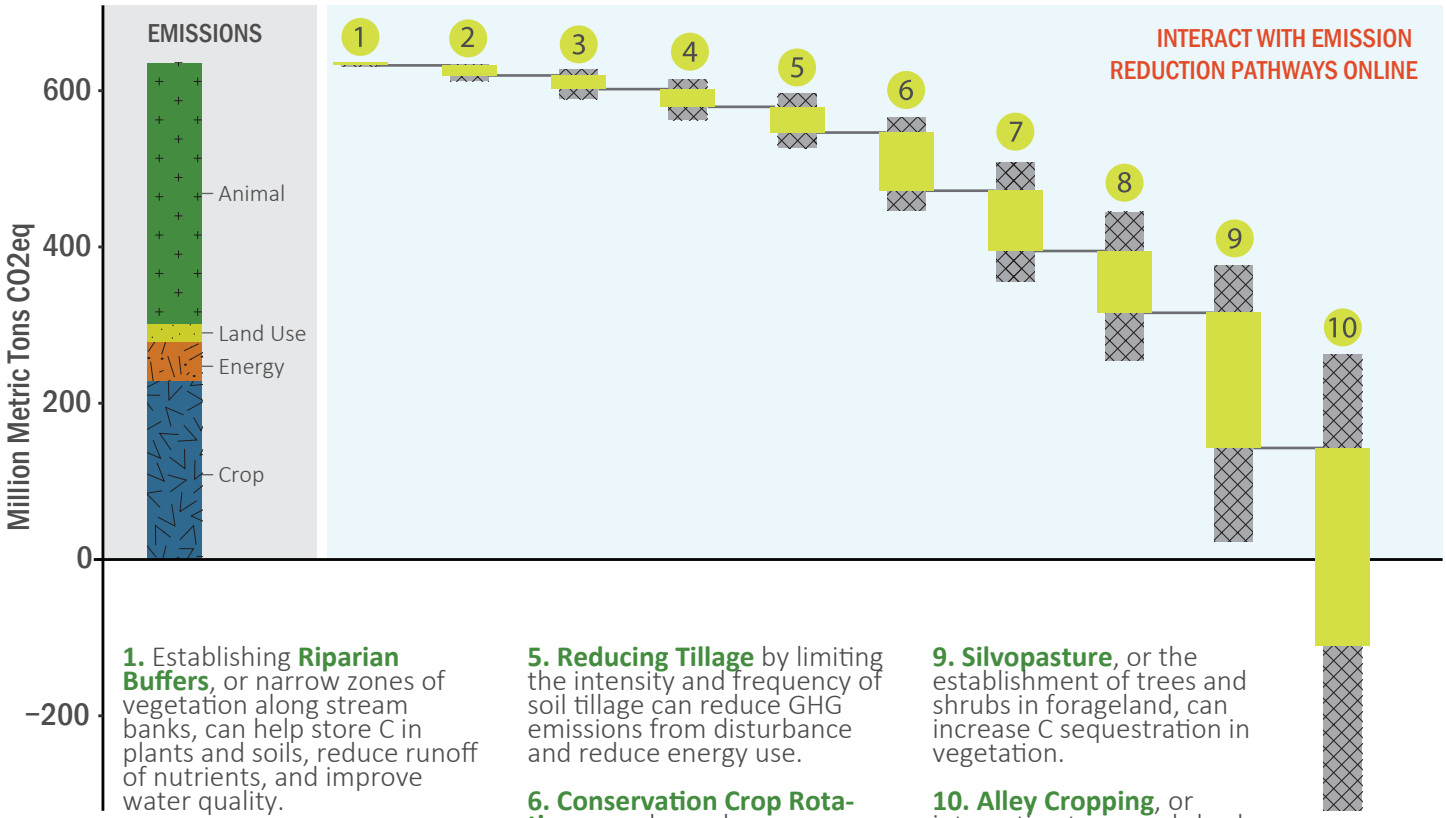
EARTHJUSTICE

A PATH TOWARDS CLIMATE-FRIENDLY AGRICULTURE

Nearly every decision on a farm or ranch has an impact on greenhouse gases and climate. Agricultural activities play a role both in generating greenhouse gases and in helping mitigate climate change through the storage and management of large stocks of carbon and nutrients. While farmers and ranchers are familiar with a number of climate-friendly practices which can reduce or offset emissions, their adoption remains low. Promoting widespread implementation of a combination of these practices across the U.S. can lead to an agricultural system in which emissions from agricultural activities are offset by the benefits of climate-friendly farming and ranching. Below, we explore ten climate-friendly practices and their projected impact on emission reductions if adopted on applicable land areas nationally. Many of these practices have synergistic effects, which would make their combined impact even greater. Finally, reducing food waste and demand can also help reduce emissions and reduce the total area of land impacted by agricultural activities.



1. Establishing **Riparian Buffers**, or narrow zones of vegetation along stream banks, can help store C in plants and soils, reduce runoff of nutrients, and improve water quality.

2. Improving **Nutrient Management** to optimize the rate, method and timing of fertilization can reduce emissions of the potent GHG N_2O.

3. Establishing **Windbreaks**, or rows of trees or shrubs between crops, can increases C storage in plants and soils and reduce soil erosion.

4. Prescribed Grazing to reduce overgrazing can improve grassland productivity and reduce soil degradation.

5. Reducing Tillage by limiting the intensity and frequency of soil tillage can reduce GHG emissions from disturbance and reduce energy use.

6. Conservation Crop Rotations, or planned sequences of crops on the same land, can increase soil organic matter accumulation and reduce soil erosion.

7. Cover Crops, or seasonal vegetation not grown for harvest, can increase C inputs into soil, reduce nutrient runoff and suppress disease pressures.

8. Organic Soil Amendments can reduce reliance on synthetic fertilizers and increase soil C accumulation.

9. Silvopasture, or the establishment of trees and shrubs in forageland, can increase C sequestration in vegetation.

10. Alley Cropping, or integrating trees and shrubs with horticultural crops, can increase C sequestration in trees and shrubs and reduce runoff and erosion.

Estimates are derived by scaling emission reductions from NRCS COMET Planner[3] by maximum applicable area[4].

Upper hashed-gray bars show lower estimate of emission reduction, green bars show average estimate, and lower hashed gray bars show maximum estimates.

EARTHJUSTICE

Agriculture must be part of any solution to the climate change crisis.

In the U.S., agricultural activities account for at least 10% of annual greenhouse gas emissions, releasing an estimated 635 MMT of CO_2 equivalents through land use conversion, energy consumption, and crop and animal-related emissions.[1] This conservative estimate is roughly equal to the annual emissions from 170 coal-fired power plants. More broadly, the global food system from fertilizer production to food waste in landfills accounts for up to 29% of anthropogenic GHG emissions.[2]

Transitioning to a climate-friendly system by reducing emissions and promoting carbon sequestration is critical for agriculture as it is particularly vulnerable to climate change. Increases in extreme weather events can lead to losses of crop productivity, endanger livestock, and pose dangerous working conditions for field workers.

While agriculture contributes to GHG emissions, practices in the field also play a key role in the rate and form in which carbon is stored and stabilized. Farmers and ranchers can help implement a number of practices which promote soil C sequestration or reduce GHG emissions, while also increasing productivity and profitability. In addition to their climate benefits, these practices can often help suppress weeds, improve water and air quality, and help defend crops against climate instability and disease risks.[3]

Despite their known benefits, many climate-friendly practices have low adoption rates. Policy-makers can facilitate the transition towards climate-friendly agricultural practices by reducing barriers to implementation, incentivizing adoption, and supporting research and education efforts to guide successful outcomes.

1. US EPA, 1990-2017 Greenhouse Gas Inventory (2019). 2. Vermeulen, S.J., et al. 2012. Climate Change and Food Systems, Annu. Rev. Environ. Resour. 37:195-222. 3. Swan, A. COMET-Planner: Carbon and Greenhouse Gas Evaluation for NRCS Conservation Practice Planning, a project report to USDA. 4. Lehner, P., & Rosenberg, N. Ch. 30, Agriculture in Legal Pathways to Deep Decarbonization in the United States (Michael B. Gerrard and John C. Dernbach, eds. (2019).

POLICY MECHANISMS

Some of the ways in which federal and state programs can help surmount barriers to climate-friendly practices include:

- Eliminating policy barriers to wide-scale adoption of agricultural management practices with climate mitigation potential by reforming crop insurance and supporting perrenial crops and prescribed grazing.

- Incentivizing practices with climate benefits and discouraging practices with environmental and climate harms by expanding farm bill conservation programs and conservation compliance requirements.

- Increasing funding for research and development for climate-mitigation practices and projects in the agriculture sector.

- Improving education, outreach and participation through federal programs including the Conservation Innovation Grants program and the Natural Resources Conservation Service's Conservation Technical Assistant program.

- Implementing water and air pollution laws to maximize long-term climate benefits and reduce industrial agriculture's impacts.