Precision farming: A new approach to cocoa farm management in Malaysia

Tee Yei Kheng
Malaysian Cocoa Board, Malaysia

Development of precision cocoa management is a game changer for cocoa industry in Malaysia by providing access to know about the conditions of crop, soil and factors contributing to the cocoa production using modern technology. Precision cocoa farm management might provide a blueprint to increase cocoa productivity and at the same time reduce agriculture input costs. This study allows for comparisons between conventional cocoa farm management against precision cocoa farm management at two different cocoa planting systems. The goal of the study was to quantify spatial soil variability at two different planting systems of cocoa-gliricidia and cocoa-coconut and to analyze the spatial and temporal variability of cocoa fresh bean weight and cocoa pod borer (CPB) infestation rate with soil properties. A systematic grid sampling was designed for soil sampling based on a cluster of six cocoa tree stands for both farms. Additionally, cocoa fresh bean weight and CPB infestation were collected at two weeks interval from cocoa-gliricidia and cocoa-coconut. All field data points were geo-referenced by a differential Global Positioning System. After normality check and outlier detection, data were analyzed by variography and interpolation techniques to quantify the spatial variability of the field data. Results showed that both plots exhibited definable spatial structures and were described by exponential models. From the study, precision cocoa farm management helped to increase crop yield by 58.8 and 51.1% at cocoa-gliricidia and cocoa-coconut, respectively, might be due to the site specific fertilization and pests control in the critical zone, especially during high peak harvesting season of cocoa.

Biography

Tee Yei Kheng is a research officer in Malaysian Cocoa Board since 2013 and currently, she is also a PhD candidate in Universiti Putra Malaysia (UPM). She has the research interests in plant physiology and precision agriculture. Ms. Tee is also the Head of Project for a research funding under 11th Malaysian Plan (2016-2020) with 10 research projects have been carried out to study the effects of climate changes on cocoa productivity. Despite that, she has the interests in applying Geographical Information System (GIS) and spectral reflectance of cocoa in response to nutrient deficiency and plant stress through precision cocoa management which grant her another research funding under 11th Malaysian Plan for 5 years (2016-2020). She was the first Borlaug Fellow from Malaysia in 2015 to join The Norman E. Borlaug International Agricultural Science and Technology Fellowship Program. This program was supported by World Cocoa Foundation and the U.S. Department of Agriculture Foreign Agricultural Service.

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