effect of various combinations of LOF and N,P,K fertilizer on corn growth and yield. 2) Investigate the effect of various combinations of LOF and N,P,K fertilizer on N,P,K macro-nutrients in Humic Ultisol soil.

The study was conducted in Kaliiori Village, Kalibagor Subdistrict, Banyumas Regency, with the experimental site located at 58 meters above sea level. Soil chemical analysis was performed at the Soil and Land Resources Laboratory of the Faculty of Agriculture, Jenderal Soedirman University. The research period spanned from March to November 2024. Research materials included biofertilizers developed in previous research stages, manure, Humic Ultisol soil, Urea fertilizer, KCl fertilizer, TSP fertilizer, P27 hybrid corn seeds, and chemicals for soil analysis. Equipment used included plastic bags for soil sampling, sprayers, soil augers, and various laboratory apparatus for soil analysis such as scales, spectrophotometers, Kjeldahl flasks, distillation flasks, Erlenmeyer flasks, burettes, volumetric flasks, graduated cylinders, pipettes, filters, mortar and pestle, spatulas, magnetic stirrers, test tubes, dispensers, digestion tubes, and centrifuges. The study employed a Non-Factorial Randomized Complete Block Design (RCBD) with 9 treatments and 3 replications. Experiments were conducted on 27 plots measuring 2.5 x 10 meters each. Observed variables included Soil properties: H₂O pH, KCl pH, CEC, organic C, C/N ratio, available N, total N, available P, total P, available K, total K Plant parameters: plant height, leaf count, fresh plant biomass weight, fresh cob weight, dehusked cob weight, and plot yield weight.

The results showed indicate that the application of a combination of Liquid Organic Fertilizer and N,P,K fertilizer can improve several soil chemical properties, plant growth, and yield. The combined application of liquid organic fertilizer and N,P,K fertilizer significantly affected the C/N Ratio with an increase of 72.73%, CEC (Cation Exchange Capacity) with an increase of 34.55%, and total N with an increase of 165.38%. Additionally, the combination of Liquid Organic Fertilizer and N,P,K fertilizer significantly influenced plant height, which increased by 51.98%, and the number of leaves, which increased by 10.72%.