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## **Effects of Different Combinations of Organic and Inorganic Fertilizers on Marginal Oil Palm (*Elaeis guineensis*) at Talgaswella Estate in WL2a Agro Ecological Zone, Sri Lanka**

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### **ABSTRACT**

Palm oil (*Elaeis guineensis*) is the most consumed edible vegetable oil in the world. Commercial scale Oil palm cultivations mostly depend on quality planting materials, correct management practices. Due to the recent price hike on chemical agricultural inputs in Sri Lanka, palm cultivation faced different hardships to maintain their plantations. An experiment was carried out at Talgaswella estate of Elpitiya Plantations PLC, in WL2a agro-ecological zone of Sri Lanka to investigate the possibility to apply organic fertilizer for a marginal conventional oil palm field for achieving a profitable yield with the integration of organic fertilizer. Ten years aged oil palm field was selected for this experiment. Three treatments namely 100% organic, 100% inorganic and a combination of inorganic fertilizer with a portion of organic fertilizer that provides the nutrients as same as the recommended inorganic fertilizer for oil palm were tested from September 2019 to September 2021. The experiment was carried out according to RCBD with three replicates and each replicate consisted of six palms. Empty fruit bunches (EFB) of oil palm, palm oil mill effluent (POME) and poultry litter (PL) were used for preparation of organic fertilizer. Fresh fruit bunch yield and the leaf chlorophyll values were recorded, and the data were analyzed with SAS statistical tool. The results revealed that the treatment with 100% organic fertilizer showed significant increments in average fresh fruit bunch weight (41kg) compared to that of the 100% inorganic fertilizer (26 kg) and 50% to 50% inorganic-organic mixture (23 kg). The leaf chlorophyll values in the 17th frond of 100% inorganic and 100% organic treatments were 75.57 and 75.91 in SPAD units respectively while it was 74.62 in the inorganic-organic mixture and there's no significant difference among the treatments. Soil organic carbon percentage varied from 100% inorganic to 100% organic (1.99 and 2.05) respectively and it clearly showed the gradual increment of soil organic carbon levels, which will directly affect the fertilizer use efficiency. Therefore, the application of organic fertilizer showed better yield (10030kg/ha/year) in oil palm compared to inorganic fertilizer (9234kg/ha/year) in Talgaswella estate, Sri Lanka.

**Keywords:** *Oil Palm, Organic fertilizer, Plant Growth, POME, Sri Lanka*