

Effect of Slag Application to Soil Chemical Properties and Rice Yield on Acid Sulphate Soils with Different Pyrite Depth

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Abstract : The expansion of marginal soil such as acid sulphate soils for the development of staple crops, including rice was unavoidable. However, acid sulphate soils were less suitable for rice field due to the low fertility and the threats of pyrite oxidation. An experiment using Randomized Complete Block Design was designed to investigate the effect of slag in stabilizing soil reaction (pH), improving soil fertility and rice yield. Experiments were conducted in two locations with different pyrite depth. The results showed that slag application was able to decrease the exchangeable Al and available iron (Fe) as well as increase the soil pH, available-P, soil exchangeable Ca²⁺, Mg²⁺, and K⁺. Furthermore, the slag application increased the plant nutrient uptakes, particularly N, P, K, followed by the increasing of rice yield significantly. Nutrients availability, nutrient uptake, and rice yield were higher in the shallow pyrite soil instead of the deep pyrite soil. In addition, slag application was economically feasible due to the ability to reduce standard fertilizer requirements.

Keywords : acid sulphate soils, available nutrients, pyrite, slag

Conference Title : ICSSPN 2018 : International Conference on Soil Science and Plant Nutrition

Conference Location : Paris, France

Conference Dates : January 25-26, 2018