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Baseline Study to Implement an Integrated Pest Management Strategy for the Red Root Rot Disease at Sabah Tea Plantation, Malaysia

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Abstract

Sabah Tea is the largest single commercial tea plantation in Sabah. Being certified by SKAL International, Netherlands Sabah Tea is one of the few tea plantations in the world to produce organic tea. Optimal yield production at Sabah tea is hampered by the presence of root diseases, the most common one being the white root rot. The causal agent of this disease is *Poria hypolateritia* a soil born pathogen. Although the red root rot is recognised to be the most destructive disease of tea particularly in Asia no sustainable control of the disease has been achieved so far. At present management strategies are solely based on sanitation, whereby infected tea trees with one or two rows of surrounding apparently healthy trees are uprooted and burned. Subsequent planting of Guatemala grass (*Tripsacum laxum*) interrupts the life cycle of Poria and allows for replanting after six to nine month. It appears that effective and sustainable management strategies to control red root rot are hampered mainly by a lack of understanding of the mechanisms of disease establishment and spread. This study was designed to collect baseline data on the behaviour and epidemiological characteristics of *Poria sp.* in order to develop and implement an effective integrated pest management strategy for the white root rot at Sabah Tea. Disease incidences were censored on a heavy infected field, whereby tea trees were visually characterised into healthy, infected and dead trees and geocoded. In addition geocoded soil samples were taken under healthy, infected,and dead trees and Guatemala grass. For each category three representable areas were selected on neighbouring fields, whereby for each area four subsoil samples were taken. Soil samples were analysed for pH, organic matter, and particle size and plant available nutrients. A DEM for the area, based on a 1:50000-scale topographic map updated with within field slope measurements was used to model the topography of the plantation. Information of spatial and temporal distribution of diseased tea trees, soil chemical parameters and topography were overlaid in a GIS environment to produce a risk map of the white root disease for the Sabah Tea Plantation.

Keywords: GIS, integrated pest management, local resource management, tea

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