

RINGKASAN

Edamame (*Glycine max* L. Merrill) merupakan kedelai dari Jepang yang berumur singkat, bijinya lebih besar, teksturnya lebih halus, rasanya lebih manis, lebih mudah dicerna dibandingkan kedelai biasa dan sangat baik untuk kesehatan serta mengandung protein setara dengan susu. Permintaan dari berbagai negara akan edamame sangat banyak, namun Indonesia hanya dapat memenuhi 3% dari kebutuhan pasar Jepang. Pemanfaatan lahan marginal seperti ultisol dapat dilakukan dengan pengupayaan berupa penambahan bahan organik melalui pemupukan. Penambahan bahan organik akan menambah ketersediaan unsur hara pada tanah dan tanaman. Bahan organik yang digunakan yaitu kasgot. Kasgot mengandung unsur hara berupa N, P, dan K namun jumlah yang tersedia masih tergolong rendah sehingga diperlukan penambahan bahan organik lainnya seperti biochar sekam padi, hijauan legum, dan zeolit. Penelitian ini bertujuan untuk (1) mengetahui pengaruh aplikasi fermentasi kasgot yang diperkaya biochar, legum dan zeolit terhadap pertumbuhan dan hasil tanaman edamame di ultisol. (2) mengetahui formulasi fermentasi kasgot diperkaya biochar, legum dan zeolit yang terbaik pada tanaman edamame di ultisol.

Penelitian ini dilaksanakan di Laboratorium Agronomi dan Hortikultura, lahan percobaan Fakultas Pertanian Universitas Jenderal Soedirman, serta BPTP Jawa Tengah. Kegiatan penelitian dilakukan pada bulan Desember 2023-April 2024. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) non faktorial dengan faktor tunggal berupa dosis formula fermentasi kasgot yang terdiri dari 7 perlakuan, yaitu K0: tanpa pemupukan, K1: pemberian pupuk NPK, K2: kasgot 100%, K3: kasgot 88% + biochar 5% + legum 2% + zeolit 5%, K4: kasgot 76% + biochar 10% + legum 4% + zeolit 10%, K5: kasgot 64% + biochar 15% + legum 6% + zeolit 15%, K6: kasgot 52% + biochar 20% + legum 8% + zeolit 20%. Data hasil penelitian dianalisis menggunakan uji ANOVA pada taraf kesalahan 5%. Jika hasil analisis menunjukkan adanya pengaruh nyata, maka dilanjutkan uji *Duncan's Multiple Range Test* (DMRT). Variabel yang diamati meliputi tinggi tanaman (cm), jumlah daun (helai), luas daun (cm²), bobot kering tajuk (g), bobot kering akar (g), rasio bobot kering tajuk-bobot kering akar, jumlah polong (polong/tanaman), bobot polong (g/tanaman), jumlah biji (biji/tanaman), dan bobot biji (g/tanaman).

Hasil penelitian menunjukkan bahwa aplikasi fermentasi kasgot yang diperkaya biochar, hijauan legum dan zeolit berpengaruh nyata pada tinggi tanaman, jumlah daun, luas daun, bobot kering tajuk, bobot kering akar, dan bobot polong per tanaman, namun tidak berpengaruh nyata pada rasio bobot kering tajuk-bobot kering akar, jumlah polong per tanaman, jumlah biji dan bobot biji per tanaman. Formulasi kasgot K4 merupakan formula yang terbaik karena menghasilkan pertumbuhan dan hasil edamame yang terbaik.

SUMMARY

Edamame (Glycine max L. Merrill) is a short-lived soybean from Japan, with larger seeds, a smoother texture, a sweeter taste, easier to digest compared to regular soybeans, and is very good for health as it contains protein equivalent to milk. The demand for edamame from various countries is very high, but Indonesia can only meet 3% of Japan's market needs. The utilization of marginal lands such as ultisol can be achieved through efforts such as the addition of organic matter through fertilization. The addition of organic matter will increase the availability of nutrients in the soil and plants. The organic matter used is kasgot. Kasgot contains nutrients such as N, P, and K, but the available amounts are still relatively low, so additional organic materials such as rice husk biochar, legume greens, and zeolite are needed. This research aims to (1) determine the effect of applying fermented kasgot enriched with biochar, legumes, and zeolite on the growth and yield of edamame plants in ultisol. (2) identify the best formulation of fermented kasgot enriched with biochar, legumes, and zeolite for edamame plants in ultisol.

This research was conducted at the Agronomy and Horticulture Laboratory, the experimental fields of the Faculty of Agriculture at Jenderal Soedirman University, and the Central Java Agricultural Technology Assessment Center (BPTP). The research activities were conducted from December 2023 to April 2024. This research uses a non-factorial Randomized Block Design (RBD) with a single factor in the form of the kasgot fermentation formula dosage, which consists of 7 treatments: K0: without fertilization, K1: NPK fertilizer application, K2: 100% kasgot, K3: 88% kasgot + 5% biochar + 2% legume + 5% zeolite, K4: 76% kasgot + 10% biochar + 4% legume + 10% zeolite, K5: 64% kasgot + 15% biochar + 6% legume + 15% zeolite, K6: 52% kasgot + 20% biochar + 8% legume + 20% zeolite. The research data were analyzed using ANOVA at a 5% error level. If the analysis results show a significant effect, it is followed by Duncan's Multiple Range Test. (DMRT). The observed variables include plant height (cm), number of leaves (leaves), leaf area (cm²), dry weight of the canopy (g), dry weight of the roots (g), ratio of dry weight of the canopy to dry weight of the roots, number of pods (pods/plant), pod weight (g/plant), number of seeds (seeds/plant), and seed weight (g/plant).

The research results show that the application of fermented kasgot enriched with biochar, legume forage, and zeolite has a significant effect on plant height, number of leaves, leaf area, dry weight of the canopy, dry weight of the roots, and pod weight per plant, but does not significantly affect the ratio of dry weight of the canopy to dry weight of the roots, number of pods per plant, number of seeds, and seed weight per plant. The K4 kasgot formulation is the best formula because it produces the best growth and yield of edamame.