

## **Application of waste raw and composted recycled paper mill sludge on orthosiphon stamineus and its effects on heavy metals in soil**

### **ABSTRACT**

The paper industry plays a major role in the global economy of the world. A study was conducted on the waste paper mill sludge applied on the *Orthosiphon stamineus* for 4 crop cycle for 1 year growth at Glasshouse, Faculty of Agriculture, Universiti Putra Malaysia. Waste Paper Mill Sludge (PMS) and waste composted Recycled Paper Mill Sludge (RPMS) was used with nitrogen (0, 100, 200 and 400 kg ha<sup>-1</sup>) at the ratio of 1:1 (Recycled Paper Mill Sludge (RPMS): Empty Fruit Brunch (EFB)). The growth parameters were measured twice a month for 6 months. Plant nutrients and heavy metals 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 waste RPMS with N significantly contributed to the improvement in plant dry matter (28.5 g plant<sup>-1</sup>) and improved soil physical and chemical properties. Total concentrations of heavy metals in soils were below the critical values. Hence, the waste paper mill sludge can be successfully used as soil amendment in acidic soil without any serious threat. The use of waste paper mill sludge for the soil fertility showing improvement in land application signifies a unique opportunity to recycle sludge back to the land to alleviate the potential waste management problem.