Leaf analysis for yield intensification in oil palm

June 30, 2014. Penang, Malaysia – Leaf nutrient analysis is commonly used as a diagnostic tool to assess the nutrient status of oil palm plants. Many plantations rely on leaf analysis to decide on which fertilizers to use for increasing yields. However, best management practice (BMP) trials conducted recently in six commercial plantations in Indonesia by the Southeast Asia Program of International Plant Nutrition Institute (IPNI SEAP) have shown the lack of a clear link between leaf nutrient status and crop yield.

A recent four-year trial monitored nutritional status, fertilizer application, yield and other growth indicators for oil palm. It was found that nutrient levels measured in the leaf and rachis of the oil palm plant did not reflect well, the differences in yield or fertilizer input, managed under commercial production operations. While BMP plantation blocks consistently produced greater yield when compared to reference blocks that maintained current plantation practices, leaf nutrient levels were not significantly different for N and P in both blocks in the various sites. Several trial sites did report some differentiation in leaf and rachis K levels between BMP and reference blocks, but it was not possible to correlate leaf K levels with rachis K levels.

The lack of clear association between plant nutrient levels, yield and soil nutrient supply indicates that leaf analysis may be not be very effective for yield intensification in oil palm plantations once acute nutrient deficiencies have been removed. IPNI SEAP suggests a complementary approach to adjust leaf nutrient indicator values via Plantation Intelligence—a concept that reduces the guesswork in crop analysis for yield intensification. Designed to reduce decision uncertainty, Plantation Intelligence utilizes on-farm data collection for a continuous learning process, by analyzing, adjusting, and observing the resulting performance of individual plantation blocks in estates.

On-farm data collection of leaf nutrient content, yield, weather and soil conditions regularly over a prolonged period of time makes it possible to more accurately investigate the relationship between leaf nutrient content and yield in commercial production operations and deduce plant nutrient requirements. The cycle of observation, interpretation and evaluation acts like a feedback loop so that the performance of indicator values can also be assessed and revised as needed.

The effectiveness of Plantation Intelligence increases with collaboration among oil palm producers, i.e., sharing their plantation data. A large number of datasets would be ideal to account for uncontrollable variables and make sense of trends in crop management in order to present more accurate analysis. This peer-to-peer dataset sharing in Plantation Intelligence would provide maximum benefits for producers by ensuring effective use of fertilizers, reducing cost and waste, while improving crop yields.

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About IPNI
The International Plant Nutrition Institute (IPNI) is a not-for-profit, science-based organization dedicated to the responsible management of plant nutrition for the benefit of people. Through cooperation and partnerships with respected institutions around the world, IPNI adds its strength to agronomic research, education, demonstrations, training, and other endeavors. Best management practices for nutrient stewardship encourage the concept of 4Rs - applying the right nutrient source, at the right rate, at the right time, and in the right place. To learn more about IPNI, please visit: www.ipni.net

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