Climate Smart Agriculture: What is it and why should you care?

22 February 2023
Ag Women Engage Conference
Terre Haute, IN
Overview

• Climate
• Climate-Smart
• Applications to agriculture and forestry
• Applications to you
A note on cliches

• Stewardship
• Sustainability
• Soil Health
• Regenerative Agriculture
• Climate Smart Agriculture and Forestry (CSAF)
Weather vs. Climate

- Weather is the day-to-day variations in the Earth’s atmosphere.
- For example, a mid-day thunderstorm, a clear sunny week, or the life span of a high pressure system crossing the U.S. are all weather phenomena.
Weather vs. Climate

• However, climate is the accumulation of these weather events over a long period of time (30 years).
• Examples include the mean annual precipitation in Madison, or the change in U.S. high temperatures for the month of July over the last 40 years.
Climate Change

Climate: 30 year average of a meteorological variable

Climate change: The difference between the 30 year average of a meteorological variable and a different set of 30 year average of a meteorological variable.

Can be whole new 30 years, or can be overlap (e.g. 1971-2000 and 1981-2010, 1981-2010 to 1991-2020).
PCCRC

• Unequivocal
• Problems we cause, we can fix
Agriculture’s Contribution

• Various life cycle analyses
• Globally, 19-29% of emissions are ag-related
• USA, 11%
• Interesting juxtaposition with transportation emissions
Greenhouse Gasses - Ag

- CO2 – tractors and farm equipment use, carbon cycling out of soils
- CH4 – Ruminant digestion, manure broadcasting
- NO2 – denitrification (synthetic or organic)
Agriculture as a Sink

• What methods can farmers adopt to sequester carbon or reduce/reuse emissions?

Discuss in groups.
Report Out!
Cow burps measured from space, revealing contribution to climate change

By Chelsea Gohd last updated May 11, 2022

A flatulent first.
Myths

Commercial afforestation can deliver effective climate change mitigation under multiple decarbonisation pathways.

Abstract

Afforestation is an important greenhouse gas (GHG) mitigation strategy but the efficacy of commercial forestry is disputed. Here, we calculate the potential GHG mitigation of a UK national planting strategy of 30,000 ha yr\(^{-1}\) from 2020 to 2050, using dynamic life cycle assessment. What-if scenarios vary: conifer-broadleaf composition, harvesting, product breakouts, and decarbonisation of substituted energy and materials, to estimate 100-year GHG mitigation. Here we find forest growth rate is the most important determinant of cumulative mitigation by 2120, irrespective of whether trees are harvested. A national planting strategy of commercial forest could mitigate 1.64 Pg CO\(_2\)e by 2120 (cumulative), compared with 0.54–1.72 Pg CO\(_2\)e for planting only conservation forests, depending on species composition. Even after heavy discounting of future product substitution credits based on industrial decarbonisation projections, GHG mitigation from harvested stands typically surpasses unharvested stands. Commercial afforestation can deliver effective GHG mitigation that is robust to future decarbonisation pathways and wood uses.
Afforestation

- Not the silver bullet
- No silver bullets exist
Stabilization
Wedge
Game

8 billion
tons carbon
per year

50 years
Renewables & Conservation Wedges
Agricultural-ish Wedges

10. Increase wind electricity capacity by 10 times relative to today, for a total of 2 million large windmills.
11. Install 100 times the current capacity of solar electricity.
12. Use 40,000 square kilometers of solar panels (or 4 million windmills) to produce hydrogen for fuel cell cars.
13. Increase ethanol production 12 times by creating biomass plantations with area equal to 1/6th of world cropland.
15. Adopt conservation tillage in all agricultural soils worldwide.
The Other Wedges

1. Double fuel efficiency of 2 billion cars from 30 to 60 mpg.
2. Decrease the number of car miles traveled by half.
3. Use best efficiency practices in all residential and commercial buildings.
4. Produce current coal-based electricity with twice today's efficiency.
5. Replace 1400 coal electric plants with natural gas-powered facilities.
6. Capture AND store emissions from 800 coal electric plants.
7. Produce hydrogen from coal at six times today's rate AND store the captured CO₂.
8. Capture carbon from 180 coal-to-synfuels plants AND store the CO₂.
9. Add double the current global nuclear capacity to replace coal-based electricity.
What are your 8?

• Small group discussion, switching between the two slides.
Carbon Markets

• Potential Incentive Structure that avoids government regulatory actions against emitting companies or agriculture
Figure 5. Carbon Credit Generation through Nori

End Users
- Use and retire credits

CARBON PROGRAM: NORI
- Marketplace
  - Sales price = credit price × 1.15 (15% in fees)
- Issuance
- Methods:
  - COMET-Farm
- Restricted tokens:
  - 10-year retention

Project Developers
- Project design

Farmers
- Implementation of practices

Verifiers
- Verification at beginning of contract and every 3 years

- Methods
- Payments
- Data
- Carbon Credits

Farmers may enroll and participate directly or through a partner
Climate Smart Commodities

• Creating climate resilient commodities (ag commodities)
• 2.8 billion dollars awarded to 70 projects – September 2022
• 0.3 billion dollars awarded to more projects – November 2022
ADM and Partners' Climate-Smart Solutions--This project will utilize incentive payments to thousands of producers across 15 states to adopt and implement climate smart agriculture (CSA). Part of the project will include engagement of ADM's 5,000 underserved producers to promote CSA opportunities, resulting in significant greenhouse gas (GHG) reductions and removals. Leading partner: Archer Daniels-Midland

Major Partners: ARTCO (wholly owned ADM subsidiary), Costco, DKY, EarthOptics, Farmers Business Network, Field to Market, Flint River Soil and Water Conservation District, Food Works Group, Iowa State University, Purdue University, University of Nebraska-Lincoln, Keurig-Dr. Pepper, Mid-America Biofuels (ADM Joint Venture), National Black Growers Council, Practical Farmers of Iowa.

Major Commodities: Corn, Soybeans, Wheat, Peanuts, Sorghum, Flax, Hemp, Canola, Edible Beans, Pulse Crops

Approximate Funding Ceiling: $90,000,000
TruCarbon

Climate SMART (Scaling Mechanisms for Agriculture’s Regenerative Transformation) -- This project, which will reach across 28 states, aims to catalyze a self-sustaining, market-based network to broaden farmer access, scale adoption of climate-smart practices, and sustainably produce grain and dairy commodities with verified and quantified climate benefits.

Lead Partner: Truterra, LLC.

Major Partners: Ag Gateway, Biofiltro, Continuum Ag, ESRI, Equilibrium Capital, Farmobile, FarmRaise, John Deere, La Crosse Seed, Macquarie, Microsoft, Northern Star Seed, Sound Ag, Strand Gard Stewardship, WinField United, American Farmland Trust, Black Family Land Trust, Farm Credit Council, Federation of Southern Cooperatives, Minorities in Ag, Natrl. Res. & Related Sciences, Soil Health Institute, Butcher Box, Campbell Soup, Green Plains, Hershey, Land O’ Lakes Dairy Foods, Nestle Purina, Perdue, Primient, Tate & Lyle, Cloud Ag, Colorado State Univ., SustainCert & 50 ag retail coops.

Major Commodities: Corn, Soybeans, Wheat, Cotton, Dairy

Approximate Funding Ceiling: $90,000,000
Climate-Smart Grasslands: The Root of Agricultural Carbon Markets -- A diverse partnership of 28 entities will develop climate-smart grasslands agriculture for the eastern US through a large-scale pilot project. The project collaborates with 245 working farms to install innovative, scientifically sound practices that improve soil carbon storage, reduce greenhouse gas emissions, and maintain operational profitability and resiliency.

Lead Partner: The University of Tennessee


Major Commodities: Beef, Small Ruminants, Dairy, Forage

Approximate Funding Ceiling: $30,000,000
Edge Dairy Farmer Cooperative Farmer-led Climate Smart Commodities Initiative: Building Success from the Ground Up--This project will expand climate-smart markets and establish dairy and sugar as climate-smart commodities by implementing climate-smart production practices, improving business practices, improving business practices for climate-smart commodities, and making use of data and information collected to inform future standards.

Lead Partner: Edge Dairy Farmer Cooperative


Major Commodities: Dairy, Sugarbeets

Approximate Funding Ceiling: $50,000,000
Expanding Agroforestry Production & Markets -- This project will build climate-smart markets and increase capital investments in tree planting that will increase the supply of agroforestry commodities utilizing a network of leaders in forestry. Working directly with manufacturers and retailers to connect potential buyers with producers (including underserved producers).

Lead Partner: The Nature Conservancy

Major Partners: Propagate, Savanna Institute, Tuskegee University, University of MO Center for Agroforestry, VA Tech, Hawai‘i ‘Ulu Cooperative, Appalachian Sustainable Development, Canopy Farm Management, Cargill, Handsome Brook Farm, NY Tree Crop Alliance, Practical Farmers of IA, Resource Environmental Solutions, Sustainable Farming Association, Trees Forever, Trees for Graziers, University of Illinois, Association For Temperate Agroforestry, Osage Nation, Agroforestry Partners, Live Oak Bank, Walnut Level Capital, Yard Stick, Propagate, Working Trees, University of Hawaii, Cargill, Danone, Applegate, Epic Institute, General Mills, Current Cassis, Hawaii Ulu Cooperative, Simple Mills, Hawaii Foodservice Alliance, 1890 Consortium, AgLaunch Early Adopter Network, Lincoln University, and Tuskegee University

Major Commodities: Nuts, Berries, Beef, Fruit Trees, Forest Products

Approximate Funding Ceiling: $60,000,000
Farmers for Soil Health Climate Smart Commodities Partnership--This project proposes to accelerate long-term cover crop adoption by creating a platform to incentivize farmers. The platform will quantify, verify and facilitate the sale of ecosystem benefits, creating a marketplace to generate demand for climate smart commodities.

Lead Partner: National Fish & Wildlife Foundation


Major Commodities: Corn, Soybeans

Approximate Funding Ceiling: $95,000,000
Dubois County

Fischer Farms Ultimate Beef Strategy--This project aims to generate knowledge of carbon sequestration and greenhouse gas emissions for the Fischer Farms beef production system, to inform future business decisions, and to generate science-based marketing tools that will enable buyers to actively participate in climate-positive purchasing and eating decisions. The project will include livestock producers, and it will support Fischer Farms’ market expansion into other areas.

Lead Partner: Fischer Farms Natural Foods, LLC
Major Partners: Indiana University, Carbon Solutions
Major Commodities: Beef
Approximate Funding Ceiling: $15,000,000
Picking Winners

Midwest Climate-Smart Commodity Program--This project will provide funding to farmers via outcome-based contracts for the reduction and removal of carbon dioxide through the adoption of new climate-smart practices. The remaining project funding will support farmer enrollment assistance, carbon quantification, technical assistance support, measurement, reporting and verification, and underserved farmer outreach and enrollment.

Lead Partner: Iowa Soybean Association

Major Partners: ReHarvest Partners, PepsiCo, Cargill, Renewable Energy Group, Ingredion, Target, JBS, Coca-Cola, Mano y Ola, FarmRaise, Rural Community Assistance Partnership

Major Commodities: Corn, Soybeans, Wheat

Approximate Funding Ceiling: $95,000,000
(Iowa) Soil and Water Outcomes Fund

Soil and Water Outcomes Fund
Cost effective solutions for soil and water stewardship

2022 ENROLLMENT OPEN FOR FARMERS IN SELECT REGIONS >>

About the Soil and Water Outcomes Fund

The Soil and Water Outcomes Fund provides financial incentives directly to farmers who transition to on-farm conservation practices that...
Geographic Distribution

- **2022 states enrolling acres**
- **2023 new target states**
FOR IMMEDIATE RELEASE

SHI to Advance Soil Health Training and Research in More Than 35 States as an Implementing Partner in Five USDA Climate-Smart Commodity Grants
Ode to the Wild West

October 26, 2021 (BOSTON) — Indigo Agriculture, a company leveraging nature and technology to unlock economic and environmental progress in agriculture, today announced a deepened commitment to advancing discovery in soil carbon science, enabled by the acquisition of Soil Metrics —

Merger Creates North America’s Largest Carbon Credit Originator and Marketer

February 23, 2022 | By Carbon Credits

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Before you Sign: Seven Tips

• Know your payment
• Know the true length of the contract
• Know your role in reporting
• Know whether you can enroll in other programs
• Current vs. Newly established practices
• Know data verification
• Who pays for verification?
Questions?

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