

Impact of paclobutrazol on the growth and development of nursery grown clonal oil palm (*Elaeis guineensis* Jacq.)

ABSTRACT

The economic life of an oil palm (*Elaeis guineensis* Jacq.) plant is associated with the stature of the palm as the height of each oil palm affects the cost of harvesting. Shorter palm allows ease of harvesting and better fruit recovery hence contributes to the increase of the fresh fruit bunch (FFB) yield. This study was conducted to investigate the effect of paclobutrazol (PBZ), an inhibitor of gibberellin (GA) biosynthesis, on the growth and development of clonal oil palms maintained under nursery conditions. Application of PBZ significantly reduced the growth of clonal palms with the optimal concentration of PBZ being 50 mg litre⁻¹ when applied as a foliar spray. PBZ-treated palms exhibited shorter fronds that were dark green in colour and plants had a more compact structure as compared to untreated controls. Longitudinal sections of PBZ-treated oil palm clones revealed that both leaves and stems comprised of fewer cells each with a smaller volume. PBZ-treated plants exhibited a higher rate of photosynthesis compared to controls and this was correlated with an accumulation of starch in stem cells. These results provide evidence that the vegetative growth of oil palm is regulated by GA levels and that by manipulating the concentration of these hormones it may be possible to attenuate the oil palm height and ultimately increase productivity.

Keyword: Gibberellins; Growth; Oil palm; Paclobutrazol; Photosynthesis; Plant anatomy