

Abstract

Laboratory studies were conducted to investigate the effect of phosphorus concentration in residues of cowpea (t *Vigna unguiculata*, L. Walp) and stylo (t *Stylosanthes hamata*, L., cv Verano) on their rate of nitrogen mineralisation when incubated in a soil whose P status was deficient for plant growth. Residues with a range of P concentrations were obtained by applying varying rates of P to soil in which the plants were grown in the field or the glasshouse. Variations in P concentration of field- or glasshouse-grown residues were not accompanied by variations in other chemical components (C:N ratio, lignin and polyphenol concentrations). Both lignin and polyphenol concentrations were higher in the field-grown than in the glasshouse-grown residues. Lignin concentration was greater in cowpea than in stylo, but polyphenols were higher in stylo. Cowpea residues mineralised N less rapidly than stylo. N mineralisation from residues with low P concentration was consistently less than from those of higher P concentration; reduced mineralisation was observed for P concentration in the residues below 1.6 g kg^{-1} . When inorganic P was added to the residue-soil systems, N mineralisation from the residues was increased, though no interaction between the effects of adding inorganic P and P concentration in the residues was observed.