# RINGKASAN

Kentang merupakan komoditas pertanian bernilai ekonomi tinggi. Selain berperan dalam diversifikasi pangan, kentang digunakan sebagai bahan baku industri dan komoditas ekspor. Di Indonesia, pemupukan kentang masih didominasi pupuk NPK sintetik karena dianggap praktis oleh petani, namun penggunaannya berpotensi menurunkan kualitas dan produktivitas lahan. Penelitian ini bertujuan untuk mengetahui pengaruh kombinasi berbagai dosis NPK dengan pupuk organik Palm Bionic atau pupuk hayati Bioneensis terhadap pertumbuhan dan hasil kentang varietas Atlantik, mengetahui aplikasi paket pemupukan terbaik untuk mendukung pertumbuhan dan hasil kentang varietas Atlantik, dan mengetahui efisiensi penggunaan pupuk berdasar nilai *Relative Agronomic Efficiency.*

Penelitian dilaksanakan di Desa Karangsari, Kecamatan Pulosari, Kabupaten Pemalang. Pengambilan data biomassa dilakukan di Laboratorium Agronomi dan Hortikultura Universitas Jenderal Soedirman, sedangkan analisis hara dilakukan di Laboratorium Pelayanan Jasa Pusat Penelitian Kelapa Sawit Unit Bogor. Penelitian berlangsung pada bulan April hingga September 2025 dan disusun menggunakan Rancangan Acak Kelompok (RAK) non-faktorial dengan satu faktor perlakuan berupa berbagai kombinasi pemupukan NPK anorganik dengan pupuk organik atau pupuk hayati. Variabel yang diamati meliputi variabel pertumbuhan (tinggi tanaman, jumlah daun, luas daun, dan kandungan klorofil), variabel hasil (bobot segar dan kering akar, tajuk, dan umbi), serta hara tanaman pada tajuk dan akar. Data dianalisis menggunakan analisis ragam (ANOVA) pada taraf kepercayaan 95%, jika analisis raga menunjukkan pengaruh nyata, maka dilanjutkan dengan uji *Duncan Multiple Range Test* (DMRT) untuk mengetahui perbedaan antarperlakuan, serta perhitungan Relative Agronomic Efficiency (RAE) untuk membandingkan efisiensi perlakuan pupuk terhadap kontrol berdasarkan hasil panen.

Hasil penelitian menunjukkan bahwa kombinasi berbagai dosis NPK dengan Palm Bionic atau Bioneensis memberikan pengaruh nyata pada seluruh variabel pengamatan, kecuali kandungan klorofil daun, serta bobot basah dan kering akar. Paket pemupukan 6,75 g NPK (75% standar) dan Bioneensis maupun Palm Bionic menjadi kombinasi terbaik karena mampu menghasilkan bobot umbi lebih tinggi dibandingkan pemupukan NPK dosis standar dengan nilai *Relative Agronomic Efficiency* (RAE) >95%. Hal ini menunjukkan bahwa pupuk organik Palm Bionic dan pupuk hayati Bioneensis dapat meningkatkan efisiensi pemupukan dengan reduksi dosis pupuk sintetik hingga 25%.

## *SUMMARY*

*Potato is an agricultural commodity with high economic value. In addition to supporting food diversification, potatoes serve as raw materials for industry and as an export commodity. In Indonesia, potato fertilization is still predominantly dependent on synthetic NPK fertilizers due to their perceived practicality for farmers; however, their continuous use may degrade soil quality and productivity. This study aimed to determine the effects of combining different NPK doses with Palm Bionic organic fertilizer or Bioneensis biofertilizer on the growth and yield of Atlantic potato variety, to identify the optimal fertilization package for enhancing growth and yield of the Atlantic variety, and to evaluate fertilizer efficiency based on Relative Agronomic Efficiency.*

*The research was conducted in Karangsari Village, Pulosari Subdistrict, Pemalang Regency. Biomass sampling was carried out at the Agronomy and Horticulture Laboratory, Jenderal Soedirman University, while nutrient analysis was performed at the Laboratory Service Unit of the Indonesian Oil Palm Research Institute, Bogor Unit. The experiment was carried out from April to September 2025 using a non-factorial Randomized Complete Block Design (RCBD) with a single treatment factor consisting of various combinations of inorganic NPK fertilizers with organic or biofertilizers. Observed variables included growth parameters (plant height, leaf number, leaf area, and chlorophyll content), yield parameters (fresh and dry weight of roots, shoots, and tubers), and nutrient content of shoots and roots. Data were analyzed using Analysis of Variance (ANOVA) at a 95% confidence level. If significant effects were detected, Duncan's Multiple Range Test (DMRT) was applied to compare treatments, followed by the calculation of Relative Agronomic Efficiency (RAE) to evaluate fertilizer efficiency relative to the control based on harvested yield.*

*The results indicated that various combinations of NPK with Palm Bionic or Bioneensis significantly affected all observed parameters except leaf chlorophyll content as well as fresh and dry root weight. The fertilization packages of 6.75 g NPK (75% of the standard dose) combined with either Bioneensis or Palm Bionic were identified as the best treatments, producing higher tuber weight than the application of the standard NPK dose, with Relative Agronomic Efficiency (RAE) values exceeding 95%. These findings demonstrate that Palm Bionic organic fertilizer and Bioneensis biofertilizer can improve fertilization efficiency while reducing synthetic fertilizer use by up to 25%.*