

RINGKASAN

Edamame termasuk jenis kacang-kacangan yang tampil sebagai komoditas menjanjikan di Indonesia. Kabupaten Jember menjadi sentra utama budidaya edamame dengan sebagian besar hasil panennya berhasil menembus pasar ekspor. Permintaan global yang kian meningkat mendorong Indonesia untuk mendongkrak produksi edamame. Hal ini perlu diiringi dengan upaya menjaga kelestarian lingkungan. Salah satu upaya tersebut dapat dilakukan melalui penelitian efisiensi penggunaan air dalam budidaya edamame. Penelitian ini dapat menjadi acuan untuk membantu petani dalam memahami kebutuhan air edamame selama masa pertumbuhan, sehingga penggunaan air dapat dioptimalkan. Tujuan utama penelitian ini adalah mengetahui pengaruh kadar air tanah yang berbeda terhadap karakter pertumbuhan dan hasil edamame.

Penelitian ini dilaksanakan di *screenhouse experimental farm*, Laboratorium Agroekologi, Laboratorium Agronomi dan Hortikultura serta Laboratorium Ilmu Tanah Fakultas Pertanian Universitas Jenderal Soedirman, Purwokerto. Penelitian dilaksanakan pada bulan November 2023 – Maret 2024. Metode penelitian yang digunakan adalah Rancangan Acak Kelompok (RAK) Non Faktorial dengan sembilan perlakuan. Perlakuan tersebut yaitu V1 = kondisi 100% kapasitas lapang; V2 = kondisi 100% kapasitas lapang per 2 hari; V3 = kondisi 100% kapasitas lapang per 3 hari; V4 = kondisi 80% kapasitas lapang; V5 = kondisi 80% kapasitas lapang per 2 hari; V6 = kondisi 80% kapasitas lapang per 3 hari; V7 = kondisi 60% kapasitas lapang; V8 = kondisi 60% kapasitas lapang per 2 hari; V9 = kondisi 60% kapasitas lapang per 3 hari.

Perlakuan terbagi dalam 3 ulangan sehingga diperoleh 27 unit percobaan. Setiap unit percobaan terdapat 3 plot (polibag) sehingga total terdapat 81 unit percobaan. Variabel yang diamati meliputi tinggi tanaman, diameter batang, jumlah daun trifoliat, bobot kering tajuk, bobot kering akar, umur berbunga, jumlah cabang produktif, jumlah buku produktif, jumlah polong isi per tanaman, jumlah biji per tanaman, bobot polong per tanaman, bobot 20 polong, indeks panen, intensitas cahaya, kelembapan dan pH tanah. Data yang diperoleh dianalisis dengan Anova pada taraf kepercayaan 95%. Pada data yang berpengaruh nyata dilanjutkan dengan DMRT (*Duncan Multiple Range Test*) pada taraf kesalahan 5%.

Hasil penelitian memperlihatkan bahwa tanaman edamame masih bertumbuh dengan baik pada kondisi kadar air 80% kapasitas lapang, sama seperti kondisi 100% kapasitas lapang. Tanaman edamame juga masih berproduksi dengan baik pada kondisi kadar air 60% kapasitas lapang, sama seperti kondisi 100% kapasitas lapang. Kondisi kadar air 80% kapasitas lapang pada fase vegetative dan kondisi kadar air 60% kapasitas lapang pada fase generatif dapat digunakan sebagai alternatif penyiraman tanaman edamame pada kondisi kekurangan air.

SUMMARY

Edamame, as a type of soybean, is emerging as a promising commodity in Indonesia. Jember Regency has become the main center for edamame cultivation, with a portion of its harvest penetrating the export market. Growing global demand is prompting Indonesia to boost edamame production, which must be accompanied by effort to preserve the environment. One such effort can be undertaken through research on water use efficiency in edamame cultivation. This research can serve as a reference to assist farmers in understanding the water requirements of edamame during its growth period, allowing for optimized water usage. The primary objective of this study is to investigate the influence of varying soil moisture level on edamame growth.

The study was conducted at the greenhouse experimental farm, Agroecology Laboratory, Agronomy and Horticulture Laboratory, and Soil Science Laboratory, Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. The research was carried out from November 2023 to March 2024. A Randomized Complete Block Design (RCBD) Non-Factorial with nine treatments was employed as the research method. The treatments were as follows: V1 100% field capacity; V2 = 100% field capacity every 2 days; V3 = 100% field capacity every 3 days; V4 = 80% field capacity; V5 = 80% field capacity every 2 days; V6 = 80% field capacity every 3 days; V7 = 60% field capacity; V8 = 60% field capacity every 2 days; and V9 = 60% field capacity every 3 days.

Each treatment was replicated three times, resulting in 27 experimental units. Each experimental unit consisted of three plots (polybag), totaling 81 experimental units. The observed variables included plant height, stem diameter, number of trifoliolate leaves, dry weight of canopy, dry weight of roots, flowering period, number of productive branches, number of productive nodes, number of filled pods per plant, number of seeds per plant, pod weight per plant, weight of 20 pods and harvest index. Light intensity, moisture level and pH were also measured. The obtained data was analyzed using ANOVA at a 95% confidence level. For data with significant effect, DMRT (Duncan Multiple Range Test) was employed at a 5% error level.

Research results show that edamame plants still grow well at 80% field capacity, similar to conditions at 100% field capacity. Edamame plants also still produce well at 60% field capacity, similar to conditions at 100% field capacity. Water content conditions of 80% field capacity in the vegetative phase and 60% field capacity in the generative phase can be used as an alternative for watering edamame plants under water scarcity conditions.