Tree root systems and nutrient mobilization
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Revaluating the role of roots and mycorrhizal hyphae in belowground carbon and nutrient cycling in forests. Guo, D. (Chinese Academy of Sciences, China; guold@igsnrr.ac.cn).

Fine roots of trees are complex branching structures composed of multiple branch orders. The two to three finest branch orders (Alnus glutinosa, Fagus sylvatica, and other) that make up the fine root turnover for 2 years. Collected roots were divided into living and dead roots of <0.5, 0.5–1, 1–2, and 2–5 mm in diameter. Litterfall was separated into leaves, twig, bark, seed, and others and all leaves were further separated by species. Our preliminary results show that fine root turnover rate was 1.68/year for deciduous forests and 2.07/year for coniferous forests. Annual fine root (<2 mm) production ranged from 47 to 335 g/m² in the first year and from 138 to 490 g/m² in the second year. The annual litterfall production ranged from 340 to 597 g/m². For further research, we will test the relationships between the fine root production, litterfall production, and environmental variables and the contribution of fine root and litterfall to nutrient dynamics by forest types.

Tree species identity influences the accumulation of recalcitrant deep soil carbon. Godbold, D., Ahmed, I. (University of Natural Resources and Life Sciences, Austria; douglas.godbold@boku.ac.at; iua@dhaka.net), Smith, A. (Bangor University, UK; a.r.smith@bangor.ac.uk).

Using an acid hydrolysis approach, easily degradable labile and recalcitrant C pools in soils from single and mixed tree stands of Betula pendula, Alnus glutinosa, and Fagus sylvatica and adjacent grassland were determined, in relation to leaf litter inputs and fine root distribution and turnover. The vertical distribution and turnover of fine roots did not differ between species planted in monoculture or polyculture. In the upper layers, no significant differences in C storage or fractionation pools were found between the treatments; however, in the deeper soil layers, the greatest storage of recalcitrant C was found in the polyculture. The C storage in the polyculture soil at depth was significantly greater compared to the B. pendula, A. glutinosa, and grassland soil, but not statistically different compared to F. sylvatica. In the lower soil profile, both F. sylvatica and the polyculture had a statistically higher C storage in the recalcitrant pool compared to under grass. In the grassland soil, only 17% of the total recalcitrant C pool was accumulated within the 40- to100-cm layer, whereas in F. sylvatica and the polyculture soils, 53% of the total recalcitrant C pool was determined.