

RINGKASAN

Jagung, yang pertama kali ditanam di Amerika Tengah 8.000 hingga 10.000 tahun lalu, memiliki banyak varietas termasuk jagung manis (*Zea mays L. saccharata*) yang memiliki potensi ekonomi tinggi sebagai pangan dan pakan ternak. Di Indonesia, pemupukan penting untuk meningkatkan produksi jagung manis, terutama pada tanah Inceptisol yang sering ditemukan di sawah. Tanah Inceptisol, dengan tekstur kasar dan kandungan bahan organik yang bervariasi, dapat diperbaiki menggunakan pupuk NZEO-SR *Plus* yang meningkatkan efisiensi nitrogen dan ketahanan tanaman, serta Fly ash dan bottom ash (FABA) yang memperbaiki tekstur tanah dan kapasitas penyimpanan air.

Penelitian dilaksanakan di lahan Kelurahan Karangwangkal, Kecamatan Purwokerto Utara, Kabupaten Banyumas yang mempunyai ketinggian tempat kurang lebih 110 meter di atas permukaan laut (mdpl), serta analisis fisika dilaksanakan di Laboratorium Tanah, Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian dilaksanakan selama enam bulan mulai bulan September hingga bulan Januari. Penelitian dilaksanakan mulai dari bulan September 2023 – Januari 2024. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) yang terdiri atas dua faktor dan diulang 3 kali, faktor yang pertama yaitu pupuk NZEO-SR *Plus*, dan faktor kedua yaitu pemberian FABA (*Fly ash bottom ash*). Variabel yang diamati yaitu sifat fisika tanah meliputi tekstur tanah, kadar air tanah, porositas tanah, dan konsistensi tanah. Selain itu, terdapat variabel pertumbuhan tanaman meliputi tinggi tanaman, jumlah helai daun, diameter batang, dan jumlah bonggol jagung.

Hasil dari penelitian pemberian pupuk NZEO-SR *Plus* memberikan peningkatan terhadap variabel pertumbuhan tanaman, dengan hubungan linear yang kuat pada variabel jumlah helai daun, tinggi tanaman, dan diameter batang. Pada (perlakuan A3), rata-rata jumlah helai daun mencapai 12,64 helai, tinggi tanaman 80,93 cm, dan diameter batang 6,84 cm, sementara pada (perlakuan A0) menunjukkan hasil-hasil terendah. Hasil analisis juga menunjukkan nilai Regresi yang tinggi, yaitu 0,7492 untuk jumlah helai daun, 0,8691 untuk tinggi tanaman, dan 0,9689 untuk diameter batang, mengindikasikan bahwa pupuk NZEO-SR *Plus* secara signifikan meningkatkan pertumbuhan tanaman. Pemberian pupuk NZEO-SR *Plus* tidak mempengaruhi hasil sifat fisika tanah yang diamati seperti tekstur tanah, kadar air tanah, konsistensi tanah, dan porositas tanah. Selain itu, pemberian pupuk NZEO-SR *Plus* juga tidak berpengaruh terhadap jumlah bonggol jagung. Pemberian FABA (*Fly ash bottom ash*) pada penelitian inipun tidak mempengaruhi variabel pertumbuhan tanaman, seperti tinggi tanaman, jumlah helai daun, diameter batang, dan jumlah bonggol jagung. Selain itu pemberian FABA (*Fly ash bottom ash*) tidak mempengaruhi variabel sifat fisika tanah yang diamati seperti tekstur tanah, kadar air tanah, konsistensi tanah, dan porositas tanah.

SUMMARY

Corn, first cultivated in Central America 8,000 to 10,000 years ago, has many varieties including sweet corn (*Zea mays* L. *saccharata*), which has high economic potential as food and animal feed. In Indonesia, fertilization is crucial for improving sweet corn production, especially in Inceptisol soils commonly found in rice fields. Inceptisol soils, with their coarse texture and variable organic matter content, can be improved using NZEO-SR *Plus* fertilizer, which enhances nitrogen efficiency and plant resilience, as well as Fly ash and bottom ash (FABA), which improve soil texture and water retention capacity.

The research was conducted in the Karangwangkal area, Purwokerto Utara District, Banyumas Regency, which has an elevation of approximately 110 meters above sea level (asl). Physical analysis was carried out at the Soil Laboratory, Faculty of Agriculture, Jenderal Soedirman University. The study took place over six months from September to January, specifically from September 2023 to January 2024. This research used a Randomized Block Design (RBD) with two factors and was replicated three times. The first factor was the application of NZEO-SR *Plus* fertilizer, and the second factor was the application of FABA (Fly Ash Bottom Ash). Observed variables included soil physical properties such as soil texture, soil moisture content, soil porosity, and soil consistency. Additionally, plant growth variables were measured, including plant height, number of leaf blades, stem diameter, and number of corn ears.

The results of the study indicate that the application of NZEO-SR *Plus* fertilizer led to improvements in plant growth variables, showing a strong linear relationship with the number of leaf blades, plant height, and stem diameter. In treatment A3, the average number of leaf blades reached 12.64, plant height was 80.93 cm, and stem diameter was 6.84 cm, whereas treatment A0 showed the lowest results. The analysis also revealed high regression values: 0.7492 for the number of leaf blades, 0.8691 for plant height, and 0.9689 for stem diameter, indicating that NZEO-SR *Plus* fertilizer significantly enhances plant growth. However, the application of NZEO-SR *Plus* did not affect the observed soil physical properties such as soil texture, soil moisture content, soil consistency, and soil porosity. Additionally, NZEO-SR *Plus* fertilizer did not influence the number of corn ears. The application of FABA (Fly Ash Bottom Ash) in this study also did not affect plant growth variables, including plant height, number of leaf blades, stem diameter, and number of corn ears. Furthermore, FABA did not impact the observed soil physical properties such as soil texture, soil moisture content, soil consistency, and soil porosity.