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**EVALUATION OF SPATIAL VARIABILITY OF SOIL AND LEAF TISSUE NUTRIENT  
STATUS AND YIELD (FRESH FRUIT BUNCH)  
IN AN OIL PALM PLANTATION**

**By**

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The study was carried out at Dusun Durian Estate, Golden Hope Plantations Berhad Banting, Selangor, in a 50 ha plot which represents a coastal oil palm plantation. The general objective of this study was to obtain accurate and timely information about the spatial distribution and status of nutrients in the soil and leaf tissue using Geographic Information System (GIS) and remote sensing technology for precision farming of oil palm plantation. Collection of soil and leaf tissue data were conducted by using systematic sampling and an Omni Star DGPS was used to precisely determine the sample sites location. Geostatistics (GS+) software and classical statistics were used for data analysis. A SPOT image of K-J.299344 acquired on March 2000 from the Malaysian Centre for Remote Sensing (MACRES) was analysed using a PCI software version 7.0. Descriptive statistical analysis classed the status of total N as low, whereas available P and exchangeable K varied from moderate to high. Soil exchangeable Ca and Mg ranged from low to moderate. Soil nutrients variability of available P, exchangeable K, Ca and Mg status were classified as high and moderate for total N. Semivariance analysis showed that the total N, available P and exchangeable K in the soil have a moderately spatial dependence and while strongly spatial dependence for exchangeable Ca and Mg with available lag distance of 52 to 117 m. Leaf nutrient analysis illustrated that the leaf nutrient variability of N, P, and K could be classified as low (CV values of 7, 8 and 12) and moderate variability for Ca and Mg (CV values of 19 and 22). Based on the semivariance analysis, all the leaf nutrients have a moderately spatial dependence with the lag distances of 75, 75, 51, 63 and 117 m for N, P, K, Ca and Mg, respectively. There was no strong relationship between nutrient content in the soil and nutrient content in leaf tissue; therefore nutrient content analysis in leaf tissue was not able to predict nutrient content in the soil. Yield of fresh fruit bunches (FFB) has a high variability and moderately spatial dependence within the lag distance of 84 m. Both the soil nutrient and nutrient content in leaf tissue were not able to predict FFB, because the statistical analysis indicated that there were no strong relationships between yield FFB and nutrients in soil and leaf tissue. SPOT image analysis using Digital Numbers (DN), unsupervised and supervised classifications methods could not be used to predict nutrient content in leaf tissue