

RINGKASAN

Kedelai edamame (*Glycine max* L. Merrill) adalah salah satu jenis tanaman kacang-kacangan dengan ukuran polong yang lebih besar dan dipanen dalam kondisi segar. Edamame di Indonesia mulai dibudidayakan di Gadong, Jawa Barat tahun 1990, dan hasil edamame dipasarkan dalam bentuk hasil segar. Tahun 1992, percobaan mulai dilakukan di Jember untuk dikembangkan. Bertambahnya penduduk meningkatkan kebutuhan akan kedelai. Lahan marginal tersebar luas di Indonesia. Lahan marginal belum pantas untuk dijadikan lahan pertanian, tetapi sebetulnya memiliki potensi. Salah satu jenis tanah marginal yang berpotensi dikembangkan menjadi lahan pertanian adalah Ultisol. Budidaya edamame potensial untuk dikembangkan di tanah marginal dengan penambahan bahan organik dan kombinasi dengan pupuk kimia sintetis untuk mendapatkan hasil optimal. Penelitian ini bertujuan untuk 1) mengetahui respon pertumbuhan dan hasil edamame pada pemberian bahan organik di tanah Ultisol, 2) mengetahui respon pertumbuhan dan hasil edamame pada pemberian fosfor di tanah Ultisol, 3) mengetahui kombinasi terbaik bahan organik dan fosfor terhadap respon pertumbuhan dan hasil edamame di tanah Ultisol.

Penelitian ini dilaksanakan di Lahan Penelitian dan Laboratorium Agronomi & Hortikultura Universitas Jenderal Soedirman. Percobaan faktorial disusun dalam Rancangan Acak Kelompok (RAK) faktorial yang terdiri dari 2 faktor perlakuan, yaitu bahan organik (B) sebanyak 4 taraf dan Fosfor (P) sebanyak 3 taraf. Variabel pengamatan terdiri atas tinggi tanaman, jumlah daun trifoliat, jumlah cabang per tanaman, bobot segar tajuk, bobot kering tajuk, bobot segar akar, bobot kering akar, jumlah polong per tanaman, jumlah polong hampa per tanaman, dan bobot polong per tanaman. Data hasil penelitian dianalisis menggunakan analisis ragam (ANOVA) pada taraf 5%. Jika berpengaruh nyata ($F_{hitung} > F_{tabel}$) maka diuji lanjut menggunakan uji Duncan's Multiple Range Test (DMRT) pada taraf kesalahan 5%.

Hasil penelitian menunjukkan pemberian bahan organik dan fosfor efektif meningkatkan respon tanaman pada variabel pertumbuhan dan hasil dibandingkan kontrol. Pemberian fosfor paling efektif pada dosis 200 kg/ha, sebab pemberian dosis yang lebih tinggi tidak meningkatkan hasil secara signifikan. Terdapat interaksi pada variabel jumlah polong per tanaman. Kombinasi terbaik dalam meningkatkan hasil yaitu pupuk kandang sapi 15 ton/ha dengan fosfor dosis 200 kg/ha, karena mampu meningkatkan jumlah polong per tanaman dan bobot polong per tanaman dengan signifikan dibandingkan dengan kombinasi lainnya.

SUMMARY

Edamame soybeans (*Glycine max* L. Merrill) are a type of legume known for their larger pod sizes and are typically harvested when fresh. In Indonesia, edamame cultivation began in Gadong, West Java, in 1990, and these products are marketed as fresh young pods. By 1992, experimental cultivation started in Jember to further the development of edamame. As the population grows, so does the demand for soybeans. In Indonesia, there is a significant amount of marginal land that is currently not suitable for agricultural use but holds potential for development. One type of marginal land with agricultural potential is Ultisol. Edamame cultivation can be enhanced on this marginal land by adding organic materials and combining them with synthetic chemical fertilizers to achieve optimal results. This research aims to: 1) Determine the growth response and yield of edamame when organic materials are applied to Ultisol soil, 2) Determine the growth response and yield of edamame when phosphorus is applied to Ultisol soil, 3) Identify the best combination of organic materials and phosphorus that maximizes growth response and yield of edamame in Ultisol soil.

This research was conducted at the Experimental Field and Agronomy & Horticulture Laboratory of Jenderal Soedirman University. The factorial experiment design arranged in a factorial Randomized Block Design (RBD) consisting of 2 treatment factors, namely organic matter (B) as many as 4 levels and phosphorus as many as 3 levels. Observation variables consist of plant height, number of trifoliate leaves, number of leaf area, number of branches per plant, fresh weight of crown, dry weight of crown, fresh weight of roots, dry weight of roots, number of pods per plant, number of empty pods per plant, and pod weight per plant. The research data were analyzed using analysis of variance (ANOVA) at the 5% level. If there is a significant effect ($F_{\text{count}} > F_{\text{table}}$), then it is further tested using Duncan's Multiple Range Test (DMRT) at an error level of 5%.

The results showed that the application of organic materials and phosphorus effectively increased plant responses to growth and yield variables compared to controls. The provision of phosphorus is most effective at a dose of 200 kg/ha, because the provision of higher doses does not increase yields significantly. There is an interaction on the variable number of pods per plant. The best combination for increasing yields is 15 tons/ha of cow manure with 200 kg/ha of phosphorus, because it has a significant effect on the number of pods per plant and the highest pod weight per plant compared to other combinations.