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Effects of composted sludge application on greenhouse gases emissions from paddy soil and heavy metals accumulation in soil and plant

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With the increase in municipal sludge, applying sludge in agriculture has been of great concern. A eld experiment was conducted to investigate the e ects of three di erent fertilization practices (CK, no N-fertilizer application; N240, applying N-fertilizer at a rate of 240 kg N ha-1; OF, applying composted sludge at a rate of 240 kg N ha-1) on methane and nitrous oxide emissions from paddy soils and heavy metals accumulation in soil and plant. e results showed that methane emission of treatment OF was 68.09 kg ha-1, being approximately 2-fold those of treatments N240 and CK ($p<0.05$). e N2O emission of treatment OF was 0.94 kg N ha-1, being 46% lower than that of treatment N240 ($p<0.05$) and 6-fold that of treatment CK ($p<0.05$). e contents of the total heavy metals in the soil were far below the national standard of environmental quality standards for soils for Grade II (GB 1518-1995) and no signi cant di erence was observed among three treatments ($p>0.05$). Di erent heavy metals accumulated in di erent parts of the plant. e accumulation of Zn, Cd was straw>crust >seed, and Cr, Ni, Cu was crust>straw>seed. For treatment OF, the content of Cu in rice grain was 10% ($p>0.05$) less than that of treatment N240, but the contents of Cr, Zn and Cd in rice grain were 76%, 31% and 50% ($p<0.05$) higher than that of treatment N240, respectively.

Recent Publications

1. Guangbin Zhang, Jing Ma, Yuting Yang, Haiyang Yu, Yaping Shi, et al. (2017) Variations of stable carbon isotopes of CH4 emissions from three typical rice elds in China. Pedosphere 27(1):52–64.
2. Minmin Sun, Yuan Zhang, Jing Ma, Wenping Yuan, Xianglan Li, et al. (2017) Satellite data based estimation of methane emissions from rice paddies in the Sanjing plain in northeast China. PlOS One 12(6):1–16.
3. Gang Liu, Haiyang Yu, Guangbin Zhang, Hua Xu and Jing Ma (2016) Combination of wet irrigation and nitri cation inhibitor reduced nitrous oxide and methane emissions from a rice cropping system. Environmental Science and Pollution Research 23(17):17426–17436.
4. Xianfang Fan, Haiyang Yu, Qinyan Wu, Jing Ma, Hua Xu, et al. (2016) E ects of fertilization on microbial abundance and emissions of greenhouse gases (CH_4 and NO_2) in rice paddy elds. Ecology and Evolution 6(4):1054–1063.
5. Guangbin Zhang, Haiyang Yu, Xianfang Fan, Yuting Yang, Jing Ma, et al. (2016) Drainage and tillage practices in the winter fallow season mitigate CH_4 and NO_2 emissions from a double-rice eld in China. Atmospheric Chemistry and Physics 16:11853–11866.

Biography

Jing Ma has her expertise in greenhouse gases emissions and mitigation mechanisms in agriculture

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