

Nitrogen fertilizers are not effective in reducing nitrous oxide emissions from drip-irrigated cotton fields

September 1 2020, by Li Yuan

Agriculture is the major source of greenhouse gas nitrous oxide (N₂O) emissions. Application of polymer-coated urea and urease and/or nitrification inhibitor has the potential in reducing soil N₂O emissions.

Drip irrigation is an effective water-saving strategy for crop production in arid regions. However, [limited information](#) is available on how [fertilizer nitrogen](#) (N) management affects soil N₂O emission under [drip irrigation](#).

Researchers from the Xinjiang Institute of Ecology and Geography (XIEG) of the Chinese Academy of Sciences found that enhanced-efficiency nitrogen fertilizers were not effective in reducing N₂O emissions from drip-irrigated [cotton fields](#) in arid northwest China.

They carried out a two-year cotton field experiment in Xinjiang to determine N₂O emissions from different fertilizer N sources (urea, polymer-coated urea-ESN, stabilized urea with nitrification and urease inhibitors-SuperU) and rates (120 and 240 kg N ha⁻¹).

Results showed that N₂O emissions over a two-year growth season were significantly increased by 29-47% in treatment of ESN or SuperU, without significant effect on cotton yield. Reducing the N rate by half significantly reduced both the N₂O emissions and cotton yield.

The efficiency of ESN and SuperU is limited, and fertigation with urea at recommended rate is the best option to ensure cotton yield and mitigation in N₂O emission in this study site, according to the study.

The study was published in *Science of The Total Environment*.

More information: Yanyan Li et al. Enhanced efficiency nitrogen fertilizers were not effective in reducing N₂O emissions from a drip-irrigated cotton field in arid region of Northwestern China, *Science of the Total Environment* (2020). [DOI: 10.1016/j.scitotenv.2020.141543](https://doi.org/10.1016/j.scitotenv.2020.141543)

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