

The Cost of Prairie Conservation Strips



Adapted from the STRIPs research paper:

Tyndall, J. C., L. A. Schulte, M. Liebman, and M. Helmers. "Field-Level Financial Assessment of Contour Prairie Strips for Enhancement of Environmental Quality." *Environmental Management*, 2013. DOI: 10.1007/s00267-013-0106-9.

What are prairie conservation strips?

Prairie conservation strips are a tool for improving the function and integrity of row-cropped farms. Researchers at STRIPs (Science-based Trials of Rowcrops Integrated with Prairies) have found that strategically planting small patches and strips of native prairie in farmland provides multifunctional benefits disproportional to the amount of land converted. In other words, small patches make a big difference.

How much does prairie planting cost?

Table 1 represents typical costs for a prairie strip planting after soybean. The range of costs is calculated based on average land rent across cropland quality, as measured by its Corn Suitability Rating (CSR). The soil and nutrient runoff from every nine acres of row crops can be treated with just one acre of perennial prairie. So, for every ten acres of farmland, the average total annual cost of converting one acre of cropland to prairie ranges from \$240 to \$350. In other words, **converting a tenth of every acre from annual crop to prairie costs between \$24 to \$35 per year.**

In Iowa, land rent or foregone revenue can scale higher than the averages used here, so the range of values calculated here may underestimate the actual total—costs may be upwards of \$60 per year for every row-crop acre treated with prairie. However, Iowa also offers Conservation Reserve Program (CRP) contracts. Under a 15-year CRP contract, farmers could receive a cost reduction of more than 80%, thus costing them only \$3 to \$5 per year per crop acre treated with prairie.

Table 1: Annualized total costs of prairie strips calculated over a 15-year management period at a 4% discount rate (in 2012 dollars)

	High quality (CSR 83)	Medium quality (CSR 73)	Low quality (CSR 60)
Per acre of prairie	\$350	\$290	\$240
Per treated crop acre	\$35	\$29	\$24
Per treated crop acre with CRP	\$5	\$4	\$3

See following page for detailed cost breakdown.

Why plant prairie strips on my land?

Prairie strips are of primary importance because they prevent soil erosion and nutrient runoff from farmland. Specifically, converting just 10 percent of farmland to prairie can reduce sediment and nutrient transport off the field into waterways by more than 90 percent. They also increase pollinator, plant and wildlife diversity, create opportunities for forage and biomass, and suppress the proliferation of annual weeds within the strips.

What else should I consider?

Land management decisions on farms are a trade-off between maximum yearly profit per acre and long-term health and sustainability of the acreage. Ongoing studies continue to establish the long-term benefits of conservation measures in farming systems. Prairie strip plantings require minimal land conversion and maintenance, and are among the cheapest best management practices (BMPs) you can employ on your farm, especially when combined with a CRP contract.

For their size, prairie strips result in dramatic, disproportionately large benefits to the landscape. In other words, a little goes a long way toward soil conservation, ecosystem health and long-term economic productivity and sustainability of farmed landscapes.

Below, visitors tour the prairie conservation strip research plots at the Neal Smith National Wildlife Refuge.



Table 2: Estimated range of costs for a 15-year management plan of 10% prairie strip planting after soybean (in 2012 dollars)

		Mean price per acre
Site preparation		
Year 0:		
Tillage	\$6–30 per acre	\$18
Herbicide	\$40–80 per gallon	\$15
Herbicide application	\$20–85 per acre	\$53
Establishment		
Year 0:		
Seed	\$120–\$250 per acre	Variable
Seed drilling	\$10–48 per acre	\$15
Seed packing	\$5–30 per acre	\$17.50
On average, site preparation and establishment are less than 10% of the total cost per year per treated crop acre		
Management		
Annual:		
General operating costs	1–3% of upfront costs	Variable
AND		
Years 1–15:		
Mowing	\$5–55 per acre	\$30
3 times in year 1, annually years 2–15		
Years 2–15:		
Baling	\$9–16 per acre	\$11
OR		
Years 2–15:		
Burning	\$30–100 per hour	\$36
Annually years 2–6, every 2 years thereafter		
Management costs are about 10–15% of the total cost per year per treated crop acre		
Opportunity costs		
Annual:		
Land rent	Variable	\$80–525
Opportunity costs are up to 90% of the total cost per year per treated crop acre		

How are these costs calculated?

Costs fall into two categories: the cost of land conversion and maintenance, and the opportunity cost of the management decision (Table 2 details these costs). For prairie strip planting, there are three kinds of land conversion and maintenance costs: **site preparation**, **prairie strip establishment** and **annual and periodic maintenance**. The range of costs varies depending on multiple factors. Proper site preparation reduces the time and money spent on subsequent management steps. The prior quality of the land also influences these costs. For example, fewer herbicide applications are needed if there are fewer established weeds in the area.

Landowners must also consider the missed opportunity represented when changing a land management regime from the status quo. The **annual opportunity cost** is the cost of foregone rent or net revenue loss associated with land converted to perennial prairie. Opportunity costs vary depending on factors relating to ownership, soil quality, management practices, and crop and land value, but they scale up incrementally with the amount of land taken out of crop production. They are often calculated using average land rent as a proxy for foregone revenue.

On most sites, site preparation and establishment are less than 10 percent of the total cost of a prairie strip planting and management about 10 to 15 percent. Opportunity costs represent the greatest proportion—upwards of 90 percent—of the total cost of prairie strip planting.

Where can I find financial support?

- The USDA offers state-specific financial and technical support: www.ia.nrcs.usda.gov/programs.
- Conservation Reserve Program (CRP) offers 10-15 year contracts.
- Environmental Quality Incentives Program (EQIP) may assist with prairies you plan to harvest or graze.
- Wildlife Habitat Incentive Program (WHIP) offers a maximum of \$30,000 to install and maintain habitat on private land.
- U.S. Fish and Wildlife Partners Program works with landowners to restore wildlife habitat: www.fws.gov/midwest/partners.
- Resource Enhancement and Protection (REAP) gives small grants for soil and water protection: www.iowadnr.gov/Environment/REAP.
- Trees Forever offers financial support to landowners interested in planting native habitat: www.treesforever.org.

Where can I learn more about prairie restoration?

The following publications are found at the Leopold Center website: www.leopold.iastate.edu/pubs/alpha. Search by title for:

- A Landowner's Guide to Prairie Conservation Strips
- Incorporating Prairies into Multifunctional Landscapes
- A Targeted Approach for Improving Environmental Quality

Learn about the STRIPs Research Team at their website: www.prairiestrips.org or visit the Neal Smith National Wildlife Refuge at 9981 Pacific Street, Prairie City, Iowa. Contact the Refuge at (515) 994-3400 or NealSmith@fws.gov.

Project partners include the US Fish and Wildlife Service, Neal Smith National Wildlife Refuge, Leopold Center for Sustainable Agriculture, Iowa Department of Agriculture and Land Stewardship, US Department of Agriculture, US Forest Service, Iowa State University, National Science Foundation and Trees Forever. Layout by Melissa Lamberton, Leopold Center. Photographs courtesy of Anna MacDonald, graduate research assistant, and the Leopold Center.

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