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Farmers’ and academia’s views”

## Specific leaflet mineral concentrations of high-yielding oil palm progenies and their implications for K/Mg management

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### Abstract

In oil palm, a similar fertilisation regime can result in leaflet potassium and magnesium concentrations that vary significantly from one progeny to another. This hinders the development of standardised fertiliser recommendations for this crop, as they are usually calculated to reach optimum leaflet nutrient concentrations. We tested the hypothesis that optimum leaflet K and Mg concentrations significantly differ between different oil palm progenies. Four high-yielding oil palm progenies with contrasting leaflet K and Mg concentrations (C1, C2, and C3 of Deli × La Mé origin and C4 of Deli × Yangambi origin) were treated with combinations of three levels of KCl and MgSO<sub>4</sub>, in a completely randomised split-plot factorial design with six replicates, where progenies were a sub-factor.

For a given level of KCl or MgSO<sub>4</sub>, different leaflet K and Mg concentrations were found between progenies ( $p < 0.0001$ ). Leaflet K concentration and yield response to KCl applications revealed that the four oil palm progenies have different optimum leaflet K concentrations. In our study period (5–8 YAP), progenies C1 and C3 had highest fresh fruit bunch (FFB) yields (13.62 and 16.54 t ha<sup>-1</sup> year<sup>-1</sup>, respectively) at K2, whereas progenies C2 and C4 showed the highest yields (14.62 and 12.39 t ha<sup>-1</sup> year<sup>-1</sup>, respectively) at K1.

For the first time in oil palm mineral nutrition research, our study highlighted specific optimum leaflet K and Mg concentrations for different oil palm progenies in a given environment. It paves the way for adopting K and Mg fertiliser application rates adapted to specific requirements of each type of oil palm planting material.

**Keywords:** Leaflet magnesium (Mg) concentration, leaflet potassium (K) concentration, nutrient diagnosis, nutrient management, oil palm, optimum leaflet mineral concentrations

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