

## INTISARI

Lahan rawa pasang surut sulfat masam berpotensi untuk dijadikan sebagai areal budidaya padi untuk meningkatkan produksi padi di Indonesia. Akan tetapi terdapat kendala yang dapat menurunkan produksi padi di lahan pasang surut sulfat masam yaitu keracunan besi ( $\text{Fe}$ ). Pengelolaan air dan bahan organik merupakan salah satu cara untuk mengurangi keracunan besi pada tanaman padi. Penelitian ini bertujuan untuk mengetahui pengaruh pelindian dan pemberian bahan organik terhadap gejala keracunan besi, pertumbuhan dan hasil tanaman padi di tanah sulfat masam. Penelitian dilakukan di Rumah Kaca Balai Penelitian Pertanian Lahan Rawa (Balittra), Banjarbaru, Kalimantan Selatan pada Agustus-Desember 2020, menggunakan rancangan acak kelompok tiga faktor. Faktor pertama: konsentrasi  $\text{Fe}^{2+}$  rendah (<300 ppm) (F1) dan konsentrasi  $\text{Fe}^{2+}$  tinggi (>300 ppm) (F2), faktor kedua: penggenangan tanpa pelindian (P1) dan pelindian dua minggu sekali (P2); dan faktor ketiga: tanpa bahan organik (B1) dan dengan bahan organik 2,5 ton ha<sup>-1</sup> (B2). Hasil penelitian menunjukkan bahwa konsentrasi  $\text{Fe}^{2+}$  tinggi (>300 ppm) di tanah sulfat masam menurunkan berat kering tanaman sebesar 26,86% dan menurunkan hasil tanaman sebesar 29,98%. Pelindian menurunkan gejala keracunan  $\text{Fe}^{2+}$  sebesar 13,64%, meningkatkan berat kering tanaman sebesar 11,26% dan meningkatkan hasil tanaman sebesar 10,10%. Sedangkan pemberian bahan organik menurunkan gejala keracunan  $\text{Fe}^{2+}$  sebesar 9,09%, meningkatkan berat kering tanaman sebesar 23,58% dan meningkatkan hasil tanaman sebesar 8,06%. Tidak terdapat interaksi antara perlakuan konsentrasi  $\text{Fe}^{2+}$ , pelindian dan pemberian bahan organik terhadap gejala keracunan  $\text{Fe}^{2+}$ , pertumbuhan dan hasil tanaman padi di tanah sulfat masam.

Kata kunci: bahan organik, keracunan besi, konsentrasi  $\text{Fe}^{2+}$ , pelindian, tanah sulfat masam

## ABSTRACT

Acid sulphate tidal swamps had the potential to be used as rice cultivation areas to increase rice production in Indonesia. However, there are obstacles that can reduce rice production in acid sulphate tidal lands, namely iron toxicity. Management of water and organic matter is one way to alleviate iron toxicity in rice plants. This study aims to determine the effect of leaching and adding organic matter on the symptoms of iron toxicity, growth and yield of rice plants in acid sulphate soils. The study was conducted in the Indonesian Swampland Agricultural Research Institute (ISARI) Greenhouse, Banjarbaru, South Kalimantan from August to December 2020, using a randomized complete block design with three factors First factor: low concentration of  $\text{Fe}^{2+}$  (<300 ppm) (F1) and high concentration of  $\text{Fe}^{2+}$  (>300 ppm) (F2), second factor: waterlogging without leaching (P1) and leaching of once every two weeks (P2); and third factor: without organic matter (B1) and with organic matter of 2.5 tons  $\text{ha}^{-1}$  (B2). The results showed that high concentration of  $\text{Fe}^{2+}$  (>300 ppm) in acid sulphate soil decreased plant dry weight by 26.86% and decreased plant yield by 29.98%. Leaching decreased symptoms of  $\text{Fe}^{2+}$  toxicity by 13.64%, increased plant dry weight by 11.26% and increased plant yields by 10.10%. While the amendment of organic matter reduced the symptoms of  $\text{Fe}^{2+}$  toxicity by 9.09%, increased plant dry weight by 23.58% and increased plant yields by 8.06%. There was no interaction between treatment of  $\text{Fe}^{2+}$  concentration, leaching and adding organic matter on symptoms of  $\text{Fe}^{2+}$  toxicity, growth and yield of rice plants in acid sulfate soils.

**Keywords:** acid sulfate soils, concentration of  $\text{Fe}^{2+}$ , iron toxicity, leaching, organic matter