Title	Changes of Soil Microbial Population and Structure Under Short-term Application of an Organically Enhanced Nitrogen Fertilizer
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Abstract	Interest in the use of alternate fertilizers has increased during recent years to improve soil productivity. An organically enhanced N fertilizer, containing 14.9% N, 4.3% P_2O_5, 18.1% S, 0.6% Fe, and 8% organic C, and is produced from a sterilized organic additive extracted from municipal wastewater biosolids and chemical fertilizers was evaluated for its effects on soil microbial populations and abundances in 0- to 15-cm depth of of two silt loam soils located at Jackson and Grand Junction, Tennessee. This treatment was compared to conventional N fertilizers and zero N control under nonirrigated corn (*Zea mays* L.) from 2011 to 2013. Three N-applied treatments (organically enhanced N fertilizer, ammonium sulfate, urea/NPKZn briquette) at 128/170 kg ha^{-1} and the zero N control were imposed at each location. The organically enhanced N fertilizer decreased the relative abundance of arbuscular mycorrhizal fungi but increased that of general microbes relative to the zero N control and increased that of general microbes compared with NPKZn briquette 4 to 7 months after their applications at an N rate of 128 kg ha^{-1} for corn within 2 years of experimentation on a relatively infertile soil with low organic matter. Soil general microbes and arbuscular mycorrhizal fungi were the two sensitive indicators of soil microbial structure response to fertilization. However, effects of the organically enhanced N fertilizer on soil microbial populations were not noticeable after corn harvest. In conclusion, application of the organically enhanced N fertilizer has noticeable influence on soil microbial structure/abundance but not on populations on relatively infertile soils with low organic matter from a short-term perspective.
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