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Full Length Article

Effects of Different Tillage Modes for Ammonia Volatilization Emissions from Flue-Cured Tobacco Fields

Jiang Yuzhou[1], Liu Qingli[1], Zhang Yungui[1], Li Zhihong[1*], Zou Yan[3], Zhu Jingwei[3], Shi Junxiong[3] and Wang Peng[2]
[1]*Aricultural resources and regional planning institute, Chinese academy of agricultural sciences, Beijing, China*
[2]*Agronomy College of Heilongjiang Bayi Agricultural University, China*
[3]*Tobacco Science Institute of Guizhou Province, China*
[*]For correspondence: silvia_201288@hotmail.com

Abstract

Ammonia (NH_3) is one of the important greenhouse gases which could affect the climate change, to reduce the number of farmland ecosystem of NH_3 emissions, using the intermittent airtight ventilation method, studied the impact of rotation and long-term plant crude opium cultivation conditions above emission regularity of NH_3 volatilization and dynamic growth. The results show that compared with the crop rotation treatment, continuous cropping treatment can significantly increase the emissions of NH_3 volatilization rate and vega cumulants, stage and basal fertilizer than vega emissions of NH_3 volatilization rate is high, the soil is 0.46 $kg.hm^{-2}\cdot d^{-1}$; In stage basic fertilizer and fertilizer, continuous cropping treatment and rotation of NH_3 volatilization cumulants are in line with the Logistic growth curve, and the measured values and calculated a highly positive correlation between simulation value; Throughout the vega fertilizing period, continuous cropping treatment of NH_3 volatilization cumulant than 0.055 kg/hm^2, rotation and continuous cropping treatment and rotation NH3 volatilization loss rate of 1.58 times. Crop rotation system can reduce the NH_3 volatilization rate, and can reduce the NH_3volatilization cumulative loss, and thus can reduce the NH_3 volatilization loss rate. © 2018 Friends Science Publishers

Keywords: Long-term test; Flue-cured tobacco; NH_3 volatilization; Continuous cropping; Crop rotation

Introduction

As one of the important greenhouse gases that affect climate change, NH_3 is also the main component of acid rain's catalytic substances and ozone emissions (Veeken *et al.*, 2002). With global warming, the issue of greenhouse gas emissions has drawn great attention from scientists and governments all over the world. By introducing the mathematical model of dynamic simulation analysis was carried out on the test, and using the characteristic parameters of quantitative simulation is deduced. The logistic dynamic simulation analysis is more practical. Farmland ecosystems are important source of greenhouse gas emissions (USEPA, 2007), and up to 90% of total ammonia emissions from agricultural activities are released into the atmosphere (Misselbrook *et al.*, 2000; Boyer *et al*., 2002). NH_3 that dissipates into atmosphere reacts with atmospheric acids to form aerosols, or return to the ground in the form of sediments and cause acidification of the soil. However, ammonia volatilization has brought many negative effects on the environment (Van der Eerden *et al*., 1998; Huckaby *et al*., 2012). Currently, in order to reduce the emission of NH_3 from farmland ecosystems, many scholars have published many relevant research reports. Someone studied the soil ammonia volatilization under different fertilization methods, including turning over after broadcasting, earthing after banding and irrigation after broadcasting (Li *et al.*, 2008). The results indicated that there is a certain difference between the various treatments, and the treatment of turning over after broadcasting and earthing after banding could help to reduce the ammonia volatilization emissions. Someone conducted studies on the ammonia volatilization of continuous cropping wheat field under long-term fertilization *via* airtight ventilation. They found that the flux of ammonia volatilization in wheat field increased with the growth and development of wheat, and reached the highest value of 20.91±3.28 $g.hm^{-2}\cdot d^{-1}$ within mature period. By studying the effects of different crop rotation patterns on ammonia volatilization in paddy fields in Taihu Lake Region (Wang *et al.*, 2006). Someone pointed out that the amount of N volatilized from ammonia volatilization in paddy fields was the lowest at a nitrogen application rate of 240 $kg.hm^{-2}$ during the Chinese milk vetch -rice rotation period, which was lower than the ammonia nitrogen loss during fallow-rice rotation at 9.7 $kg.hm^{-2}$ (Hu *et al.*, 2013). Some scholars also pointed out that the ammonia volatilization rate reached the highest in alfalfa grassland during the later growing stage (flowering

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