中国农学通报 2011, 27(第16期7月) 186-189 DOI: ISSN: 1000-6850 CN: 11-1984/S

园艺—研究报告

土壤灭菌对紫茎泽兰和番茄的反馈作用

李会娜,**刘万学**,**万方浩**

中国农业科学院植物保护研究所

摘要:

：土壤微生物对陆生植物的生长极为重要，本文通过灭菌处理控制云南和北京两份土壤的土壤微生物，来比较不同来源土壤的微生物群落对入侵恶性杂草紫茎泽兰和蔬菜番茄生长的反馈作用。结果表明：对于紫茎泽兰，两种土壤灭菌后均不利于其生长。北京菜园土灭菌后，紫茎泽兰的株高和生物量显著低于对照处理，其中生物量是对照处理的14.3%；云南紫茎泽兰入侵土壤灭菌后，株高和生物量分别为对照处理的58.1%和42.9%。而对于番茄，北京菜园土灭菌后，株高和生物量分别为对照处理的226.9%和644.5%；云南土中，灭菌后株高和生物量都与对照处理无显著差异，分别为对照的94.6%和88.7%。以上结果揭示不同来源土壤，灭菌处理后对外来入侵杂草紫茎泽兰和蔬菜作物番茄的反馈作用存在差异。

关键词： 反馈作用

Feedback of Soil Sterilization on Ageratina adenophora and Lycopersicum esculentum

Abstract:

Soil microbe is very important for terrestrial plants. Studies were conducted to compare the feedback of different sources of soil microbial community on the growth of noxious weeds Ageratina adenophora and tomatoes by sterilization of soil from Yunnan and Beijing. The results showed that the two types of soil were unfavorable for the growth of A. adenophora after sterilization. Specifically, for soil collected from a vegetable garden in Beijing, plant height and biomass of A. adenophora cultivated in sterilized soil were significantly lower than control. The plant biomass of A. adenophora was only 14.3% that of control. For soil collected from invaded area by A. adenophora in Yunnan, plant height and biomass of A. adenophora cultivated in sterilized soil were 58.1% and 42.9% that of control, respectively. However, plant height and biomass of tomato cultivated in soil from the vegetable garden after sterilization were 226.9% and 644.5% that of control, respectively. The plant height and biomass of tomato cultivated in soil from Yunnan after sterilization were 94.6% and 88.7% that of control respectively, which showed no significant differences. Our findings suggested that for different sources of soil, their sterilization had different feedbacks for the growth of invasive weed A. adenophora and common vegetable crop tomato.

Keywords: feedback

收稿日期 2011-01-05 **修回日期** 2011-02-28 **网络版发布日期** 2011-07-04

DOI:

基金项目:

国家重点基础研究发展计划项目、国家自然科学基金项目

通讯作者: 李会娜

作者简介:

作者Email: lihuina0807@163.com

参考文献：

[1]吴凤芝，王伟，奕非时.土壤灭菌对大棚连作黄瓜生长发育影响[J].北方园艺,1999,(5):49-49

[2]汪立刚, 王玉, 华天懋.等. 土壤灭菌对大豆的增产效果及其机理探讨[J].西北农业学报,2001,10(1):67-71

[3]Mazzola M.Rotate to prevent replant[J].Agricultural Research,2000,48(9):16-17
[4]侯永侠，周宝利，吴晓玲，等.土壤灭菌对辣椒抗连作障碍效果[J].生态学杂志,2006,25(3):340-342
[5]程新胜，杨建卿.熏蒸处理对土壤微生物及硝化作用的影响[J].中国生态农业学报,2007,15(6):51-53
[6]Nijjer S, Rogers W.E, Lee CT. A, et al. The effects of soil biota and fertilization on the success of Sapium sebiferum[J].. Applied soil ecology,2008,38:1-11
[7]Cui Q G, He W M.Soil biota, but not soil nutrients, facilitate the invasion of Bidens pilosa relative to a native species Saussurea deltoidea[J].Weed research,2008,49:201-206
[8]MacKay J, Kotanen P M.Local escape of an invasive plant, common ragweed (Ambrosia artemisiifolia L), from above-ground and below-ground enemies in its native area[J].. Journal of Ecology,2008,96:1152-1161
[9]Callaway R.M, Thelen G C, Rodriguez A, et alSoil biota and exotic plant invasion[J].. Letters to nature,2004,427:731-733
[10]Klironomos J N.Feedback with soil biota contributes to plant rarity and invasiveness in communities [J].Nature,2000,417:67-70
[11]Levine J M, Vila M, D’Antonio C M, et al.Mechanisms underlying the impacts of exotic plant invasions[J].Proceedings of the royal society B-Biological sciences,2003,270:775-781
[12]Niu H B, Liu W X, Wan F H, et al.An invasive aster (Ageratina adenophora) invades and dominates forest understories in China: altered soil microbial communities facilitate the invader and inhibit natives [J].Plant and soil,2007,294:73-85
[13]Zhang S S, Jin Y L, Tang J J, et al.The invasive plant Solidago canadensis Lsuppresses local soil pathogens through allelopathy[J].. Applied soil ecology,2009,41:215-222
[14]李会娜，戴莲，刘万学，等.紫茎泽兰入侵对土壤微生物、酶活性及肥力的影响[J].中国农业科学,2009,42(11):3964-3971
[15]于兴军，于丹，卢志军，等.一个可能的植物入侵机制：入侵种通过改变入侵地土壤微生物群落影响本地种的生长[J].科学通报,2005,50(9):896-903

本刊中的类似文章
