

转Bt基因棉种植对根际土壤生物学特性和养分含量的影响

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Effect of transgenic Bt cotton planting on biological characteristics and nutrient content in rhizosphere soil

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摘要 通过盆栽试验, 比较了转Bt基因棉Bt新彩1和Bt基因的受体棉新彩1根际土壤可培养微生物种群数量、酶活性及养分含量的变化。结果表明, Bt新彩1根际土壤可检测到Bt蛋白, 且花期达到峰值56.14 ng/g; 与对照新彩1相比, Bt新彩1根际土壤更有利于细菌和真菌的生长和繁殖, 放线菌数量没有显著变化。Bt新彩1的根际土壤碱性磷酸酶活性受到抑制, 在生长旺盛期脱氢酶活性受到激活, 而根际土壤蛋白酶、脲酶和蔗糖酶活性无显著变化; 苗期、花期Bt新彩1根际土壤有机质、全氮、速效氮和钾含量没有显著变化, 且苗期速效磷含量也没有显著改变, 花期其含量显著降低。

关键词: 转Bt基因棉 Bt蛋白 生物特性 养分含量 转Bt基因棉 Bt蛋白 生物特性 养分含量

Abstract:

A pot experiment with a transgenic Bt cotton BtXincai1 and an acceptor cultivar of Bt gene Xincai1 was conducted to investigate the effect of transgenic Bt cotton planting on the biological characteristics and nutrient contents in rhizosphere soil at different growth stages. Biological characteristics were assessed by measuring the number of culturable microorganisms and enzymes activity in rhizosphere soil. Results showed that Bt protein could be detected in the rhizosphere soil of BtXincai1, and reached the peak value of 56.14 ng/g at flowering stage of cotton growth. Compared with Xincai1, BtXincai1 stimulated the proliferation of bacteria and fungi. However, no significant effect on actinomycete was observed. BtXincai1 showed a significant inhibition effect on alkaline phosphatase activity and no significant effect on protease, urease and sucrase activity over the growing season, but a significant stimulation effect on dehydrogenase activity at fast growth stages. BtXincai1 had no significant influence on the content of organic matter, total N, available-N and K at seedling and flowering stages as well as available-P at seedling, but decreased the content of available-P at flowering stage significantly.

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