Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Optimal Fertilisation for Oil Palm (*Elaeis guineensis* Jacq.) Plantations: Conclusions from a Long-Term Fertiliser Trial in Nigeria

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Abstract

With a yield potential of more than 8 tons of oil per hectare the African oil palm (*Elaeis guineensis* Jacq.) is the most productive oil crop in the world. Since 2006, oil palm is the major global source of vegetable oil and production is expected to continuously increase by at least 2 % per year until 2050 (Byerlee et al., 2017). Oil palm cultivation is limited to the humid tropics where it is one of the most profitable land-uses despite the large investment costs of plantation establishment.

Fertilisation represents a major yield-impacting factor but is also the most costly input in the annual running cost of an oil palm plantation. As a perennial crop with a typical life-cycle of 25 years and a physiological lag effect of up to 3 years, it is essential to consistently optimise the fertilisation in the pursuit of high yields and greater sustainability.

This paper presents the results from a long-term factorial fertiliser trial in Nigeria comprising of 4 levels of potassium, 2 levels of magnesium and 2 levels of phosphor. The field was planted in 1997 with standard planting material for the region; the fertilisation protocol started in 2000 when the trees reached maturity. After 17 years of continuous implementation, a clear production response for K is observed which allows calculation of the economically optimal dosage. There are no significant effects from Mg and P, however. In addition, as a final conclusive study, the total standing biomass and its nutrient contents were also evaluated in 2018 and results presented.

Keywords: Biomass, fertilisation, Nigeria, nutrient content, oil palm, potassium

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