Determination and mapping of calcium and magnesium contents using geostatistical techniques in oil palm plantation related to basal stem rot disease

ABSTRACT

The basal stem rot (BSR) disease has been reported as the most destructive disease of oil palms in Southeast Asia. Adequate contents of nutrient in soil and leaf helps improve the plant health and its productivity. This study aims to determine the spatial variability of calcium (Ca) and magnesium (Mg) in soil and leaf collected in BSR infected oil palm plantation. The exchangeable calcium (Ca ex) and magnesium (Mg ex) in soil were found low in the study area ranged from 0.03-0.50% and 0.06- 0.35%, respectively. The Ca and Mg content in leaf were also low ranged from 0.09-0.60%, and 0.03-1.87%, respectively. The Ca ex in soil of both blocks showed a negative significant correlation with the disease at $p < 0.01$. However, only Ca content in leaves of one study site (Block 2) showed a negative significant correlations with the disease ($p < 0.05$). The generated map and significant correlations revealed that unbalanced nutrient content occurred in the study area.

Keyword: Ganoderma; Geostatistic; Kriging; Oil palm; Spatial variability