

Nitrogen Mineralization Potential Of Three Animal Manures Applied On A Sandy Clay Loam Soil

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Abstract

Understanding the dynamics of N forms applied as manure is germane for appropriate rate and timing of applications of manure. Manure characterization and laboratory incubation were conducted for 120 days to study the mineralization of poultry, cattle and goat manures. Results showed that manure properties differ. Net immobilization of N was recorded for goat and cattle manures while poultry manure mineralized marginally. The relationship between N release and time is polynomial (cubic). The release phases were: initial rapid N release at 0–30 days; phase of constant release; 40–55 days; decline phase in N release 70–90 days and sharp increase in N release at 120 days. Increasing the N rates of manures above 120 kg N ha⁻¹ will improve their potential as plant nutrient sources. Complementing the manures with inorganic N fertilizers in integrated nutrient management will also improve its quality and effectiveness.

Keywords: Animal manures; Nitrogen immobilization; Nitrogen mineralization; Mineralization kinetics