Lignin Degradation in Grassland, Forest, and Shrub-Steppe Soils. (S03-bailey172130-Oral)

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Abstract:

Lignin decomposition was studied in soils from research plots in 5 locations in the US: restored tallgrass prairie, farmland (grain), semiarid shrub-steppe, and loblolly pine and Douglas fir forests. Soils were amended with 14C- lignocellulose and incubated for 6 months during which total and 14C-CO2 evolution were monitored and some replicates sampled for analysis of POM-C and microbial biomass. Soils that respired the most CO2 did not have the highest specific activities (14C activity/total CO2; dpm/(microgram CO2-C)) during the incubation, nor were the specific activities for any soil constant through the incubation. Thus, it appears that in different soils and at different timepoints, C was mineralized to CO2 disproportionately from the labeled and residual soil C. For example, a tilled soil had an initial specific activity of 90 and decreased to 50 by 7 d. In contrast, the tallgrass prairie had an initial specific activity of 5, and then peaked at 7 d at 20. The specific activity of the CO2 evolved reached approximately constant values for all soils after 8 wk suggesting that the perturbation of the stable soil C caused by addition of fresh C was not permanent.

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