Initial Decomposition and Humification Dynamics of Ponderosa Pine Fine Roots and Needles. (S03-bird201813-Poster)

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Abstract:

To predict the sequestration potential of plant C inputs in temperate forest soils, it is essential to better understand biological and chemical regulation of the conversion to stable soil organic matter (SOM). We will present first year results will from a 3-year field study examining the fate of 13C- and 15N- labeled Pinus ponderosa in an 80-year-old conifer forest in the Sierra Nevada, CA on an Ultic Haploxeralf. Our objectives are to assess of the effects of substrate placement depth (O vs. A horizon) and litter type (fine roots vs. needles) on the rates of C and N mineralization, immobilization into microbial biomass and specific microbial groups, and stabilization into SOM fractions. Data will be presented on recovery of 13C and 15N in soil microbial, mineral and SOM fractions after 152 d and C respiration over the initial 300 d. In situ litter decomposition, as estimated by 13C respiration, of needles exceeded that of roots by 270% at 61 d, by 140% at 152 d and was similar for the two substrates at 221 d. Pine needles in the O horizon had greater 13C respiration than in the A horizon through 152 d, while fine root C respiration was similar at both soil depths through 221 d.

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