Mitigation of Nitrous Oxide Emission from Fertilized Upland Fields: Laboratory and Field Studies. (S11-hou143800-Poster)

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Abstract:

Fertilized agriculture has been identified as the single most important anthropogenic source of nitrous oxide (N2O) going into the atmosphere. This paper presents laboratory and field studies to evaluate the effects of N fertilizer modification and placement method on N2O emission from upland fields. In situ measurements on a Chinese cabbage field showed neither the coated urea nor the band placement was able to significantly reduce the total N2O emission through the season, yet the banding produced a 22.8% increase in crop yield as compared with broadcasting. On a maize field, N2O emission was reduced by 75% and 21% when ammonium bicarbonate and urea were modified by DCD, and the crop yield was increased by 13.6% and 8.6%. Incubation experiments coincided well with the field experiments. Results demonstrated that the application of nitrification inhibitor significantly mitigates N2O emission; the controlled-release urea and the band placement do not reduce total amount of N2O emission if the observation period is long enough. However, by improving fertilizer use efficiency to decrease the amount of N needed to better meet the crop growing demand, band placement may be a good agricultural practice for mitigation of N2O emission.

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