

INTISARI

Penelitian bertujuan untuk 1) mengetahui pengaruh keracunan Al terhadap karakter anatomi akar dan daun bibit kelapa sawit hibrida, dan 2) mengetahui pengaruh perubahan karakter anatomi jaringan akar dan daun akibat keracunan Al terhadap pertumbuhan bibit kelapa sawit hibrida pada fase pembibitan utama. Penelitian disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) faktor tunggal dengan 3 blok sebagai ulangan. Perlakuan yang diuji adalah konsentrasi Aluminium (Al) yang bersumber dari senyawa Aluminium Sulfat, $Al_2(SO_4)_3$, dengan konsentrasi sebagai berikut 0, 300, dan 600 ppm. Variabel yang diamati mencakup karakter iklim mikro di lokasi penelitian, karakter kimia tanah sebelum dan setelah diberi Al, karakter anatomi akar dan daun, dan pertumbuhan bibit kelapa sawit. Data yang diperoleh selanjutnya dianalisis varians (ANOVA) dengan tingkat kepercayaan 95%, dan dilanjutkan dengan uji HSD Tukey's jika terdapat beda nyata antar perlakuan. Hubungan antara konsentrasi Al dalam media tanam dengan karakter anatomi dan pertumbuhan ditentukan dengan analisis regresi. Sedangkan pola hubungan antarvariabel pengamatan ditentukan dengan analisis korelasi. Hasil penelitian memberikan informasi bahwa konsentrasi Al yang sama dengan atau lebih tinggi dari 1025 ppm pada media tanam menyebabkan penurunan diameter akar, diameter stele, densitas stomata, lebar bukaan stomata, lebar sel penjaga stomata, lebar stomata, dan diameter floem daun bibit kelapa sawit di tahapan pembibitan utama. Penurunan diameter akar, diameter stele, tebal daun, densitas stomata, lebar bukaan stomata, lebar sel penjaga stomata, lebar stomata, dan diameter floem daun pada bibit kelapa sawit yang media tanamnya menyediakan Al sama dengan atau lebih tinggi dari 1025 ppm mengakibatkan hambatan pertumbuhan bibit dalam bentuk bobot segar dan kering akar yang lebih ringan, daun yang berjumlah lebih sedikit, daun yang lebih sempit, bobot segar dan kering tajuk yang lebih ringan, diameter batang yang lebih kecil, serta tinggi bibit yang lebih pendek.

Kata kunci : kelapa sawit, cekaman Al, anatomi akar dan daun, pertumbuhan

ABSTRACT

The research objectives were 1) to determine the effects of aluminium stress on the properties of root and leaf anatomy of oil palm seedlings on the main nursery stage, and 2) to determine the effects of the change of root and leaf anatomy properties that caused by Al stress on the growth of oil palm seedlings at the main nursery stage. The research was arranged in a single factor of Randomized Complete Block Design (RCBD), with three blocks as replications. The treatment was Al stress, with the three concentration levels of Al, namely 0, 300, and 600 ppm. The source of Al was aluminium sulfate. The observations were done on several variables of root and leaf anatomy, and growth of oil palm seedlings on the main nursery stage. Data were analyzed with Analysis of Variance (ANOVA) at 5% levels, and continued with Tukey HSD test if there were differences among treatments. The relationships between Al concentration in the planting media with root and leaf anatomy properties and growth of oil palm seedlings on the main nursery stage were determined with regression analysis. Meanwhile, the relationships pattern among variables were determined with correlation analysis. The result showed that Al concentrations ≥ 1025 ppm in the planting media were decreased root diameter, stele diameter, stomatal density, width of stomatal opening, width of stomata, and floem diameter of leaf of oil palm seedlings at main nursery stage. The decrease in root diameter, stele diameter, stomatal density, width of stomatal opening, width of stomata, and floem diameter of leaf were inhibited the growth of oil palm seedlings at main nursery stage when treated by Al with the concentrations ≥ 1025 ppm. The indicators of inhibition of oil palm seedlings growth were lighter fresh and dry weight of roots, fewer leaves, narrower leaves, lighter fresh and dry weight of shoot, smaller stem diameter, and shorter stem height.

Keywords : oil palm, Al stress, roots and leaves anatomy, growth