

SEASONAL VARIATION OF SOIL INORGANIC NITROGEN IN AN ULTISOL AS AFFECTED BY LAND USE

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The importance of soil inorganic nitrogen ($\text{NH}_4^+\text{-N}$ plus $\text{NO}_3^-\text{-N}$) in plant nutrition and concerns over the environmental impact of nitrate leaching and N_2O emissions has focused attention on inorganic N in soils. Inorganic N in soils can originate from many sources including fertilizer additions and mineralization of organic N from soil organic matter, crop residues/plant litter and organic wastes. This study was conducted in an Ultisol in the low country wet zone of Sri Lanka to determine influence of land use on seasonal variation of soil inorganic N. Five contrasting land use types (mahogany woodlot/forested area, grass, legume, cinnamon and vegetable cropping) were periodically monitored during the March-June, 2003 for soil inorganic N. Composite soil samples were taken to 0-15cm depth from four separate blocks of each land use type. Sampling was done initially at weekly and later at biweekly intervals.

Soil samples were analyzed for inorganic N and moisture content was measured gravimetrically for each sample. Soil from forested area contained the highest content of soil inorganic N (39 mg N kg^{-1} soil) on average during the entire sampling period while the other land use types showed similar (around 25 mg N kg^{-1} soil) results. No distinct relationship could be observed between the inorganic N and moisture content in soil. The average $\text{NH}_4^+\text{-N}$ content observed throughout the sampling period was higher in the soil from the forested area compared to all other land use types indicating the status of N mineralization in soil. Vegetable field had relatively high average content of $\text{NO}_3^-\text{-N}$ in soil compared to mahogany/forest and other land use types. Results revealed that inorganic N in soil is highly variable during the season and all land use types had more $\text{NH}_4^+\text{-N}$ than $\text{NO}_3^-\text{-N}$ in soil at any given time.