

## 三种控释肥在赤红壤中的氧化亚氮排放

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Effects of applying controlled release fertilizers on N<sub>2</sub>O emission from a lateritic red soil.

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**摘要** 采用静态箱收集和对比法,研究了无作物种植条件下包膜与否对高氮、均衡及高钾3种氮磷钾配比复合肥在华南赤红壤发育的菜园土中氧化亚氮(N<sub>2</sub>O)排放情况.结果表明:肥料氮磷钾配比不同,N<sub>2</sub>O排放量差异显著,3种类型复合肥N<sub>2</sub>O累积排放量表现为均衡型>高氮型>高钾型;同一类型复合肥,包膜控释能显著降低N<sub>2</sub>O排放量,包膜控释高氮、均衡及高钾型复合肥N<sub>2</sub>O排放总量分别为不包膜复合肥N<sub>2</sub>O排放量的34.4%、30.5%和89.3%;与不包膜相比,复合肥包膜能降低肥料在土壤中的N<sub>2</sub>O日排放通量,滞后和削减N<sub>2</sub>O排放高峰,减少土壤氮素损失以及由N<sub>2</sub>O排放造成的全球增温潜势.

**关键词:** N<sub>2</sub>O排放 氮磷钾配比 包膜肥 复合肥 全球增温潜势

**Abstract:** Static closed chamber technique and contrast method were adopted to study the effects of three coated compound fertilizers (N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O=19:8.6:10.5, high N; 14.4:14.4:14.4, balanced NPK; and 12.5:9.6:20.2, high K) on the N<sub>2</sub>O emission from a lateritic red soil under the condition of no crop planting, taking uncoated compound fertilizers (N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O=20:9:11, high N; 15:15:15, balanced NPK; and 13:10:21, high K) as the contrasts. Different formula of fertilizer NPK induced significant difference in the N<sub>2</sub>O emission. Under the application of uncoated compound fertilizers, the cumulative N<sub>2</sub>O emission was in the order of balanced NPK ≥ high N > high K. Applying coated compound fertilizers decreased the N<sub>2</sub>O emission significantly, and the emission amount under the application of high N, balanced NPK, and high K was 34.4%, 30.5%, and 89.3% of the corresponding uncoated compound fertilizers, respectively. Comparing with the application of uncoated compound fertilizers, applying coated compound fertilizers also decreased the daily N<sub>2</sub>O flux significantly, and delayed and shortened the N<sub>2</sub>O peak, suggesting that coated fertilizers could reduce soil nitrogen loss and the global warming potential induced by N<sub>2</sub>O emission.

**Key words:** N<sub>2</sub>O emission NPK formula coated fertilizer compound fertilizer global warming potential

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