

NITROGEN TRANSFORMATIONS IN PIG SLURRY AMENDED SOILS UNDER AEROBIC INCUBATION

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EXTENDED ABSTRACT

To optimise the efficient use of nutrients in pig slurry by crops and to reduce the pollution risks to surface and ground water, a full knowledge of the fate of N in amended soils is needed. A 120-d laboratory incubation experiment was conducted to study the effects of pig slurry application on soil N transformations. Pig slurry was added at the rates of 150 and 300 m³/ha. A nonamended soil was used as a control treatment. Soil samples were taken after 0, 7, 14, 30, 45, 60 and 120 d of incubation and analysed for NH₄⁺-N and NO₃⁻-N. Initially, the application of pig slurry produced significant increases in NH₄⁺-N, especially at the highest application rate, whereas NO₃⁻-N content was not affected. Nitrification processes were active during the entire incubation time in the three treatments. In the control soil, the net N mineralization rate was highest during the first week (5.7 mg/kg d), followed by a low-steady phase. Initially, net N mineralization rate was slower in soil with the lowest slurry rate (2.7 mg/kg d), whereas in the treatment with the highest slurry rate, a net N immobilization was observed during the first week (4.8 mg/kg d). Mineral-N concentrations after 120 d were 180, 310 and 475 mg/kg in soils amended with 0, 50 and 100 g/kg of pig slurry, respectively. However, when results were expressed as net mineralized N, the opposite trend was observed: 74, 65 and 44 mg/kg.

Key words: aerobic incubation, N immobilization, N mineralization, pig slurry, soil amendment