

Possibility of Replacing Recommended Fertilizer Applications with Palm Oil Mill Effluent Sludge as Organic Fertilizer for Okra and Kangkung Cultivation

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Abstract

Despite high economical return, palm oil mills generate large amount of waste during extraction and purification processes. Wastewater generated through the process is considered as Palm Oil Mill Effluents (POME) and it is the most polluted organic residue from mills. However, in Sri Lanka open pond systems are used to treat POME to reduce environmental impact generated when raw POME is discharged to the outside environment. Meanwhile, through the treatment process, POME sludge is generated at the bottom of ponds and dumping of POME sludge into oil palm fields is practiced. This dumping has created numerous environmental and social issues. POME sludge contains vital elements required for plant growth and development. Effective use of POME as an organic fertilizer was investigated in this experiment. Specific objectives were to find out the most effective quantity of recommended fertilizer mixture to be replaced by POME sludge for both Okra and Kangkung cultivation and find out the characteristics of POME sludge. The experiment was set up according to a complete randomized design with five replicates. Six treatments were applied including 100% recommended fertilizer and gradual increasing of POME sludge up to 50%. Growth and yield parameters were measured for both Okra and Kangkung. The pH value of POME sludge was 7.8 while nitrogen, phosphorus and potassium were 2.37%, 1.16% and 0.38%, respectively. Comparatively higher vegetative growth resulted in 50:50 replaced treatment and there was no significant difference among yield parameters of Okra. For Kangkung, leaf area, fresh weight of tender shoots, root length and fresh weight of underground parts indicated significant differences among treatments. Most of the parameters denoted comparatively higher mean values in 70:30 replaced treatment. POME sludge has a significant effect on vegetative growth and further research is needed to prove the findings.

Keywords: Kangkung, Okra, Organic, POME sludge, Recommended fertilizer

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