

The improvement of the nitrogen removal capacity in wetlands

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ABSTRACT

We are studying the nitrogen removal function of wetlands (rice paddy fields). The site of our investigation was polluted by nitrogen ground water from upland fields in which nitrogen fertilizer and animal manure were overused. We carried out an experiment with the aim of improving the purification capacity of these fields from 2006 to 2008. Two test plots were used. Both had been non-vegetation plots since 1991. A temperature rise effect was higher in the tunnel plot than in the open-air plot. Temperatures were observed at 1-h intervals by automatic record thermometers. The average temperatures were 18.9°C for the tunnel plot and 16.6°C for open-air plot. The average amount of nitrogen removal was 557.4 kg ha⁻¹ y⁻¹ in the open-air plot and 661.8 kg ha⁻¹ y⁻¹ in the tunnel plot. The amount of nitrogen removal in the tunnel plot reached a level 104.4 kg ha⁻¹ y⁻¹ larger than the open-air plot. This means that the thermal effect of the tunnel plot was higher than in the open-air plot. The denitrification and ANAMMOX activity ratio in August was 5:1 in the open-air plot, but there was no ANAMMOX activity in the tunnel plot.

Keywords: Nitrogen removal; Water temperature; Wetland; Denitrification; ANAMMOX

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