

## **Application of raw and composted recycled paper mill sludge on the growth of *Khaya senegalensis* and their effects on soil nutrients and heavy metals**

### **ABSTRACT**

The paper industry performs an essential role in the global economy of the world. A study was conducted on the paper mill sludge that is applied on the *Khaya senegalensis* for 4 crop cycle for 1 year growth at glasshouse, Faculty of Agriculture, Universiti Putra Malaysia. Paper Mill Sludge (PMS) and composted Recycled Paper Mill Sludge (RPMS) was used with nitrogen (0, 150, 300 and 600 kg ha<sup>-1</sup>) at the ratio of 1:1 (Recycled Paper Mill Sludge (RPMS): Empty Fruit Bunch (EFB)). The growth parameters were measured twice a month for 6 months. Plant nutrients and heavy metal uptake were determined. The paper mill sludge has the potential to be a supplementary N fertilizer as well as a soil amendment. The application of RPMS with N, significantly contributed to the improvement in plant growth parameters such as plant height (193 cm), basal diameter (27.00 mm), total plant biomass and improved soil physical and chemical properties. Total concentrations of heavy metals in soils were below the critical values. Hence, the paper mill sludge can be successfully used as soil amendment in acidic soil without any serious threat. The use of paper mill sludge for soil fertility, shows improvement in land application and signifies a unique opportunity to recycle sludge back to the land to alleviate the potential waste management problem.

**Keyword:** Growth; Heavy metals; Nutrient uptake; Production; Waste management