Tropentag, October 5-7, 2011, Bonn

"Development on the margin"

Function and Nutrient Status of Sulphur in Oil Palm in Indonesia

Jóska Gerendás[1], Chris Donough[2], Thomas Oberthür[2]

[1] *K+S Kali GmbH, Agricultural Advisory, Germany*
[2] *International Plant Nutrition Institute (IPNI), Southeast Asia Program, Malaysia*

Abstract

Sulphur (S) is indispensable for plant growth as S is a constituent of proteins, co-factors and in the form of sulphate esters a structural component of membranes. In recent decades the use of more concentrated straight and multi-nutrient fertilisers has led to a reduced S input from fertilisers in many regions of the world. Other important S inputs for agro-ecosystems, organic fertilisers and depositions from industrial pollution, are either of limited significance or not available.

In oil palm (OP) S has not been considered in nutrient management to any large extent, and in Indonesia S-free fertiliser regimes, consisting of urea, rock phosphate, KCl and dolomite, are frequently used. In addition, S losses by leaching are naturally high in the humid tropics suitable for OP cultivation. Hence, there is a potential risk of S supply being insufficient, but data that allow assessing the S status were not available. In the course of a BMP (Best Management Practise) project initiated by IPNI SEA in July 2006 comprising of 30 commercial-size blocks in six locations in Sumatra and Kalimantan (three sites each) the leaf nutrient status was assessed by analyses of frond #17.

A decline in the S status of the blocks receiving a typical fertiliser management (estate practise) was apparent at all six sites. In 2009 average leaf S levels of only 0.13 % (range: 0.11 - 14 %) were observed. It is argued that published critical S value (0.20 %) might be inflated. Therefore, the N/S ratio, frequently considered a more reliable indicator of the S status, was also evaluated. On average a ratio of 19/1 (range: 16.8 - 22.8 to 1) was obtained, strongly suggesting a S deficiency situation. Assuming a critical N/S ratio of 15/1 and a critical and adequate N concentration of 2.3 and 2.5 %, respectively, adjusted critical S concentrations of 0.15 and 0.17 % may be proposed. The S status of oil palm reported here is even below these adjsuted critical levels. Experiments are currently being initiated to (1) re-evaluate the critical S concentration and (2) assess the yield response to S supply at commercial block scale.

Keywords: Fertilisation, Indonesia, nutrient status, oil palm, sulphur

Contact Address: Jóska Gerendás, K+S Kali GmbH, Agricultural Advisory, Bertha-von-Suttner-Straße 7, 34131 Kassel, Germany, e-mail: joska.gerendas@kali-gmbh.com