MPOB F3 FERTILIZER FOR OIL PALM

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The MPOB agronomic research team critically analysed NPK fertilizer combinations, then verified them in trials conducted from 1990 onwards in order to formulate a fertilizer with optimum balanced nutrients ratio for maximum yield of oil palm (Tarmizi *et al.*, 2003).

UREA-BASED FERTILIZER WITH ZEOLITE AS CONDITIONER

Zeolite decreases ammonia loss from urea by trapping the volatilized gas in its pores structure (He *et al.*, 2004). *Figure 1* shows zeolite mixtures reducing the loss of ammonia from urea.

Mixing zeolite with urea can also enhance phosphorus uptake by plants (Pickering *et al.*, 2001). The zeolite-PR exchange-induced dissolution system enables better P release in response to plant demand. The model of P release proposed (Allen *et al.*, 1993) is as follows:

$$PR + NH_4^+\text{-zeolite} \rightarrow Ca_2^+\text{-zeolite} + NH_4^+ + PO_4^{3-}$$

Formulation of MPOB F3 fertilizer with balanced nutrients was carried out using a hierarchical approach as shown in *Table 1*.

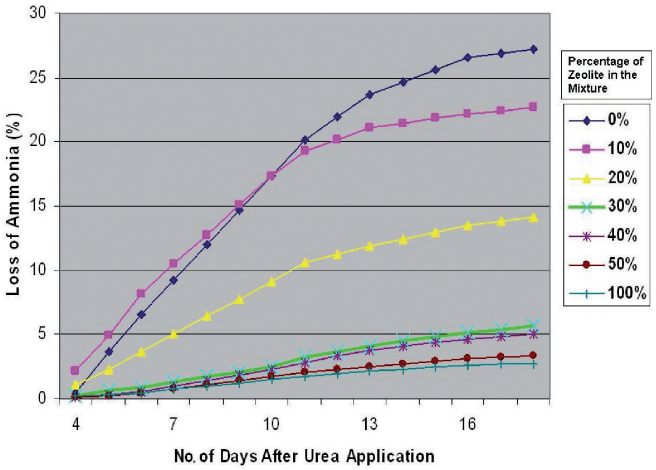

Figure 1. Cumulative loss of NH_3 from urea volatilization with different combinations of zeolite and urea mixture.

APPLICATION OF BALANCED COMPOUND FERTILIZER

It is important for oil palm growers to use optimum balanced fertilizers to raise their yield. Even though nutrient requirement is site-specific, the balanced nutrient ratio in such formulated compound fertilizers will provide a satisfactory nutri-

TABLE 1. FORMULATING MPOB F3 FERTILIZER WITH BALANCED NUTRIENTS AND ZEOLITE

Step 1	The nutrients to be incorporated must consider the amount likely to be exported from the system, taking into account the agronomic efficiency (Tarmizi and Mohd Tayeb, 2006).
Step 2	The nutrient ratio inferred from the response curves of fertilizer trials (*Figure 2*) (Tarmizi *et al.*, 1999).
Step 3	The formulation should consider the effectiveness of the minerals used.
Step 4	The formulation to include a conditioner (zeolite) to increase nutrient recovery by the crop.
Step 5	The fertilizer to be homogenously granulated as a compound.

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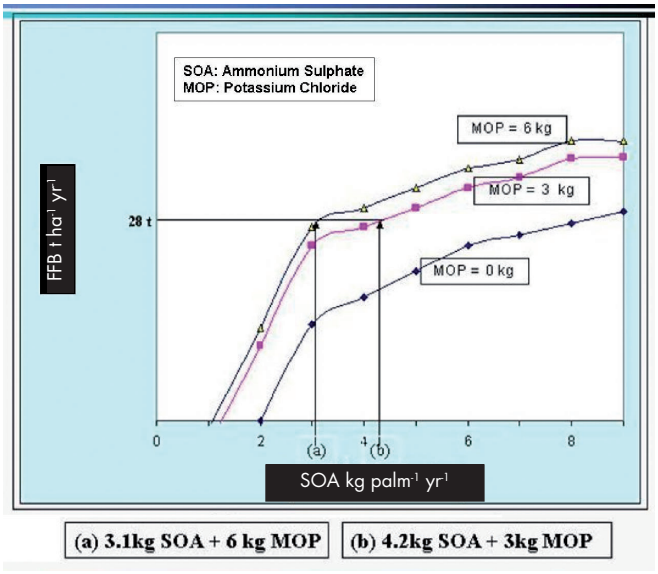

Figure 2. Typical yield response curves (FFB t ha^{-1} yr^{-1}) to N and K applications.

ent input needed at the various locations. Besides higher yield, there are other benefits in terms of cost savings. The advantages of using MPOB F3 are shown in *Table 2*.

TABLE 2. ADVANTAGES OF USING MPOB F3 FERTILIZER WITH CONDITIONER

1	Improved cost-effectiveness because of reduced nutrient losses and improved nutrient uptake.
2	The fertilizer contains balanced nutrient suitable for oil palm planted on various soils.
3	For problematic soils, the amounts used can be easily adjusted by applying more of particular nutrients.
4	The fertilizer has a long shelf-life without caking, can be applied manually or by a mechanical spreader.
5	The fertilizer can reduce the number of application rounds because it contains all the nutrients needed. Hence, it reduces the fertilizer application cost.

REFERENCES

ALLEN, E; HOSSNER, L R; MING, D and HENNIGER, D (1993). Solubility and cation exchange in phosphate rock and saturated clinoptilolite mixture. *Soil Sci. Soc. Am. J., 57*: 1368-*1374*.

HE, Z L; CALVERT, D V; ALVA, A K; LI, Y C and DANKS, D J (2002). Clinoptilolite zeolite and cellulose amendment to reduce volatilization in calcareous sandy soil. *Plant and Soil Vol. 294 No. 2: 253-260.*

PICKERING, H P; MENZIES, N W and HUNTER, M N C (2002). Zeolite/rock phosphate - a novel slow release phosphorus fertilizer for potted plant production. *Scientia Horticulture, 94 : 333-343.*

TARMIZI, A M; HAMDAN, A B; ZIN, Z Z and ARIFFIN, D (2003). Formulation of balanced fertilizer for oil palm. *MPOB Information Series No. 78*: 4 pp.

TARMIZI, A M; HAMDAN, A B; MOHD TAYEB DOLMAT and CHAN, K W (1999). Development and validation of PORIM fertilizer recommendation system in Malaysian oil palm cultivation. *Proc. of the 1999 PIPOC International Palm Oil Congress*. PORIM, Bangi. p. 203-215.

TARMIZI, A M and MOHD TAYEB, D (2006). Nutrient demands of *Tenera* oil palm planted on inland soils of Malaysia. *J. Oil Palm Research Vol. 18 June 2006*: 204-209.

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