

Tropentag 2018

International Research on Food Security, Natural
Resource Management and Rural Development

Global food security and food safety: The role of universities

Book of abstracts

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Impressum

Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.ddb.de> abrufbar.

Tropentag 2018: Global food security and food safety: the role of universities
Tielkes, E. (ed.) 1. Aufl. - Weikersheim: Margraf Publishers GmbH, 2018

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Kanalstraße 21, 97990 Weikersheim
Telefon: 07934 - 3071
Telefax: 07934 - 8156
www.margraf-publishers.eu

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ISBN: 978-3-8236-1760-0

Online-Version: <http://www.tropentag.de/>



Margraf Publishers GmbH

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

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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 lifecycle 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