

Patterns of decomposition and nutrient release by fresh *Gliricidia sepium* leaves in an ultisol

ABSTRACT

Legume leaves used as green manure are a potential alternative to the use of commercial N fertilizers for non-legume crop production. Thus it is important to understand the rate of legume leaf decomposition and its release of nutrients. This paper reports the results of a litter bag experiment using fresh *Gliricidia sepium* leaves under field conditions. The leaves were confined in litterbags (5.3 mm mesh) and buried 10 cm in the soil. Dry matter, C, N, P, K, Ca, and Mg remaining after decomposition was determined at 0, 5, 10, 20, 30, 40, 50, 60 and 70 days. A rapid initial phase followed by a much slower one was identified in the decay and nutrient release patterns. The duration of the former ranged from 21 to nearly 30 days for dry matter and nutrients. Potassium and Ca were the most rapidly released nutrients, with the early phase lasting 28 and 6 days respectively. Nitrogen and P showed similar patterns of release and initial phase duration (21 and 22 days). Their rate constants were also 10 and 8 times that of their respective slow phases. C:N and C:P ratios increased initially and then decreased in the subsequent phase of decomposition. Magnesium also gave an identical pattern and rate of release as N in the early phase. No influence of rainfall was observed on the parameters studied.

Keyword: Decomposition; Fresh leaves; *Gliricidia sepium*; Nutrient release; Rainfall; Recalcitrant fractions; Soluble fractions