**Ameliorating plant available water by addition of treated palm oil mill effluent (POME) sludge on entisols**

ABSTRACT

Palm oil mill contributed a significant benefit to agro-based industry and social-economic for Malaysia. The treated POME sludge was produced from the open treatment ponds and palm oil mill effluent (POME) without any treatment is considered as a polluted wastewater. This study is to determine the effect of POME sludge on Entisols for plant available water (PAW). The data obtained from this study were selected to measure physicochemical parameters (bulk density, porosity, compaction, organic matter), hydraulic parameter (hydraulic conductivity, hydraulic capacity and water retention) to determine the PAW. The POME sludge from different treatment ponds (control, mixing pond, anaerobic pond, facultative pond, algae pond and dumping pond) was applied to the Zea mays (Hibrimas) as a test crops. The results showed that maize treated with POME sludge from the dumping pond indicated significant difference on soil organic matter, bulk density, porosity, soil compaction and plant available water compared to mixing and anaerobic ponds. As a conclusion, POME sludge from the dumping might improve soil physical properties of Entisols. The dumping pond sludge has significant potential to be used as an organic amendment for plant growth in the future.

**Keyword:** POME sludge; Selected soil physical properties; Plant available water