



Depth Effects on Plant Residue Decay in Diverse Soils

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Decay of plant residues is tied to many ecosystem functions, affecting atmospheric CO₂, plant-available nutrients, microbial diversity, soil organic matter quality, among others. The rate of decay, in turn, is governed by soil type and management, location in the soil profile, and environmental variables, some of which may be changing in coming decades. Our objective in this study was to elucidate the decomposition dynamics of plant-derived C and N at different soil depths. To describe mathematically the importance of these variables across a broad scale, we established a long-term study at two sites in Canada and one site in New Zealand. At each site, labelled barley straw (¹³C = 10.2 atom%, ¹⁵N = 8.3 atom %; C = 37.9%; N = 0.95%; C:N = 40) was installed at 3 depths (5-10, 20-25 and 40-45 cm). Soil temperature was logged at each depth. Samples were collected at different times over 5-6 year after application of the residues. Data on recovery and kinetics of residue C and N over the experimental period will be discussed as well as ¹³C- PLFA results.