Do Selected Groups of Microorganisms Enhance Carbon Storage in Laboratory Microcosms? (S03-fansler162138-Poster)

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Abstract:
It has been hypothesized that soils in which the microbial community is dominantly fungal are more likely to store carbon (C) than those that are dominated by bacteria. We sought to demonstrate the different roles that three groups of organisms play in soil C cycling. Culturable species of fungi (2 species), bacteria (5), and actinomycetes (4) were isolated from a restored prairie soil and inoculated as mixed cultures of the individual groups into two different agricultural soils. The soils were amended with wheat straw (ground > 0.053 mm), and then sterilized by cobalt irradiation prior to inoculation. Over three weeks of incubation, in one soil fungi respired more CO2 (55 mcg C/g soil) than either of the other two groups of organisms (bacteria, 45 mcg C/g; actinomycetes, 48 mcg C/g), whereas in the other soil, fungi respired less CO2 (59 mcg C/g) than either of the other two groups (72 and 74 mcg C/g). At the end of the incubation the soils were fractionated into particulate organic matter (POM) C and mineral-associated C. Results indicate that differences in the enrichment of the mineral-associated C are detectable in soils incubated with different microorganisms.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 1:30-3:30 pm
Poster Board Number: 1835

Keywords:

C Sequestration, Fungi, Bacteria, Actinomycetes