Environmental Sustainability Metrics
Learning Objectives

• Understand how agricultural supply chain groups are driving development and adoption of sustainability metrics

• Summarize eight metrics of environmental sustainability that are measured using common frameworks.
Interpreting Market Signals

Chapter 1
Consumers are Driving the Sustainability Movement

- Disconnected from farm
- Bombarded by information
- Concerned about agriculture’s impacts on the environment
- Need for transparency, accountability and action
- Supply chain is listening
Agricultural Supply Chain

- Ag Input Providers
- Growers
- Ingredient Processors
- Consumer Brands and Retail
Field to Market: The Alliance for Sustainable Agriculture

• Field to Market uniquely brings together stakeholders from across the agricultural supply chain and creates unparalleled opportunities for collaboration.

• **Credibility**
  Leading universities and conservation groups are actively engaged in Field to Market’s science-based approach to identify opportunities to improve the environmental performance of U.S. food, feed, fiber and fuel production.

• **Harmonization**
  Utilizing a multi-stakeholder approach to build consensus, Field to Market creates clear agreed upon terms and definitions and develops metrics and benchmarks that can be universally adopted by all stakeholders.

• **Efficiency**
  By providing a common framework to measure the sustainability of U.S. commodity crop production, Field to Market minimizes duplication of efforts and reduces the supplier burden of responding to a proliferation of supply chain surveys.
Company Examples

- Working with 15 suppliers to reduce fertilizer loss and improve yields on 76 million acres by 2025
- Project Gigaton: establish nutrient management goals that reduce greenhouse gases at farm level
- Founder-member of Midwest Row Crop Collaborative - support projects that improve soil health and water quality
  - Cover crops
  - Conservation tillage
  - Science-based nutrient management

https://www.walmartsustainabilityhub.com/
Company Examples

- Reducing greenhouse gas emission
- Conserving water
- Member of Midwest Row Crop Collaborative
- Tackling row crop impacts on hypoxic dead zone in Gulf of Mexico

Company Examples

• Conserving natural resources
• Reducing energy use
• Reducing water use
• Lowering greenhouse gas emissions
• Member of Midwest Row Crop Collaborative
• Ground-water quality in Upper Mississippi River Basin

Company Examples

- Tracking and reducing greenhouse gas emissions and water use in supply chain
  - Water stewardship program
  - Ecosystem commitments
  - Sustainable sourcing
- Working with local agronomists and farmers to:
  - Boost soil health
  - Sequester carbon
  - Reduce greenhouse gas emissions
- Founder-member of Midwest Row Crop Collaborative

Company Examples

- Reduce supply chain impacts:
  - Improve water use efficiency by 15% by 2025
  - Reduce greenhouse gas emission by 20% by 2030
- Sustainable Farming Initiative - sustainably source
  - Direct ag raw materials by 2020
  - Non-direct ag raw materials by 2025
- Member of Midwest Row Crop Collaborative

Connect to supply chain sustainability projects

• Expand business for yourself and growers
• Conserve natural resources for future generations
• Offer sustainability insights to growers
  • Determine baseline values
  • Recommend and implement changes
  • Measure and document
  • Make continuous improvement
Discussion
Metrics
Chapter 2
Eight Environmental Indicators

- Biodiversity
- Energy Use
- Greenhouse Gases
- Irrigation Water Use
- Land Use
- Soil Carbon
- Soil Conservation
- Water Quality

www.calculator.fieldtomarket.org
Biodiversity

• Cultivated fields and non-productive areas of the farm all contribute.
• Conserve healthy ecosystems
• Protect pollinators and pest predators
• Preserve wildlife habitat for foraging and nesting
Energy Use

• Variable cost of farming-affected by diesel and electricity prices
• Combustion of fossil fuels releases greenhouse gas CO$_2$
• Direct energy - operating equipment, pumping irrigation water, grain drying and transport
• Embedded energy - required to produce crop inputs (seeds, fertilizers, crop protectants)
Greenhouse Gases

• Hold heat inside the Earth’s atmosphere
• Cause the atmosphere to warm
• Weather patterns become more volatile
• Attributed to ag:
  • Carbon Dioxide (CO₂)
  • Nitrous Oxide (N₂O)
  • Methane (CH₄)
Irrigation Water Use

• Finite supply of fresh water
• United States agriculture accounts for 80% of fresh water consumed
• Can be expensive
Land Use

• Efficient use of agricultural land is necessary for farm financial stability
• Best land for agricultural use is already under cultivation in the U.S
• Balance yield with input optimization
Soil Carbon

- From organic matter
- Indicator of soil health
- Reservoir for plant nutrients and water
- Causes aggregate formation
- Enhancing soil carbon removes carbon dioxide from the atmosphere
Soil Conservation – Preventing Erosion

Erosion is expensive
• lost soil takes inputs with it
• harms productivity

Sedimentation in waterways
• reduces transportation efficiency
• harms water quality

Soil suspended in air causes
• traffic hazards
• respiratory ailments
Water Quality

- Soil sediment, nutrients and crop protectants leave field and enter water through
  - runoff directly into surface waters
  - leach through the soil profile
    - enter tile lines that discharge to surface water
    - leach into groundwater
- Structural and edge of field practices – last line of defense
- Protect freedom to operate
Social and economic considerations

All three pillars are equally important.
Discussion
Review

- Consumer demand for sustainable products
- Company response to demand
- 8 environmental metrics have been widely agreed upon
- Intersection of environment, economy, and community
Thank you!

Sustainability Programming for Ag Retailers and CCAs (SPARC)

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