

Spent Mushroom Medium Compost as a Soil Conditioner for the Initial Stage of Paddy Growth

Abstract

Spent mushroom medium (SMM) is one of the agricultural wastes that produce daily from the cultivation of mushroom and is usually disposed by burning or landfilling, which is a waste of biological resources. The composted SMM has the potential physico-chemical properties that can be utilized as organic soil conditioner to improve soil fertility in paddy field. Conventionally, paddy field is usually fertilized by granular urea (GU) as nitrogen (N) fertilizer. The excessive use of GU had caused several environmental problems such as soil acidification and ammonia (NH₃) volatilization. To evaluate the feasibility of organic SMM compost used as soil conditioner in paddy field, analysis was carried out to measure the physico-chemical properties. Pot experiment has been conducted, and the paddy growth was evaluated after 21 days of plantation. The soil sample was applied with GU and SMM compost with the same N fertilizer rate. Soil properties were measured before and after treated with soil conditioner. The paddy growth was evaluated with plant height and root:shoot (R/S) ratio. From the result obtained, SMM compost improved both physical and chemical properties of paddy soil, significantly increased WHC and soil porosity that help reduce nitrate (NO₃⁻) leaching and reduce NH₃ volatilization. As a whole, the application of SMM compost was successfully improved the soil fertility and had the potential to replace GU as the soil conditioner, but further improvement in the management practices should be performed to achieve better plant growth.

Keywords

Composting; Organic compost; Plant growth; Soil conditioner; Spent mushroom medium