

# Fertilising practices to reduce nitrous oxide emissions from managed grasslands

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## Hazardous cocktail

Fertiliser and manure application on grassland comprise all ingredients for potentially high nitrous oxide ( $N_2O$ ) losses. Grasslands generally contain relatively high levels of easy degradable carbon (C). Fertiliser is a source of nitrate ( $NO_3$ ) and ammonium ( $NH_4$ ), while manure provides  $NH_4$  as well as C. We assessed several strategies to reduce  $N_2O$  emissions, either by reducing the amounts of available  $NO_3$  and  $NH_4$ , or by preventing the simultaneous availability of fertiliser  $NO_3$  and manure C.



## Smart fertilising

Three mitigation strategies were field-tested during three consecutive years.

- (i) application of  $NH_4$ -based fertilisers,
- (ii) split fertiliser applications, and
- (iii) separate application of fertiliser and manure.

The  $N_2O$  concentrations were measured in the headspace of vented PVC flux chambers, using a Brüel and Kjær photo-acoustic spectroscopic infrared gas analyser.



## It works...sometimes

The observed  $N_2O$  emissions of the standard fertiliser (CAN) were rather low, especially in the second and third year. The tested strategies only showed an emission reduction in the first year. None of the mitigation strategies resulted in a lower emission in the second and third year. We conclude that choice of fertiliser type and timing can reduce  $N_2O$  emissions, but solid recommendations on when to apply these strategies are still lacking.

Emission factor (kg  $N_2O$ -N per kg applied N) for all treatments. Different colours indicate a significant difference ( $P < 0.05$ ).

