Monsanto’s Carbon-Neutral Collaborative

MICHAEL M. LOHUIS, PHD
MONSANTO COMPANY

C-AGG Meeting
(Washington, DC - Sept 27-28, 2016)
Monsanto’s Carbon Neutral Commitment: (Dec. 1, 2015)

• Monsanto commits to achieve a carbon-neutral footprint across its entire operations by 2021
• The company will:
  – establish an internal carbon price
  – drive carbon neutral crop production practices in seed production operations
  – provide incentives to farmer customers who adopt carbon neutral crop production methods in exchange for associated carbon reduction values
  – share the data and modeling results
Why make this commitment?

• Climate change is bad for environment & business
• Ag is a significant source of emissions
• Both adaptation + mitigation are needed
• Change in practices could lead to new opportunities
What is the Path to Carbon-Neutral?

- **Reduce emissions intensity of operations**
  - process improvements, precision Ag, travel, etc.
- **Sponsor carbon-neutral practices**
  - no-till, cover crops, maintaining & building SOC
- **Purchase offsets from vol. carbon mkt**
  - option if shortfall remains
- **Projects to halt deforestation**
  - sustainable intensification + land zoning + preventing LUC + verification
Carbon-Neutral Product Solutions

Reduce Emissions
Precision Ag & Nutrient Management:
- Nitrogen Advisor™
- FieldView Plus™
- QuickRoots®
- JumpStart®
- Profit Zone Manager™

Soil Carbon Sequestration
No-till & cover-crops:
- RR-Xtend™ System
- Acceleron® seed coat
- Disease-Shield™
- Health Advisor™
- Early-Maturing hybrids

Halt Deforestation
Sustainable Intensification:
- Advanced breeding tech.
- Genuity® yield protection
- Variable-rate seeding
- Drought-Tolerant Corn
- Double-cropping

Many products & strategies available for a global solution
OFFSETTING IS COMMON: Collectively, companies reporting to CDP purchased 39.8 MtCO₂e and originated another 102.4 MtCO₂e.

**Market Snapshot:** Number and Percentage of Reporting Companies That Engage in Offseting and Number of Offsets They Purchase or Originate

- **248 companies** with 5.7 billion tonnes of annual emissions (across all scopes) offset a portion of their emissions.
- **79 companies** with 4.7 billion tonnes of annual emissions (across all scopes) originated their own offsets.

Notes: Based on 39.8 MtCO₂e in offset purchases by 248 unique buyers in 2014 as well as 102.3 MtCO₂e in offset origination by 79 unique companies. “All scopes” refers to emissions in Scopes 1, 2, and 3. See Figure 7 on p. 15 for more detail.

Data source: CDP public disclosure, reporting year 2015.
Reaching Scale

On-Farm Barriers
- Incentive costs
- Data access & privacy

Industry-Wide Needs
- Harmonized GHG accounting standards
- Efficient paths to GHG quantification
  - Model-based
  - Default tables
- Low-cost verification
Insetting: Developing carbon offset projects within a company’s own supply chain and supply chain communities
2016 USDA-NRCS Conservation Innovation Grant:
Scalable On-Farm GHG Reductions & Water Quality Improvements:
Development and implementation of an economical and verifiable insetting and accounting framework

Awardee: National Corn Growers Assoc / Soil Health Partnership
Partners: Monsanto, AgSolver, Applied GeoSolutions, DNDC-ART, Climate Smart Group and CropGrowers LLC

CIG Project Deliverables:
• Carbon accounting and insetting framework
• Documentation of water quality modeling metrics
• Low-cost, low-touch verification system
• Integration of precision business planning
• On-farm demonstration (Soil Health Partnership)

Prerequisites:
• Standardized GHG metrics, terminology and accounting methods
• Scientific support for model-based quantification of GHG reductions
**The Carbon-Neutral Collaborative**

**Challenge:** To achieve net GHG neutrality via reducing direct GHG emissions, storing soil carbon and avoiding indirect GHG emissions

**How?** This collaboration of experts is helping Monsanto in the goal of achieving carbon-neutrality. Their expertise in GHG reduction, quantification and verification will help develop a path to GHG mitigation at an industry scale.

**Benefits:**
- climate change mitigation
- climate resilience
- improved soil health
- reduced soil erosion
- improved water quality
- ecosystem services

---

[Diagram showing collaborations and benefits]
Collaborative Goals:

- Quantification of on-farm GHG mitigation practices
- Transparent GHG accounting, computation and “insetting” framework
- 3rd-party verification of mitigation practices
- On-farm demonstration and testing of best practices
- Ongoing fundamental research into soil health and soil carbon stocks
- A series of peer-reviewed papers documenting quantification, accounting and verification methodologies
The Carbon-Neutral Collaborative & Partners

- Soil Health Partnership
- Monsanto Company/Climate Corp.
- AgSolver Inc.
- Univ. Of Illinois/Crop-Grower LLC
- C-AGG
- DNDC-ART & Applied Geo-Solutions
- Climate Smart Group Inc.
- Kansas State University
- Colorado State University
- USDA (USA Ag GHG Inventories & Standards)
- World Business Council for Sustainable Dev. (Scalable Solutions)
- ICF International (GHG Mitigation Potential)
- Field-to-Market (Supply-Chain Reporting Standards)
- Conservation International (Land Use Change Avoidance)
- Conservation Tech. Info. Center (Conservation Ag Info Sharing)
- Purdue University (Economic Modeling)
- Univ. of Chicago (Climate Change Crop Impact Modeling)
Requests of GHG Modeling & Policy Community:

1. Government-supported standardized metrics, terminology & accounting

2. Support for science-based GHG modeling to establish baselines & reductions (based on #1)

3. Regionally-specific default tables for GHG reduction values for Ag practice changes (based on #2)
Monsanto Public-Private Partnerships

**SUSTAINABILITY:**
- Carbon-Neutral Collaborative
- Soil Health Partnership
- Midwest Row Crop Collaborative (MRCC)
- Low-Carbon Tech. Partnership Initiative (LCTPi) - WBCSD

**BIODIVERSITY:**
- Honey-Bee Health Coalition
- Monarch Butterfly Commitment
- Conservation International Biodiversity Partnership

**RESILIENCY:**
- Water-Efficient Maize for Africa (WEMA) - Africa
- Sustainable Harvest- Ag, Resources, Environment (SHARE) - India
- AquaTEK Project - Italy
- Seedbed of the Future - Latin America

**DIALOGUE:**
- Beachell-Borlaug International Scholars
- Sustainable Food Systems Advisory Council
- Leaders Engaged in Advancing Dialogue (LEAD) Initiative

Discussion