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Hörsaal Fahnenbergplatz (Rektoratsgebäude)**

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## **Redistribution of soil phosphorous in forest stands by accumulation of harvest residues in skid trails: a problem for forest nutrition?**

Phosphorus is an essential yet scarce macronutrient. Forest nutrition often relies on cycling of P between biomass and soils through litterfall and roots. Intensified forestry extracts more P-rich biomass, and can lead to P depletions. However modern extraction methods deposit some P-rich biomass as thick mats on highly compacted skid trails. The role of P in accumulated harvest residues on skid trails in forest nutrition is unknown. What portion of redistributed P is immobilized or possibly accessible could be significant to forest nutrition and management.

We quantified harvest residue, forest floor and soil P stocks from an *Abies alba* Mill. stand five years after a whole-tree thinning. Findings suggest accumulated P is a significant proportion of redistributed P. Modeling shows up to 60% of P in harvested biomass was left on a skid trail. In contrast, current P stocks in the organic layer are less than those deposited in 2009 and are not evident in soil stocks. Loss from runoff or leaching is highly unlikely due to the skid trail's thick organic layer and site-specific soil conditions. Crucially most root mass in the organic layer is found in the middle of the skid trail. The skid trail's thicker biomass and consequentially improved porosity and aeration allow roots to recolonize, thus showing accumulated P is accessible to roots. Foliar, root and organic P analysis could confirm the suggested processes with wider implications for forest nutrition.