Determining rates and limits of carbon sequestration in soil. (S03-stewart113004-Poster)

Authors:

- C.Stewart - *Colorado State University, Natural Resource Ecology Lab*
- J.Six - *University of California, Davis Department of Agronomy and Range Science*
- K.Paustian - *Colorado State University, Natural Resource Ecology Lab*
- R.Conant - *Colorado State University, Natural Resource Ecology Lab*

Abstract:

Increasing soil C through changes in land use and management is a low cost and environmentally beneficial method of sequestering atmospheric CO2. However, it has been hypothesized that soils have an inherent upper limit above which no additional C can be stored. The magnitude of this upper or 'saturation' limit will govern the ultimate significance of the soil sink and the time period it can be exploited for CO2 sequestration. Currently we have little knowledge of the 'C carrying capacity' of soils. We investigated the role of physiochemical soil characteristics in determining soil C saturation levels. We examined the hypothesis of saturation in a 2.5-year incubation of A- and C-horizon soil with 1 and 5 times 13C-labeled wheat straw addition to six agricultural soils. We report preliminary respiration results 132 days into the incubation. In four of the six sites, both the 1x and 5x addition had significantly lower residue-derived C in the C-horizon compared to A-horizon. The 5x addition increased residue-derived respiration in the C- but not the A-horizon. This preliminary data support the saturation hypothesis between horizons but are inclusive when comparing additions.

Corresponding Author Information:

Catherine Stewart
Natural Resource Ecology Laboratory
A245 NESB, CSU
Fort Collins , CO 80523

phone: 970-491-1604
fax: 970-491-1965
e-mail: cstewart@nrel.colostate.edu

Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 1:30-3:30 pm

Poster Board Number: 1933

Keywords:
soil carbon, carbon saturation, carbon sequestration, incubation