



Field to Market[®]
The Alliance for Sustainable Agriculture



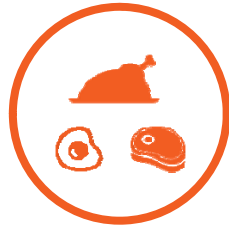


Meeting the 2050 challenge

Producing enough food, fiber and fuel for more than 9 billion people by 2050, while conserving natural resources



50-70%
in middle class



purchasing
more protein
rich foods



doubling
agricultural
output



facing a
changing
climate



decreased
rainfall



extreme
weather
patterns



70%
fresh water
used



37%
of land use

1/3
edible food
lost or wasted

Slide 2

1

Betsy Hickman, 9/16/2014



Responding to the Challenge

Corporate Sustainability Commitments





Reduce greenhouse gas emissions: Reduce the greenhouse gas emissions across its entire value chain by 25% by 2020, making comprehensive carbon footprint reductions across its manufacturing processes, packaging formats, delivery fleet, refrigeration equipment and ingredient sourcing.

Sustainably source key agricultural ingredients: Sustainably source its key ingredients, including sugarcane, sugar beet, corn, tea, coffee, palm oil, soy, pulp and paper fiber, and orange by 2020.

Expand acreage in Field to Market: Rapidly expand the application of the Field to Market program and its data-driven tool to quantify water use, fertilizer use, energy use, and greenhouse emissions, engaging farmers representing 250,000 acres by the end of 2015, and by 2020, up to 1 million acres—equating to roughly 50% of the company’s global corn supply.



Sustainable Living Plan: Halve the environmental footprint of the making and use of our products as we grow our business by 2020

Reduce Greenhouse Gas Emissions: Halve the GHG impact of our products across the lifecycle by 2020

Sustainable Agriculture: Source 100% of our agricultural raw materials sustainably by 2020

Sustainable Sugar/Oils: Sustainably source all sugar and all soy, sunflower, and rapeseed oils by 2020

Sustainable Dairy: Source all dairy produce sustainably by 2020



Sustainably source 100 percent of 10 priority ingredients by 2020:

These ingredients include oats, wheat, corn, dairy, fiber packaging, cocoa, vanilla, palm oil, sugar cane and sugar beets, representing 50 percent of General Mills' total raw material purchases.

Expand acreage in Field to Market: General Mills commits to expand 2.5 times the acreage enrolled in Field to Market: Alliance for Sustainable Agriculture's continuous improvement program to 2.5 million acres by 2015.

Reduce greenhouse gas emissions: General Mills is co-sponsoring an innovation challenge with Walmart providing incentives for the innovators and farmers who demonstrate the most promise to reduce GHG emissions in fertilizer management.



Responsibly source its top 10 ingredients and materials by 2020:

Responsibly source its top 10 ingredients, including corn, wheat, rice, oats, potatoes, sugar (beets and cane), cocoa, palm oil, fruits, and honey using a combination of certification and documented continuous improvement and validate compliance across all direct suppliers by 2015.

Continue to provide sustainable agriculture resources and education to key agricultural suppliers, millers and farmers: Helping them increase their resilience to climate change; optimize their use of fertilizer inputs; reduce greenhouse gas (GHG) emissions in their agricultural practices; optimize water use and enhance watershed quality; and improve soil health.

Drive agricultural conservation management in Midwest Corn Belt:

Together with Bunge and The Nature Conservancy, encourage farmers to implement best management practices, track farm-level and watershed outcomes that will benefit the region, and measure continuous improvement of on-farm practices using Field to Market metrics.



Produce more food with fewer resources and less waste:

Reduce and optimize the resources required to produce that food and driving more transparency into its supply chain, engaging suppliers on the water, energy, fertilizer and pesticide they use per unit of food produced.

Fertilizer optimization in agriculture

Walmart is requiring suppliers who use commodity grains, such as corn, wheat and soy in their products, to develop a fertilizer optimization plan that outlines clear goals to improve performance based on Walmart's Sustainability Index research. Through this program, the company and its suppliers have the potential to reduce fertilizer use on 14 million acres of farmland in the U.S. by 2020.

Sustainably source key agriculture products:

Require sustainably sourced palm oil for all Walmart private brand products globally by the end of 2015. Only source beef that does not contribute to the deforestation of the Amazon rainforest by the end of 2015.

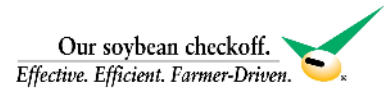


What is Field to Market®?

- **A collaborative stakeholder group**
 - Producers, agribusinesses, food and retail companies, conservation associations, universities, and NRCS
 - Established as a 501(c)(3) with staff and headquarters in Washington, DC in 2014
- **Identifying supply chain strategies to define, measure, and promote continuous improvement for agriculture**
 - Addressing the challenge of increasing demand and limited resources
- **Developing and implementing outcomes-based, science-based metrics and tools**
 - Fieldprint Calculator®, a free, online tool to help growers analyze their operations and help the supply chain explain how food is produced
 - National Report on environmental and socioeconomic trends over time for U.S. commodity crops



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How We Define Sustainable Agriculture

Meeting the needs of the present while improving the ability of future generations to meet their own needs by:

- Increasing productivity to meet future food and fiber demands
- Improving the environment
- Improving human health
- Improving the social and economic well-being of agricultural communities



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Guiding Principles

- Engage the full supply chain including producers
- Focus on commodities crops with unique supply chains and traceability issues
- Science based
- Outcomes based
- Technology neutral
- Commitment to individual grower data privacy
- Measure broad-scale trends and field-scale outcomes



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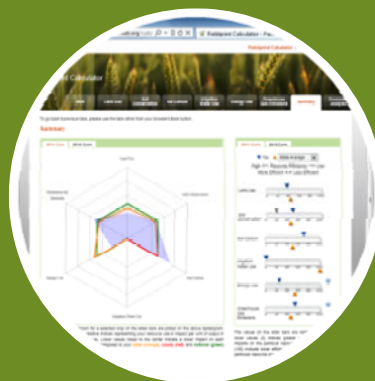


Deliverables: What We Are Doing

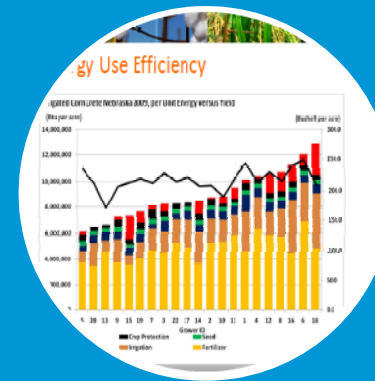


Environmental and Socioeconomic Indicators for Measuring Outcomes of On-Farm Agricultural Production in the United States

National indicators report:
Documentation of overall trends



Grower Fieldprints:
Individual opportunities for continuous improvement



Supply chain projects:
Direct engagement in continuous improvement

Public data and models
Collaboratively developed
Outcomes based





National Indicators Report:

The Sustainability Story of U.S. Agriculture





National Indicators Report: Objectives

- **Analyze trends** over time for environmental and socioeconomic sustainability indicators
- **Establish a baseline** against which to measure future improvements
- **Create enabling conditions** for an informed, multi-stakeholder discussion of sustainability
- Advance an **outcomes-based, science-based** approach
- **Provide broad-scale context** for more local efforts



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National Indicators Report

Criteria

- Outcomes based
- Practice/technology neutral
- Transparent and credible science
- On-farm production outcomes within a grower's control

Data & Methods

- Crops: corn, cotton, potatoes, rice, soybeans, and wheat (2012)
- Indicators : land use, soil use, irrigation water, energy use, green house gas emissions in socio-economic added in 2012
- Analyzed publicly available data, 1980-2011; U.S. national-scale indicators
- Peer reviewed



Summary Results: Environmental Indicators

- Resource use/impact **per unit of production** (“efficiency”)
 - Improvement for all six crops on all five environmental indicators
 - Driven in part by improvements in yield
 - Helps track resource uses vs. production/demand concerns
- **Total resource use/impact**
 - Variability across crops and indicators (increases, decreases)
 - Driven in part by overall increases or decreases in production



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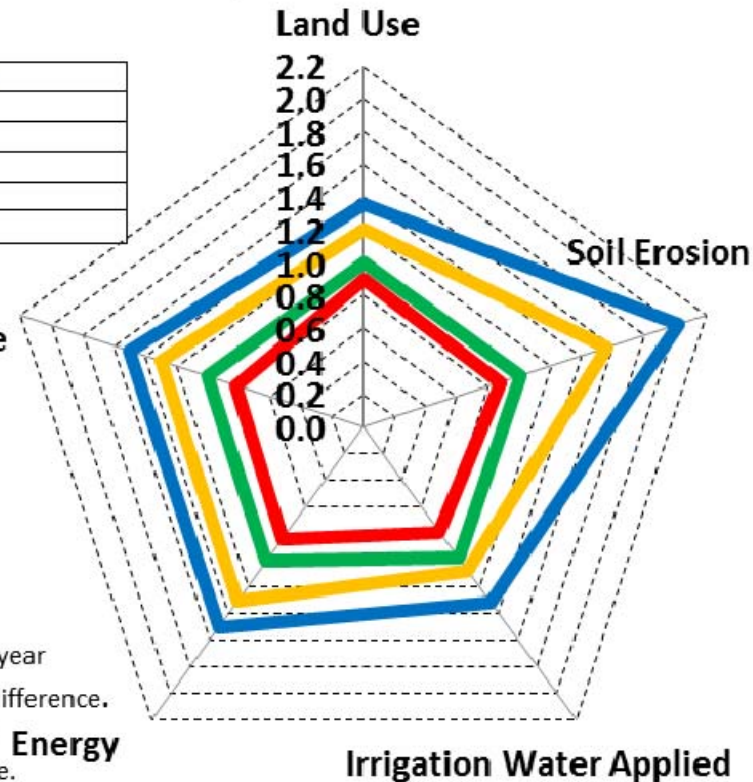
Sample Results: Resources per bushel – Soybeans

**Index of Per Bushel Resource Impacts to Produce Soybeans
(United States, Year 2000 = 1)**

Year	2000 *	Unit - per Bushel
Land Use	0.027	Planted Acres
Soil Erosion	0.131	Tons
Irrigation Water Applied	0.766	Acre Inches
Energy	44,840	Btus
Greenhouse Gases	8.2	Pounds CO ₂ e

* Five-year average 1996 - 2000

- 5 Yr. Avg. 1980 - 84
- 5 Yr. Avg. 1987 - 91
- 5 Yr. Avg. 1997 - 01
- 5 Yr. Avg. 2007 - 11



Note: Data are presented in index form, where the year 2000 = 1 and a 0.1 point change is equal to a 10% difference. Index values allow for comparison of change across multiple dimensions with differing units of measure.



The Fieldprint Calculator[®]

Measuring Field Level Outcomes and Identifying Opportunities for Improvement





What is the Fieldprint Calculator?

- An online education tool for row crop farmers that indexes their agronomics and practices to a Fieldprint
- Helps growers evaluate their farming decisions and compare their sustainability performance
 - **In the areas of:**
 - Land use
 - Soil conservation
 - Soil carbon
 - Water use
 - Energy use
 - Greenhouse gas emissions
 - Water Quality
 - Biodiversity (in development)
 - **Comparing against:**
 - Their own fields
 - Their own performance over time
 - County, state and national averages



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Measuring at the Field Level

The screenshot shows a web browser window with the URL <http://www.fieldtomarket.org/calculator>. The page title is "Fieldprint Calculator - Field ...". The website header includes the "Field to Market" logo and navigation links for "Fieldprint Calculator", "My Account", and "Logout".

The main content area features a "Fieldprint Calculator" title and a series of tabs: "Start", "Land Use", "Soil Conservation", "Soil Carbon", "Irrigation Water Use", "Energy Use", "Greenhouse Gas Emissions", "Summary", and "Economic Analysis". The "Start" tab is currently selected.

Below the tabs, a message states: "To go back to previous tabs, please use the tabs rather than your browser's Back button." The "Start" section contains the following text: "On this page, you will locate your field and enter information about its soil and your crop rotation, management system, transportation, and drying practices. This information will be used to calculate your Fieldprint for a variety of indicators on the following tabs."

The form includes the following fields and options:

- Session: Demo - IA Corn
- Units: U.S. Customary
- Location section:
 - State: Iowa
 - County: Kossuth County
 - Field Name: My Typical Corn Field
 - Field Lat (optional): [] dec. deg.
 - Field Lon (optional, negative value for U.S.): [] dec. deg.
 - Area: 158.97 acres
- Buttons: Zoom, Submit
- Expandable sections: Soil, Crop Rotation, Management, Transportation, Drying, Planted but not harvested

On the right side, there is a satellite map with a yellow field boundary. The map includes a scale bar (300 m / 1000 ft) and coordinates (-94.08448, 43.41567). A "Data Sources" link is visible in the bottom right corner of the map area.

The footer contains navigation links: Home, About Us, Contact Us, Members, Privacy Policy, Sitemap, and a copyright notice: © 2011 Field to Market. All Rights Reserved.





Fieldprint Summary

Field to Market Fieldprint Calculator | My Account | Logout

Fieldprint Calculator

[Start](#) | [Land Use](#) | [Soil Conservation](#) | [Soil Carbon](#) | [Irrigation Water Use](#) | [Energy Use](#) | [Greenhouse Gas Emissions](#) | **Summary** | [Economic Analysis](#)

To go back to previous tabs, please use the tabs rather than your browser's Back button.

Summary

2011 Corn | 2010 Corn

The Fieldprint values shown for a selected crop on the slider bars are plotted on the above Spidergram. The Spidergram axes are relative indices representing your resource use or impact per unit of output in each of the five resource areas. Lower values closer to the center indicate a lower impact on each resource. Your results (blue) are compared to your state (orange), county (red) and national (green) averages (50).

[Create Report](#)

2011 Corn | 2010 Corn

▼ You ▲ State Average ▾

High ← Resource Efficiency → Low
More Efficient ↔ Less Efficient

Land Use: 0 20 40 60 80 100

Soil Conservation: 0 20 40 60 80 100

Soil Carbon: 0 20 40 60 80 100

Irrigation Water Use: 0 20 40 60 80 100

Energy Use: 0 20 40 60 80 100

Greenhouse Gas Emissions: 0 20 40 60 80 100

The values on the slider bars are relative indices, where lower values (0) indicate greater efficiency and/or lower impacts on the particular resource area and higher values (100) indicate lower efficiency and/or higher impacts on the particular resource area.



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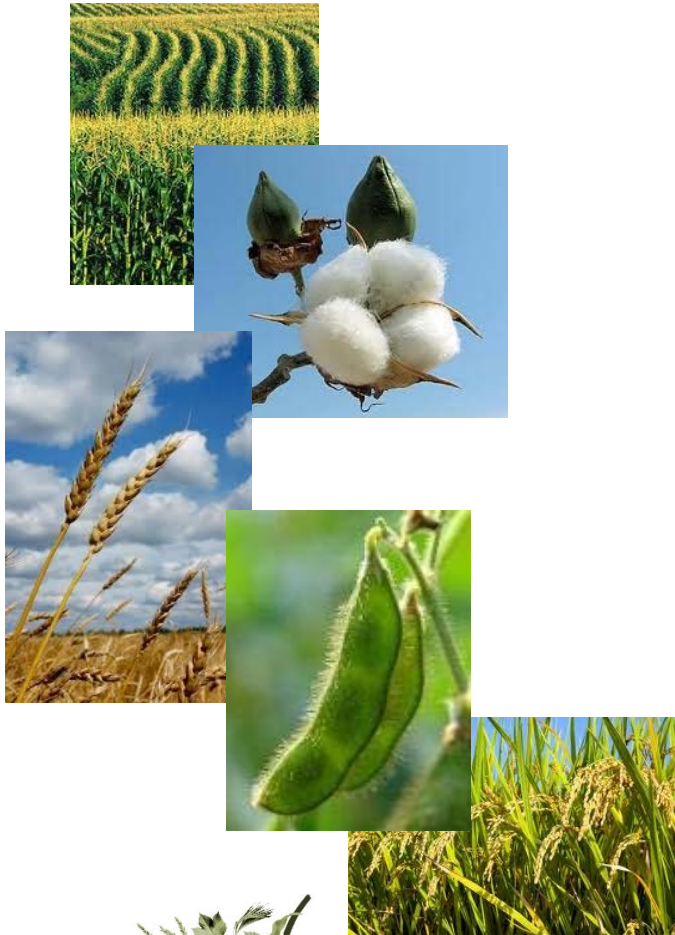
Fieldprint® Projects

Supply Chain Partnerships for Continuous Improvement





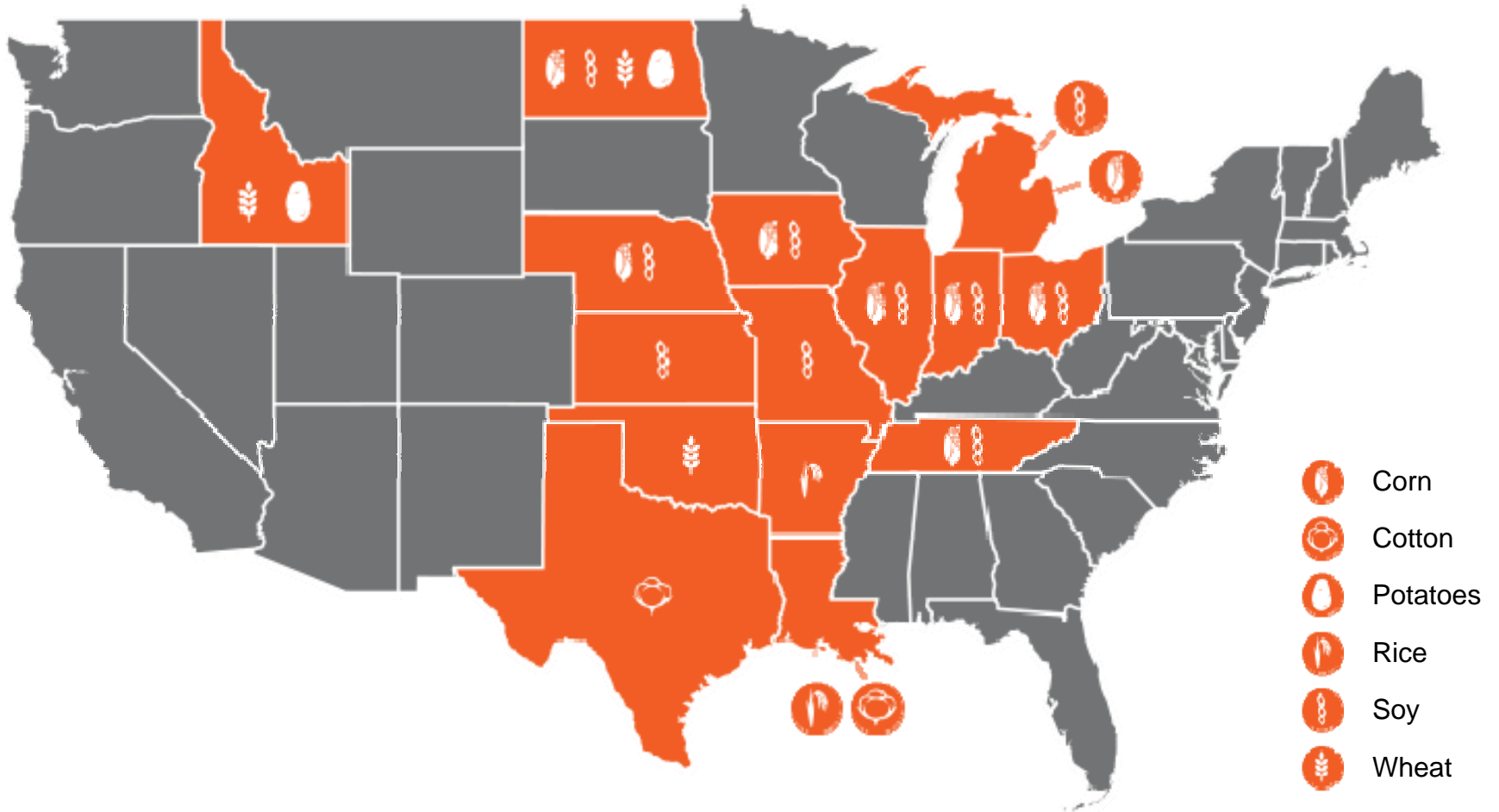
Fieldprint Supply Chain Projects



- Demonstrate use of calculator on the ground to test utility at the grower level and through the supply chain
- Engage farmers across geographies, crops, and supply chains
- Sponsors include grower organizations, supply chain companies, conservation organizations, and NRCS



Fieldprint Projects





FTM program expansion in 2014-2015

- New headquarters and staff in Washington, DC will oversee licensing of FTM assets
- Technology development key to exponential growth in Fieldprint Calculator participation
 - Interface with existing farm management and recordkeeping programs to reduce duplicate data entry
- Participation in ISEAL is shaping program verification and enabling sourcing claims



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The Future: FTM's three basic functions

1. Benchmarking and data collection
2. Identifying opportunities for continuous improvement by leveraging existing tools/programs/initiatives
3. Aggregating information and enabling supply chain sustainability claims



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Two phase program design

- **Phase One: 2014 – 2015**
 - Development of APIs & license agreements for Fieldprint Calculator integration with other tools/platforms
 - Development of protocols for linking to continuous improvement programs / conservation resources / technical assistance
 - FTM supporting “Participation” claims
- **Phase Two: 2016 – Beyond**
 - Updated metrics & algorithms (FPC 3.0)
 - Integration with a greater number of tools/platforms
 - Established partnerships for continuous improvement
 - FTM supporting “Measurement” and “Impact” claims



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2014 Workgroups

- **Goals:** Provide further clarity and recommendations for collective near-term, mid-term and long-term goals
- **Metrics:** Identify which metrics need to be updated, and possible new metrics and process and timeline
- **Technology:** Fieldprint Calculator maintenance, including integration of new benchmarks, crops, and metrics. Review integration/coordination with other platforms.
- **Continuous improvement:** Establish protocols for continuous improvement options, including partnerships and reporting
- **Verification:** Use ISEAL guidance to develop a protocol for the FTM program and sustainability claims



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Partnership with CCAs

- FTM to collaborate with CCA program on sustainability curriculum
- Helping producers achieve “continuous improvement” within Fieldprint supply chain projects
- Opportunity to provide a service to growers as they respond to supply chain demands
- FTM invites the Certified Crop Advisors to join as a member to help craft our program moving forward



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Value of the Field to Market Approach

- **Food and retail companies** can access aggregated data in a pre-competitive fashion to make sustainable sourcing claims.
- **Agribusinesses** have a business opportunity to provide relevant decision support tools, technologies, programs and initiatives to growers.



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Value of the Field to Market Approach

- **Grain buyers** can report the sustainability of their sourcing areas through a single platform rather than responding to multiple, competing surveys that may not have the same degree of supply chain support or recognition.
- **Conservation organizations** have full confidence in a sustainability framework that can become the focal point of their agricultural work and goals for production and supply chain sustainability.



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Value of the Field to Market approach

- **Farmers** can evaluate their current footprint and connect with tools, technologies, programs and initiatives that will facilitate continuous improvement within their operations.
- Growers can benefit from an outcomes-based, technology neutral sustainability platform that will help ensure market access while reducing or eliminating a proliferation of supply chain surveys.
- Commodity Organizations have opportunities to partner with the agricultural supply chain in communicating sustainability messages to the general public.



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For More Information

- www.fieldtomarket.org
 - National Report, Calculator, and other resources
- Rod Snyder, President
 - rsnyder@fieldtomarket.org



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