

## Intisari

Rawa lebak merupakan sumber pertumbuhan produksi pangan prospektif. Padi merupakan salah satu komoditas pertanian tanaman pangan yang dapat dikembangkan pada lahan rawa lebak. Rawa lebak yang mempunyai kadar Fe tinggi membatasi pertumbuhan dan hasil padi apabila kelarutan Fe tinggi. Oleh sebab itu telah dilakukan penelitian tiga tahap sebagai berikut (1) karakterisasi tanah dan keragaan padi petani yang bertujuan untuk mengidentifikasi sifat-sifat tanah awal dan keragaan padi petani serta mempelajari pengelolaan dan penggunaan tanah sawah rawa lebak kadar Fe tinggi di Kabupaten Poso pada berbagai regim curah hujan dan formasi geologi, (2) percobaan rumah kaca yang bertujuan untuk mempelajari pengaruh pengelolaan air dan pemberian kompos campuran jerami padi dengan kulit buah kakao (KBK) terhadap perilaku Fe dan ketersediaan P, serta pertumbuhan dan hasil padi; mendapatkan komposisi kompos campuran jerami dan KBK yang menurunkan ketersediaan Fe tetapi meningkatkan ketersediaan P serta pertumbuhan dan hasil padi sawah pada rawa lebak kadar Fe tinggi, dan (3) percobaan lapangan yang bertujuan untuk mengetahui pengaruh kompos dan dolomit terhadap ketersediaan P dan Fe, serta pertumbuhan dan hasil padi pada rawa lebak kadar Fe tinggi. Tahap pertama dilakukan melalui survey dan deskripsi profil tanah, pengamatan tanaman padi dan wawancara sejumlah petani. Tahap kedua merupakan percobaan pot dua faktor yang diatur menurut rancangan acak lengkap yang terdiri dari pengelolaan air (macak-macak dan berselang) dan pemberian  $5 \text{ t ha}^{-1}$  kompos campuran jerami dan KBK dengan komposisi (0><0%, 100><0%, 75><25%, 50><50%, 25><75%, 0><100%). Tahap ketiga merupakan percobaan satu faktor tentang modifikasi pengelolaan lahan. Unit percobaan diatur menurut pola rancangan acak kelompok yang terdiri dari kontrol (A0), cara petani (A1), pemberian kompos jerami 25% + KBK 75% dengan pengairan macak-macak (A2), pemberian kompos jerami 100% dengan pengairan berselang (A3), A2 + pupuk SP-36  $180 \text{ kg ha}^{-1}$  (A4), A3 + pupuk SP-36  $180 \text{ kg ha}^{-1}$  (A5), dan pemberian dolomit (A6). Hasil penelitian menunjukkan bahwa (1) tanah sawah rawa lebak di Kabupaten Poso mengandung Fe total sangat tinggi, Al-dd hanya ditemukan pada tanah dengan  $\text{pH}<5,5$ , hasil padi petani paling tinggi pada wilayah dengan regim curah hujan rendah, dan 65,72% petani responden belum mengetahui gejala keracunan Fe dan belum menggunakan limbah jerami dan KBK sebagai kompos, (2) pada percobaan rumah kaca, P tersedia, Fe amorf, Fe kristalin, Fe organik dalam tanah dan jumlah anakan padi pada pengairan berselang lebih rendah dibandingkan dengan pengairan macak-macak, tetapi tinggi tanaman dan komponen hasil padi lebih tinggi; pemberian kompos jerami 75-100% cenderung meningkatkan P tersedia, Fe amorf, Fe kristalin, Fe organik serta pertumbuhan dan hasil padi pada sawah rawa lebak kadar Fe tinggi, (3) pada percobaan lapangan, pemberian kompos jerami 100% dengan penambahan pupuk SP-36  $180 \text{ kg ha}^{-1}$  (setara dengan  $\text{P}_2\text{O}_5$   $60 \text{ kg ha}^{-1}$ ) dan pengairan berselang meningkatkan P tersedia, Fe organik, serta pertumbuhan dan hasil padi pada rawa lebak kadar Fe tinggi. Hasil padi tertinggi diperoleh pada perlakuan tersebut adalah sebesar  $6,77 \text{ t ha}^{-1}$ . Pemberian dolomit cenderung menurunkan P tersedia, Fe tersedia, Fe organik, serta pertumbuhan dan hasil padi pada sawah rawa lebak dengan kadar Fe tinggi.

Kata kunci: amelioran, kelarutan besi, pengelolaan air, P tersedia, rawa lebak

## Abstract

Non-tidal swamp is a source of prospective food production growth. Rice is one of the agricultural commodities of food crops that can be developed on non-tidal swamp land. Non-tidal swamp with high Fe content limits the growth and yield of rice if high Fe solubility. Therefore, three stages of research have been undertaken: (1) land characterization and farmers' rice performance aimed to identify the initial soil characteristics and farmers' rice performance as well as to study the management and use of high content Fe non-tidal swamp land in Poso District in various rainfall regimens and geological formation, (2) greenhouse experiment aimed at studying the effect of water management and composting of rice straw mixture with cocoa husks to Fe behavior and P availability, along with growth and yield of rice; derived the compost mixture of straw and cocoa husks that decrease the availability of Fe but increase the P availability to the growth and yield of rice in non-tidal swamp land with high Fe content, and (3) field experiments aimed at knowing the influence of compost and dolomite on the availability of P and Fe, along with growth and yield of rice in non-tidal swamp land with high Fe content. The first stage was conducted through survey and description of soil profile, observation of rice plants and interviews of farmers. The second stage was a two-factor pot experiment arranged according to a complete randomized design consisting of water management (saturated and intermittent) and the application of 5 t ha<sup>-1</sup> mixed straw compost and cocoa husks with composition (0><0%, 100><0 %, 75><25%, 50><50%, 25><75%, 0><100%). The third stage was a one-factor experiment on land management modification. The experimental unit was arranged according to a randomized complete block design pattern consisting of controls (A0), farmer's way (A1), 25% straw compost + 75% cocoa husks with saturated irrigation (A2), 100% straw compost with intermittent irrigation (A3), A2 + 180 kg ha<sup>-1</sup> SP-36 fertilizer (A4), A3 + 180 kg ha<sup>-1</sup> SP-36 fertilizer (A5), and dolomite (A6). The results showed that (1) the non-tidal swamp paddy fields in Poso district contained very high total Fe, exchangeable Al was only found in soils with a pH<5.5, the highest rice yield of farmers in areas with low rainfall regimens, and 65,72% of farmers were not aware of Fe toxicity symptoms and did not use straw waste and cocoa husks as compost, (2) in greenhouse experiments, available P, amorphous Fe, crystalline Fe, organic Fe in soil and number of tillers in intermittent irrigation was lower than saturated irrigation, but plant height and rice yield components are higher; 75-100% of straw compost tends to increase available P, amorphous Fe, crystalline Fe, organic Fe as well as growth and yield of rice in high content Fe non-tidal swamp land, (3) on field experiment, 100% straw composting with additional 180 kg ha<sup>-1</sup> SP-36 (equivalent to 60 kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub>) and intermittent irrigation increased available P, organic Fe, as well as growth and yield of rice in high Fe content non-tidal swamp land. The highest rice yield obtained at the treatment was 6,77 t ha<sup>-1</sup>. The application of dolomite tends to decrease available P, available Fe, organic Fe, as well as growth and yield of rice in high Fe content non-tidal swamp land.

Keywords: ameliorant, iron solubility, water management, available P, non-tidal swamp