

# Nutrient Dynamics and Litter Decomposition in *Leucaena leucocephala* (Lam.) De Wit Plantation in the Nigerian Derived Savanna

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## Abstract

Nutrient contents and rate of litter decomposition were investigated in *Leucaena leucocephala* plantation in the University of Agriculture, Abeokuta, Ogun State, Nigeria. Litter bag technique was used to study the pattern and rate of litter decomposition and nutrient release of *Leucaena leucocephala*. Fifty grams of oven-dried leaf litter of the species was weighed into 0.2 mm mesh litter bag, 35 cm × 25 cm in size, these bags were closed at all ends. Eighteen litter bags were used for the studies. The litter bags were numbered and placed on the field (above ground) on 26th April 2005. Three bags were retrieved randomly from the field at 20-day intervals for 120 days. The nutrient concentration in *L. leucocephala* followed the trend N > P > Mg > Ca > K > Na for leaf litter and seed components. Nutrient concentration in twigs and pods ranked N > Mg > P > Ca > K > Na. Among all the litter components, leaf litter contributed more nutrients, especially nitrogen, than other litter components. High potassium concentration during the dry season was due to lack of rainfall to leach out the element. Lower magnesium content in leaf litter was due to chlorophyll decay. High N-flux reflected the quantity and quality of nitrogen in the soil. Mass loss was significantly correlated with calcium ( $P < 0.05$ ). At 120 days, 80% of the litter had decomposed; this implies that decomposition rate was at 0.6% per day. A net immobilization of all the nutrient elements at 20 days was due to lack of rainfall to leach out the nutrients. High rate of decomposition at the early stage was due to less moisture content in the soil and high temperature. Litter decomposed more during the wet season than the dry season.