



KONTRIBUSI KALSIMUM TERHADAP AKTIVITAS FISIOLOGIS DAN PERTUMBUHAN BIBIT KELAPA SAWIT (*Elaeis Guineensis jacq.*) TEREKSPOS CEKAMAN KEKERINGAN

INTISARI

Penelitian bertujuan untuk 1) menguji efektifitas kalsium (Ca) dalam memodifikasi aktivitas fisiologis dan pertumbuhan bibit kelapa sawit terekspos kekeringan yang mengarah pada upaya pertahanan terhadap cekaman, dan 2) mengetahui dosis optimal Ca yang mampu meningkatkan ketahanan bibit kelapa sawit terhadap cekaman kekeringan. Percobaan lapangan disusun menggunakan rancangan petak terbagi, dengan tiga blok sebagai ulangan. Perlakuan utama adalah cekaman kekeringan, terdiri atas 3 level yaitu kapasitas lapangan (FTSW 1), cekaman kekeringan moderat (FTSW 0,35), dan cekaman kekeringan berat (FTSW 0,15). Sedangkan yang bertindak sebagai anak perlakuan adalah dosis Ca, terdiri dari empat dosis yaitu 0,00; 0,04; 0,08; dan 0,12 g/bibit. Variabel yang menjadi obyek pengamatan adalah karakter iklim mikro di lokasi penelitian, karakter fisika dan kimia media tanam, konsentrasi Ca daun, karakter morfologis akar, aktivitas fisiologis tajuk, dan pertumbuhan bibit kelapa sawit. Data yang diperoleh selanjutnya dianalisis menggunakan Analisis Varian (ANOVA) pada level 5%, dan dilanjutkan dengan Uji Jarak Berganda Duncan's jika hasil analisis varian menunjukkan perbedaan yang nyata antar perlakuan. Hubungan antar variabel pengamatan ditentukan dengan analisis regresi. Hasil penelitian memberikan informasi bahwa penambahan Ca pada media tanam sampai dengan dosis 0,12 g/bibit secara nyata meningkatkan konsentrasi Ca daun muda, panjang stomata daun, klorofil a, b, dan total (optimal pada dosis Ca 0,04 g/bibit), penurunan kadar prolin daun, penurunan prosentase daun kering, peningkatan luas daun, dan peningkatan diameter batang, serta jumlah daun bibit kelapa sawit, khususnya saat bibit kelapa sawit terekspos cekaman kekeringan moderat dan berat. Penambahan Ca sampai dengan dosis 0,12 g/bibit masih ditanggapi secara positif oleh bibit kelapa sawit dalam bentuk peningkatan ketahanan bibit terhadap cekaman kekeringan.

Kata kunci : kelapa sawit, cekaman kekeringan, kalsium, aktivitas fisiologis, pertumbuhan.



CALCIUM CONTRIBUTION ON PHYSIOLOGICAL ACTIVITIES OF OIL PALM SEEDLINGS (*Elaeis guineensis* Jacq.) EXPRESSED DROUGHT STRESS

ABSTRACT

The objectives of study were 1) to determine effectiveness of calcium (Ca) in comparison of physiological activities and growth of oil palm seedlings exposed to drought which leads to increase in defense against stress, and 2) to determine optimal dose of Ca that able to increase tolerance level of oil palm seedlings to drought stress. The study was arranged in split plot design with three blocks as replications, drought stresses as the main plots and Ca doses as subplots. The main plots consist of three levels, namely field capacity (FTSW 1.00), moderate drought stress (FTSW 0.35), and heavy drought stress (FTSW 0.15). Meanwhile, the subplots consist of four Ca doses, namely 0.00g/seedlings, 0.04g/seedlings, 0.08g/seedlings, and 0.12g/seedlings. Observations were done on several variables of micro-climates, micro, physical and chemical characteristics of planting media, Ca leaf concentration, root morphological characters, canopy physiological activities, and growth of oil palm seedlings. Data were analyzed using analysis of variance (ANOVA) at 5% levels, and continued with Duncan's Multiple Range Test (DMRT). The relationships patterns among the variables were determined using regression analysis. The results showed that addition of Ca dosage on the planting media up to 0.12g/seedlings were significantly increased the concentration of Ca leaves, increased stomatal length, increased concentrations of chlorophyll a, b, and total, decreased leaf proline levels, decreased in percentage of dried leaves, increased in leaf area, increased in stem diameter, and number of leaves of oil palm seedlings, especially when oil palm seedlings were exposed to moderate and heavy drought stresses. The addition of Ca dosage on planting media up to 0.12 g/seedling were responded positively by oil palm seedlings in the form of increasing the resistance of the seedlings to drought stress.

Key words: oil palm, drought stress, calcium, physiological activities, and growth