

## ABSTRAK

### KETERSEDIAAN UNSUR HARA MIKRO Fe DAN Mn PADA TANAH SAWAH SERTA SERAPANNYA PADA TANAMAN PADI (*Oryza sativa* L.) DI SENTRA PERTANAMAN PADI LAMPUNG

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Unsur hara mikro besi (Fe) dan mangan (Mn) merupakan unsur hara yang dibutuhkan tanaman dalam jumlah kecil, namun sangat penting. Kandungan unsur hara di dalam tanaman berkaitan dengan ketersediaannya di dalam tanah dan sifat tanah seperti, pH tanah, KTK, C-Organik, dan tekstur tanah. Tanah sawah yang tergenang (tereduksi) mengakibatkan Fe dan Mn dalam bentuk tersedia ( $Fe^{2+}$  dan  $Mn^{2+}$ ) pada tanah sawah masam tinggi sehingga dapat menyebabkan toksisitas. Penelitian ini bertujuan untuk mempelajari status ketersediaan Fe dan Mn pada tanah-tanah sawah di sentra pertanaman padi di Lampung, keterkaitan sifat-sifat tanah dengan ketersediaan Fe dan Mn pada tanah sawah, dan pengaruh ketersediaan Fe dan Mn pada tanah sawah terhadap serapannya pada tanaman padi. Penelitian dilakukan pada Agustus 2022 – September 2023. Penelitian ini menggunakan metode survei lapangan dengan mengambil sampel tanah dan tanaman padi di 10 lokasi sentra pertanaman padi di Lampung. Hasil penelitian menunjukkan bahwa, Fe-tersedia pada tanah sawah adalah 61 – 171 mg kg<sup>-1</sup>, berstatus toksisitas di 8 daerah dan cukup di 2 daerah. Mn-tersedia berstatus cukup (13 – 167 mg kg<sup>-1</sup>). Fe pada beras berstatus cukup (34,00-66,00 mg kg<sup>-1</sup>), status serapan Fe di jerami (145-623 mg kg<sup>-1</sup>) cukup di 4 daerah dan toksisitas di 6 daerah. Mn pada beras berstatus defisiensi (6,91-11,03 mg kg<sup>-1</sup>), sedangkan Mn di jerami berstatus cukup (112-355 mg kg<sup>-1</sup>). Fe-tersedia berkorelasi positif dengan C-Organik, namun tidak berkorelasi dengan Fe-total, pH tanah, KTK, dan kandungan liat. Mn-tersedia berkorelasi positif dengan pH tanah dan Mn-total, namun tidak berkorelasi dengan pH tanah, KTK, dan kandungan liat. Mn-tersedia berkorelasi dengan Mn-jerami, namun tidak berkorelasi dengan Mn-beras sedangkan Fe-tersedia tidak berkorelasi dengan serapan Fe pada beras dan jerami.

Kata kunci: Besi (Fe), Ketersediaan, Mangan (Mn), Tanah Sawah, Tanaman Padi

## ABSTRACT

### THE AVAILABILITY OF MICRONUTRIENTS Fe AND Mn IN PADDY SOILS AND THEIR UPTAKE BY RICE PLANTS (*Oryza sativa* L.) AT RICE CULTIVATION CENTERS IN LAMPUNG

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Iron (Fe) and manganese (Mn) are essential micronutrients needed by plants. The contents of nutrients in plants are determined by their availability in soil and soil properties such as soil pH, CEC, Organic-C, and soil texture. Flooded (reduced) and acid paddy soils result in the increase of Fe and Mn availability in the forms of Fe<sup>2+</sup> and Mn<sup>2+</sup> that can cause toxicity. This study aimed to study the status of Fe and Mn availability in paddy soils in rice cultivation centers in Lampung, the relationships between soil properties and the availability of Fe and Mn in paddy soils, and the effects of Fe and Mn availability in paddy soils on their uptake by rice plants. The study was conducted in August 2022 until September 2023. This study used a survey method by taking soil and rice plant samples at 10 locations of rice cultivation centers in Lampung. The results showed that the amounts of available Fe in paddy soils are 61 – 171 mg kg<sup>-1</sup>, in which the status in 8 regions are in toxicity and 2 regions are sufficient. The amounts of available-Mn in paddy soils are sufficient (13 – 167 mg kg<sup>-1</sup>). The amounts Fe in rice are sufficient (34.00-66.00 mg kg<sup>-1</sup>), Fe uptake status in straw (145-623 mg kg<sup>-1</sup>) is sufficient in 4 regions and toxic in 6 regions. The amounts of Mn in rice are deficient (6.91-11.03 mg kg<sup>-1</sup>), but Mn in straw is sufficient (112-355 mg kg<sup>-1</sup>). The amounts of available Fe in soils are positively correlated with Organic-C, however it does not correlate with total-Fe, soil pH, CEC, and clay content. The amounts of available Mn in soils are positively correlated with soil pH and total Mn, but it does not correlate with soil pH, CEC, and clay content. The amounts of available Mn in soil are positively correlated with Mn content in straw, but it does not correlate with Mn contents in rice whereas the amounts of available Fe in soils do not correlate with Fe contents in straw and rice.

Keywords: Availability, Iron (Fe), Manganese (Mn), Paddy Soils, Rice Plants