

INTISARI

TANGGAPAN FISILOGIS DAN PERTUMBUHAN DELAPAN HIBRIDA KELAPA SAWIT (*Elaeis guineensis* Jacq.) TERHADAP KERACUNAN BESI

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Penelitian bertujuan untuk mengelompokkan delapan hibrida kelapa sawit ke dalam kategori peka, dan toleran terhadap keracunan Besi. Percobaan disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) faktorial dua faktor dengan tiga blok sebagai ulangan. Faktor pertama adalah hibrida kelapa sawit, terdiri dari delapan hibrida, yaitu Yangambi, Avros, Langkat, PPKS 239, Simalungun, PPKS 718, PPKS 540 dan Dumpy. Faktor kedua adalah keracunan besi, yaitu tanpa dan keracunan besi. Keracunan besi diaplikasikan menggunakan FeSO_4 dengan konsentrasi 600 ppm. Variabel yang diamati meliputi karakter morfologis, fisiologis, dan pertumbuhan hibrida kelapa sawit. Data yang diperoleh dianalisis varian (ANOVA) pada level 5%, dan dilanjutkan dengan uji beda nyata terkecil (BNT) apabila terdapat beda nyata antar perlakuan. Hubungan antar variabel pengamatan ditentukan menggunakan analisis korelasi. Hasil penelitian memberikan informasi bahwa Yangambi dan PPKS 540 adalah hibrida yang toleran terhadap keracunan besi, sedangkan hibrida yang berkategori peka terhadap keracunan besi adalah Yangambi, Avros, Langkat, PPKS 239, Simalungun PPKS 718 dan Dumpy. Hibrida Yangambi dan PPKS 540 toleran terhadap keracunan Fe melalui mekanisme menghindari, yaitu mencegah serapan Fe yang tinggi pada saat ketersediaan Fe dalam media berada pada tingkat meracun, dengan cara a) pemendekan dan b) penyempitan luas permukaan akar, c) pelunakan jaringan akar, d) orientasi pertumbuhan yang difokuskan kepada tajuk sehingga rasio akar tajuknya rendah, dan e) peningkatan KAN daun sehingga konsentrasi Fe terlarut dalam jaringan daun lebih rendah dari hibrida lainnya yang berkategori peka.

Kata kunci: keracunan Besi, hibrida, dan kelapa sawit

ABSTRACT

THE PHYSIOLOGICAL AND GROWTH RESPONSES OF EIGHT OIL PALM (*Elaeis guineensis* Jacq.) HYBRIDS TO IRON TOXICITY

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The objectives of study were to group the eight of oil palm hybrids into three categories, sensitive, moderate-tolerant, and tolerant to iron toxicity. The experiment was arranged in Randomized Complete Block Design (RCBD) two factors with three blocks as replications. The first factor was oil palm hybrid, consisting of eight hybrids, namely Yangambi, Avros, Langkat, PPKS 239, Simalungun, PPKS 718, PPKS 540, and Dumpy. The second factor was iron toxicities, namely without and iron toxicities. The iron toxicity applied using FeSO₄ with a concentration of 600 ppm. The observations were done on several morphological, physiological and growth variables of oil palm hybrids. Data were analyzed with Analysis of Variance (ANOVA) at 5% levels, and continued with the Least Significant Difference (LSD) test if there were significant differences among treatments. The relationships pattern among variables were determined with correlation analysis. The results showed that Yangambi and PPKS 540 was a hybrid that was tolerant to iron toxicity. The oil palm hybrids that were sensitive to iron toxicity were Avros, Langkat, PPKS 239, Simalungun, PPKS 718 and Dumpy. Yangambi and PPKS 540 was tolerant to Fe toxicity through avoidance mechanism. Yangambi and PPKS 540 was able to prevent the uptake of high level Fe, through a) roots length shortening, b) roots surface area narrowing, c) roots tissue softening, d) change of growth orientation which focused on the shoot, so that root shoot ratio was low, and e) improved the relative water content of leaves, so that the concentration of dissolved Fe in the leaf tissue of Yangambi and PPKS 540 was lower than compared to others hybrids.

Key words: iron toxicity, hybrids, and oil palm