

# User Guide for the Cover Crop Economic Simulator

**INTRODUCTION:** Cover crops have the potential to be a financial asset when managed well. Farm profitability depends on current input costs and market prices, but also on the long-term dynamics of soil health, and the benefits of cover crops are cumulative, but also variable. The online “Cover Crop Economic Simulator” will help to illuminate strategies that may make them effective in your operation. The tool is designed for farmers, landlords as well as members of the public interested in the environmental and economic outcomes of cover crops.

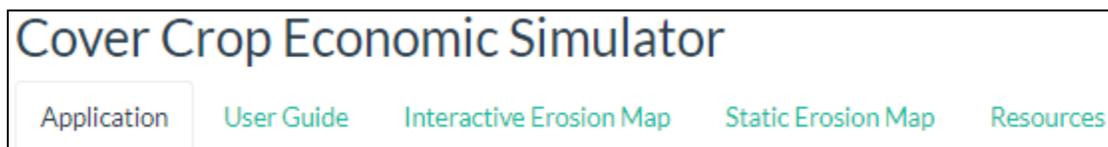
Based on partial budget economic analyses of cover crops, this unique, interactive simulator provides a dynamic visual illustration of estimated net return outcomes based on a range of market prices, potential yield changes, and various income and cost offset opportunities, all of which go into creating a sensitivity analysis of net return.

This tool provides an easy starting point for those unfamiliar with cover crop management, as well as a useful platform for long-time cover crop beneficiaries. All cost and income formulas can be viewed, and default values edited, with results automatically recalculated. Offset sources have quick-select options, which can also be tweaked to reflect specific programs and erosion impacts in your area.

Beyond farm revenue and land value improvement, the simulator raises awareness of some of the societal benefits you and your community will reap from cover crops. These things are more difficult to tie directly to your bottom line in dollars and cents, but their value is no less tangible or meaningful.

**PARTS:** The simulator has 5 tabs, 5 pages, 2 navigation mechanisms, a Dynamic Net Return grid and 2 sliders.

**THE 5 TABS:** You are currently on the User Guide Tab.



- The simulator opens to the Application since you will only need this User Guide as a reference after you understand the simulator’s basic operation.

**THE 5 PAGES:** Three of the pages provide values that feed into the fourth.

- Page 1 captures field and market information and indicates the dynamic net return of all the costs and offsets you select or customize on pages 2 through 4.
- Page 2 has costs to establish cover crops. Click the “Edit Formula” button to see how the “Summarized Costs to Establish” value was generated. Double click on any value to highlight and edit it. The summarized cost, dynamic net return and grid will update instantly. Use the reset button to start over. Select “Perennial Ground Cover” to see initial economics for this system currently in research status.
- Page 3 has costs and revenue values for several income opportunities. These most commonly center on livestock grazing or harvest of biomass for forage. Preliminary seed harvest information is included after soybean which has a later planting date.
- Page 4 has opportunities to offset costs through government and ecosystem services programs, as well as erosion reduction and soil health improvements.
- Page 5 shows estimated societal and community benefits not easily broken down to the field level.
- Hovering over an option provides more information.

# Page Calculations Included in Dynamic Net Return

**Page 2 Costs**

- Drop down selection
- Edit Formula
- Click button to "Edit Formula"
- Per Acre costs by step
- Edit all values to customize
- Summarized Costs to Establish
  - Per Acre Cost to Establish: \$38.62
  - Total Field Costs to Establish: \$38.62

**Page 3 Income**

- Drop down selections
- Hide Formula
- Click button to "Hide Formula"
- Per Acre costs & values by step
- Edit all values to customize
- Summarized Income Values
  - Per Acre Income: \$6.91
  - Total Field Income: \$6.91

**Page 4 Cost Offsets**

- Edit all values to customize
- Summarized Mitigation Values
  - Per Acre Costs Mitigated: \$38.87
  - Total Field Costs Mitigated: \$38.87

Using "hover" for more information about an option.

**Cover Crop Economic Simulator**

3 - Income Opportunities

Income Source: Grazing

Fall Grazing: Do not include this option

Early Spring Grazing (\$/acre): Do not include this option

4 - Cost Mitigation Opportunities

State or Federal Assistance: Do not include this option

Other Organization: Do not include this option

Soil & Water Outcomes Fund - Water Quality: Do not include this option

Soil & Water Outcomes Fund - Carbon Sequestration: Do not include this option

Other EcoSystem Service: Do not include this option

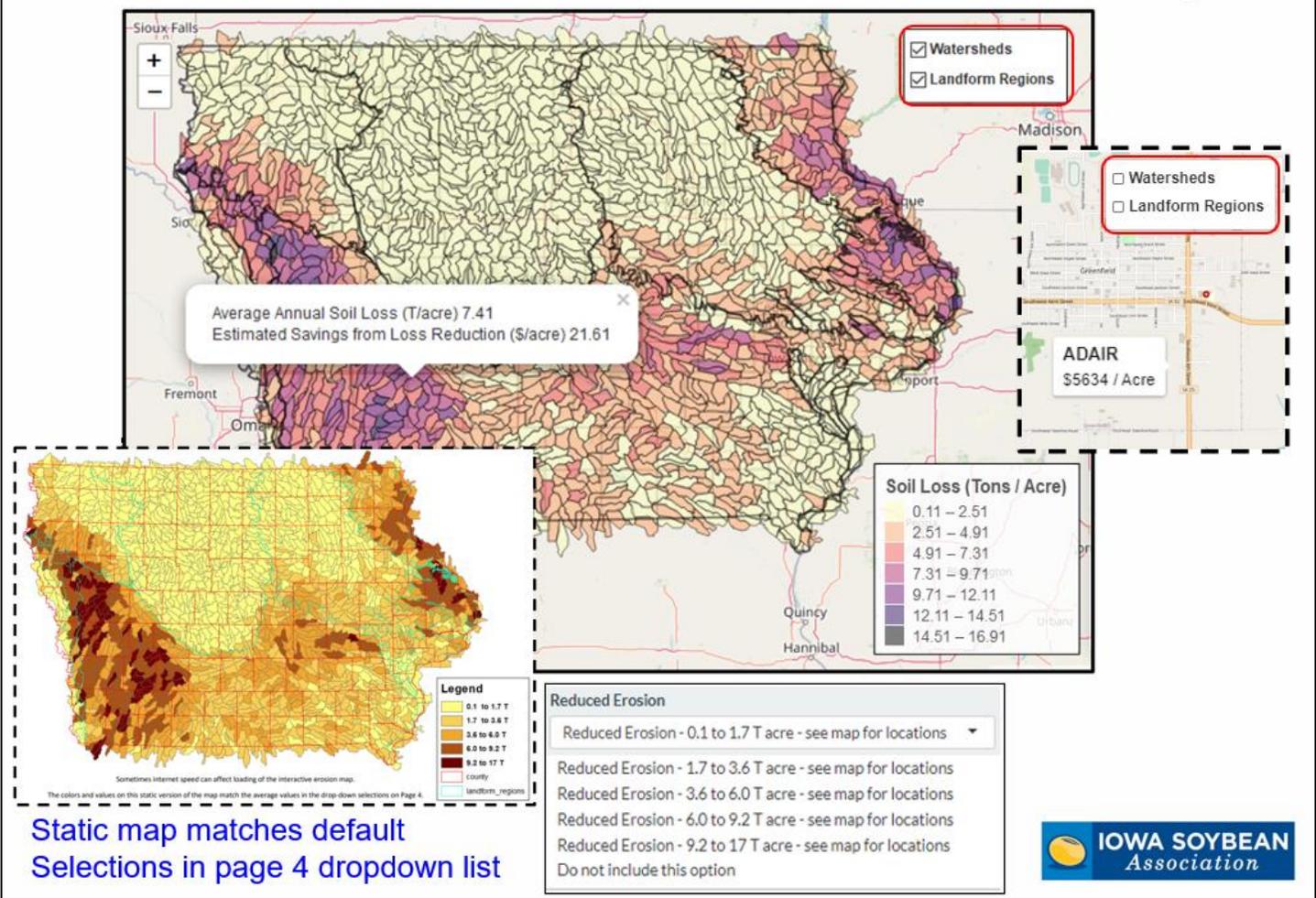
Early Season Trafficability: Dry Spring; do not include this option

**Tooltip for Grazing:**

- Do not include this option: Not Selected
- Include this option: Based on 2.25% of 1200 lb dry cow/day & 350 lbs of biomass/acre (no new infrastructure)

- The Interactive Erosion Map opens with the watersheds layer selected. Click the checkbox beside “watersheds” to see a county map with roads and towns identified, as well as 2020 average land values by county as you hover your mouse. Once you have located your field, recheck the watersheds box and click your location to find average soil loss T/acre 2007-2020 by HUC 12 watershed as measured by the Iowa State University Daily Erosion Project, and annualized dollar savings from estimated 50% reduced soil erosion by using cover crops. You can enter this value or one you feel is more reflective of your actual erosion reduction probability on Page 4 as a mitigation value. Biomass levels vary annually, but even a poor stand has roots that help to stabilize the soil. A better stand will produce a larger reduction in erosion.
- The Static Erosion Map provides 5, color-coded erosion categories that correspond to the 5 erosion categories in the dropdown list on Page 4. This map may be useful if your internet service has difficulty rendering the interactive map. You can use a pre-defined erosion mitigation value or enter you own estimate.

# Interactive Erosion Reduction Map



- The Landform Region over the watershed layer highlights the source of some of the significant regional differences across the state.

**THE NET RETURN GRID:** There is only one grid, and it is continually updated on-the-fly as selections are made or values are changed.

- The middle row of the grid shows the net value of the selections made if yield of the subsequent cash crop is unaffected by the inclusion of cover crops into the cropping system.
- The blue rows represent net return increase from yield increase due to the addition of cover crop. Red rows represent net return decrease from a yield loss due to the addition of cover crop.
- The column in the center reflects the value of yield change at the marked price entered on page 1.
- Columns to the right of center reflect the value of yield change if market price goes up and columns to the left of the center represent the value of yield change if market price goes down.

# Reading the Dynamic Net Return Grid

Application
User Guide
Interactive Erosion Map
Static Erosion Map
Resources

Navigate menu pages by category

1 - Field and Market Information

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1 - Field and Market Information

Field size (acres)

1

Cash crop after cover

Corn

Average Corn Yield for this field (bu/acre)

200

Cash grain market price (\$/bu)

4

Check box for cost savings if you consider reducing tillage

Check box to increase labor costs if you hire the work done

**Dynamic Net Return**

Per Acre base Income: \$12.33

Total Field base Income: \$12.33

Reset to Defaults

Prev Next 1 2 3 4 5

Estimated field level cover crop Net Return by cash crop price (\$/bu) and yield change (%)

8	\$39.53	\$40.73	\$41.93	\$43.13	\$44.33	\$45.53	\$46.73	\$47.93	\$49.13
6	\$32.73	\$33.63	\$34.53	\$35.43	\$36.33	\$37.23	\$38.13	\$39.03	\$39.93
4	\$25.93	\$26.53	\$27.13	\$27.73	\$28.33	\$28.93	\$29.53	\$30.13	\$30.73
2	\$19.13	\$19.43	\$19.73	\$20.03	\$20.33	\$20.63	\$20.93	\$21.23	\$21.53
0	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33
-2	\$5.53	\$5.23	\$4.93	\$4.63	\$4.33	\$4.03	\$3.73	\$3.43	\$3.13
-4	-\$1.27	-\$1.87	-\$2.47	-\$3.07	-\$3.67	-\$4.27	-\$4.87	-\$5.47	-\$6.07
-6	-\$8.07	-\$8.97	-\$9.87	-\$10.77	-\$11.67	-\$12.57	-\$13.47	-\$14.37	-\$15.27
-8	-\$14.87	-\$15.07	-\$17.27	-\$18.47	-\$19.67	-\$20.87	-\$22.07	-\$23.27	-\$24.47
	\$3.40	\$3.55	\$3.70	\$3.85	\$4.00	\$4.15	\$4.30	\$4.45	\$4.60
	-	-	-	-	+	+	+	+	+

Market Price with Change (\$/bu)

Grid Increments

Average Yield Change Percent Increment

0.05 0.5 1 1.5 1.7 2.25 2.0 3.35 2.9 4.45 5 5.5

Market Price change (\$/bu) Increment

0.05 0.15 0.25 0.35 0.45 0.55 0.65 0.75 0.85 0.95 1

Center (white) row – no yield change

Center column – no price change

Blue rows – yield increase

Red rows – yield decrease



**THE 2 SLIDERS:** The sliders below the grid adjust the increments by which yield change is presented and by which market price values are selected in the grid.

# Slider functionality in the Dynamic Net Return Grid

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4	\$25.93	\$26.53	\$27.13	\$27.73	\$28.33	\$28.93	\$29.53	\$30.13	\$30.73
2	\$19.13	\$19.43	\$19.73	\$20.03	\$20.33	\$20.63	\$20.93	\$21.23	\$21.53
0	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33	\$12.33
-2	\$5.53	\$5.23	\$4.93	\$4.63	\$4.33	\$4.03	\$3.73	\$3.43	\$3.13
-4	-\$1.27	-\$1.87	-\$2.47	-\$3.07	-\$3.67	-\$4.27	-\$4.87	-\$5.47	-\$6.07
-6	-\$8.07	-\$8.97	-\$9.87	-\$10.77	-\$11.67	-\$12.57	-\$13.47	-\$14.37	-\$15.27
-8	-\$14.87	-\$16.07	-\$17.27	-\$18.47	-\$19.67	-\$20.87	-\$22.07	-\$23.27	-\$24.47
	\$3.40	\$3.55	\$3.70	\$3.85	\$4.00	\$4.15	\$4.30	\$4.45	\$4.60
	—	—	—	Market Price with	Change (+/-)	+	+	+	+

Grid Increments

Average Yield Change Percent Increment

Market Price change (\$/bu) Increment



The **Resources** tab will give you the date of the latest update to the application and provide great information about where you can go to dig deeper into cover crops.

If you have any questions at all or suggestions for improving this tool, please contact us!

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