

Machinery compaction effects on physical properties of Bernam Series in an Oil Palm Plantation

Abstract

Problem statement: Introduction of mechanisation in oil palm (*Elaeis guineensis*) plantations could result in soil compaction and cause soil degradation. This could be a serious problem in the future due to increase in size, weight and transportation frequency of machines used. Objectives: This trial was carried out to evaluate the effect of different trailer weights and transportation frequencies on the soil physical properties of Bernam series soil. Approach: The treatments were a combination of three trailer weights and four transportation frequencies. At the end of 6 years of the experiment, soil samples were taken for soil physical properties characterisation at 0-10, 10-20 and 20-30 cm depths. Results: After six years of soil compaction treatments, the results showed that the mean soil bulk density increased and the porosity decreased annually. However, the mean soil bulk density was still less than 1.0 g cm⁻³. The mean soil bulk density decreased with increasing soil depth, but porosity and available water increased with soil depth. The 3 rounds per month transportation frequency for all trailer weights and 2 rounds per month for the 4 tonnes trailer weight significantly affected the soil physical properties. Conclusion: Generally, the results indicated that the 6 years of compaction treatments did not cause serious soil compaction that could alter the soil physical properties for this particular soil type. © 2009 Science Publications.