Soil Quality:
Prairie Restoration

Restoration of degraded prairies and old cultivated fields to landscapes that resemble the native prairies typical of Missouri before European settlement typically focuses on re-establishing above-ground ecological communities including native plants and wildlife. Of equal importance in restoration projects are critical soil properties that must be returned to optimal levels to support the native prairie ecosystem. Effectiveness of prairie restoration on the soil environment can be evaluated by soil quality assessment. Soil quality is the ability of a soil to function within an ecosystem to sustain plants and animals, resist erosion, and reduce negative impacts on water and air resources. Grasslands (above L) exhibit higher soil quality attributes including soil organic carbon, microbial activity, and aggregate stability than do soils in agroecosystems (above R). Because restored grasslands are sinks for carbon and are potential sources of biofuel feedstock, we are evaluating soil biological indicators of soil quality as influenced by prairie restoration. In studies conducted since 2004 at Prairie Fork Conservation Area (restored) and Tucker Prairie (native), *we found that re-establishment of the perennial cover of grasslands on former cropland reduced soil erosion, improved soil structure through increased aggregate stabilization, increased C inputs due to development of dense root biomass, and increased microbial diversity and activity, approaching levels in native prairie*. This research is important because it demonstrates the value of perennial vegetation in conserving the soil resource, helps landowners in making land use decisions, and may be useful in integrating prairie restoration practices into ecological farming systems.

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