Restoring Soil Function on Illinois’ Ag Lands
SOIL HEALTH:
The continued capacity of a soil to **function** as a vital, **living ecosystem** that sustains plants, animals, and humans.

- Nutrient cycling
- Water (infiltration & availability)
- Filtering and Buffering
- Physical Stability and Support
- Habitat for Biodiversity (90% is mediated by soil microbes)
Size of the Prize

25 million metric tons of greenhouse gas emissions mitigated

116 million metric tons of soil erosion eliminated

344 million pounds of nutrient loss to the environment reduced

3.6 million acre-feet of available water capacity in cropland soils
Soil Health Planning Principles

- Provide Continuous Living Roots
- Minimize Disturbance
- Maximize Biodiversity
- Maximize Soil Cover

Feed

Protect
Principles ➔ Practices

- Prescribed Cover Crops
- Diverse Crop Rotation
- New Technology and Integrated Weed & Pest Management
- Adapted Nutrient Management
- Quality No-Till/Strip-till
Quality No-Till / Strip Till
# Cover Crops

- Species Selection
- Seeding
- Termination

![Cover Crop Chart](https://www.ars.usda.gov/plains-area/mandan-nd/ngprl/docs/cover-crop-chart/)

https://www.ars.usda.gov/plains-area/mandan-nd/ngprl/docs/cover-crop-chart/
Adaptive Nutrient Management
Adaptive Nutrient Management

<table>
<thead>
<tr>
<th>Material</th>
<th>C:N Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rye Straw</td>
<td>82:1</td>
</tr>
<tr>
<td>Wheat Straw</td>
<td>80:1</td>
</tr>
<tr>
<td>Oat Straw</td>
<td>70:1</td>
</tr>
<tr>
<td>Corn Stover</td>
<td>57:1</td>
</tr>
<tr>
<td>Rye Cover Crop (Anthesis)</td>
<td>37:1</td>
</tr>
<tr>
<td>Rye Cover Crop (Vegetative)</td>
<td>26:1</td>
</tr>
<tr>
<td>Mature Legumes</td>
<td>25:1</td>
</tr>
<tr>
<td><strong>Balanced Microbial Diet</strong></td>
<td><strong>24:1</strong></td>
</tr>
<tr>
<td>Daikon Radish</td>
<td>19:1</td>
</tr>
<tr>
<td>Crimson Clover</td>
<td>17:1</td>
</tr>
<tr>
<td>Ryegrass (Vegetative)</td>
<td>15:1</td>
</tr>
<tr>
<td>Young Alfalfa</td>
<td>13:1</td>
</tr>
<tr>
<td>Hairy Vetch Cover Crop</td>
<td>11:1</td>
</tr>
<tr>
<td>Soil Microbes (Average)</td>
<td>8:1</td>
</tr>
</tbody>
</table>

Good for Corn

Good for Soybean
Illinois Ag Strategy

- Practices
- Farm Advisors
- Supply Chain
- Non-Operating Landowners
- Public Policy

Science
Communications
IL Levers: Trainings, Networks

(Practices, Advisors)

Barriers addressed: Technical assistance providers currently lack in-depth knowledge on soil health, drainage practices

ReGenerateIL

IDEA Farm Network
ideas, experience, community
Supply Chain: Soil Health, Corporate Climate Goals

**Soil becomes fertile ground for climate action**

By HollySecor

Monday, February 25, 2019 - 1:43am

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**GENERAL MILLS AIMS TO DRIVE REGENERATIVE AGRICULTURE ON 1 MILLION ACRES BY 2030**

GM’S SUSTAINABILITY OFFICER SAYS TRAINING, PROGRAMS WILL BOOST SOIL HEALTH AND ECONOMIC RESILIENCE.

By Bill Spiegel

3/4/2019

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**Agriculture and transformation (50% of total value chain GHG emissions)**

Growing and transporting crops, and turning them into food ingredients

GENERAL MILLS' LEVEL OF INFLUENCE: MEDIUM

<table>
<thead>
<tr>
<th>Year</th>
<th>Emissions (MILLION METRIC TONS CO₂E)</th>
<th>Key Drivers (% of Phase in FY17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>8.86</td>
<td><strong>ROW CROPS</strong>*: 36%</td>
</tr>
<tr>
<td>2016</td>
<td>7.91</td>
<td><strong>DAIRY</strong>: 27%</td>
</tr>
<tr>
<td>2017</td>
<td>7.76</td>
<td><strong>MEAT</strong>: 7%</td>
</tr>
<tr>
<td>2025</td>
<td>6.39</td>
<td><strong>OTHER</strong>: 30%</td>
</tr>
</tbody>
</table>
Non-Operating Landowners: Lease Addendums

Barriers addressed: template language makes it easy for owners to require conservation, begins conversation, neutral

- Conservation Habitat
- Nutrient Management
- Soil Health and Conservation

https://farmdoc.illinois.edu/agricultural-law
Non-Operating Landowners: S.T.A.R.

Barriers addressed: robust science creates a simple roadmap for pr

S.T.A.R SCIENCE ADVISORY COMMITTEE

- Dan Schaefer, Director of Nutrient Stewardship | Illinois Fertilizer and Chemical Association
- Lowell Gentry, Principal Research Specialist in Agriculture | University of Illinois Natural Resources and Sciences
- Doug Gucker, Extension Educator, Local Food Systems and Small Farms | University of Illinois Extension
- Dr. Emily Bruner, Midwest Conservation and Stewardship Program Manager | American Farmland Trust
- Eric Miller | Piatt County farmer and SWCD Board Member
- Dr. Emerson Nafziger, Professor Emeritus | College of ACES, University of Illinois
- Brett Roberts, State Conservation Agronomist | Illinois Natural Resources Conservation Service
- Erin Bush, Resource Conservationist | Champaign County Soil and Water Conservation District
- Joe Rothermel, Chair and Farmer | Champaign County Soil and Water Conservation District

www.starfreetool.com
Public Policy:

Barriers addressed: institutional support for ag systems that provide external benefits

Illinois:
Fully funded SWCDs
Crop Insurance Reward

Federal:
AGree Coalition
Farm Bill
Questions?

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