

Table 5: Partial budget template for replacing cropland with prairie (avg. \$/acre for a typical year over 15-year CRP contract length); values used are estimated averages. The table is defaulted to using Option #1 for prairie maintenance. Visit the MiSTRIPS page on the KBS LTER website (link on previous page) to download this interactive spreadsheet. Adjust values in the shaded gray boxes to create a personalized partial budget.”

Step 1. Determine average crop income				
A. Foregone crop revenue	Corn	Soybean	Wheat	
Price of crop (\$/bu)	\$5.58	\$13.47	\$6.42	
Yield (bu/A)	165	48	79	Average revenue
Revenue per acre	\$920.70	\$646.56	\$507.18	\$691.48
B. Input cost savings				
Planting & seed	\$121.00	\$81.45	\$64.56	
Fertilizer	\$260.75	\$65.98	\$159.99	
Tillage	\$43.50	\$43.50	\$43.50	
Pesticide	\$64.07	\$62.28	\$81.94	
Harvest	\$47.00	\$45.00	\$37.00	
Drying & hauling	\$72.60	\$16.32	\$24.49	Average cost
Cost per acre	\$608.92	\$314.53	\$411.48	\$444.98
		Crop income		\$246.50
Step 2. Estimate CRP incentives				
		Rate	Average cost	Est. payment
A. Practice incentive payment		0.5	\$311.10	\$155.55
B. Signing incentive payment		0.325	\$152.00	\$49.40
C. Cost-share		0.5	\$311.10	\$155.55
D. Annual rental payments		0.9	\$2,280.00	\$2,412.50
Total payment		\$2,364.40	Annualized CRP	\$160.83
Step 3. Estimate prairie management costs				
A. Establishment (Year 1)				Cost per acre
			Tillage	\$19.00
			Herbicide	\$28.00
			Seed (\$175-600)	\$175.00
			Seed drilling	\$19.00
			Cultipak/rolling	\$22.00
			Mow (2x)	\$48.10
		Total establishment cost		\$311.10
B. Maintenance (Year 2-15)		Annual cost per acre	Years required	Total cost per acre
Mow	Option #1, Yr 2-15	\$24.05	14	\$336.70
Burning every third year	Option #2, Yr 2-15	(approx. \$40)	5	(approx. \$200)
General operating costs	1-3% upfront costs	\$7.89	14	\$110.46
		Total maintenance cost		\$467.36
	Establishment cost	Maintenance cost	Total prairie cost	Annualized cost
Total prairie cost	\$311.10	\$467.37	\$778.46	\$51.90
Step 4. Calculate total annualized net profit of prairie conservation				
	Lost crop income	CRP payment	Prairie cost	Net profit per acre
Totals from Steps 1-3	-\$246.50	\$160.83	-\$51.90	-\$137.57
		Net profit per acre	% ac. under prairie	Net by prairie area
Net profit by prairie area		-\$137.57	0.1	-\$13.76

References

Tyndall, J. C., L. A. Schulte, M. Liebman and M. Helmers (2013). “Field-Level Financial Assessment of Contour Prairie Strips for Enhancement of Environmental Quality.” *Environmental Management* 52(3): 736-747.

Calculations

2023 Iowa Farm Custom Rate Survey: <https://www.extension.iastate.edu/agdm/crops/html/a3-10.html>

2022 Michigan Farm Business Summary: <https://ageconsearch.umn.edu/record/338729/files/Michigan%20Farm%20Business%20Analysis%20Report%20Staff%20Paper%202023-001.pdf>

USDA NASS QuickStats: <https://quickstats.nass.usda.gov/results/2A04C300-BBC6-3453-84BA-1B697E614A18>

USDA NASS Farm Real Estate Values: https://www.nass.usda.gov/Statistics_by_State/Michigan/Publications/Current_News_Release/2023/nr2346mi.pdf

Iowa State University Cost of Prairie Strips: <https://bmppcosttools.nrem.iastate.edu/>

CPI Index: https://www.bls.gov/data/inflation_calculator.htm

Resources

Prairie Strip Funding Sources: <https://pollinators.msu.edu/resources/pollinator-planting/large-scale-pollinator-planting.aspx>

Guidelines are available from the MSU Extension Farm Business Team for a more complete [template for partial budgets that incorporates capital costs](#).

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Budgeting for Prairie Strips

A prairie strip is a conservation practice that establishes a diverse mix of native perennial plant species in row-crop fields. Prairie strips have been shown to improve soil health, protect water quality, and provide habitat for pollinators, without reducing adjacent crop yields. Low yielding areas (<50% average yield) of the farm can be converted to prairie strips, potentially saving farmers money. This bulletin shows how to calculate where and how prairie strips can be a financial benefit to the farm operation.



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KBS LTER
Kellogg Biological Station
Long-term Ecological Research

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Where to plant prairie strips with no cost-share opportunity

The opportunity costs associated with planting prairie strips include the revenue lost from crop production in exchange for planting native perennials. However, if planted strategically, this practice can save money. Farmers can select areas of the field that are consistently low-yielding and not financially feasible for row crops, leading to opportunity costs that are low or zero. Figure 1 shows an example field using yield mapping which illustrates how much variation in yield can exist within a single field. Areas in green have high yields, while areas in orange and red have yields less than 40% of peak areas of the field. Opportunity costs can reach zero when yield is 50% or lower than the statewide USDA average (Table 1 & 2).

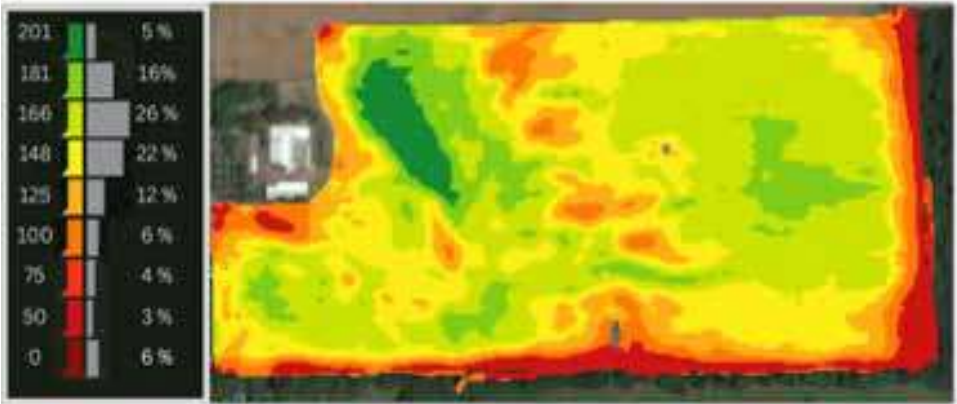


Figure 1: Yield map depicting the variability of corn yield on a crop field.

Table 1: 2020-2022 USDA yield averages for Michigan, in bu/A.

	Corn	Soybean	Wheat
100% yield potential	165	48	79
75% yield potential	123.75	36	59.25
50% yield potential	82.5	24	39.3

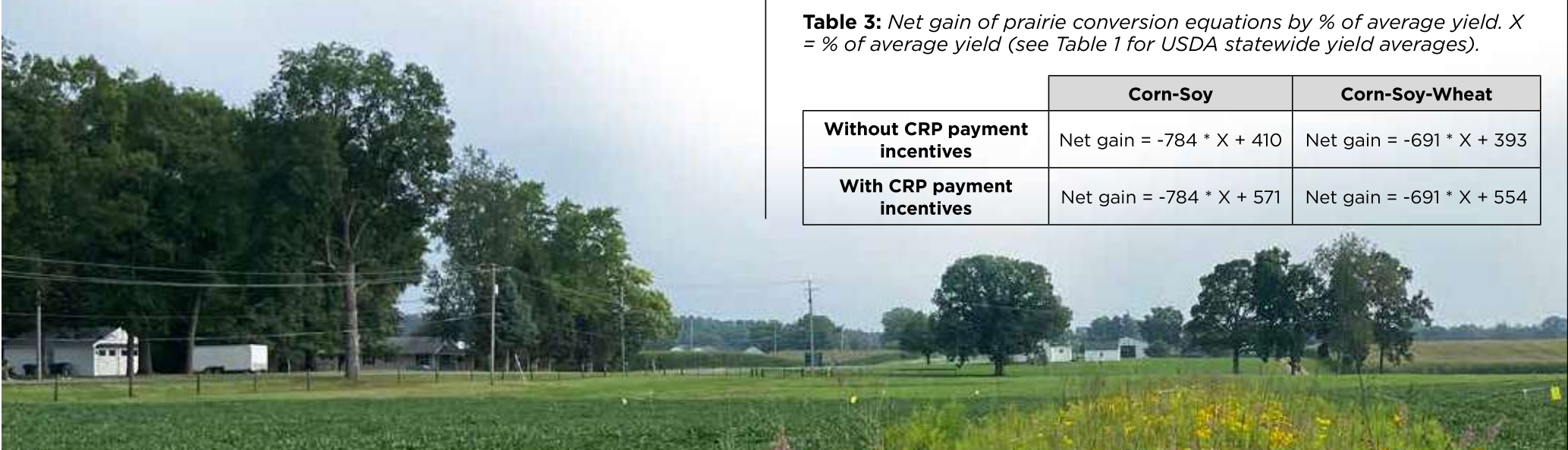


Table 2: Annualized average cost of converting cropland to prairie over a 15-year timeline with a CRP-43 payment contract. See Table 3 for values used in these calculations.

	Foregone crop sales	Input cost savings	Cost of prairie management	Estimated CRP payments	Net gain of prairie conversion
Avg. corn/soy yields	-\$783.63	\$461.73	-\$51.90	\$160.83	-\$212.97
75% c/s yields	-\$587.72	\$461.73	-\$51.90	\$160.83	-\$17.06
50% c/s yields	-\$391.82	\$461.73	-\$51.90	\$160.83	\$178.84
Avg. c/s/ wheat ylds	-\$691.48	\$444.98	-\$51.90	\$160.83	-\$137.57
75% c/s/w ylds	-\$518.61	\$444.98	-\$51.90	\$160.83	\$35.30
50% c/s/w ylds	-\$345.74	\$444.98	-\$51.90	\$160.83	\$208.17

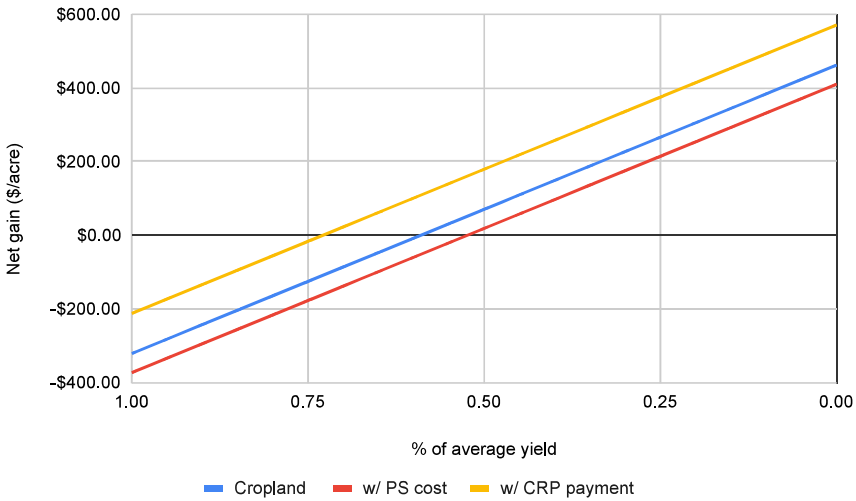


Figure 2: Break-even analysis of converting cropland (under a corn-soy rotation) to prairie, with line equations included in the legend. Blue = fallow cropland (no prairie), Red = prairie conversion (no CRP payments), Yellow = prairie w/ CRP payments. See Table 3 to determine net gain for any yield.

Table 3: Net gain of prairie conversion equations by % of average yield. X = % of average yield (see Table 1 for USDA statewide yield averages).

	Corn-Soy	Corn-Soy-Wheat
Without CRP payment incentives	Net gain = -784 * X + 410	Net gain = -691 * X + 393
With CRP payment incentives	Net gain = -784 * X + 571	Net gain = -691 * X + 554

What to consider when calculating the cost of prairie strips?

Costs of establishing prairie strips will differ depending on farming operation and site specific factors. It is important to identify financial feasibility under current farming operations, and the suitability of the practice to meet the intended conservation goal. Costs associated with establishing and maintaining a prairie strip can fluctuate depending on access to resources and site preparation needs. These costs can be offset by enrolling in the Conservation Reserve Program. Prairie Strip Practice (CP-43) is an eligible practice that focuses on improving water quality. According to Table 2 and Figure 2, with CRP-43 payment assistance, land will “break-even” at about 75% of average statewide USDA yields. Other payment programs are available, including through MISTRIPS. See the link in “Resources” for more funding sources.

Table 4: Estimated payment breakdown (per acre) of the CRP-43 program (for prairie strips) over a 15-year contract. Payments will differ depending on farming operation, please contact your local USDA Farm Service Agency office for an accurate estimate.

	Description	Rate	Avg. cost	Est. payment (total over 15 years)
Practice incentive payment	Up to 50% is paid for establishment	0.5	\$311.10	\$155.55
Signing incentive payment	32.5% of the first year annual rental payment for newly enrolled acreage	0.325	\$152.00	\$49.40
Cost-share	50% cost-share assistance for establishment	0.5	\$311.10	\$155.55
Annual rental payments	10-15 years of annual rental payments	0.9	\$2,280.00	\$2,052.00
Total payment				\$2,412.50
Annualized payment				\$160.83

Using a partial budget to determine the profitability of adopting prairie strips

A partial budget considers the monetary gains and losses that occur when a single change is made to a farm operation. Prairie strips gains include (1) CRP program payments and (2) decreased costs from planting, maintaining, and harvesting crops. Prairie strip losses include (1) direct costs of planting and maintaining prairie strips, and (2) the opportunity cost of lost revenue on land that originally grew crops.

The potential profitability of adopting prairie strips inside a crop field can be analyzed using the partial budget below (Table 5). To access this spreadsheet digitally, visit <https://lter.kbs.msu.edu/who-we-help/ag-professionals/mistrips/> (or use the QR code).

Use this partial budget to calculate the break-even bid for an annual CRP-43 payment by simply listing \$0 under CRP payment; the resulting bottom line, “Net profit per acre,” if negative, will be the annual payment needed to break even.

