

Influence of water table depths, nutrients leaching losses, subsidence of tropical peat soil and oil palm (*Elaeis guineensis* Jacq.) seedling growth

ABSTRACT

Inadequate availability of nutrients and leaching losses due to water table fluctuations is a serious concern in oil palm cultivation on tropical peat land. The objectives of the study were to determine peat subsidence and leaching losses of N, P, K, Mg, Ca, Cu, and Zn from tropical peat soil under cultivation of oil palm seedlings at different water table depths. The study was conducted using cylindrical lysimeters with five water table depths namely, 25, 40, 55, 70, and 85 cm from the soil surface. The experimental layout was a Randomised Completely Block design. Leachate from each lysimeter was collected after a rainfall event to determine the leaching loss of nutrients. The highest water table depth (25 cm) from the soil surface showed the highest nutrient leaching losses, and the lowest water table depth (85 cm), showed the highest subsidence and lowest nutrients leaching losses. Plant growth was highest under the 55 cm water table depth, and the lowest under the highest and lowest water table depths of 25 and 85 cm. The 55 cm water table depth was the best for oil palm growth because the active root zone of oil palm is within the 60 cm soil depth.

Keyword: Peat soils; Oil palm growth; Nutrients leaching; Subsidence; Water table depth