Introduction

Intensive row-crop agriculture in the US Corn Belt produces high yields of grain that provide food, feed, and fuel to our economy. The landscape alteration and simplification supporting this productivity have significantly reduced many of the ecosystem services the land would otherwise provide in exchange for crop production, including loss of wildlife habitat, increased soil erosion, and nutrient loss from fields into our waterways. The STRIPS research project (Science-based Trials of Row-crops Integrated with Prairie Strips) addresses the question of whether we can achieve conservation goals on production acres by strategically placing native prairie vegetation strips in the landscape.

Objectives

- Identify and compare species diversity and cover of prairie plants between the upper edges, center, and lower edges of mid-slope prairie strips
- Identify and compare soil functional characteristics between crop areas, crop edges immediately adjacent mid-slope prairie conservation strips, upslope and downslope prairie edges, and center of prairie strips.

Methods

- 3 fields with prairie strips across the middle backslope

Results

- Prairie conservation strips were more evenly diverse in their interiors than at either edge.
- Perennial monocots comprised a greater proportion of cover in strip centers than in edge positions.
- Non-native perennial monocots dominated all areas after 7 years without controlled burning.

Ecosystem services: Soil erosion control - Enhanced belowground plant biomass and MBC in diverse prairie improves soil structure; Habitat - diverse plant structure and composition in prairie center

Soil Functional Characteristics

- Prairie conservation strip soil was more stable (resistant to slaking) below 10 cm than soil under no-till annual row crops.
- Microbial biomass in prairie soil was greater than in both immediately adjacent and distant crop soil.
- Soil at 20-30 cm under prairie edges had significantly lower $K_s$ than in the crop or center of prairie strips, while $K_s$ in crop, mid prairie, and shallower depths was similar and rapid.
- Crop soil trends to greater density than prairie soil.

Ecosystem services: Water flow and soil erosion control via soil structure regulation - Aggregate stability, MBC

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