



Field to Market[®]

The Alliance for Sustainable Agriculture





Meeting the Challenge

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



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



Responding to the Challenge
Corporate Sustainability Commitments



- Reduce GHG emissions across value chain by 25% by 2020
 - Sustainably source key agricultural ingredients by 2020
 - Expand acreage in Field to Market to 1 Million acres by 2020
-



- Sustainably source 100 percent of 10 priority ingredients by 2020
 - Expand acreage in Field to Market to 2.5 Million acres by 2015
 - Reduce GHG emissions in fertilizer management
-



- Halve the GHG impact of our products across the lifecycle by 2020
 - Source 100% of our agricultural raw materials sustainably by 2020
 - Halve the environmental footprint of the making and use of our products as we grow our business by 2020
-



- Reduce and optimize the resources required to produce that food and driving more transparency into its supply chain
- Reduce fertilizer use on 14 Million acres of U.S. farmland by 2020



Field to Market®

Field to Market: The Alliance for Sustainable Agriculture focuses on defining, measuring and advancing the sustainability of food, fiber and fuel production



Our soybean checkoff.
Effective. Efficient. Farmer-Driven.



THE CONSERVATION FUND



Bayer CropScience



Field to Market®

The Alliance for Sustainable Agriculture





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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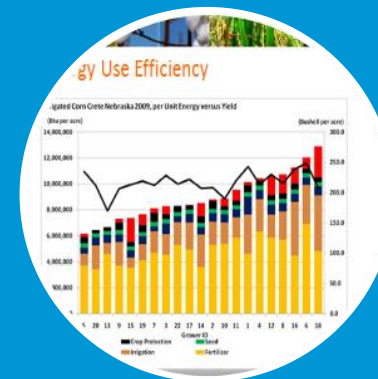
Deliverables: What We Are Doing



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



Sample Results: Resources per bushel – Soybeans

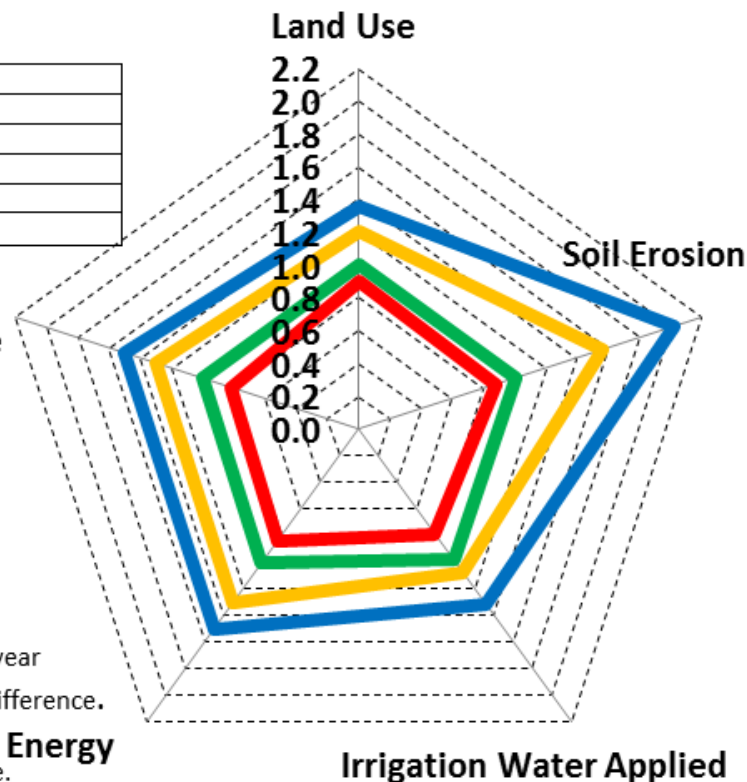
**Index of Per Bushel Resource Impacts to Produce Soybeans
(United States, Year 2000 = 1)**

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



Measuring at the Field Level

The screenshot shows the Fieldprint Calculator web application. The browser address bar displays <http://www.fieldtomarket.org/calculator>. The page title is "Fieldprint Calculator - Field ...". The navigation menu includes "Start", "Land Use", "Soil Conservation", "Soil Carbon", "Irrigation Water Use", "Energy Use", "Greenhouse Gas Emissions", "Summary", and "Economic Analysis". The "Start" tab is active.

Fieldprint Calculator | My Account | Logout

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

Start

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.

Session: Demo - IA Corn
Units: U.S. Customary

Location

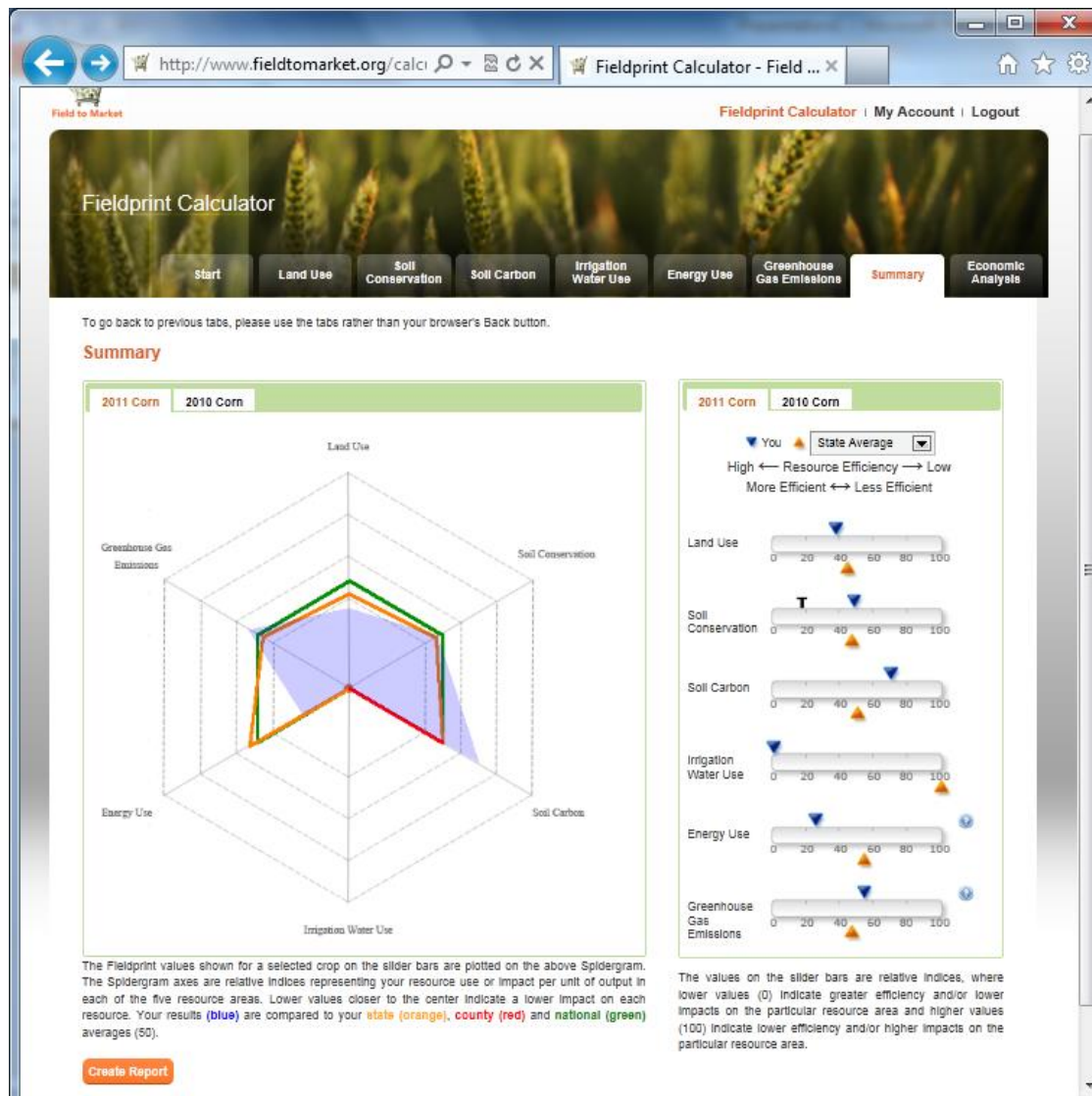
State: Iowa
County: Kossuth County
Field Name: My Typical Corn Field
Field Lat (optional): dec. deg.
Field Lon (optional, negative value for U.S.): dec. deg.
Area: 158.97 acres

Soil
Crop Rotation
Management
Transportation
Drying
Planted but not harvested

The right side of the interface features a satellite map with a yellow rectangular field boundary. A scale bar indicates 300 m and 1000 ft. The map coordinates are -94.08448, 43.41567. A "Data Sources" link is visible in the bottom right corner of the map area.

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Fieldprint Summary



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Fieldprint[®] Projects
Supply Chain Partnerships
for Continuous Improvement



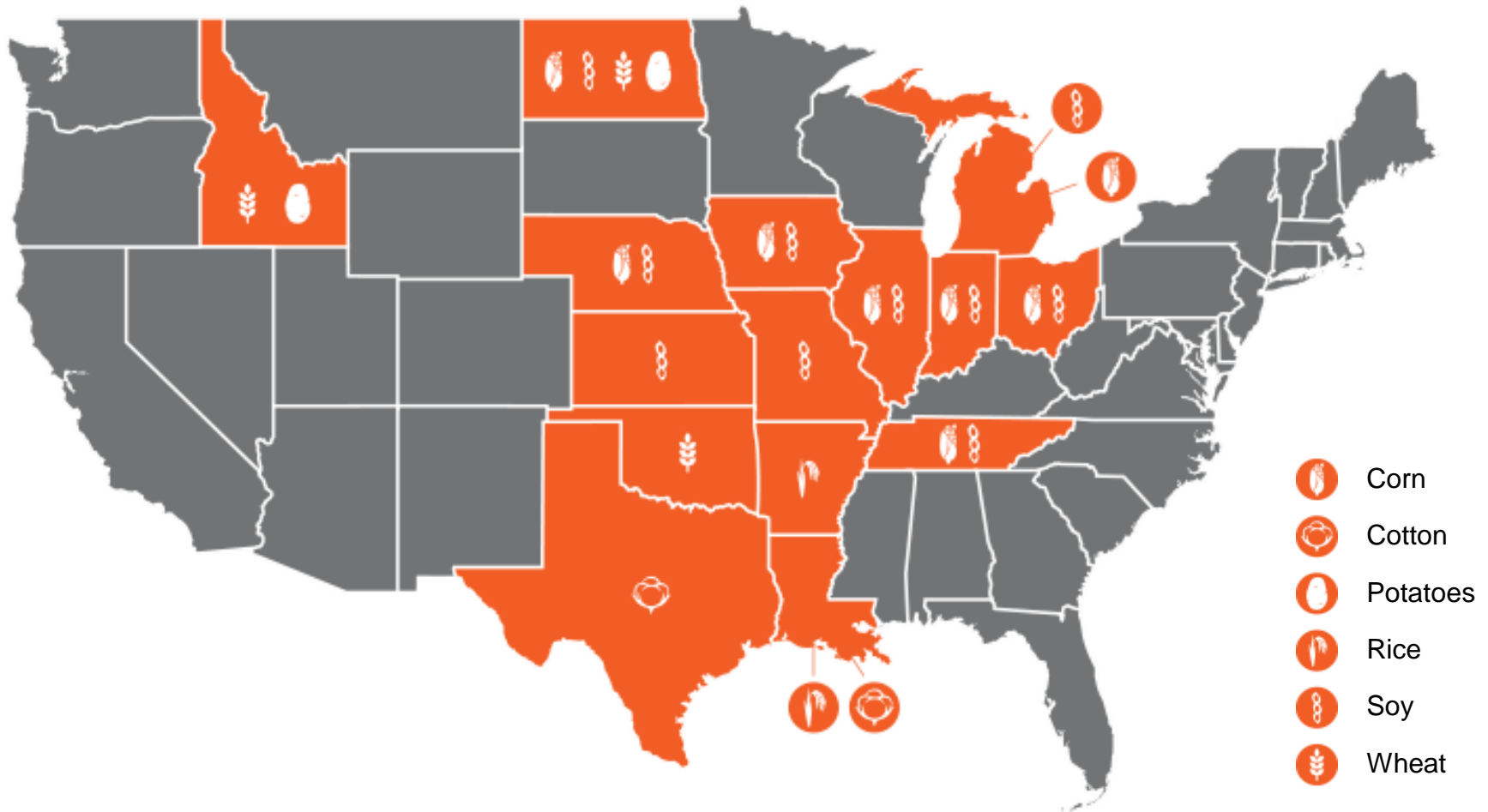
Fieldprint Projects



- 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



Field to Market's Fieldprint Projects





Future of Field to Market
Building a Supply Chain
Sustainability Program



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 and claims:** Continue to use ISEAL guidance to develop a protocol for the FTM program



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The image shows a field of young soybean plants. The plants are small, with two leaves each, and are growing from the soil. The background is a warm, orange-brown color, suggesting a sunset or sunrise. The text is overlaid on the left side of the image.

Greenhouse Gas Metric

Current and future considerations



How Were the Current Metrics Developed?

Diverse stakeholders and technical experts:

- Working groups and subcommittees
- Technical advisors (IHS, Waterborne)
- Invited experts and guests

Iterative and collaborative dialogue, consultation, and peer review:

- Establishment of priorities/scope
- Understanding of existing models
- Consideration of criteria
- Agreement on methodology





Scope of Calculator Metrics

- Single field (planted acreage)
- Single crop (including co-products allocated their share of the resource Fieldprint based on economic allocation)
- Single year
- Per unit of output
- Inputs to production and activities up to the first point of sale



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Criteria for Calculator Metrics

- Balance simplicity vs. accuracy to allow for a farmer-friendly user interface
- Link practices to outcomes
- Demonstrates on-farm outcomes of practices within a farmers' control
- Transparent and credible science, based on publicly available methods and data





Greenhouse Gas Metric

- **Overview**

- Accounts for the total (on-farm and embedded) greenhouse gas emissions in crop production.
- Inputs include field location, crop rotation, tillage and management systems, chemical and manure applications, drying and transportation
- Units of greenhouse gas (GHG) emissions per unit of production, e.g., carbon dioxide equivalents (CO₂e) per bushel





Greenhouse Gas Metric

- **Direct Emissions Coverage**

- Equipment operation including product and manure application
- Irrigation energy use
- Crop drying
- Transport from field to first point of sale or on-farm storage
- Tier 1 nitrous oxide emissions estimate based on nitrogen application rate for fertilizer, legume cover crops, and manure (1.4% of applied N direct and indirect emissions)
- Credit for residue removal



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Greenhouse Gas Metric

- **Embodied GHG**
 - Fertilizer product applied N-P-K (Based on GREET model values)
 - Crop protection products (Based on Cranfield report)
 - Seed
- **Not included**
 - residue burning
 - lime
 - carbon sequestration
- **Other notes**
 - Rice methane uses a constant of 70.7 pounds of carbon dioxide equivalent per hundred pounds of rice produced





Greenhouse Gas Metric

- **Future considerations**
 - Moving toward a more management driven metric that considers 4Rs, not just rates
 - Adding sophistication to nitrous oxide emission calculations; learnings from other conversations (e.g., industry, C-AGG, USDA)
 - Adding sophistication to rice methane - moving from a constant toward regional variability
 - Incorporating methods for residue burning, lime, and carbon sequestration
 - Improve the capture of Crop Rotation
 - Add Double cropping methodology





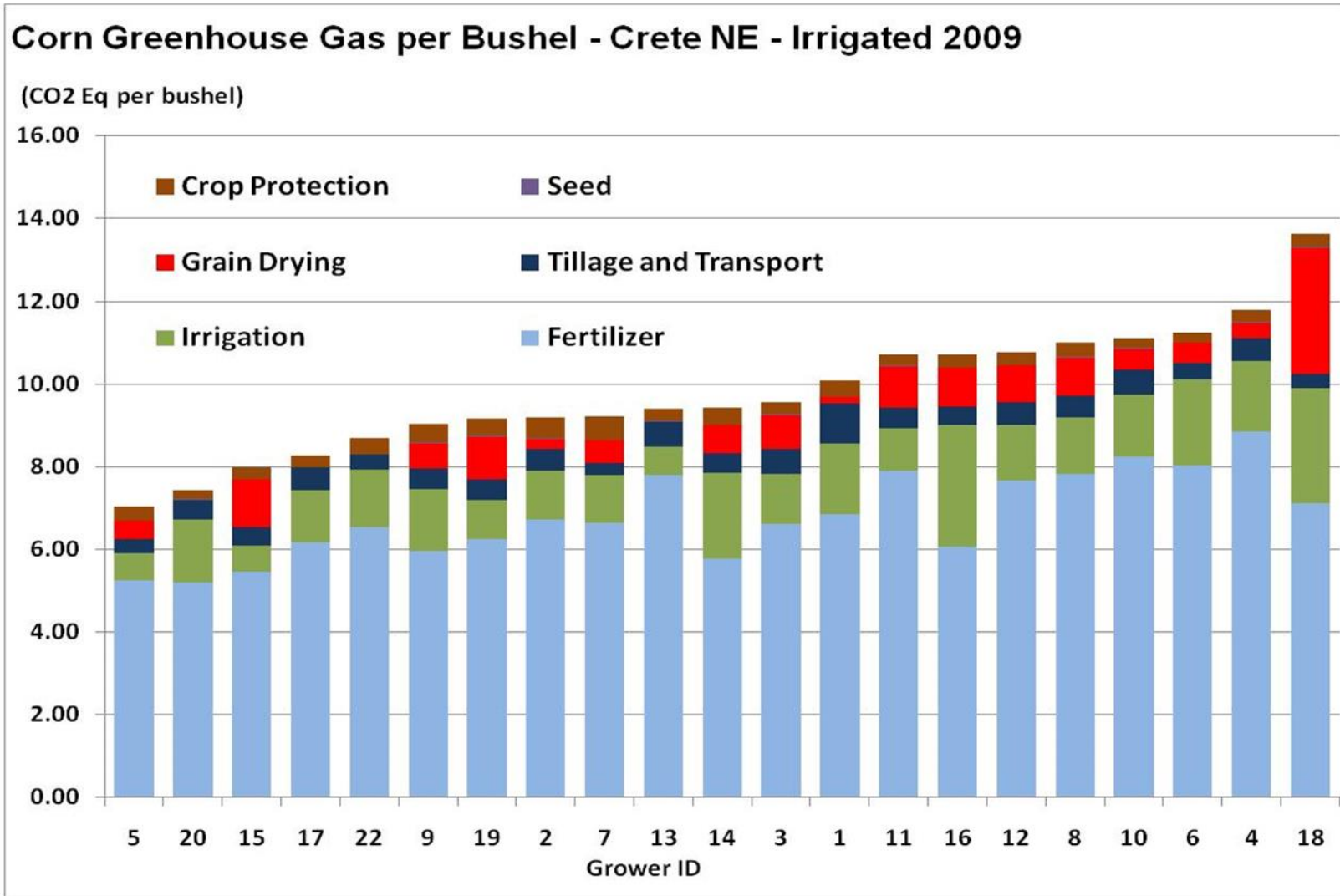
GHG Revision – proposed scope

- **Keeping in mind threshold questions...**
 - Is there a newly available scientific basis (that was not available the first time around)?
 - Is there now greater feasibility for integration into the Fieldprint Calculator?
 - Can it be accomplished over the course of the next year? (for launch of FPC 3.0)





Example of FTM GHG output





Value of Field to Market
A Common Sustainability Framework
from Farm to Fork



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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Collaboration with NRCS

- Over the past several years, Field to Market and USDA-NRCS have worked closely together:
 - NRCS an ex-officio member of FTM
 - MOU between NRCS & FTM signed on January 2, 2014
 - NRCS involved in several Fieldprint projects
 - Use of technical tools
 - Revised Universal Soil Loss Equation 2
 - Soil Conditioning Index
 - Water Quality Index
 - Wind Erosion Prediction System



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Future opportunities

- Expanded use of NRCS tools and models as FTM increases scale of its program
- FTM developing Fieldprinting curriculum for use by local advisors including NRCS
- Fieldprinting included as a possible enhancement activity under CSP
- Data interoperability with Resource Stewardship Benchmark tool
- FTM aligning goals and regional resource priorities with RCPP Critical Conservation Areas map



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Thank You
For more information
visit www.fieldtomarket.org