

RINGKASAN

Edamame adalah salah satu jenis tanaman kacang-kacangan yang sangat potensial untuk dibudidayakan. Daerah di Indonesia dengan produksi edamame terbesar terdapat di Jember yang sebagian besar produksinya di ekspor ke beberapa negara. Semakin tinggi permintaan edamame di berbagai negara, membuat Indonesia harus lebih meningkatkan jumlah produksinya. Munculnya fenomena pemanasan global menyebabkan terjadinya kekeringan. Kondisi kekeringan yang berkelanjutan membuat ketersediaan air tanah terbatas. Oleh karena itu, penting dilakukan penelitian mengenai efisiensi penggunaan air selama budidaya edamame. Penelitian ini dilakukan agar para petani lebih mengetahui kebutuhan air edamame selama masa pertumbuhan untuk mengoptimalkan penggunaan air. Penelitian ini bertujuan untuk 1) mengetahui pengaruh kadar air tanah yang berbeda terhadap karakter fisiologi edamame, dan 2) mengetahui pengaruh kadar air tanah yang berbeda terhadap hasil edamame.

Penelitian dilaksanakan dengan melakukan budidaya di *screen house experimental farm* Fakultas Pertanian, Universitas Jenderal Soedirman, dan Laboratorium Agroekologi, Laboratorium Agronomi dan Hortikultura, Laboratorium Ilmu Tanah, serta Laboratorium Riset Universitas Jenderal Soedirman. Penelitian dilaksanakan pada bulan November 2023 – Februari 2024. Penelitian menggunakan Rancangan Acak Kelompok (RAK) non faktorial. Perlakuan yang diaplikasikan 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 penelitian dilakukan dalam 3 ulangan, sehingga diperoleh 27 unit percobaan. Setiap unit percobaan terdapat 3 polibag, sehingga pada penelitian ini terdapat 81 unit percobaan. Variabel yang diamati adalah kadar klorofil, kehijauan daun, jumlah stomata, kerapatan stomata, luas daun, bobot kering tajuk, bobot kering akar, jumlah polong per tanaman, jumlah biji per tanaman, bobot polong per tanaman, bobot 20 polong, indeks panen, intensitas cahaya, suhu, kelembapan, dan pH tanah. Data yang diperoleh dianalisis dengan uji F pada taraf kepercayaan 95% dan dilanjutkan dengan DMRT (*Duncan Multiple Range Test*) pada taraf kesalahan 5%.

Hasil penelitian menunjukkan Karakter fisiologi edamame mampu dipertahankan pada kondisi 80% kapasitas lapang per 3 hari dan kondisi 60% kapasitas lapang, sama seperti kondisi 100% kapasitas lapang. Kondisi tersebut dapat dijadikan alternatif penyiraman pada kondisi defisit air. Karakter hasil edamame mampu dipertahankan produksinya pada perlakuan kadar air tanah kondisi 60% kapasitas lapang, sama seperti kondisi 100% kapasitas lapang. Kondisi tersebut dapat dijadikan alternatif penyiraman pada kondisi defisit air.

Kata kunci: edamame, fisiologi, hasil, kadar air kapasitas lapang.

SUMMARY

Edamame is a type of bean plant that has great potential for cultivation. The region in Indonesia with the largest edamame production is Jember, where most of the production is exported to several countries. The higher demand for edamame in various countries means that Indonesia must further increase its production. The emergence of the global warming phenomenon causes droughts. Continuous drought conditions mean that groundwater availability is limited. Therefore, it is important to carry out further research regarding the efficiency of water use during edamame cultivation. This research was conducted so that farmers know more about the water needs of edamame during the growing period to make water use more efficient. This research aims to 1) determine the effect of different soil water levels on the physiological characteristics of edamame, and 2) determine the effect of different soil water levels on edamame yield.

The research was carried out by cultivating in the screen house experimental farm of the Faculty of Agriculture, Jenderal Soedirman University, and the Agroecology Laboratory, Agronomy and Horticulture Laboratory, Soil Science Laboratory, and General Soedirman University Research Laboratory. The research was carried out in November 2023 – February 2024. The research used a non-factorial Randomized Block Design (RBD). The treatments applied are V1 = condition of 100% field capacity, V2 = condition of 100% field capacity per 2 days, V3 = condition of 100% field capacity per 3 days, V4 = condition of 80% field capacity, V5 = condition of 80% field capacity per 2 days, V6 = condition of 80% field capacity per 3 days, V7 = condition of 60% field capacity, V8 = condition of 60% field capacity per 2 days, V9 = condition of 60% field capacity per 3 days. The research treatment was carried out in 3 replications to obtain 27 experimental units. Each experimental unit had 3 polybags so that in this study there were 81 experimental units. The variables observed were chlorophyll content, leaf greenness, number of stomata, stomata density, leaf area, shoot dry weight, root dry weight, number of filled pods per plant, number of seeds per plant, pod weight per plant, weight of 20 pods, harvest index, light intensity, temperature, humidity and soil pH. The data obtained were analyzed using the F test at a confidence level of 95% and continued with DMRT (Duncan Multiple Range Test) at an error level of 5%.

The results of the research show that the physiological characteristics of edamame can be maintained at 80% field capacity per 3 days and at 60% field capacity, the same as at 100% field capacity. This condition can be used as an alternative to watering in conditions of water deficit. The yield characteristics of edamame were able to be maintained in soil water content treatment under conditions of 60% field capacity, the same as conditions at 100% field capacity. This condition can be used as an alternative to watering in conditions of water deficit.

Keywords: edamame, moisture content field capacity, physiology, yield.