

## NITROGEN AND PHOSPHORUS DYNAMICS IN A LEGUME BASED INTEGRATED NUTRIENT MANAGEMENT SYSTEM.

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### ABSTRACT

This study was carried out on a tropical alfisol for two consecutive years to investigate the effect of a legume based integrated nutrient management system on the soil status of nitrogen and phosphorus. The treatments consisted of two rates of poultry manure (0 and 5 t ha<sup>-1</sup>), three rates of N fertilizer (0, 50 and 100 kg N ha<sup>-1</sup> applied as urea), three rates of P fertilizer (0, 30 and 60 kg P ha<sup>-1</sup> applied as single superphosphate) and two soybean treatments (with or without legume residue) arranged as a factorial experiment using randomized complete block design (RCBD) with three replicates. Soil samples were collected, processed and analyzed before planting and after harvests each year for N and P and other soil properties. Results show that the impact of legume on Soil P was the least as it accounted for mere 4.0% and 0.8% increase in Soil P in 2004 and 2005 respectively. Manure x P fertilizer interactions produced the most significant effect on Soil P as it accounted for 47.2% increase in Soil P at 5 t ha<sup>-1</sup> M and 60 kg P ha<sup>-1</sup> level of combination over control. Of all the interactions studied on Soil N, only the LxMxN and MxN interactions were significant. In 2005, MxN interaction increased Soil N by 110.5% while LxMxN interaction increased Soil N in 2004 by 166%. Manure, fertilizer N and fertilizer P were found to be controlling factors in Soil N and soil P. Soybean on its own had little or no effect on Soil N and P.