# Assessment of Environmental Effects of Manure Policy Options in The Netherlands. (S08-oenema061824-Oral)

#### Authors:

- O.Oenema\* Wageningen University, Wageningen, Netherlands
- O.Schoumans Wageningen University, Wageningen, The Netherlands
- L.van Liere *RIVM*, *Bilthoven*, *The Netherlands*
- G.Stam *RIZA*, *Lelystad*, *The Netherlands*

• T.Prins - *RIKZ*, *Middelburg*, *The Netherlands* 

### Abstract:

We explored the effects of manure policy options for agricultural land in The Netherlands on nitrate leaching to groundwater, ammonia and nitrous oxide emissions to the atmosphere and on eutrophication of surface waters. The implementation of the nutrient accounting systems MINAS at farm level, with levy-free N surpluses in the range of 300 to 40 kg per ha per year, and levyfree P surpluses in the range of 17.5 to 0.4 kg of P per ha per year, have been examined by using a sequence of models. Results indicate that nitrate concentrations in the upper groundwater are related to N surplus, land use, soil type and groundwater level. On dry sandy soils, the N surplus has to be below 60 to 140 kg of N per ha per year, depending on land use, to decrease the nitrate concentrations in the upper groundwater to below 50 mg nitrate per liter. Losses of ammonia (NH3) and nitrous oxide (N2O) decreased less than proportional with N surpluses, because the use of N fertilizer will decrease stronger than the amount of animal manure, which is suggested to be the largest source of these gases. Decreases of N and P concentrations in surface waters, upon lowering levy-free surpluses appear relatively small. For improving the ecological state of surface waters, we recommend a combination of low levy-free N and P surpluses with dredging P rich sediments, flushing of ditches, and decreasing discharges from other sources

#### **Corresponding Author Information:**

Oene Oenema Wageningen University and phone: +31 317 474613 e-mail: o.oenema@alterra.wag-

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Research Center P.O. Box 47 Wageningen NL-6700 AA The Netherlands

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