

RINGKASAN

Jagung menjadi tanaman pangan yang penting, selain gandum dan padi sebagai sumber karbohidrat utama. Rendahnya produktivitas tanaman jagung disebabkan oleh faktor tanah dan unsur hara. Tanaman jagung dapat tumbuh dan berproduksi optimal dengan unsur hara yang cukup selama pertumbuhannya. Permasalahan pengembangan tanah Ultisol dalam budidaya tanaman jagung yaitu Ultisol mempunyai kemasaman tanah tinggi, kejenuhan Al tinggi, dan kandungan hara yang rendah. Alternatif yang dapat dikembangkan untuk meningkatkan produktivitas jagung pada tanah Ultisol adalah dengan pemberian pupuk organik cair yang dikombinasikan dengan pupuk anorganik (Urea, TSP-46 dan KCl). Penelitian dilaksanakan di Desa Kaliori, Kecamatan Kalibagor, Kabupaten Banyumas untuk penanaman tanaman jagung dan pengambilan sampel tanah. Uji efektivitas pupuk organik cair di Desa Kaliori dilakukan pada ketinggian tempat pengujian yaitu 58 mdpl. Lokasi penelitian memiliki klasifikasi tanah Ultisol. Karakteristik tanah di lokasi pengujian meliputi pH tanah masam, tekstur halus hingga agak halus, KTK rendah, dan kandungan bahan organik rendah.

Penelitian ini bertujuan untuk mengetahui pengaruh pupuk organik cair dan pupuk NPK terhadap sifat kimia tanah Ultisol pada tanaman jagung serta mengetahui efektivitas pupuk organik cair dan pupuk NPK terhadap pertumbuhan tanaman jagung pada tanah Ultisol. Penelitian dilaksanakan dari bulan Maret hingga November 2024 dengan menggunakan RAK (Rancangan Acak Kelompok) terdiri atas 9 perlakuan dan 3 ulangan. Perlakuan yang digunakan adalah P0 (kontrol), P1 (100% NPK), P2 (75% NPK), P3 (75% NPK + 50% POC), P4 (75% NPK + 100% POC), P5 (75% NPK + 150% POC), P6 (100% NPK + 50% POC), P7 (100% NPK + 100% POC), dan P8 (100% + 150%). Variabel yang diukur yaitu pH H₂O, pH KCl, C-organik, KTK, N-tersedia, N-total, P-tersedia, P-total, K-tersedia, dan K-total, tinggi tanaman, jumlah daun, bobot tongkol berkelobot, bobot tongkol tanpa kelobot, bobot tongkol ubinan, dan bobot pipilan kering.

Hasil penelitian menunjukkan bahwa kombinasi pupuk organik cair dan pupuk anorganik berpengaruh nyata terhadap pH KCl (3,81), KTK (15,46 cmol⁽⁺⁾ kg⁻¹), N-tersedia (247,24 ppm), P-tersedia (5,75 ppm), tinggi tanaman 4 MST (52,16 cm), 6 MST (111,66 cm), dan 8 MST (172,06 cm), jumlah daun 8 MST (10,60 helai), bobot tongkol berkelobot (181,73 g), bobot tongkol tanpa kelobot (118,53 g), bobot tongkol ubinan (3386,66 g), dan bobot pipilan kering (49,93 g). Perlakuan kombinasi pupuk terbaik dalam meningkatkan sifat kimia tanah adalah P4 (75% NPK + 100% POC) dan kombinasi pupuk terbaik dalam meningkatkan pertumbuhan dan hasil tanaman jagung adalah P8 (100% NPK + 150% POC). Nilai RAE (*Relative Agronomic Effectiveness*) pupuk organik cair pada dosis 15 L ha⁻¹ sebesar 392 % yang artinya 3,92 kali lebih efektif dibandingkan dengan pemupukan NPK standar.

SUMMARY

Corn is an important food crops, besides wheat and rice as the main sources of carbohydrates. The low productivity of corn plants is caused by soil and nutrient factors. Corn plants can grow and produce optimally with sufficient nutrients during their growth. The problem in developing Ultisol soil for corn cultivation activities is that Ultisol has low soil acidity, high Al saturation, and is poor in nutrient content. An alternative that can be developed to increase corn productivity on Ultisol soil is the use of liquid organic fertilizer combined with inorganic fertilizers. The research was conducted in Kaliori Village, Kalibagor District, Banyumas Regency for planting corn plants and taking soil samples. The Effectiveness Test of Liquid Organic Fertilizer in Kaliori Village was carried out at an altitude of 58 meters above sea level. The research location has an Ultisol soil classification. Soil characteristics at the test location include acidic soil pH, fine-slightly fine texture, low CEC, and low organic matter content.

This study aims to determine the effect of liquid organic fertilizer and NPK fertilizer on the chemical properties of Ultisol soil on corn plants and to determine the effectiveness of liquid organic fertilizer and NPK fertilizer on the growth of corn plants on Ultisol soil. The study was conducted from March to November 2024 using RAK (Randomized Complited Design) consisting of 9 treatments and 3 replications. The treatments used were P0 (Control), P1 (100% NPK), P2 (75% NPK), P3 (75% NPK + 50% Liquid Organic Fertilizer), P4 (75% NPK + 100% Liquid Organic Fertilizer), P5 (75% NPK + 150% Liquid Organic Fertilizer), P6 (100% NPK + 50% Liquid Organic Fertilizer), P7 (100% NPK + 100% Liquid Organic Fertilizer), and P8 (100% + 150% Liquid Organic Fertilizer). The parameters measured were pH H_2O , pH KCl, C-organic, Kation Exchange Capacity, N-available, N-total, P-available, P-total, K-available, and K-total, plant height, number of leaves, weight of husked cobs, weight of unhusked cobs, weight of tiled cobs, and weight of dry corn kernels.

The results of the study showed that the combination of liquid organic fertilizer and inorganic fertilizer had a significant effect on KCl pH (3.81), CEC (15.46 $cmol^{(+)} kg^{-1}$), N-available (247.24 ppm), P-available (5.75 ppm), plant height 4 weeks after planting (52.16 cm), 6 weeks after planting (111.66 cm), and 8 weeks after planting (172.06 cm), number of leaves 8 weeks after planting (10.60 strands), weight of cobs with husks (181.73 g), weight of cobs without husks (118.53 g), weight of tiled cobs (3386.66 g), and weight of dry shells (49.93 g). The best fertilizer combination treatment in improving soil chemical properties is P4 (75% NPK + 100% Liquid Organic Fertilizer) and the best fertilizer combination in increasing corn plant growth and yield is P8 (100% NPK + 150% Liquid Organic Fertilizer). The value Relative Agronomic Effectiveness (RAE) of liquid organic fertilizer at a dose of 15 L ha^{-1} is 392%, which means it is 3,92 times more effective than standard NPK fertilization.