

Installing Prairie Strips: Frequently Asked Questions

Prairie strips are a conservation practice that uses strategically placed native prairie plantings in crop fields. Prairie strips hold soil in place, improve soil health, impede nitrogen and phosphorus from entering water bodies, and enhance wildlife habitat. The practice was adopted, further developed, and tested by the STRIPS (Science-based Trials of Row crops Integrated with Prairie Strips) team at the Neal Smith National Wildlife Refuge and farms across Iowa, and is now available for cost-share via the Conservation Reserve Program (CP-43).

This publication provides reasons why farmers and farmland owners might consider prairie strips as a conservation option for their farms and important factors to consider regarding their installation and maintenance.

What are the benefits of prairie strips?

Researchers have found that converting as little as 10 percent of a row-cropped field to prairie can help reduce soil erosion, retain nutrients, and provide habitat for wildlife. Research has demonstrated that sowing native prairie species in strips along contours and at the base of slopes on corn and soybean farmland is a relatively low cost way to garner multiple agricultural conservation benefits. They also give farmland owners flexible management options and provide numerous benefits that other conservation practices may not offer.

Reduce soil loss and water runoff

Possible to reduce sediment loss by 95% with only 10% land in prairie strips

Possible to reduce water runoff by 42% with only 10% land in prairie strips

Retain nutrients

Possible to reduce overland phosphorus loss by 90% with only 10% land in prairie strips

Possible to reduce overland nitrogen loss by nearly 85% with only 10% land in prairie strips

Provide wildlife habitat

Prairie strips increase habitat diversity, and especially wider strips provide habitat for birds

Prairie strips support pollinators and other beneficial insects



These flumes measure surface water movement and sediment, nitrogen and phosphorus export from field experiment plots at the Neal Smith National Wildlife Refuge. Compare the transport of these resources from: 1) A 100% no-till, corn-soybean crop field, 2) A field treated with a 10% prairie strip and 3) A 100% prairie.



1) Prairie strips between row crops create diverse habitat for numerous plant and animal species. Prairie strips may support species of ecological, commercial and recreational significance, including 2) honeybees and native pollinators, 3) cattle and 4) game birds. They may also support haying, native seed production, wildlife viewing and nature photography.

How are prairie strips installed?

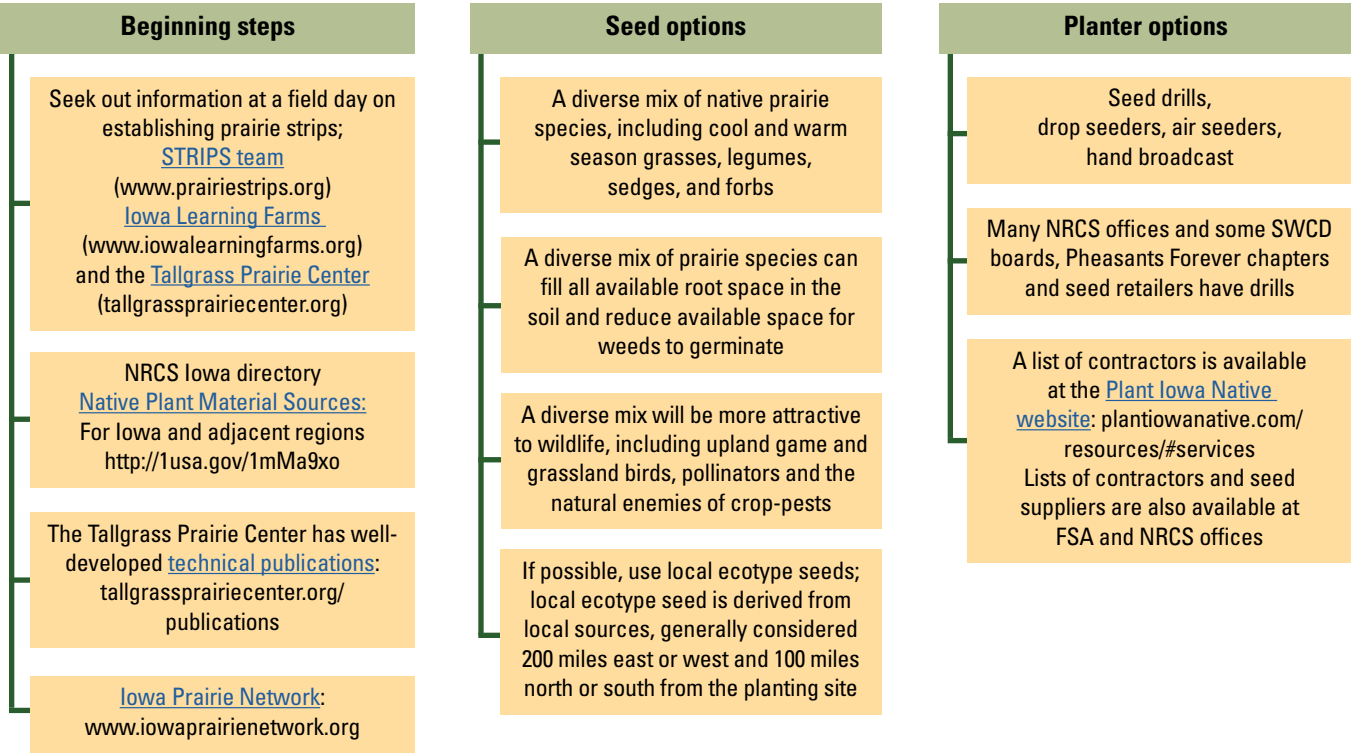
Where to put strips?	How much land to put in strips?	How wide should strips be?	Does the area need to be prepared?	When is the best time to plant?
<p>Depends on field size, slope and soil types; minimally at the foot of a slope, and also potentially upslope within the row crops</p> <p>Areas of potential erosion through the concentrated flow of water should be protected by conservation practices such as grassed waterways. Where contour row curvature becomes too sharp to keep equipment aligned with rows during field operations, increasing the buffer strip width can help avoid sharp ridge points.</p>	<p>Depending on the field, approximately 10% of the total acreage can effectively protect the entire field; actual amounts may vary depending on field size, slope, soil quality and existing conservation practices</p>	<p>Variable; at least 30 feet required for CRP enrollment</p> <p>Strip width can vary based on anticipated water movement</p> <p>Strip width and placement is designed to accommodate modern commercial farm implements</p>	<p>Prairie strips are most easily established following a soybean crop; seeds can be drilled into or broadcast over soybean stubble in the fall</p> <p>Be mindful of the past season's herbicide use to prevent carryover that may impact the development of young prairie plant species; CDMS maintains a searchable database of herbicide labels, which include information about plant-back restriction times: www.cdms.net/Label-Database</p>	<p>Prairie can be planted at any time of year; spring before crop planting or fall after crop harvest are ideal</p> <p>Seeding Calendar For Warm and Cool Season Grasses, from United Seeds: bit.http://bit.ly/1fyo3kA</p>



Prairie seed contains numerous native plant species. Once established, prairie strips add diverse habitat to landscapes dominated by row crops.

In diverse plant communities, even if an individual plant species performs poorly due to yearly nutrient or water fluctuations, the community as a whole thrives, staying resilient when faced with extreme weather.

How are prairie strips planted?

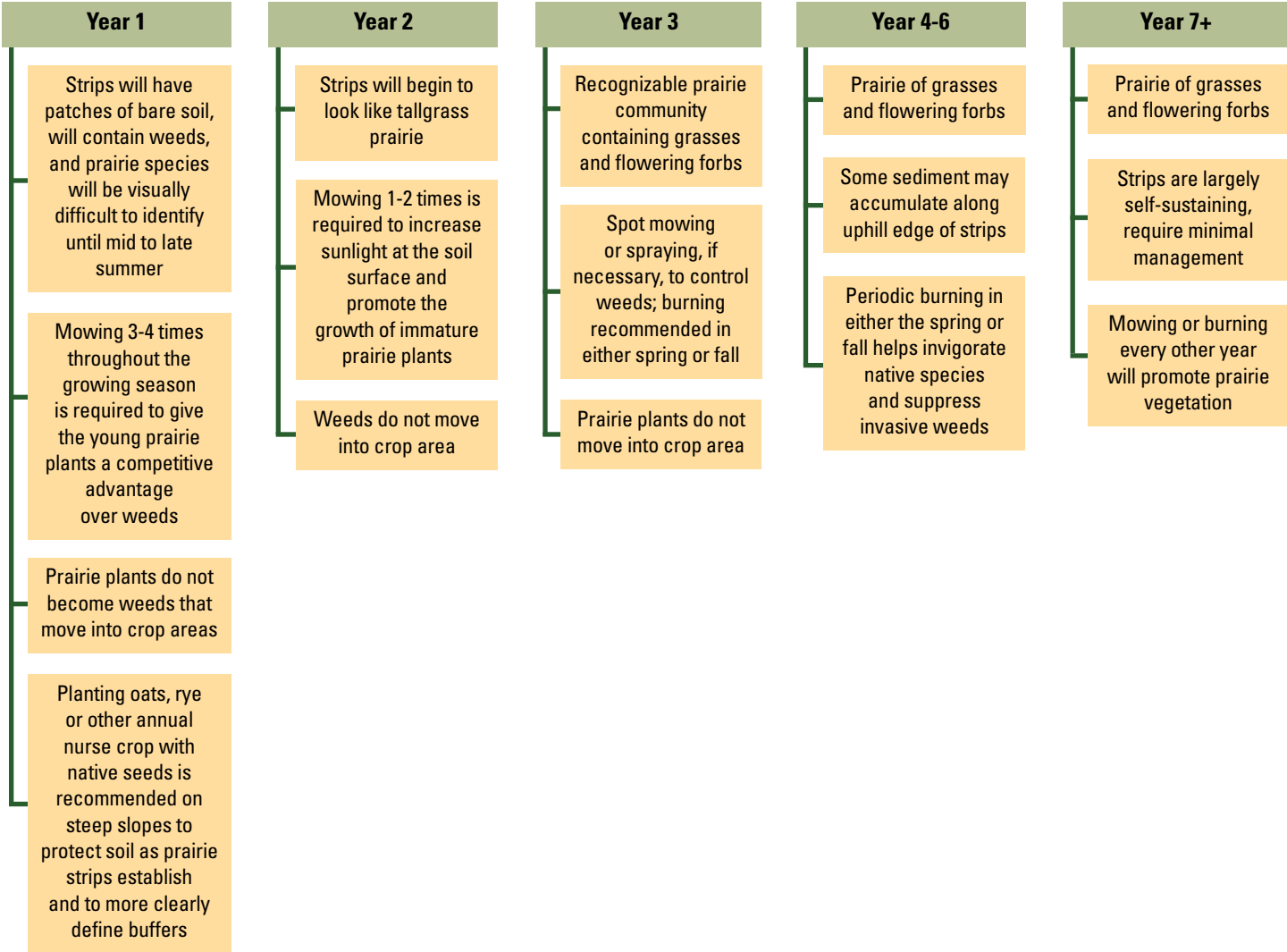




In the first few years after planting, strips may not look much like prairie. They may contain annual weeds. Depending on the size of the farm, weed suppression options include mowing – as shown here – spot treatment with mowing or herbicide, or burning to promote prairie seedling establishment.

Mature prairie plants outcompete weedy plants and do not require much maintenance. Prairie plants do not move into adjacent the crop fields, but could become valuable habitat for pollinators and other beneficial insects. Prairie strips could become a component of an integrated pest management approach.

What is the typical life cycle of a prairie strip?



Cost of prairie strips, 2020

The average annual cost of converting one acre of crop land to prairie ranges from \$200 to \$300 per year (without cost-share) depending on the prairie seed mix and cost of land. The soil and nutrient runoff from every nine acres of row crops can be “treated” with just one acre of perennial prairie. As such the cost per treated row crop acre ranges from \$26 to \$33 per year. The range of costs is calculated based on average 2019 land rent across a range of cropland quality, as measured by Corn Suitability Rating (CSR).

Table 1 represents typical costs for a prairie strip planting

after soybean. Table 2 displays the cost breakdown for all the activities generally involved in establishing and managing prairie strips.

Iowa offers a number of conservation program options for landowners interested in utilizing prairie strips. For example, under a 15-year Conservation Reserve Program contract for a CP 15A contour buffer strip, a farmer could receive a cost reduction of about 75 percent the cost to about \$8 per treated acre.

Table 1. Annualized total costs of prairie strips calculated over a 15-year management period at a 2% real discount rate (in 2020 dollars).

Annual cost	Average costs for a CP 42 seed mix ¹			Average costs for a CP 25 seed mix ²		
	High quality (CSR2 83)	Medium quality (CSR2 73)	Low quality (CSR2 62)	High quality (CSR 83)	Medium quality (CSR 73)	Low quality (CSR 60)
Per acre of prairie	\$293	\$266	\$230	\$353	\$319	\$279
Per treated crop acre	\$33	\$30	\$26	\$35	\$31	\$28
Per treated crop acre with CRP ³		~\$7			~\$8	

¹ CP 42 seed mix is a high-diversity grass and forb pollinator seed mix. 2020 seed prices used are a composite of five regional prairie seed companies. Average CP 42 seed mix cost used here is \$705 per acre. Note that prairie seed costs can scale upwards of \$3,000 per acre or more for specialty seed mixes.

² CP 25 is a high diversity grass and forb seed mix for rare and declining habitat. 2020 seed prices used are a composite of five regional prairie seed companies. Average CP 25 seed mix cost used here is \$250 per acre.

³ The USDA CRP program for CP 15A was used as the proxy for CRP payments; a 90% rental payment was assumed.

Table 2. Costs associated with planting multi-purpose prairie strips planted after soybeans (in 2020 dollars).

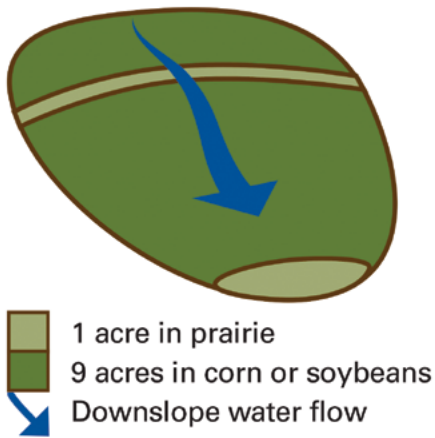
Cost Activities ¹ / items	Year cost incurred ²	Range of costs (units)	Mean price (ac)	Notes
Site Preparation				
Tillage	0	\$9 to \$23/acre	\$15.50	Tillage type will be variable depending upon initial conditions. Tillage may also be unnecessary, e.g., prairie seed can be drilled directly into bean stover. Data: Plastina et al (2020).
Herbicide and application	0	\$39.75 to \$49/acre	\$44.37	Chemical mix for site or seedbed prep or weed control (Glyphosate \$40 to \$80/gal. - 1 qt/ac). Data: Plastina et al (2020).
Prairie Establishment				
Prairie Seed	0	Highly variable; depends upon goals of planting.	Variable	There are a number of companies that sell regional genotypic prairie grass and forb seed.
Seed drilling	0	\$12 to \$25/acre	\$18.70	Data: Plastina et al (2020)
Cultipacking	0	\$8 to \$20/acre	\$14	Data: Plastina et al (2020)
Prairie Management				
Mow, rake/row, bale and move	3 x yr 1; annually 2-15 after	\$24 to \$49/acre	\$36.50	Data: Plastina et al (2020)
Burning ³	Mow 3x yr 1; Mow, rake/row and bale yr 2; burn every 3 yrs after	Mow and bale ~ \$23/acre. Burning \$35 to \$124/acre	Variable	Data: SNR Foundation 2007 & Plastina et al (2020)
General operating costs	Annual	1-3% of upfront costs	Variable	--
Opportunity Costs⁴				
Land rent	Annual	Highly variable; \$90 - \$370	\$219	Data: Plastina et al (2020)

¹ Establishment and management of prairie strips will vary from site to site depending on initial conditions, soil, previous cropping system, and practice design.

² Assumes early spring expenditure.

³ Burning the prairie is an alternative to mowing and baling; assumption is land manager would either mow/bale or burn.

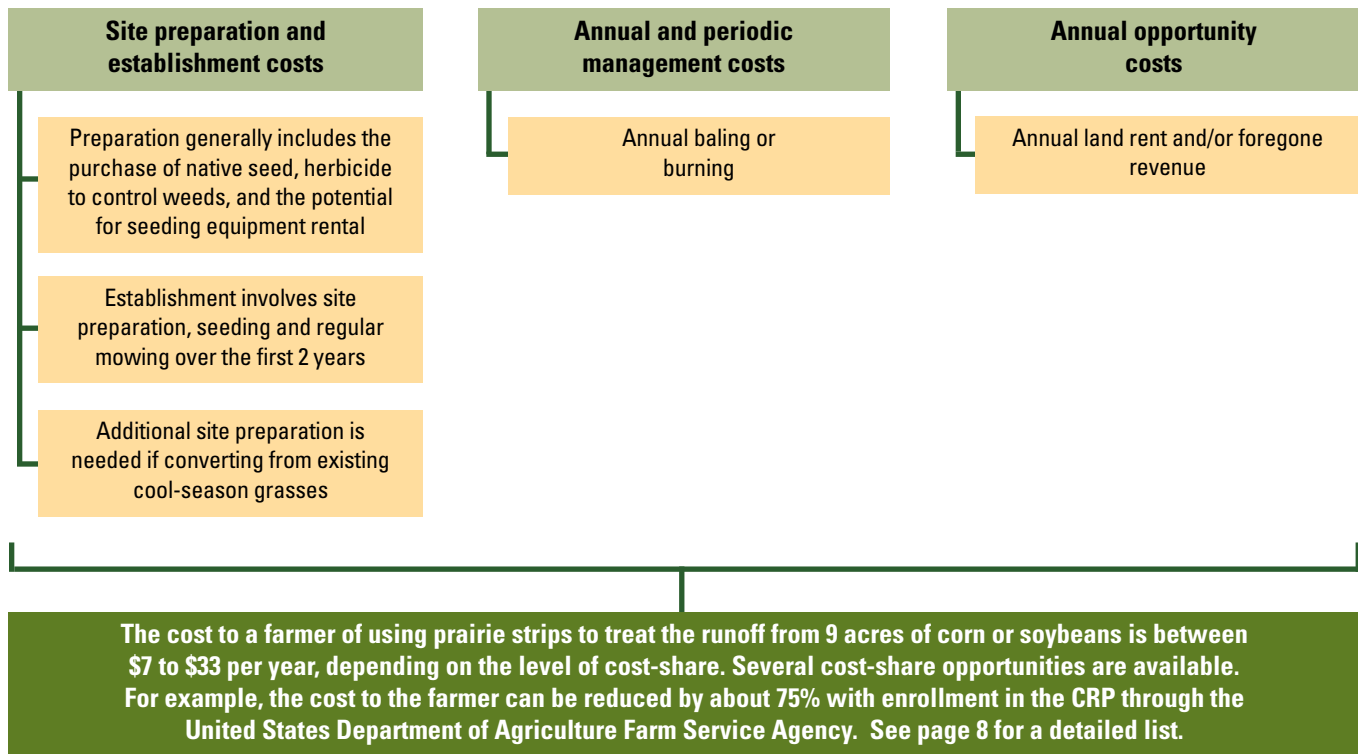
⁴ Note that research has shown no negative yield impacts on crops adjacent to prairie.

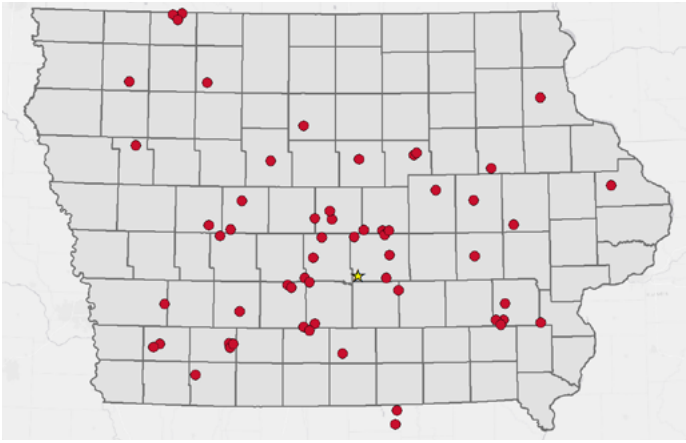


Standard farm equipment can be used to establish and maintain prairie strips, with the possible exception of a drill used for seeding.

Treatment costs are calculated over the entire field area. One acre of prairie can treat 9 acres of row crops. The cost of prairie strips is therefore spread out over 10 acres, 90% of which remain in crop production.

What does it cost to install prairie strips?



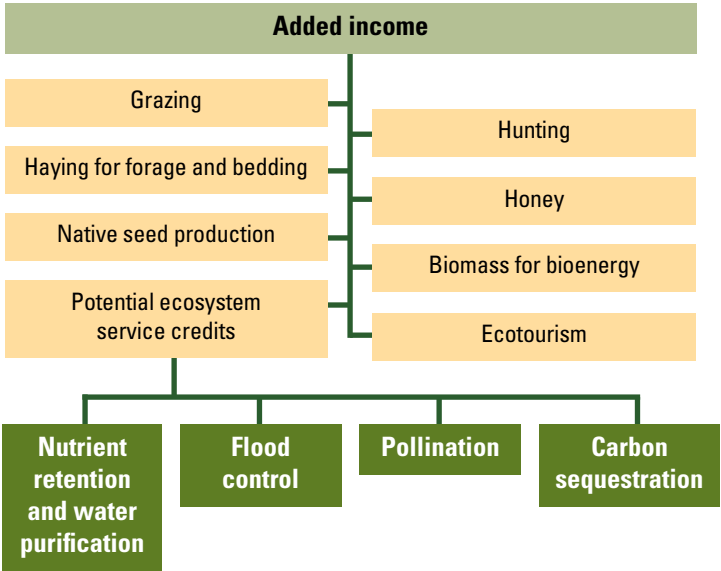
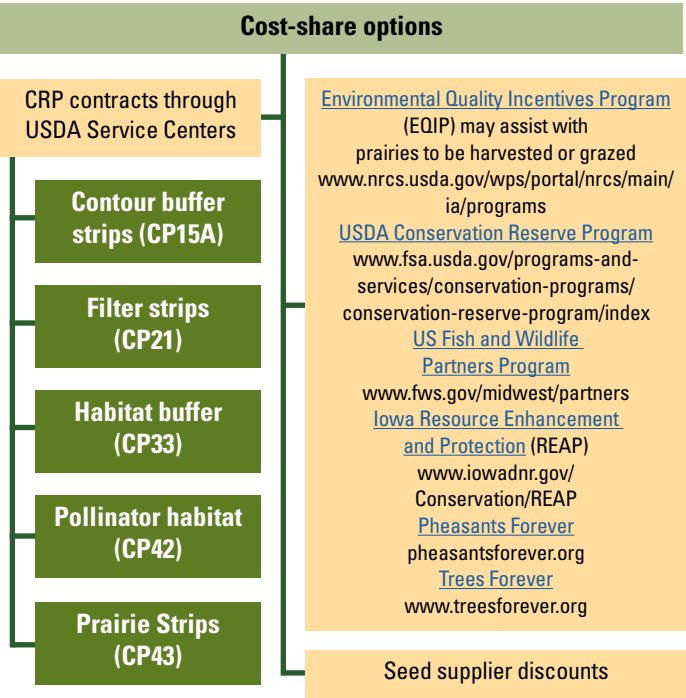


The above map shows STRIPS research collaborators in 2020. Each of the 33 sites is unique since prairie strip placement varies based on field type and maintenance needs.



1) An aerial view of prairie strips on a 400-acre property in north central Iowa, 2) Prairie strips in action at the long-running experimental site at the Neal Smith National Wildlife Refuge in Jasper County, Iowa, 3) A prairie strips consultant can discuss their experience working with farmers and farmland owners.

What are some possible cost reduction and income sources with prairie strips?



Where can more information about prairie strips be found?

Prairie strip demonstrations

- Fields with prairie strips are located at the [Iowa State University Research and Demonstration farms](http://farms.ag.iastate.edu/farms) across the state: farms.ag.iastate.edu/farms
- Prairie strips research fields are located at the [Neal Smith National Wildlife Refuge](http://www.fws.gov/refuge/Neal_Smith), Prairie City, Iowa: www.fws.gov/refuge/Neal_Smith
- Prairie strips can also be found on private farms throughout the state. See the [STRIPS project website](http://www.prairiestrips.org) (www.prairiestrips.org) for field days periodically hosted by these farmers and farmland owners.
- For a [full list of STRIPS project partners](http://www.nrem.iastate.edu/research/STRIPS/content/partners) visit www.nrem.iastate.edu/research/STRIPS/content/partners.

Resources on the web

- [STRIPS project website](http://www.prairiestrips.org): www.prairiestrips.org
- The [Tallgrass Prairie Center](http://tallgrassprairiecenter.org) website: tallgrassprairiecenter.org
- This and other publications can be found on the [ISU Extension Store](http://store.extension.iastate.edu): store.extension.iastate.edu

Technical assistance

- The STRIPS team on-staff prairie strips consultant trains technical service providers to work across the Midwest. Email prairiestrips@iastate.edu for more information.
- Plant Iowa Native maintains a [list of prairie seed suppliers and contractors](http://www.plantiowanative.com/resources/#services) who can provide custom planting services: www.plantiowanative.com/resources/#services

Prairie restoration

- *The Tallgrass Prairie Center Guide to Prairie Restoration in the Upper Midwest* by Daryl Smith, Dave Williams, Greg Houseal and Kirk Henderson
- *A Practical Guide to Prairie Reconstruction* by Carl Kurtz
- *The Tallgrass Restoration Handbook for Prairies, Savannas, and Woodlands*, edited by Stephen Packard and Cornelia F. Mutel
- *Incorporating Prairies into Multifunctional Landscapes* by Meghann Jarchow and Matt Liebman. Iowa State University Extension and Outreach, 2011. store.extension.iastate.edu/Product/13357.pdf

Financial support

USDA programs offer financial and technical assistance to landowners.

Contact your local USDA Service Center for more information.

- CRP offers [10-15 year contracts](http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index): www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index
- [EQIP](http://www.nrcs.usda.gov/wps/portal/nrcs/main/ia/programs) may assist with prairies to be harvested or grazed: www.nrcs.usda.gov/wps/portal/nrcs/main/ia/programs
- Wildlife Habitat Incentive Program offers a maximum of \$30,000 to install and maintain habitat on private land. Funds are limited and vary by state.

Assistance also is available from:

- [US Fish and Wildlife Partners Program](http://www.fws.gov/midwest/partners) works with landowners to restore wildlife habitat: www.fws.gov/midwest/partners
- [Resource Enhancement and Protection](http://www.iowadnr.gov/Conservation/REAP) awards small grants for soil and water protection: www.iowadnr.gov/Conservation/REAP
- [Pheasants Forever](http://iowapf.net/NativeGrassProgram.aspx) funds habitat projects including native prairie seedings: iowapf.net/NativeGrassProgram.aspx
- [Trees Forever](http://www.treesforever.org) funds pollinator projects: www.treesforever.org

References

- Edwards, W. 2009. [Natural Resources Custom Rate Survey](http://www.extension.iastate.edu/agdm/crops/html/a3-11.html), Iowa. Iowa State University Extension and Outreach. File A3-11 (www.extension.iastate.edu/agdm/crops/html/a3-11.html) September 2009.
- Plastina, A., and A. Johanns (2020) [2020 Iowa Farm Custom Rate Survey](http://store.extension.iastate.edu/Product/1792). Ag Decision Maker File A3-10. Iowa State University Extension and Outreach. FM 1698 (store.extension.iastate.edu/Product/1792) Revised May 2020.
- Plastina, A., Johanns, A., and C. Welter (2020). [Cash Rental Rates for Iowa 2020 Survey](http://store.extension.iastate.edu/Product/1841). Ag Decision Maker File C2-10. Iowa State University Extension and Outreach. FM 1851 (store.extension.iastate.edu/Product/1841) Revised May 2020.



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