Evaluation of nutrients released from phosphorus-enriched empty oil palm fruit bunches as growing media using Setaria splendida.

ABSTRACT

The use of oil palm empty fruit bunch, an agricultural waste from oil palm plantations, as a feeding material for earthworms during composting provides an alternative source of nutrients for plants. Information regarding the ability of earthworms in processing phosphorus-enriched empty oil palm fruit bunch and their effects on plants is still lacking. The objective of this study was to compare the effects of phosphorus-enriched empty oil palm fruit bunches applied as fresh, composted or vermicomposted media in supplying nutrients on a test crop, Setaria splendida L., grass planted on Bungor (Typic Kandiudult) soil. The soil treated with phosphorus-enriched vermicomposted empty oil palm fruit bunch increased the grass dry matter yield significantly higher compared to that treated with composted empty oil palm fruit bunch and control. The root volume of vermicomposted- and composted- empty oil palm fruit bunches treated soil was similar but significantly greater than the control. There was significant interaction between dosage and type of growing media on cumulative N, P, K, Ca, and Mg uptake. However, these factors did not show significant influence on total N, P, Ca and Mg in the soil amended with composted oil palm empty fruit bunch at the end of the experiment. In general, phosphorus-enriched vermicompostedand phosphorus-enriched composted- empty oil palm fruit bunches treated soil resulted in a greater positive effect on growth and nutrient uptake of S. splendida, and also on the total nutrient content in soil except for total K. Total soil K in the control treatment was 242.0 mg/kg and significantly higher compared to soil treated with composted- (173 mg/kg) and vermicomposted- empty oil palm fruit bunches (167 mg/kg). The vermicomposted empty oil palm fruit bunch resulted in better growth performance of the S. splendida in comparison to composted- and fresh- empty oil palm fruit bunches due to the readily available P and other nutrients being readily available to the plants.

Keyword: Enriched P; Empty fruit bunches; Oil palm; Vermicomposted.