

Leaching Losses of Nutrients from a Mature Oil Palm Catchment in Malaysia*

CHANG KC, GOH KJ, KEE KK, FOONG SF AND LAW KF

A catchment in Federal Land Development Authority (FELDA), Sungai Tekam was used to estimate leaching losses of nutrients from a mature oil palm field in 1992 and 1993. Water was sampled regularly from the stream draining Catchment B (under mature oil palm) and was found to have very low levels of nutrients. The mean nutrient levels from stream baseflow for the two years (in p.p.m.) : Total N 0.79, P 0.023, K 1.40, Mg 3.69 and Ca 4.10.

No direct estimate of drainage volume was made. But taking the rainfall (1992: 1 773.5 mm; 1993: 2 454.0 mm), annual evaporation of 1 374 mm (a purposely low figure to increase drainage) and the upper limits of nutrient contents in drainage water (2 p.p.m. N; 4 p.p.m. K), it was estimated that 7.99 kg/hectare N was lost in 1992 and 21.60 kg/hectare in 1993 in a "worst case scenario".

The losses of K for the two years were 15.98 kg/hectare and 43.20 kg/hectare. These were 6.5 per cent and 17.6 per cent of the N applied as fertiliser in the two years, and 5.8 per cent and 13.9 per cent of the K applied. The higher losses of nutrients in 1993 resulted from the higher drainage assumed (the rainfall was higher while evaporation was held constant) and by not allowing dilution in the nutrient contents of drainage water despite it being the wetter year.

As the water samples mostly had nutrient contents well below half the levels assumed in the estimation of nutrient losses, as evaporation was likely to be higher than that assumed, as the "drainage" volume contained an element of surface runoff, and as some of the nutrients lost were from the rainfall received, the actual losses of nutrients by leaching would be much less than half of the already low losses estimated. It was concluded that leaching losses of nutrients from mature oil palm fields are not serious under average Malaysian conditions.

