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Sustainable Soil Management in Oil Palm Plantations*

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With the current phenomenal increase in the overall cost of fertiliser inputs, the palm oil industry is now under pressure to reduce production costs and thus the need to adopt production practices which is agriculturally sustainable, economically viable, and environment friendly. This posed a great challenge to the plantation management since most of the oil palm planting in the country is mostly on the acidic and highly weathered tropical soils which are inherently poor in nutrients. With its high rainfall and temperature, and after loss of vegetation cover, soil degradation and erosion are real problems. A sustainable soil management programme is a key component to the conservation of soil resources and fertility to sustain a long-term productivity of the oil palm.

There is a need to implement cultural practices that could significantly reduce soil degradation processes and conserve soil fertility to enhance crop productivity and protect the environment. Appropriate management of the organic biomass that is readily available in the plantation for nutrient recycling may also have the beneficial effects in maintaining soil fertility, besides conserving the biodiversity of soil fauna and microbial communities and ultimately have implications for pest and disease control. Wide ranges of palm biomass which are rich in plant nutrients and organic carbon are available in the oil palm ecosystem. During regular harvesting and pruning rounds about 14.75 tonnes of pruned fronds are available annually from a hectare of oil palm. At the palm oil mills, large volume of empty fruit bunches are generated after the processing of fresh fruit bunches (0.2 tonnes of EFB produced for every tonne of FFB processed). These organic biomass could be returned to the field for mulching oil palm which could help improve soil fertility and oil palm productivity. The adoption of zero burning technique during replanting of oil palm could also generate a significant amount of organic matter and plant nutrients from the above-ground palm biomass (estimated at 85 tonnes of dry matter per hectare).

Proper management of oil palm biomass for nutrient recycling and addition of organic matter to the soil could sustain soils productivity and saves on fertiliser cost and reduces the cost of production. More importantly, it goes a long way towards environmental conservation by reducing our dependence on fossil fuel required for the manufacture of inorganic fertilisers. With limited land resources for expansion, the only way forward is to adopt sustainable soil management which could increase efficiency and productivity, sustainability, and be environment friendly.

Keywords: Sustainable, soil management, productivity, oil palm biomass, nutrient recycling.