

Effect of organic farming on soil nematodes and microbial communities

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Awareness about the negative impact of agronomic conventional practices (CONV) is increasing the implementation of organic and sustainable agriculture (BIO). Soil organisms, used as indication of soil health, can assess the impact that BIO practices have on the soil. Studies mainly focus on one group of organisms or one trophic layer. The objective of this study was to characterize the effects of BIO and CONV management and the residual effect of soil health treatments (SHTs) on soil nematode and microbial communities. A qPCR-method permitted us to obtain information about composition of nematode, bacterial, and fungal communities. Microbial community has been monitored also after harvesting of maize and seedbed preparation (tillage). Overall, BIO systems hosted higher abundance of bacteria, fungi, bacterivorous and entomopathogenic nematodes, and

less plant parasitic nematodes. Before tillage, BIO resulted in a more than 50% higher than CONV bacterial and fungal abundance. Mixed effect of season and tillage increased bacterial abundance, especially in CONV. Fungal abundance, on the contrary decreased in BIO after tillage. Of the thirteen nematode taxa studied, nine were higher in BIO. These included bacterivorous and entomopathogenic nematodes. Four taxa out of thirteen were higher in CONV. These included plant parasitic and fungivorous nematodes. Regarding SHTs no residual effect of treatments within systems was observed, because of the end of application of SHTs in 2009. The current work sustains the hypothesis that agricultural systems with fewer inputs may promote self-regulating systems with less dependence of chemical input.