Prairie Strips

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Research Highlight: Prairie strips support farmers' soil, water, and wildlife conservation goals.

Background: Soil, nutrients, and ecosystem services continue to be lost from agricultural lands despite decades of investment in conservation. A unique component excluded from previous approaches has been the integration of native vegetation with the crop production environment. Results from the initial Science-based Trials of Rowcrops Integrated with Prairie Strips (STRIPS) project, conducted across 12 experimental catchments between 2007 and 2015, indicate that treatments with strips of native prairie vegetation comprising 10% of catchment area retain 20 times more sediment, 4.3 times more phosphorus, and 1.4 times more nitrogen than catchments in which 100% of the area is in corn-soybean production. Prairie strips minimally affected crop production while also supporting a greater richness of insect taxa (2.6-fold), abundance of pollinators (3.5-fold), richness of native bird species (2.1-fold), and abundance of bird species of greatest conservation need (2.1-fold). In 2015, the project expanded to work with farmers across Iowa to determine whether conservation impacts also accrue at the broader scale of commercial farm fields.

Goal: Improve implementation of the USDA Conservation Reserve Program (CRP) through evaluation of prairie strips compared to traditional contour buffer and filter strip designs.

Findings:

Soil and Water

- Initial data indicate a trend toward reduced sediment and nutrient loss through surface runoff from fields with prairie strips compared to those without.
- Data from ground water wells exhibits high variability; additional years of data will be required to detect significant effects.

Plants and Pollinators

- The frequency of blooming plant species is greater in prairie strips compared to typical conservation plantings, which are often planted to cool-season grasses such as smooth brome.
- The number of bees and bee species increases with the plant diversity of the conservation planting. The greater abundance of flowers likely contributes to the higher bee abundances and species richness.

Birds

- Fields with prairie strips have significantly higher density of birds compared to fields with conventional grass and filter strips. Strongest responses are from dickcissels, common yellowthroats, and red-winged blackbirds.
- Some species in need of conservation assistance, including the dickcissel, eastern meadowlark, and grasshopper sparrow, have responded positively to the presence of prairie strips.
- Preliminary results indicate that red-winged blackbirds fledge young 2.1 times as often from nests in prairie strips compared to low-diversity vegetated areas on farms, dickcissels fledge young 5.6 times as often, and vesper sparrows fledge young 8.4 times as often.

Economic

- At $28-35 per protected acre per year, prairie strips are one of the most cost-effective mechanisms for achieving farmland conservation. The annualized cost scales with the opportunity cost of removing land from corn-soybean production.
- Cost to farmers is ~$8 per protected acre if the prairie strips are enrolled in CRP.

Social

- 2018 survey data indicated that the majority of Iowa farmers have heard of prairie strips and are considering implementing them on their farms.
- Existing farmer and farmland owner adopters indicate scientific, technical, and policy barriers presently impede expanded adoption.

Next Steps: Additional years of data will further elucidate impacts to soil and water measures and for a greater number of wildlife species. Specific recommendations to improve conservation design are forthcoming.

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