臭氧杀灭循环营养液中三种土传病原菌的试验

Ozone disinfection of three soilborne pathogens in nutrient solution

投稿时间：2006-9-21　　最后修改时间：2006-11-22

稿件编号：20070637

中文关键词：臭氧消毒； 营养液； 植物病原菌； 接触时间； 残余浓度

英文关键词：ozone disinfection; nutrient solution; plant pathogen; contact time; concentration

基金项目：“十五”国家科技攻关计划项目(2004BA521B01)；北京市教育委员会都市农业学科群建设项目(XK100190553)

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中文摘要：

为给臭氧应用于循环营养液消毒提供指导，该文研究了营养液中臭氧浓度的上升、衰减，臭氧杀灭营养液中3种植物病原菌所需的残余臭氧浓度、接触时间和残留臭氧对黄瓜根系的伤害。结果表明：高浓度臭氧气体在营养液中形成的臭氧平衡浓度高，达到平衡浓度所需的时间短；低浓度臭氧气体形成的臭氧平衡浓度低，达到平衡浓度需要的时间长。当营养液中残余臭氧浓度为0.6 mg/L，接触时间5 min时，臭氧对10^3 cfu/mL浓度黄瓜枯萎病、番茄枯萎病和10^6 cfu/mL浓度十字花科软腐病3

英文摘要：

Experiments were conducted to determine the rising and attenuation performance of ozone concentration in nutrient solution, and the relationship between 99.99% sterilization rate of three plant pathogens and ozone concentration and the contact time. Experimental results showed that the higher the concentration of ozone air was, the higher the equation concentration of ozone in water was, and the shorter time was needed. Otherwise the lower the concentration of ozone air was, the lower the equation concentration of ozone in water was and the longer time was needed. When the ozone concentration was 0.24～0.48 mg/L and contact time was 2 min, the sterilization rates of the cucumber and tomato wilt pathogens, the mustard family soft rot pathogens were 99%, 99%, 99.3%, respectively. When the ozone concentration was 0.6 mg/L and contact time was 5 min, the three pathogens, i.e., the cucumber and tomato wilt pathogens with initial concentration of 10^3 cfu/mL, the mustard family soft rot pathogens with initial concentration of 10^6 cfu/mL, in nutrient solution were totally killed. It was demonstrated that remaining ozone in nutrient solution was harmful to the cucumber root which had germinated for 72 h. After the roots were treated by 0.54～0.60 mg/L and 0.64～0.72 mg/L ozone for 30 min, the injury rates were 7.7%, 22.2%, respectively. The results indicated that ozone could kill the pathogens of epiphyte and bacteria in the nutrient solution effectively, but the nutrient solution could not be applied to irrigate plants immediately after being treated by ozone.

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