

## **Oil palm empty fruit bunch as a source of nutrients and soil ameliorant in oil palm plantation**

### **ABSTRACT**

A lysimeter study on the decomposition and nutrient release from oil palm empty fruit bunch (EFB) component parts (spikelet, stalk and mixture of stalk and spikelet) was carried out with and without mineral N fertilizers under field conditions over a period of nine months. A field experiment was also conducted where 17 year-old oil palms were treated with different N and K inorganic fertilizer rates, with and without EFB mulching. Two years of yield data were collected and at the end of this period, the soils were collected and analyzed for pH, exchangeable Ca, Mg and K and organic C content. It was observed that the EFB component parts decomposed at a significantly different rates in the order of stalk > mixture > spikelet. The decomposition pattern for all the parts conforms to the double exponential model by which most organic materials decompose. Lignin, polyphenol, carbon and nitrogen content in the EFB showed good correlation with soil N dynamics. The model identified was:  $\text{soil min N} = 20.45 - 25.02\text{RN} + 0.388\text{PP} + 0.47 \text{LIG} - 0.40 \text{LIG/N}$  ( $R^2 = 0.80$ ). Application of EFB parts lead to complete soil N immobilization for the entire 36 weeks of experimental period accompanied by 80 - 88% loss of K, Mg and Ca. In mature oil palm, application of inorganic N, EFB and N + EFB significantly increase EFB yield. The soil chemical characteristics like pH, organic C and exchangeable K were significantly improved with EFB application, making EFB a suitable ameliorant in improving soil quality for sustainable oil palm production.

**Keyword:** Empty fruit bunch (EFB); Mulching; N fertilizer; K fertilizer; FFB yield