



Scaling up Biochar Use in Agriculture for Soil Health and Climate Mitigation

American Farmland Trust
Soil Health and Climate Initiative

February 13, 2024

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About American Farmland Trust

AFT's Mission:

- **Protect farmland**
- **Promote sound farming practices**
- **Keep farmers on the land**

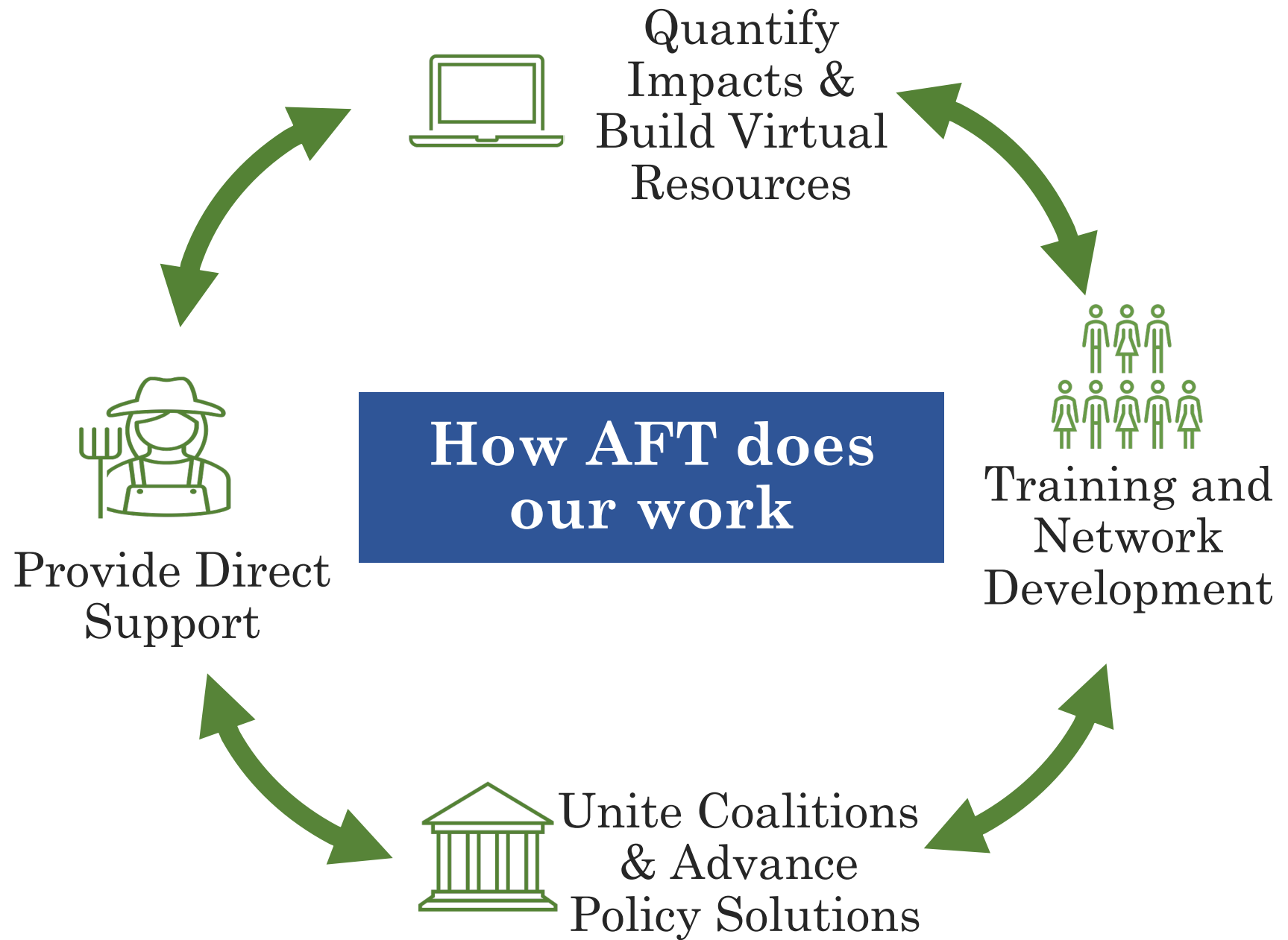
Since our founding in 1980, AFT has:

- Helped protect millions of acres
- Connected farmers to billions \$
- Bridged research and practice and policy
- Developed the Research Fellows Program



For all 3 Legs of our Mission:

- **Protect farmland**
- **Promote sound farming practices**
- **Keep farmers on the land**



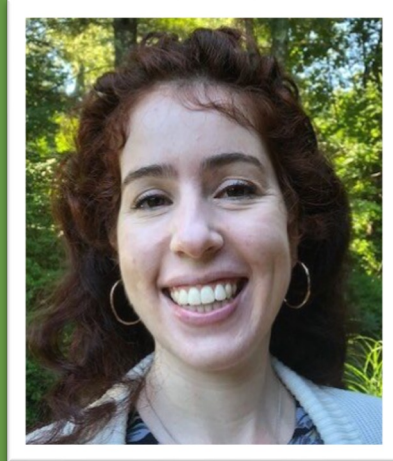
AFT's Climate and Soil Health Initiative



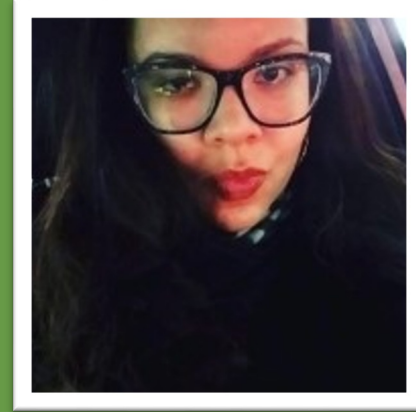
**Alexandra
Duprey**



**Bonnie
McGill**



**Emma
Rapperport**



**Shayla
Coleman**



**Bianca
Moebius-Clune**



Dana Havas



**Rachel
Seman-Varner**

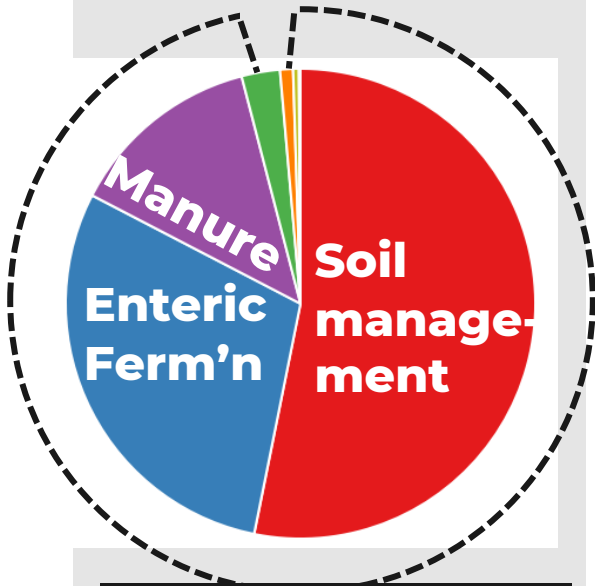


**Seann
Sweeny**



Agricultural climate solutions

US GHG emissions from ag by activity



>98% emissions from ag are CH₄ and N₂O



Many of the same practices that reduce net ag emissions, also build farm **resilience** and **adaptation** to climate change.

Soil health management systems hold many of the keys to address climate.



Biophysical levers for change



Reduce CH₄ emissions



Reduce N₂O emissions

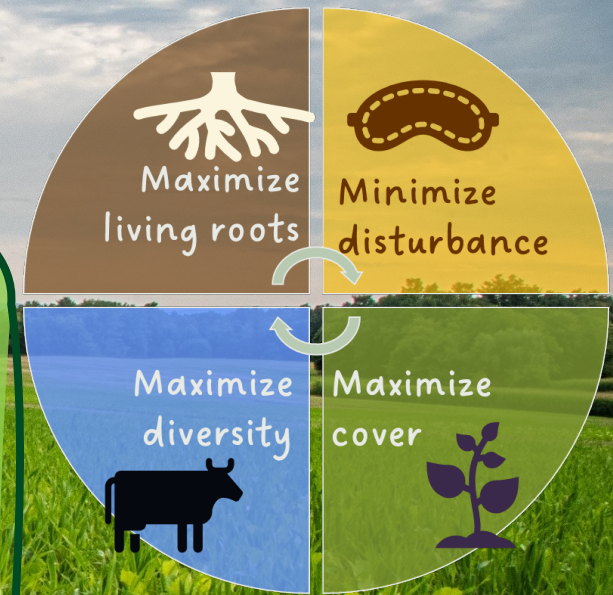


Build soil organic C

We also work with social levers of change.

Key Messages

- AFT is working to catalyze a **New Conventional Agriculture**
- **Biochar is a Tool in the Soil Health Toolbox:** to improve soil health, adaptation, resilience & mitigation
- Biochar applications should include the **right biochar** amendment at the **right rate** on the **right soil** to address a constraint.
- **AFT is a Bridge and Convener:** core funds support project development facilitating our work across policy, research, outreach, education, and implementation.



American Farmland Trust
SAVING THE LAND THAT SUSTAINS US



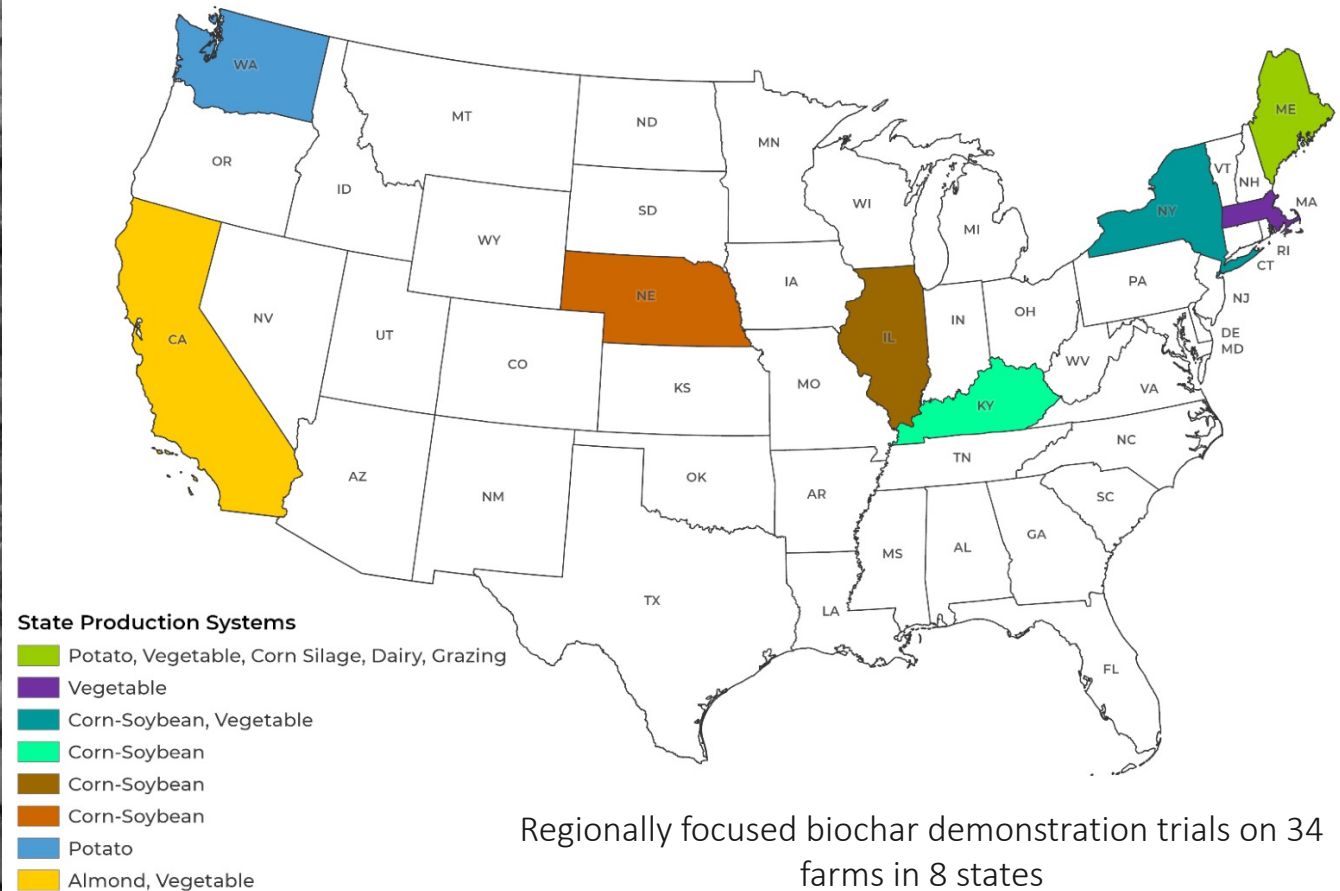
NATIONAL CENTER
FOR APPROPRIATE
TECHNOLOGY

Scaling Sustainable
Biochar Research &
Commercialization for
Agriculture & Conservation:
A Summary from a Stakeholder Convening
December, 2022



Breaking Down Barriers to Biochar Soil Health Demonstration Trial

- Showcase farmer-driven implementation of biochar in cropping systems
- Address regional issues
- Provide TA, FA, and peer-to-peer networking
- Quantify environmental, economic, and social outcomes



WA: high disturbance

NE: N₂O, NO₃

NY: Dairy manure biochar

ME: PFAS, high disturbance

MA: small scale vegetables

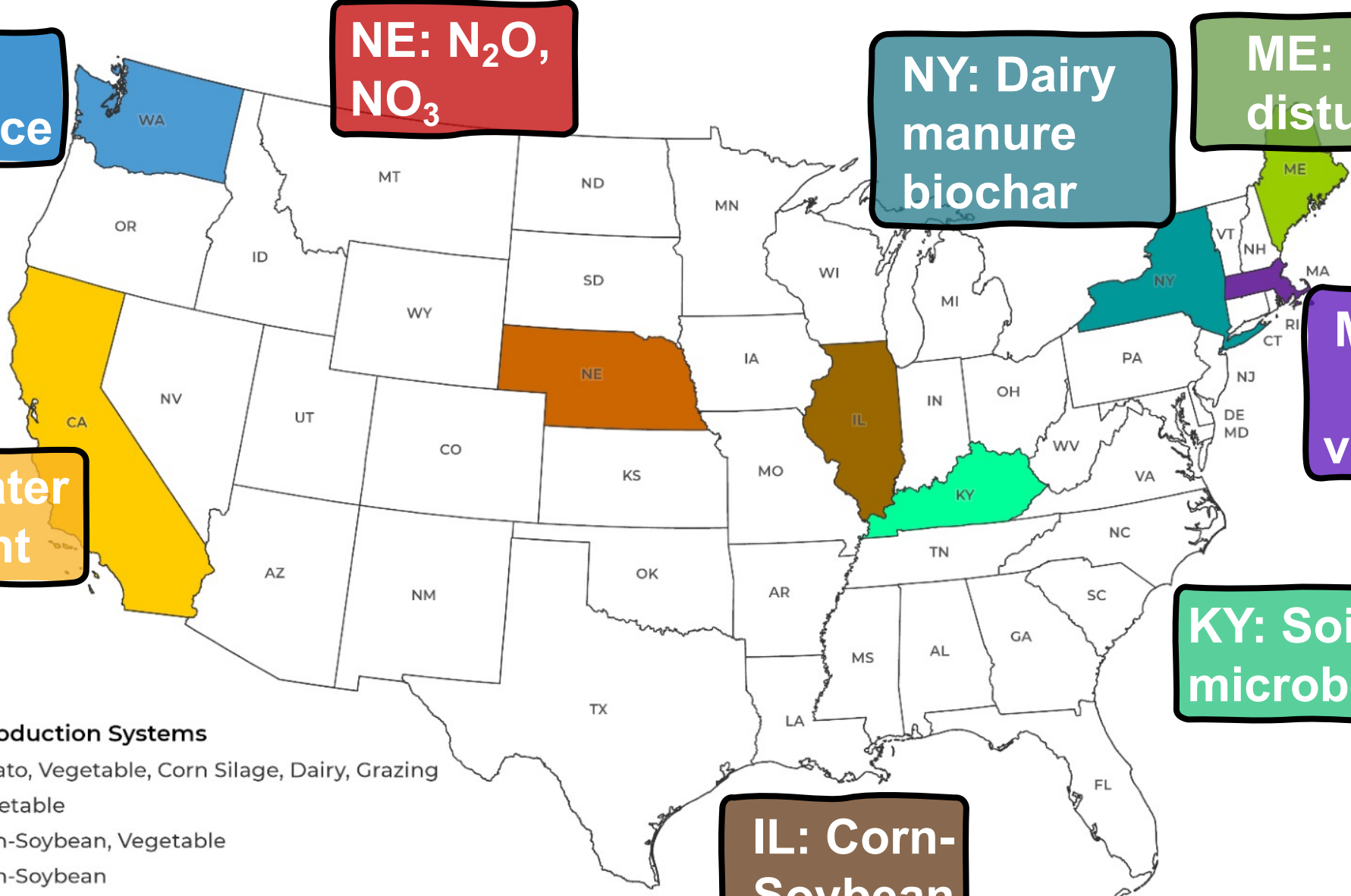
CA: Soil Water Management

KY: Soil microbes

IL: Corn-Soybean

State Production Systems

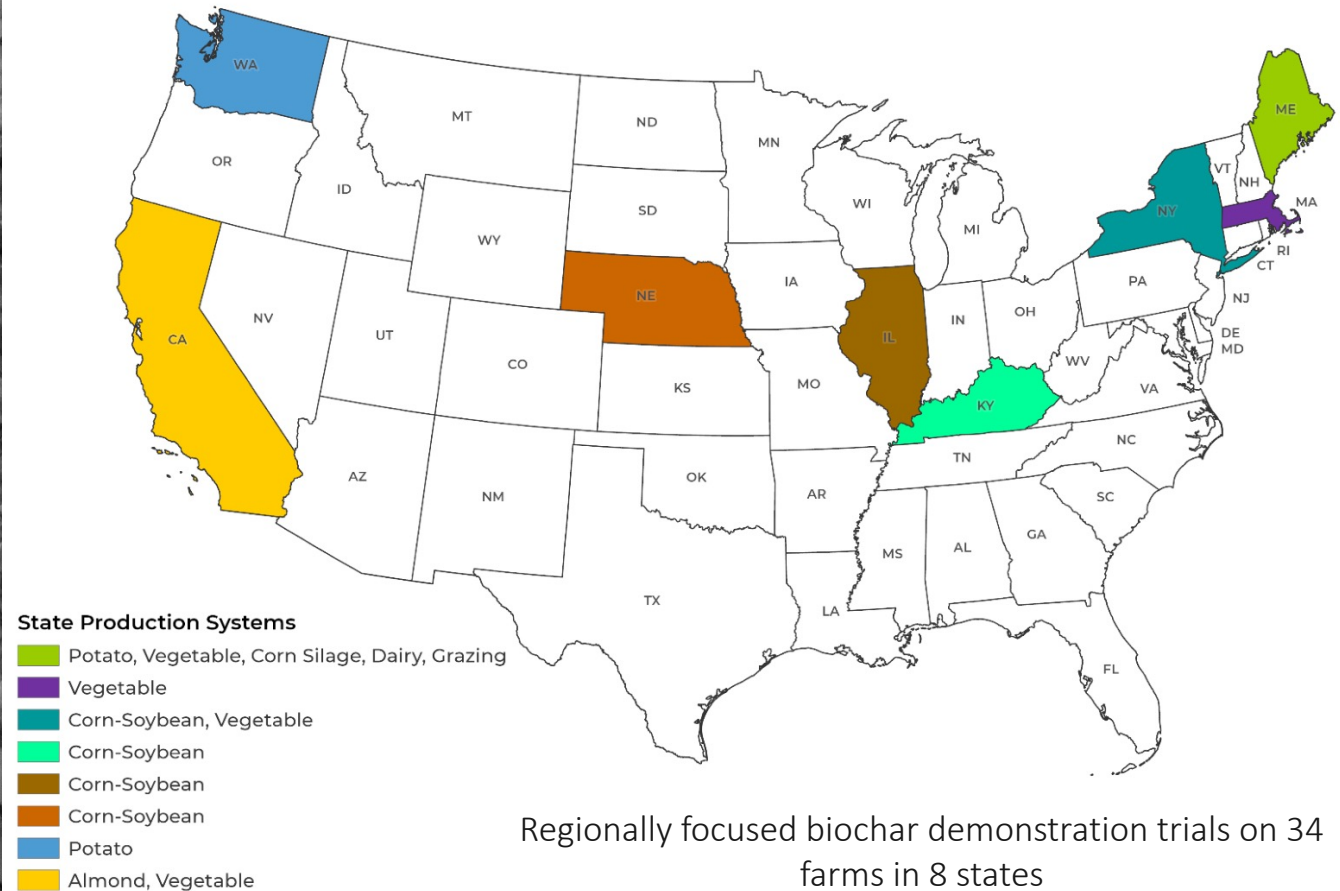
- Potato, Vegetable, Corn Silage, Dairy, Grazing
- Vegetable
- Corn-Soybean, Vegetable
- Corn-Soybean
- Corn-Soybean
- Corn-Soybean
- Potato
- Almond, Vegetable



Breaking Down Barriers to Biochar Soil Health Demonstration Trial

Many Partners

- Cornell University
- U of Nebraska-Lincoln
- U of Louisville
- USBI
- EarthOptics
- Myno Carbon
- Standard Biocarbon
- White Feather Farm
- The Ecology School



Regionally focused biochar demonstration trials on 34 farms in 8 states

Benefits

Engagement payments (~\$1000/ year)

Expert **technical assistance**

Small trial plots (designed for site-specific replication, <1 ac to 2.5 acres)

Free 1-time **biochar amendment** application

Yield loss payments (in the unlikely chance there are negative effects)

Free **soil testing** including soil health and soil carbon stock at start and end of project

Free **economic outcomes analysis** (partial budgets and T-charts)

Reports with baseline and treatment soil effects, economics and social survey results

Responsibilities

Share detailed **field operations** annually (e.g., tillage, crop rotation, planting, seeding rates, etc.)

Share **yield** information for experimental plots annually

Follow an agreed upon management plan for the duration of the project

Implement **biochar vs no** biochar treatments with AFT guidance.

Communicate any planned changes to operations prior to making those changes

Allow AFT partners and staff to conduct soil sampling at start and end of project

Engage with economists to answer operations questions to enable economic analysis

Complete all required surveys and participate in field days and outreach events

Producer Led Collaborative Effort to Fundamentally Transition the U.S. Beef Supply Chain Toward Carbon Neutral

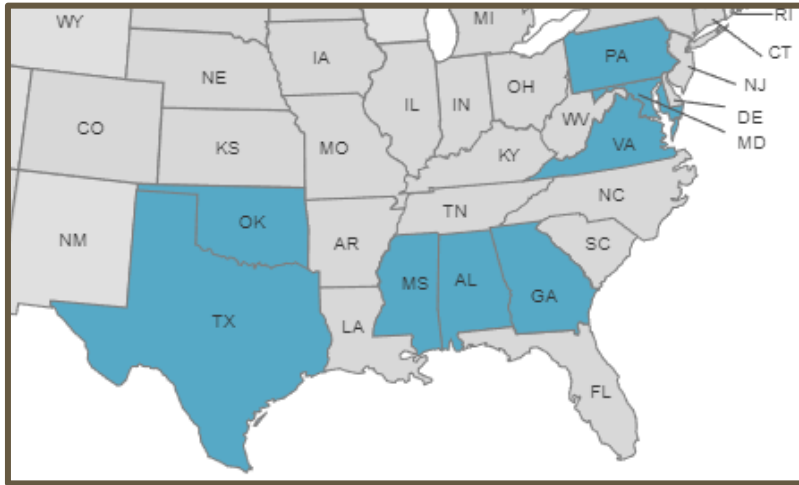
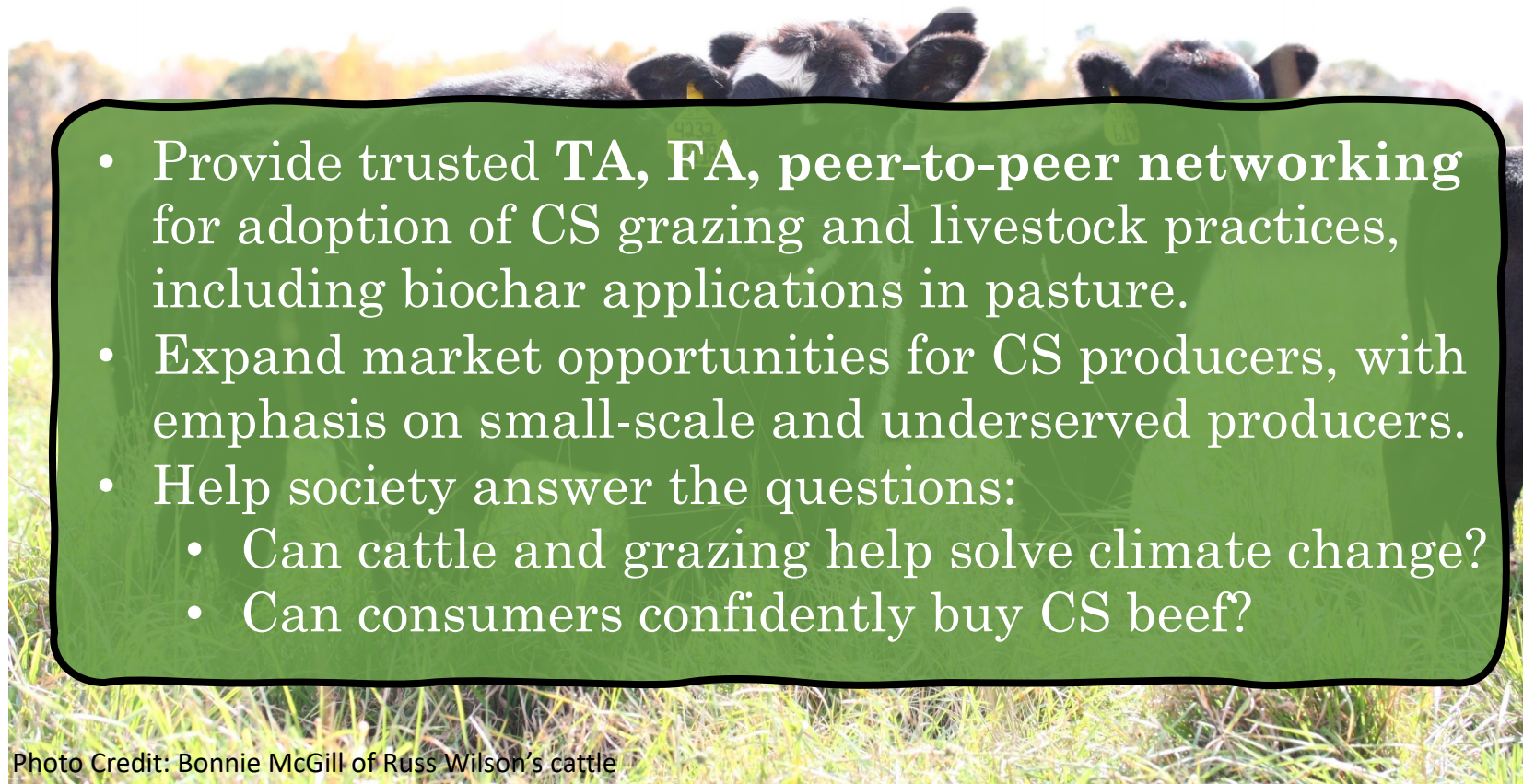
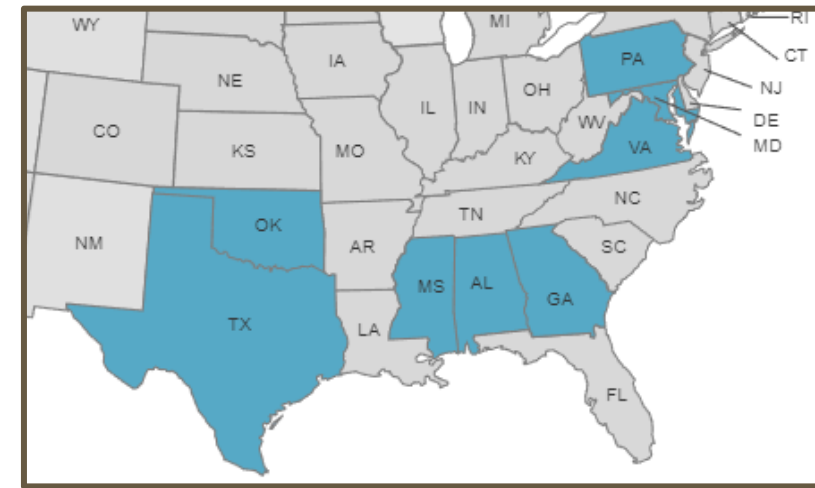


Photo Credit: Bonnie McGill of Russ Wilson's cattle



Producer Led Collaborative Effort to Fundamentally Transition the U.S. Beef Supply Chain Toward Carbon Neutral



- Provide trusted TA, FA, peer-to-peer networking for adoption of CS grazing and livestock practices, including biochar applications in pasture.
- Expand market opportunities for CS producers, with emphasis on small-scale and underserved producers.
- Help society answer the questions:
 - Can cattle and grazing help solve climate change?
 - Can consumers confidently buy CS beef?

Photo Credit: Bonnie McGill of Russ Wilson's cattle



For Generations to Come...



Open Technology Ecosystem for Agricultural Management

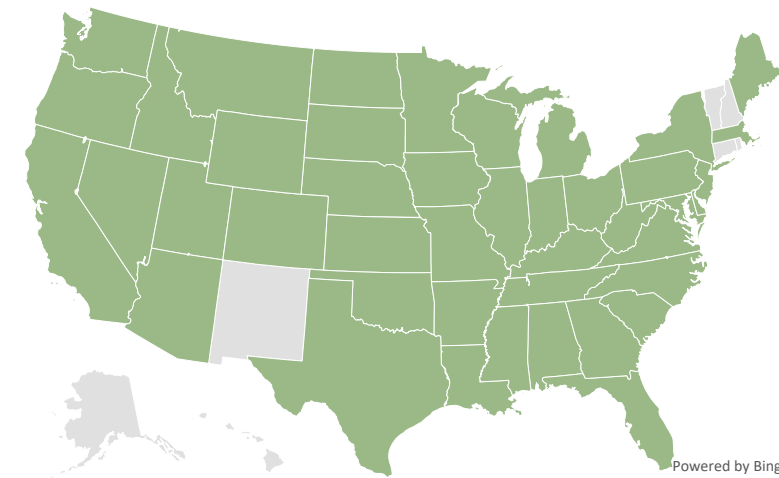


FARMER VETERAN COALITION



Climate SMART – Scaling Mechanisms for Agriculture’s Regenerative Transformation

- Provide trusted TA, FA, **peer-to-peer networking** for adoption of CS cropping practices through **Advanced SH Training**.
- Innovative practice on-ramping such as biochar
- **Expand market opportunities** for CS producers, with emphasis on small-scale and underserved producers.
- Build sustainable business models for continued adoption of CS systems



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In partnership with > 20 other partners and > 50 ag retail coops



Mentors Networks



Mentors and mentees at 2-day Ranching for Profit Workshop hosted by AFT and Virginia Forage and Grassland Council in 2023.

Photo credit: Becky Szarzynski.

- Mentors will receive structured training to expand knowledge
- Producer-led solutions
- Flexible and adaptive
- Compensated (reward early adopters)
 - Equipped to successfully support mentees, lead workshops and build networking groups
 - Subset will be certified NRCS TSPs



Planned trainings

- Advanced Soil Health Training
- NRCS TSP Certification
- Soil Health and Nutrient Management
- Record keeping – MMRV protocols
- Marketing CS Products
- Communication Training
- Farmland Protection

Photo by USDA.

Developing a Biochar National Decision Support Tool

- Cooperative Agreement with NRCS
- Collaboration of ARS-AFT-USBI to expand the PNW Biochar Atlas nationally
 - Research and model integration
 - Outreach and education
 - Technical resource development
- AFT leading outreach and education
 - 5 Live Conversations
 - 8 Webinars
 - Biochar Factsheets
 - NRCS Technical Note and Training



Photo Credit: Kristin Trippe, USDA-ARS



PBI webinar recordings can be found here: [PBI Webinars](#)

Practical Biochar Implementation Webinar Series

Webinar 1

Introduction to Biochar & Production Technologies
with Tom Miles, Executive Director, USBI





FARMLAND INFORMATION CENTER

Search "biochar"

1. FAQ about biochar applied to soil
2. NRCS Biochar Funding for US Producers – A Quick Guide
3. Biochar Basics: Current status of NRCS incentive payments
4. Beyond Application: Learning more about biochar
5. Biochar Guidelines for Agriculture Applications
6. Practical Biochar Implementation Webinar Series
7. Biochar Convening recording and resources

Biochar in Agriculture Toolkit

American Farmland Trust, in partnership with USDA Natural Resources Conservation Service, created the Biochar in Agriculture Toolkit to help break down the barriers to on-farm biochar adoption. The toolkit is a comprehensive collection of resources and tools to help farmers, ranchers, landowners, biochar producers and policy makers successfully plan and implement biochar application in agricultural systems.

Farmers & Service Providers

Biochar Producers

Policy Makers



Thank you!

These projects are supported by the USDA agreements:

NRC22IRA0011056,
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NR233A750011G029

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<https://farmland.org/membership/>

