



Scheduling fertilizer applications as a simple mitigation option for reducing N₂O emission in intensively managed mown grassland systems

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A general principle in all proposed N₂O mitigation options is the fertilization according to plants' requirements. Meanwhile the amount of N fertilization allowed is regulated in many countries. Due to the high pressure from food security and the need for economic efficiency the given limits are generally used up.

In mown grassland systems a simple mitigation option is to optimize the timing of the fertilizer applications. Application of fertilizer, both organic manure and mineral fertilizer, is generally scheduled after each cut in a narrow time window. In practice, the delay between cut and fertilizer application is determined by weather conditions, management conditions and most important by the planning and experience of the individual farmer. Many field experiments have shown that enhanced N₂O emissions tend to occur after cuts but before the application of fertilizer, especially when soils are characterized by a high WFPS. These findings suggest that the time of fertilizer application has an important implications for the N₂O emission rate and that scheduling fertilization according to soil conditions might be a simple, cheap and efficient measure to mitigate N₂O emissions.

In this paper we report on results from a sensitivity analysis aiming at quantifying the effects of the timing of the fertilizer applications on N₂O emissions from intensively managed, mown grasslands. Simulations for different time schedules were carried out with the comprehensive ecosystem model "ECOSYS" . To our knowledge this aspect has not been systematically investigated from a scientific point of view, but might have been always there within the experiences of attentive environmentally concerned farmers.