

生物有机肥对甜瓜根结线虫病的田间防治效果研究

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Effect of bio-organic fertilizers on root-knot nematode of muskmelon in field

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摘要 为研究生物有机肥对根结线虫的田间防治效果, 在根结线虫发病严重的甜瓜田进行了田间试验。结果表明: 1) 在仅施用无机肥的田块, 根结线虫病发生严重, 而在施用生物有机肥的田块, 发病率降低, 最高防治率达81.1%; 2) 与对照相比, 施用加入根结线虫拮抗菌X5的生物有机肥使地上部鲜重增加, 根系鲜重(根结量)减少; 3) 施用生物有机肥可显著减少土壤中根结线虫二龄幼虫的密度和根中卵块的数量; 4) 生物有机肥处理与常规肥料处理的土壤线虫DGGE图谱明显不同, 分别归于两个聚簇, 表明土壤线虫群落结构受到施用含根结线虫拮抗菌的生物有机肥影响。综上所述, 施用生物有机肥能有效防治田间条件下根结线虫对甜瓜的危害。

关键词: 根结线虫 生物有机肥 甜瓜 土壤线虫群落

Abstract: To evaluate the effect of bio-organic fertilizers on bio-controlling muskmelon root-knot nematode (RKN) in farming system, a field experiment was carried out in the root-knot nematode severely infected soil. The results were as follows: 1) The incidence of RKN was significantly reduced in the treatments of bio-organic fertilizers with a high control efficiency of 81.14%, whereas high incidence was observed in the chemical fertilizer control; 2) Compared with the chemical fertilizer control, application of the bio-organic fertilizer coupled with strain X5 increased the shoot fresh weight and decreased root fresh weight or amount of root-knots; 3) Application of bio-organic fertilizers effectively reduced the population of the second instar larvae of RKN in soil and egg mass of RKN in roots; 4) The DGGE patterns of nematodes from the soil treated with bio-organic fertilizers and common fertilizers belonged to two corresponding clusters, suggesting that application of bio-organic fertilizers contained the antistatic strains of RKN changed the structure of nematode community in soil. In conclusion, application of bio-organic fertilizers in field conditions could effectively control damages caused by RKN to muskmelon.

Keywords: root-knot nematode bio-organic fertilizer muskmelon community of soil nematode

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