

Nitrogen mineralization and phosphorus solubilization due to rewetting of forest and paddy soils

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ABSTRACT

Rewetting of soils may cause an increase in phosphorus solubilization and nitrogen mineralization resulting in the release of bioavailable phosphates and nitrates associated with eutrophication of surface waters but at the same time important to crop production. This study evaluated the degree of P solubilization and N mineralization due to drying and rewetting of forest and paddy soils under laboratory conditions. Forest and paddy soils were tested for water extractable P and mineralizable N (NH_4^+ and NO_3^-) after being subjected to drying and rewetting cycles for 7 and 14 days of drying. Soil samples were also analyzed for pH, OM, total N, total P, available P, and clay contents. Results indicated a significant increase in water- extractable P and total mineralized N in all the samples tested. N mineralization and P solubilization were correlated with OM, total N, available P, and percent clay. Findings also revealed that NH_4^+ concentration increased while that of NO_3^- decreased significantly in all the soil samples tested. The levels of water- extractable P and NO_3^- released due to rewetting could potentially accelerate eutrophication if transported to bodies of water but could also benefit the growing plant.

Key words: soil rewetting, nitrogen mineralization, phosphorus solubilization, eutrophication

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