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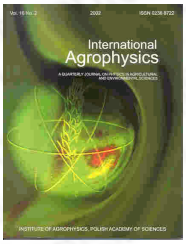

International Agrophysics
publisher: Institute of Agrophysics
Polish Academy of Sciences
Lublin, Poland
ISSN: 0236-8722

vol. 22, nr. 3 (2008)

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N2O emission and sorption in relation to soil dehydrogenase activity and redox potential

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vol. 16 (2002), nr. 3, pp. 249-252

abstract Two soils: a peaty-muck soil (Eutric Histosol) and a brown soil (Eutric Cambisol) developed from sand) were in- cubated anaerobically with addition of KNO3 (100 mg NO3 -N kg 1 and 2% C2H2) for the determination of N2O emission or with addition of 1% N2O for the determination of N2O sorption. The rates of nitrous oxide, nitrate, dehydrogenase activity, redox po- tential and CO2 production at 20oC were measured over 14 days. The peaty-muck soil showed about 4 times higher denitrification activity (as measured by N2O emission and NO3 depletion) and on average 27 times higher dehydrogenase activity than the brown sandy soil. In turn, the brown sandy soil was characterized by better capacity for nitrous oxide sorption and more intensive respiration activity. Production of CO2 and redox potential were not influen- ced by the form of N which was added. Dehydrogenase activity in the organic soil was significantly higher with N2O-treatment than with nitrate-treatment (P<0.001).

keywords N2O emission and sorption, dehydrogenase activity, redox potential, peaty-muck and brown sandy soils