Glomalin contributions to soil carbon and nitrogen pools in a prairie reconstruction. (S03-miller120016-Poster)

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Abstract:

The chronosequence nature of the prairie restorations at Fermilab (IL) provide a unique opportunity to investigate the contributions of arbuscular mycorrhizal fungi (AMF) to a soil's organic matter reserve. The chronosequence nature of the restoration allows first-order modeling to estimate decomposition rate (k) for extraradical hyphal carbon (ERH-C) and the AMF produced glycoprotein, glomalin. Modeling furthermore allows for estimating maximum values for ERH-C and glomalin. Estimated input rates (I) indicate that ERH-C on average contributes 0.051 g/kg soil per year, whereas immuno-reactive glomalin C (IRTG-C) contributes 0.005 g/kg soil per year. When AMF inputs are expressed in relation to accumulated soil organic carbon (SOC) we estimate that during the first year of restoration the mycorrhizal fungus (ERH-C + IRTG-C) contributes about 6% of the accumulated SOC, while by year 10 the contributions represent about 2% of total accumulated SOC. The inputs of AMF contributed nitrogen to the soil N pool follows a similar trend.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 1:30-3:30 pm
Poster Board Number: 1737

Keywords:

Mycorrhizal carbon acrual in soil, Mycorrhizal nitrogen acrual in soil,

Glomalin pools in soil, Carbon sequestration