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滇池流域集约化菜田NO与NO_2排放的研究

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NO and NO_2 emissions from intensive vegetable field of Dianchi watershed

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摘要

采用密闭通气气室法，在滇池流域旱季和雨季开展了2个生长周期内集约化西芹地NO/NO_2排放研究。结果表明， NO/NO_2排放速率的日变化规律受温度的影响较为明显，中午时段最高，凌晨时段最低。西芹生育期间，CK处理（裸地）的NO/NO_2排放速率维持在一定水平，中后期NF处理（不施氮）NO/NO_2排放速率有所升高；LF（N 450 kg/hm^2）和HF（N 1200 kg/hm^2）处理受西芹的生长和频繁氮肥追施的影响，生育期NO/NO_2排放速率逐渐升高。旱季与雨季CK处理NO/NO_2排放量分别为1.30和NOx-N 1.51 kg/hm^2，NF处理分别较CK高出NOx-N 1.0和1.44 kg/hm^2。LF处理旱季与雨季NO/NO_2排放量分别为NOx-N 4.88和5.67 kg/hm^2，其损失率分别为0.79%和0.92%；HF处理旱季和雨季NO/NO_2排放量分别为NOx-N 7.58和10.19 kg/hm^2，其损失率分别为0.63%和0.85%，说明氮肥用量较高时，土壤—作物系统的NOx-N损失量也较高，但其损失率并不随施氮量的升高而升高。

关键词： 滇池流域 集约化菜田 NO与NO_2排放速率 NOx-N损失率 滇池流域 集约化菜田 NO与NO_2排放速率 NOx-N损失率

Abstract:

Enclosure growth chamber method, which removes the air inlet NO/NO_2 first and then monitors NO/NO_2 flux of enclosed growth chamber, was used to collect and determine in situ NO/NO_2 emission from intensive vegetable field in Dianchi watershed in both dry and rainy seasons. The following results were obtained: 1) The NO/NO_2 flux varied diurnally along with the soil temperature, its maximum appeared at noon, and its minimum appeared before dawn; 2) In the celery growth stage, the NO/NO_2 flux of CK treatment(bare land) maintained at a certain level; the NO/NO_2 flux of NF treatment (N 0 kg/ha) was higher than CK treatment in the mid and late period of celery growth; the NO/NO_2 fluxes of LF (N 450 kg/ha) and HF (N 1200 kg/ha) treatments increased gradually because of the celery's growth and frequent N fertilizer application; 3) In dry and rainy seasons, the NO/NO_2 emission of CK treatment in the growth stage was NOx-N 1.30 and 1.51kg/ha, respectively, and the NO/NO_2 emission of NF treatment in the growth stage was NOx-N 1.07 and 1.44 kg/ha higher than that of CK, respectively; 4) In dry and rainy seasons, the NO/NO_2 emission of LF treatment in the growth stage were NOx-N 4.88 and 5.67 kg/ha, which accounted for about 0.79% and 0.92% of applied fertilizer N, respectively; the NO/NO_2 emission of HF treatment in the growth stage was NOx-N 7.58 and 10.19 kg/ha, which accounted for about 0.63% and 0.85% of applied fertilizer N, respectively. The NO/NO_2-N emission in the growth stage increased with nitrogen fertilizer application rate, but its loss rate does not increase accordingly.

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