# Long-term forest establishment on prairie soils: effects on soil microbiological, mineralogical, physical, and chemical properties. (S05-zanner153437-Poster)

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### **Abstract:**

The Nebraska National Forest at Halsey is a 25,000-acre experimental forest that was planted in the first half of the 20th century in the midst of Sand Hills prairie. Gradients from open grassland to forests of ponderosa pine and eastern redcedar offer opportunities to study changes in soil microbiological, mineralogical, physical, and chemical properties. In preliminary studies of seven sites representative of these gradients, pine pHs have decreased up to one unit and cedar pHs are elevated up to one unit compared to the prairie surface pH of ~6.0. Recycling of basic cations to surface mineral horizons was evident under old cedar sites. Conductivities are also higher under the cedars but extractable iron decreased. Lamellae development is stronger under cedars than prairie suggesting increases in clay translocation. Compared to the prairie soils, losses of organic carbon are greatest under pine followed by cedar with parallel declines in soil microbial biomass. Evidence from microbial fatty acids indicates significant shifts in microbial community structure with change in vegetation type, particularly for mycorrhizal fungi. More detailed studies of the seven sites are ongoing.

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