Assessment on the quality of recycled paper mill sludge mixed with oil palm empty fruit bunch compost.

ABSTRACT

Recycled Paper Mill Sludge (RPMS) is currently disposed off in the landfill and the costs are becoming expensive. Therefore, an alternative disposal through land application of RPMS and empty fruit bunches (EFB) (as a bulking agent) compost requires investigation. This study was conducted to determine the physico-chemical characteristics of composted RPMS and EFB mixtures, their phytotoxicity and the effect of the composts on plant growth performance. Composting experiment was arranged in a completely randomized design (CRD) with four replicates. The RPMS were mixed with EFB in 3 ratios, that is 1:1, 1:2 and 1:3 (RPMS: EFB) based on volume/volume. The mixtures were filled in a polystyrene box up to 90% volume and water was sprinkled onto the compost (50% moisture content) to accelerate decomposition. During composting, the compost was turned every three days to ensure that the material on the outside of the pile was turned from the center outwards to dissipate heat. The RPMS and EFB compost mixtures were evaluated for physical, chemical, phytotoxicity and short term plant growth effects. These composts mixtures had no toxicity effects on plants, had 100% seed germination, high in nutrient contents, low in C/N ratio and had fine particle size of <18 mm. The concentrations of heavy metals were also within the recommended level of the Council of European Communities (CEC) for compost. Compost produced from a ratio of 1:1 volume is suitable for land application as compared to 1:2 and 1:3 (RPMS: EFB). However, further study should be carried out to evaluate the effect of raw and RPMS compost on soil fertility, plant productivity and quality.

Keyword: Compost quality; Nutrients; Heavy metals; Phytotoxicity; Compost.