Oil palm (Elaeis guineensis) roots response to mechanization in Bernam series soil

Abstract

Problem statement: Field practices involving the use of mechanization in oil palm plantations could result in soil compaction which alters the soil physical properties. The gradual deterioration of soil physical conditions could restrict the growth and function of roots. This study was carried out to evaluate the response of oil palm roots to changes in soil physical properties due to mechanization in Bernam series soil belonging to the clay texture class.

Approach: Compaction treatments were imposed for 6 consecutive years and a comparison was done on the effects of different trailer weights on oil palm roots growth. Roots and soil were sampled using root and soil augers at 0-30 cm depth from the harvesting and frond pile paths.

Results: The results showed that the oil palm roots were affected by the mechanization treatments. Growth of oil palm roots was significantly affected by the 4T trailer weight. Palms in compacted soil produced less primary and secondary roots but this was compensated for by the production of longer and thicker tertiary and quaternary roots.

Conclusion: The compaction treatments affect the soil physical properties, which in turn affect the growth and distribution of oil palm roots. © 2010 Science Publications.

Keyword: Soil compaction; Oil palm; Bernam series.