

## RINGKASAN

Kedelai [*Glycine max* (L.) Merr.] termasuk kedalam tiga besar komoditas pangan utama selain padi dan jagung. Kebutuhan kedelai di Indonesia mengalami peningkatan setiap tahunnya, akan tetapi produksi kedelai yang mampu dipenuhi berkisar 30% dari total kebutuhan. Rendahnya produksi kedelai dikarenakan kurangnya areal penanaman. Pemerintah melakukan perluasan areal penanaman di lahan-lahan marginal, salah satunya tanah salin. Konsentrasi garam yang tinggi pada tanah salin dapat menghambat penyerapan air dan unsur hara pada tanaman. Alternatif agar tanah salin dapat dimanfaatkan yaitu dengan menggunakan kultivar tanaman yang toleran terhadap cekaman salinitas. Penelitian ini bertujuan untuk mengetahui konsentrasi garam yang optimum untuk pertumbuhan kedelai Kultivar Sinabung, dan untuk mengetahui respons anatomis dan fisiologis daun kedelai kultivar Sinabung terhadap pemberian garam dengan berbagai konsentrasi.

Penelitian ini dilakukan menggunakan metode eksperimental yang disusun berdasarkan Rancangan Acak Lengkap (RAL) dengan 5 taraf konsentrasi garam (0,30,60,90, dan 120 mM). Variabel bebas berupa garam dengan berbagai konsentrasi. Variabel terikat berupa respons anatomis dan fisiologis daun kedelai. Parameter yang diamati meliputi tebal epidermis atas dan bawah, tebal mesofil, ukuran stomata (panjang dan lebar), kerapatan stomata dan trikomata, kadar klorofil, bobot basah dan kering tanaman kedelai. Penelitian dilakukan di Laboratorium Struktur dan Perkembangan Tumbuhan, Laboratorium Fisiologi Tumbuhan, dan *green house* Fakultas Biologi Universitas Jenderal Soedirman pada bulan Juli sampai Agustus 2022. Data yang diperoleh dari hasil pengukuran respons anatomis dan fisiologis daun kedelai dianalisis menggunakan analisis ragam (ANOVA) dan uji lanjut menggunakan Tukey HSD (*Honest Significant Difference*) pada tingkat kepercayaan 95%. Pengolahan data menggunakan program statistik SPSS Versi 16.

Hasil penelitian menunjukkan bahwa konsentrasi garam 60 mM optimum untuk pertumbuhan kedelai Kultivar Sinabung. Salinitas mempengaruhi respons anatomis pada daun kedelai Kultivar Sinabung berupa peningkatan ketebalan epidermis atas dan bawah, penurunan tebal mesofil, penurunan ukuran stomata (panjang dan lebar stomata), penurunan kerapatan stomata, dan peningkatan kerapatan trikomata. Salinitas juga mempengaruhi respons fisiologis pada daun kedelai Kultivar Sinabung berupa penurunan kadar klorofil a dan klorofil b, serta penurunan bobot basah dan kering tanaman kedelai Kultivar Sinabung.

Kata Kunci : *anatomi, fisiologi, kedelai, salinitas, sinabung*

## SUMMARY

Soybean [*Glycine max* (L.) Merr.] is included in the top three main food commodities besides rice and corn. Demand for soybeans in Indonesia is always increasing every year, but around 30% of the total demand can be met. The low production of soybeans is due to the lack of planting area. The government is expanding the soybean planting area on marginal lands, one of which is saline soil. High salt content in saline soil can inhibit the absorption of water and nutrients in plant. One alternative for the use of saline soils is to use plant cultivars that are tolerant to salinity stress. This study aims to determine the optimum salt concentration for the growth of Sinabung cultivar soybean and determine the anatomical and physiological response of Sinabung cultivar soybean leaves to salt administration with various concentrations.

This research was conducted using an experimental method based on a completely randomized design (CRD) with 5 salt levels (0,30,60,90, and 120 mM). The independent variable is salt with various concentrations. The dependent variable was the anatomical and physiological response of soybean leaves. Parameters observed included upper and lower epidermis thickness, mesophyll thickness, stomatal size (length and width), stomatal and trichome density, chlorophyll content, fresh weight and dry weight of soybean plants. The research was carried out at the Laboratory of Plant Structure and Development, Laboratory of Plant Physiology, and the Greenhouse of the Faculty of Biology, Jenderal Soedirman University from July to August 2022. Data obtained from the results of measuring the anatomical and physiological responses of soybean leaves were analyzed using analysis of variance (ANOVA) and further testing using Tukey HSD (Honest Significant Difference) at a 95% confidence level. Data processing using the statistical program SPSS Version 16.

The results showed that 60 mM salt content was optimum for the growth of Sinabung cultivar soybean. Salinity affects the anatomical response of Sinabung cultivar soybean leaves in the form of increasing the thickness of the upper and lower epidermis, decreasing the thickness of the mesophyll, and decreasing the size of the stomata (length and width of stomata), decreased stomatal density, and increasing the density of trichomes. Salinity also affects the physiological response of soybean leaves of Sinabung cultivar in the form of decreased levels of chlorophyll a and chlorophyll b, as well as decreased wet and dry weight of soybean plants of Sinabung cultivar.

Keywords: anatomy, physiology, salinity, sinabung, soybean