

FOREST HARVEST EFFECTS ON SOIL CHEMICAL PROPERTIES AND NUTRIENT
CONCENTRATIONS IN OZARK HIGHLAND SOILS

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ABSTRACT

Mixed hardwood systems of the Missouri Ozark Forest Ecosystem Project are harvested using clearcutting (CC) and single-tree selection (STS) regeneration methods. This work indicates possible effects of regeneration method on surface soil nutrient pools. Ten years after harvest, soil samples were collected in 10 cm increments from 0-to-30 cm in each treatment (CC, STS, and no-harvest removal sites), in three different nutrient status soils pre-determined by subsoil percent base saturation (BS: low, $\leq 20\%$ BS; medium, 20 – 50 % BS; and high, $\geq 50\%$ BS) using a paired sampling approach (i.e., samples were collected in treated and nearby non-treated locations). Samples were analyzed for pH, extractable base cation concentrations, total organic carbon (TOC), total nitrogen (TN) content, and stabile and labile nitrogen pools (SN and LN, respectively) via extractions and mineralization (PMN). Statistical analyses were performed on concentration difference values of paired samples (i.e., treated – untreated concentrations). Results indicate that Ca, TOC, TN, SN, LN and PMS concentration difference values are consistently smaller in STS and greater in CC than their paired controls, especially in high nutrient status soils and the surface 10 cm ($\alpha=0.10$). Disparity in soil nutrients is attributed to differences in slash distribution within the treatments.