

Selected Precision Agriculture studies in oil palm: a 10-year summary

ABSTRACT

Precision Agriculture (PA) embodies a holistic field management strategy that allows adjustment of crop input use and cultivation methods, including seed, fertilizer, pesticide and water application, variety selection, planting, tillage and harvesting, to match varying soil, crop and other field attributes. PA involves mapping and analyzing field variability, and linking such variability to management actions. This contrasts with conventional agriculture that is based on uniform treatment(s) across a field. Oil palm is an excellent candidate for PA implementation simply because it consumes a large amount of chemical and physical inputs. However, a major constraint in implementing PA strategies on a detailed scale for oil palm is the typically large plantation size. The agronomic challenge of increasing oil palm yield productivity hinges on three primary issues: 1) fertilization, 2) cropping practices such as planting density, ground cover, pruning and drainage, and 3) pest and disease management. This paper presents a 10-year Abstract of selected PA studies carried out in Malaysian and Indonesian oil palm plantations. These studies are: spatial variability of soil fertility across topography, removal of spatial effects to improve interpretation of data from fertilizer trials, development of a non-destructive oil yield and oil quality estimation protocol, stand density assessment using remote sensing, spatial variability of soil organic carbon across different crop ages, spatial variability of orange spotting disease, discriminating between potassium deficiency and orange spotting disease symptoms using remote sensing, estimating fresh fruit bunch yields using remote sensing, and estimating palm oil quality and yield using proximal sensing.

Keyword: Precision Agriculture; Agriculture study; Oil palm