Assessing the GHG Mitigation Potential of the US Agricultural Sector

C-AGG Meeting

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

Field to Market®
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
• Emphasis on continuous improvement
• Measure broad-scale trends and field-scale outcomes
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
Individual Companies Setting Sustainability Goals

- **Coca-Cola**
  - 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

- **General Mills**
  - 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

- **Unilever**
  - 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

- **Walmart**
  - Reduce and optimize the resources required to produce that food and driving more transparency into its supply chain
  - Fertilizer optimization on 14 Million acres of U.S. farmland by 2020
Working with Growers in 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 and crops, through supply chain
- Measuring 8 metrics of sustainability, including:
  - GHG emissions
  - energy use
  - irrigation water use
  - water quality
  - soil erosion
  - soil conditioning
  - land use
  - habitat potential
Supply Chain Partnerships in 20 States

Corn
Cotton
Potatoes
Soy
Rice
Wheat
Greenhouse Gas Metric

- **Accounts for the total (direct and embedded) GHG emissions from 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., CO2e per bushel

- **Direct Emissions Coverage**
  - Equipment operation including product and manure application
  - Irrigation energy use
  - Crop drying & transportation to storage or sale
  - Tier 1 nitrous oxide emissions estimate based on N application rate for fertilizer, legume cover crops, and manure (1.4% of applied N direct and indirect emissions)

- **Embodied GHG**
  - Fertilizer product applied N-P-K (Based on GREET model values)
  - Crop protection products
  - Seed

- **Not included**
  - residue burning
  - lime
  - carbon sequestration

Field to Market®
GHG Metric Development

• Future considerations for GHGs
  – Moving toward a more management driven metric for nitrous oxide that considers 4Rs, not just rates, for nutrient management
  – Adding sophistication to rice methane - moving from a constant toward regional variability and including relevant practices.
  – Considering revisions based on the recent USDA GHG guidelines report
  – Incorporating methods for residue burning, lime, and carbon sequestration
  – Alignment with Farm Smart tool GHG metric for representing feed produced on dairy farms
Scaling up

• Field to Market is moving from a pilot phase into an implementation phase
  – Scaling from 1 million to 50 million acres of land engaged by 2020
  – Developing ISEAL compliant standards for verifiable claims of participation, measurement and impact on agricultural sustainability goals
  – Release of a next generation Fieldprint Calculator that can be integrated across platforms (2016)

• In 2014 began to set goals for the organization as a whole
Field to Market Goals 2014

- **Land Use** – Sustained improvement of land use efficiency by increasing productivity on US cropland, conserving native habitat, and enhancing landscape quality.

- **Greenhouse Gases** – Sustained reduction in greenhouse gas emissions from U.S. cropland per unit of output.

- **Water Quality** – Sustained contribution to solving regional water quality problems as evidenced by reductions in sediment, phosphorus, nitrogen, and pesticide loads from U.S. cropland.

- **Soil Conservation** – Sustained reduction in soil erosion to tolerable levels or below on all U.S. cropland.

- **Irrigation Water Use** – Sustained contribution to solving regional water scarcity problems through continual improvement in irrigation water use efficiency and conservation.

- **Energy Use** – Sustained improvement in energy use efficiency from U.S. crop production.
Longer term evolution of FTM Goals

• Field to Market will outline the progress that can be made for the areas above, and conduct further assessment of what will be needed to accomplish the following:
  – Overall reductions of greenhouse gas emissions from U.S. crop production, including a consideration of carbon sequestration.
  – Conservation of native habitat, enhancement of landscape quality, and improvement of conservation outcomes
  – Overall maintenance and improvements to soil health.
GHG Goal Considerations

- A subgroup of members and staff has been tasked with identifying potential avenues for a more specific GHG goal
  - Considering FTM engaged acreage, crops and geographies
  - Considering what is an achievable, measurable level of impact

- Opportunities to collaborate with aligned sustainability efforts

- Opportunities to leverage previous research and modeling of agricultural GHG reduction potential
GHG Goal Considerations

• Is a directional or quantitative goal scientifically justified?

• What baseline information on historical trends and the potential for future reductions is available?

• What scenarios can we consider for future improvements based on direct FTM engagement?

• How can the sustainability outcome - GHG emissions - be accurately quantified and verified?
Thank You
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