Transforming spatio-temporal yield maps to classified management zone maps for efficient management of oil palm

ABSTRACT

One of the major challenges in oil palm plantations today is proper interpretation of yield maps for site-specific management and development of classified management zone maps for its efficient management. A study was conducted on an on-going fertilizer response trial in Sabah, Malaysia to examine the possibility of converting spatio-temporal yield maps of oil palm to classified management zone maps for practical management purposes. Two clusters of palms were selected for the study; with and without N fertilizer applications for the past 10 years. Fresh fruit bunch (ffb) yields were summarized on an annual basis. Point kriging method of geostatistics was used to interpolate ffb yields at unsampled locations. A classified management zone map was developed based on the spatial and temporal stability yield maps from 1992-1999. Nine management zones were derived from the spatio-temporal features in the ffb yield variations for decision making. Two management zones of high, stable yields and high, fairly stable yields and 4 management zones of moderate, stable yields; moderate, fairly stable yields; moderate, unstable yields; and low, unstable yields were then demarcated from area with and without N applications for practical management purposes. The results demonstrate the potential of transforming spatial and temporal stability of ffb yield maps from multi-year yield data to practical classified management zone maps for site-specific oil palm management particularly for fertilizer application. However, the potential of misinterpretation of yield maps can be high if limited data are available. Further work is necessary to ascertain the minimum number of palms and years required for the generation of meaningful yield maps and management zones.

Keyword: Temporal variability ; Spatial variability ; Nitrogen fertilizer ; Oil palm yield ; Malaysia ; Oil palm yield Management maps