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Experiences from the UK on documenting nitrous oxide from different fertilisers

Research and industry have collaborated to develop an improved national Agricultural Greenhouse Gas Emissions Inventory for the UK, based upon a synthesis of country specific (IPCC Tier 2) emissions measurements and farm management data, supported by computer modelling (IPCC Tier 3). The inventory is disaggregated by farm system and by soil and climate zones, to take account of environmental and management interactions affecting farm inputs and emission factors. We will summarise the process by which improvements to the UK Agricultural Greenhouse Gas Inventory were made, with a focus on nitrous oxide emissions. This will include a brief summary of the prioritisation phase, experimental field protocols and method of analysis that resulted in the improved emission factors.

Default IPCC (Tier 1) emission factors for direct nitrous oxide emissions from managed soils following the application of manufactured fertiliser nitrogen and organic nitrogen amendments (e.g. livestock manures) have been updated with the results of the UK field experiments. The nitrous oxide emission factors for manufactured nitrogen fertilisers are non-linear with fertiliser N application rate, and both the nitrous oxide and ammonia emission factors are geographically sensitive to climate. We illustrate the consequence of the inventory's spatial sensitivity on substituting fertiliser types with and without a urease inhibitor.