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**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

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