



## **NEWSFLASH : Sulphur, the long-neglected nutrient in oil palm cultivation**

July 31, 2013. Penang, Malaysia – With much attention given to the importance of NPK in oil palm nutrient management, sulphur (S) has been largely ignored.

Sulphur was hardly an issue in the past, thanks to abundant S availability from existing soil organic matter, organic fertilizers, volcanic eruptions, forest burning and crop residue. Early research on oil palm nutrition in Malaysia did not reveal the need for S supply due to the widespread use of ammonium sulphate as N source. However, recent findings indicate S input has diminished from continuous S removal due to crop harvesting and leaching. In Indonesia, the popularity of S-free fertilizers (e.g. urea, rock phosphate, dolomite) in recent years, on top of the sulphate leaching, has exacerbated the condition.

Analyses of samples from Indonesian oil palm growing regions reveal a disturbing trend. Data were obtained from best management practice (BMP) projects established by the International Plant Nutrition Institute, Southeast Asia program (IPNI SEAP) together with plantation groups in Sumatra and Kalimantan between 2007 and 2011. While the BMP projects did not directly address the management of sulphur, leaf samples from the reference blocks of six sites, representative of standard estate practice in Indonesia, were assessed for S nutrient status. All sites reported a continuous decline in S status<sup>1</sup>.

From observations on-site and other crop research studies, IPNI SEAP and partners have proposed a new critical S concentration of 0.15%, substantially lower than the 0.2% published value<sup>2</sup>. Even with the revised values, datasets from the BMP projects in 2009 show that S status is insufficient at all sites, reporting levels even lower than the proposed 0.15%.

An essential component of protein and enzymatic co-factors, S is important for the formation of oil in crops. In several oil crops, deficiency in S leads to a decrease in oil formation, affecting oil yield. Drawing from these experiences in other oil crops, the study authors anticipate that the application of S nutrient will increase oil palm yield in S-deficient plantations.

The substantial impact of sulphur on N-use efficiency and oil formation also warrants a closer look at S status. The study recommends a N/S ratio of 10/1 in the fertilizer application regime to be adequate for oil palm cultivation. The moderate cost of adding S into the fertilizer mix is likely minimal when compared to the potential increase in oil yields that lead to greater profitability. Research is now being conducted to support this hypothesis, with field trials to assess yield response to S application, in order to support sustainable S fertilization using the 4R nutrient stewardship concept.

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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](http://www.ipni.net)

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<sup>1</sup> J. Gerendás, C.R. Donough, T. Oberthür 2011 Function and nutrient status of sulphur in oil palm in Indonesia. Tropentag Bonn, Germany (<http://www.tropentag.de>).

<sup>2</sup> Fairhurst, TH, Caliman, JP, Hardter, R and Witt, C 2005, Oil Palm Series Volume 7, Pocket Guide: Nutrient Disorders and Nutrient Management. PPI/PPIC: Singapore and AgriSoft Systems Pte Ltd, Australia