

Soil Microbial Community Structure under Endophyte-Free and Endophyte-Infected Tall Fescue as Determined by FISH Analysis. (S03-jenkins724331-poster)

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Abstract:

Endophyte-infected tall fescue appears to enhance soil carbon sequestration. The mechanisms accounting for this phenomenon have not been elucidated. We conducted short-term incubations of tall fescue with and without endophyte infection to detect differences in total bacterial counts and various bacterial kingdoms and subdivisions. We used published oligonucleotide probes and fluorescent in situ hybridization methodology to detect and quantify metabolically active Eubacteria, Archaea, high GC, Gram-positive bacteria, Cytophaga-Flavobacteria, Planctomycetes, and the Alpha-, Beta-, Gamma-, and Delta-Proteobacteria in both the bulk and rhizosphere soils of the two grasses. No differences were observed after week 36. After week 60 and an incomplete preliminary analysis, a significant decrease (at $P = 0.04$) was seen in the delta-proteobacterial community, and (at $P = 0.08$) in the archaeal community associated with the rhizosphere soil of endophyte-infected tall fescue. These data suggest that the activity of certain components of the soil bacterial community are affected by the presence of the endophyte, and a reduction in bacterial activity may be one factor accounting for the enhanced accumulation of soil organic C.

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