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Oil Palm (*Elaeis guineensis* Jacq.) Leaf K and Mg Contents Differ with Progenies: Implications and Research Needs

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Abstract

Good management practice in oil palm rely on accurate predictions of fertiliser requirements that respect the environment and are economically optimal. A study performed in Indonesia pointed out that K and Mg leaf contents greatly vary from one oil palm progeny to another for the same production level. Such differences in nutrient contents may lead to an incorrect assessment of the nutrient requirements, questioning the validity of leaf analysis as a diagnostic tool and raise several research questions:

Do oil palm progenies with different leaf nutrient contents need to be fertilised with specifics fertilisation tables? Does the difference in leaf nutrient contents between progenies reflect different patterns for nutrient allocation within plant tissues? Do mineral absorption and fertiliser recovery efficiency differ according to oil palm progenies? and to what extend so far? Is there any progeny which can adapt itself to agronomic practices requiring less fertiliser for highest production?

To answer these questions, a split plot trial has been set up and fertiliser was applied during seven years. It consisted of a factorial design, with 3-levels of K and Mg fertiliser respectively (KxMg) as main factor combined with 4-oil palm progenies (crosses having the same Dura and Pissifera origin) in subplots and 6-repetitions.

In the control treatment (K0Mg0), significant differences between progenies were observed. K leaf content of progeny-4 was 11 % higher than K leaf content of progeny-1 and progeny-2 and 35 % higher than K leaf content of progeny-3. This progeny-3 had the highest Mg leaf content, which was 24 % higher than that of progeny-2. All progenies responded differently to increasing K and Mg levels. Leaf K content increased with K levels for all progenies and significantly depressed leaf Mg contents. Mg leaf content of progeny-1 and progeny-4 increased with Mg levels but decreased in progeny-3 when progeny-2 didn't change. Also, after applying maximum dose of MOP, progeny-2 and progeny-3 K leaf contents were significantly lower than that of progeny-4 receiving nil MOP.

These results confirm the differences in foliar contents between the various oil palm genetic origins and thus of their contrasted foliar K and Mg mineral absorption spectrum.

Keywords: Leaf analysis, magnesium and foliar mineral signature, potassium, progenies

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