Land O’Lakes SUSTAIN

Using Data to Drive Sustainability Solutions from Farmer-to-Fork
Let’s take a look at the Big Picture …

‘Sustainability’ is here to stay.

Here’s why.
On Both Sides of the Aisle, Policymakers and Regulators Act

Ohio

Gov. John Kasich targets farm nutrient runoff into Lake Erie in executive order  
July 11, 2018

Lawmakers, farmers say Kasich is moving too quickly on rules to combat Lake Erie algae  
July 23, 2018

Here’s why farmers are pushing back against Governor Kasich’s plan to fight toxic algal blooms  
July 25, 2018

Iowa

Scientists Forecast Near-Record 'Dead Zone' In Gulf Of Mexico This Summer  
June 12, 2019

Water quality issues persist: new report shows Iowa leads country in poop per square mile  
June 11, 2019

Reports: Iowa water quality getting worse and underfunded  
April 4, 2019

Groups sue Iowa, claim farm fertilizer runoff hurting Raccoon River, Des Moines drinking water  
March 27, 2019
The Three Hot Topics in Agriculture Consumers Care About According to Mintel

- Soil Health
- Regenerative Agriculture
- Farmer Welfare
Five Big Ways the [We] Will Need to Adapt to Climate Change

November 26, 2018

1. Rethink how we farm
2. Build for the future, not the past
3. Retreat from the costs
4. Enlist nature to help
5. Expect the unexpected

“The nation’s farm belt is likely to be among the hardest-hit regions, and farmers in particular will see their bottom lines threatened.”

Kansas farmers harvested a smaller winter wheat crop this year because of drought. Credit Charlie Riedel/Associated Press
At Land O’Lakes SUSTAIN …

- Sustainability means:
  
  - Protecting natural resources
  
  - Supporting profitability and resiliency for farmers

Only **39%** of consumers say they understand what “sustainable” means (Mintel 2017)
Stewardship that is farmer owned and farmer driven.
The Truterra Insights Engine
# The Truterra™ Insights Engine

**U.S. Crops**
- Corn
- Wheat
- Soy

**Canadian Crops**
- Spring Oats, Canola
- Lentils, Peas, Canada Prairie Spring Wheat
- Durum Spring Wheat
- Durum Winter Wheat
- Hard Red Spring Wheat
- Hard Red Winter Wheat
- Hard White Spring Wheat
- Hard White Winter Wheat
- Soft Red Winter Wheat
- Soft Spring Wheat
- Soft White Spring Wheat
- Soft White Winter Wheat
- Soft Winter Wheat

**Features**
- Sustain Metrics
- Walmart Gigaton Reporting
- Insights Score (Field Scoring)
- Fieldprint Calculator Score
- Profit Insights
- Revenue Opportunities
- KPI’s / Stewardship Indicators
- NDVI Imagery / Yield
Profit Insights

Current Field Information
Field Name: Dunkin co MO
Field Size: 225.87
Current Crop: Corn
Crop Year: 2018

Select Comparison Scenario:
Compare Conventional Practices with:
- Current Practices
- Enhanced Nitrogen Practices
- Improved Residue Cover
- Strip Tillage
- Interseeded Winter Cover
- Post Harvest Winter Cover
- Contour Conservation Management
- Terrace Conservation Management

Customize Current Practices with:
- Profit Focused Conservation Cover
- Reduced Tillage
- Strip Tillage

Conventional Practices
Profit Performance Estimate
- Acres: 225.88
- Yield: 185 bu/ac
- Profit: 82.17 $/ac
- Total Profit: 18,560.64 $
- ROI: 14.29%

Improved Residue Cover
Profit Performance Estimate
- Acres: 225.88
- Yield: 185 bu/ac
- Profit: 108.95 $/ac
- Total Profit: 24,609.58 $
- ROI: 19.87%

Stewardship Performance Estimate
Insights Score: 11
- Soil Erosion: 76.12
- Soil Quality: 0.36
- Emissions: 102.2

Stewardship Performance Estimate
Insights Score: 47
- Soil Erosion: 34.11
- Soil Quality: 0.07
- Emissions: 35.66
**Profit Insights**

**Current Field Information**
- Field Name: Dunkin co MO
- Field Size: 225.87 acres
- Current Crop: Corn
- Crop Year: 2018

**Conventional Practices**

- **Profit Performance Estimate**
  - Acres: 225.88
  - Yield: 185 bu/ac
  - Profit: $82.17
  - Total Profit: $18,560.64
  - ROI: 14.29%

**Post Harvest Winter Cover**

- **Profit Performance Estimate**
  - Acres: 225.88
  - Yield: 185 bu/ac
  - Profit: $80.39
  - Total Profit: $18,158.58
  - ROI: 13.93%

**Stewardship Performance Estimate**

- Insights Score: 11

- **Soil Erosion**
  - Score: 76.12

- **Soil Quality**
  - Score: 102.2

- **Emissions**
  - Score: 102.2

- **Insights Score**
  - Score: 74

- **Soil Erosion**
  - Score: 9.04

- **Soil Quality**
  - Score: 102.2

- **Emissions**
  - Score: 102.2
Profit Insights

Current Field Information
- Field Name: Wallis Home Place
- Field Size: 19.67
- Current Crop: Corn
- Crop Year: 2018

Select Comparison Scenario:
- Compare Conventional Practices with:
  - Current Practices
  - Enhanced Nitrogen Practices
  - Improved Residue Cover
  - Strip Tillage
  - Interseeded Winter Cover
  - Post Harvest Winter Cover
  - Contour Conservation Management
  - Terrace Conservation Management

Customize Current Practices with:
- Profit Focused Conservation Cover
- Reduced Tillage
- Strip Tillage
- No Tillage

Current Practices

<table>
<thead>
<tr>
<th>Profit Performance Estimate</th>
<th>Profit Performance Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres</td>
<td>19.67</td>
</tr>
<tr>
<td>Yield</td>
<td>235 bu/ac</td>
</tr>
<tr>
<td>Profit</td>
<td>32.53 $/ac</td>
</tr>
<tr>
<td>Total Profit</td>
<td>640.06 $</td>
</tr>
<tr>
<td>ROI</td>
<td>4.20 %</td>
</tr>
</tbody>
</table>

No Tillage

<table>
<thead>
<tr>
<th>Profit Performance Estimate</th>
<th>Profit Performance Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres</td>
<td>19.67</td>
</tr>
<tr>
<td>Yield</td>
<td>235 bu/ac</td>
</tr>
<tr>
<td>Profit</td>
<td>40.95 $/ac</td>
</tr>
<tr>
<td>Total Profit</td>
<td>805.72 $</td>
</tr>
<tr>
<td>ROI</td>
<td>5.34 %</td>
</tr>
</tbody>
</table>

Stewardship Performance Estimate
- Insights Score: 41
- Soil Erosion: 2.83
- Soil Quality: 0.31 SCI
- Emissions: 3.2

Stewardship Performance Estimate
- Insights Score: 64
- Soil Erosion: 0.43
- Soil Quality: 0.76 SCI
- Emissions: 0.19

Potential Revenue Opportunities
### Potential Revenue Opportunities

#### USDA Natural Resources Conservation Service Programs

#### Environmental Quality Incentives Program (EQIP)

<table>
<thead>
<tr>
<th>Code</th>
<th>Low</th>
<th>High</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residue and Tillage Management, No Till - 329</td>
<td>$10.89</td>
<td>$10.89</td>
<td>ac</td>
</tr>
</tbody>
</table>

#### Conservation Stewardship Program (CSP)

<table>
<thead>
<tr>
<th>Code</th>
<th>Low</th>
<th>High</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation Crop Rotation - 328</td>
<td>$1.23</td>
<td>$3.27</td>
<td>ac</td>
</tr>
<tr>
<td>Integrated Pest Management - 595</td>
<td>$1.12</td>
<td>$3.20</td>
<td>ac</td>
</tr>
<tr>
<td>Nutrient Management - 590</td>
<td>$0.82</td>
<td>$5.14</td>
<td>ac</td>
</tr>
<tr>
<td>Residue and Tillage Management - No Till - 329</td>
<td>$2.18</td>
<td>$3.00</td>
<td>ac</td>
</tr>
<tr>
<td>Residue and Tillage Management - Reduced Till - 345</td>
<td>$2.57</td>
<td>$2.57</td>
<td>ac</td>
</tr>
</tbody>
</table>

#### Riparian Forest Buffer - 391

<table>
<thead>
<tr>
<th>Code</th>
<th>Low</th>
<th>High</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian Forest Buffer - 391</td>
<td>$81.34</td>
<td>$90.13</td>
<td>ac</td>
</tr>
</tbody>
</table>
**CURRENT YEAR 2018**

**PROGRESS**  BY ACRES (% COMPLETED)

- **STARTED** 101K
- **COMPLETED** 88K (87.71%)

**ACRES BY CROP**  STARTED & COMPLETED

- **CORN**
  - Started: 60K
  - Completed: 53K

- **SOYBEANS**
  - Started: 37K
  - Completed: 34K

- **WHEAT**
  - Started: 1,267
  - Completed: 1,173

- **OTHER**
  - Started: 2,379
  - Completed: 368

---

**PRIOR YEAR 2017**

**PROGRESS**  BY ACRES (% COMPLETED)

- **STARTED** 73
- **COMPLETED** 0 (0%)

**ACRES BY CROP**  STARTED & COMPLETED

- **CORN**
  - Started: 54
  - Completed: 0

- **SOYBEANS**
  - Started: 0
  - Completed: 0

- **WHEAT**
  - Started: 0
  - Completed: 0

- **OTHER**
  - Started: 18
  - Completed: 0

---

*with current or prior year acres started*
2018 GEOGRAPHIC OVERVIEW

ACRES BY COUNTY

1 STATES

39 COUNTIES

TOP COUNTIES BY ACRES

- IN Bartholomew: 16K
- IN Sullivan: 11K
- IN Huntington: 8K
- IN Fulton: 5K
- IN Vigo: 5K
- IN Harrison: 4K
- IN LaGrange: 4K
- IN Jennings: 4K
- IN Jackson: 4K
- IN Parke: 3K
- IN Wabash: 3K
- IN Marshall: 3K
- IN Warren: 3K
- IN Jefferson: 2K
- IN Knox: 2K
- IN Montgomery: 2K
- IN Kosciusko: 2K
- IN Vermillion: 2K
- IN Clay: 2K
- IN Tippecanoe: 2K
- IN Hendricks: 2K
- IN Fountain: 1K
- IN Cass: 1K
- IN Scott: 1K

LAST REFRESHED 5/31/2019 9:03 AM
2018 FIELD MANAGEMENT

COVER CROPS

ACRES USING COVER CROPS

ACRES BY TILLAGE MANAGEMENT TYPE

15%

85%

100%

94K

3K

Reduced till; 15-30% residue

0K

Mulch till; > 30% residue

1K

Strip till; > 70% residue

No till; > 85% residue

© 2019 Microsoft Corporation Terms

LAST REFRESHED 5/31/2019 9:03 AM
2018 NUTRIENT MANAGEMENT

NUTRIENT MANAGEMENT PLAN
A plan used to guide the application of fertilizers, developed by an agronomist, crop consultant, or conservation planner

89% OF ACRES USE A NUTRIENT PLAN

VARIABLE RATE TECHNOLOGY
Applying the primary nutrient source for N, P, or K using variable rate technology

80% OF ACRES USE VARIABLE RATE TECHNOLOGY

NUTRIENT MODELING TOOLS
Applicable nutrient models include: Field Forecasting Tool®, Climate®, AdaptN®, Encirc®

30% OF ACRES USE NUTRIENT MODELING TOOLS

SOIL SAMPLING
Have conducted soil sampling / soil testing on the field

91% OF ACRES USE SOIL SAMPLING

89% OF ACRES USE GRID OR ZONE SAMPLING

ACRES BY SOIL SAMPLING FREQUENCY

<table>
<thead>
<tr>
<th>Sampling Methods</th>
<th>% of Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sampling method</td>
<td>92%</td>
</tr>
<tr>
<td>Tissue sampling</td>
<td>8%</td>
</tr>
<tr>
<td>Stalk nitrate, Tissue sampling</td>
<td>0%</td>
</tr>
<tr>
<td>Soil nitrate, Tissue sampling</td>
<td>0%</td>
</tr>
</tbody>
</table>

8% OF ACRES USE VARIABLE RATE TECHNOLOGY

<table>
<thead>
<tr>
<th>Nutrients Applied Using Variable Rate Technology</th>
<th>% of Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>K, P</td>
<td>73%</td>
</tr>
<tr>
<td>Flat Rate</td>
<td>20%</td>
</tr>
<tr>
<td>K, N, P</td>
<td>6%</td>
</tr>
<tr>
<td>K</td>
<td>1%</td>
</tr>
<tr>
<td>N</td>
<td>0%</td>
</tr>
<tr>
<td>P</td>
<td>0%</td>
</tr>
</tbody>
</table>
### 10% OF PASSES USE STABILIZERS

#### STABILIZERS BY PASS & FERTILIZER TYPE

<table>
<thead>
<tr>
<th>Fertilizer Type</th>
<th>Commercial Passes</th>
<th>Commercial Acres</th>
<th>Manure Passes</th>
<th>Manure Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>3147</td>
<td>62,654</td>
<td>22</td>
<td>1,747</td>
</tr>
<tr>
<td>Nitrification Inhibitor</td>
<td>271</td>
<td>10,741</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urease Inhibitors</td>
<td>80</td>
<td>3,815</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3498</strong></td>
<td><strong>62,760</strong></td>
<td><strong>22</strong></td>
<td><strong>1,747</strong></td>
</tr>
</tbody>
</table>

---

**LAST REFRESHED 5/31/2019 9:03 AM**
Driving Value Beyond the Data
“With the right policy and the right incentives, farmers can keep improving across the board. We can produce an abundant food supply, safeguard resources for the future, maintain our businesses, and also lead the way on climate solutions.”

- Matt Rezac before the Senate Ag Committee
Local View

Local View: Climate solutions start on the farm
MATT REZAC May 28, 2019

Agriculture has key role in climate solutions
By CAROL RYAN DUMAS Capital Press May 23, 2019

Opinion: Farming offers a one-of-a-kind solution to climate change

To address the climate crisis, state legislatures are pushing dozens of bills on soil health

AG OFFERS ANSWERS TO CLIMATE CHANGE

Senators examine intersection of agriculture and climate change
By WES WOLFE wofote@thebrunswicknews.com May 24, 2019

NEBRASKA FARMER TESTIFIES TO SENATE AG COMMITTEE
BY Chuck Lippstreu, Land O’Lakes, Inc. May 21, 2019
Solutions start here.