

Impact of soil compaction on soil physical properties and physiological performance of sweet potato (*Ipomea batatas* L.)

ABSTRACT

Sweet potato is the most important food crop after wheat, rice, maize and cassava. Soil compaction degrades soil by altering its structure and aggregate, thereby causing poor plant-water relationship. This study aimed to determine the effect of soil compaction on some soil physical properties and eco-physiological characteristics of sweet potato. Prior to planting and after harvest, soil bulk density and moisture content were determined. For the eco-physiological measurements, the treatments tested were assembled in a factorial combination of three levels of soil compaction as main plots and three varieties in the sub-plots. The treatments were arranged in a split plot design and replicated four times. Gas exchange parameters, leaf area index and chlorophyll content were subsequently determined. The results showed that soil compaction significantly decreased plant chlorophyll content, leaf area index and gas exchange parameters. On tropical sandy loam soils, tilling the soil once was sufficient for optimum emergence and establishment of a sweet potato. Gendut proved to be a tolerant variety, suitable to be planted in environments prone to compaction stress.

Keyword: Bulk density; Compaction; Physiology; Soil and sweet potato