NEW YORK STATE
Department of Agriculture and Markets
Soil and Water Conservation Committee

KATHY HOCHUL
Governor
RICHARD A. BALL
Commissioner
DALE STEIN
Committee Chair

Hudson Valley Carbon Farming Pilot Project
Final Narrative Report
2020-2024

The Hudson Valley Carbon Farming Pilot Project (HVCF) piloted the implementation of regenerative farm practices and the methods to study the carbon and other greenhouse gas sequestration potential of on-farm best management practices (BMPs) on Hudson Valley farms. The project implemented regenerative farming practices that mitigate greenhouse gases (GHGs) and established soil health monitoring and reporting practices that measure the effect of certain farming practices on carbon and nitrogen cycles and water holding capacity within the soil.

Cover crops in Columbia County.

Regenerative farming practices mitigate GHGs and improve soil health. Soil health practices such as cover crops protect the soil surface from the negative effects of rainfall and erosion during storm events. Cover crops improve soil health, making it an effective BMP for farmers.

The Dutchess County Soil and Water Conservation District (SWCD) along with four other Hudson Valley SWCDs (Columbia, Orange, Ulster, and Sullivan) worked to provide technical assistance and planning for the implementation of regenerative farming measures including soil health practices on 20 farms in the Hudson Valley. Farms and practice systems were chosen based on local Agricultural Environmental Management (AEM) planning that was underway with the farms.

Technical Assistance

SWCDs provided farms with technical assistance utilizing the AEM framework to guide each operation to implement regenerative agricultural practices including soil health management practice systems. The web-based COMET-Planner tool, developed and supported by USDA and Colorado State University, was used to estimate GHG emissions reductions per practice system.

Agricultural Environmental Management (AEM) Framework

SWCDs utilized the AEM framework to guide all elements of the projects. AEM tools for cover crop planning, project planning and implementation, and evaluation were completed throughout project implementation. SWCDS collected information on practice implementation to document implementation of the core practices being used: cover cropping, type, time of planting, and when terminated, use and rate of compost to help ensure the success of the practices and the continued implementation beyond the project timeframe.

Cover crops in Columbia County.

Soil Health Testing

SWCDs worked with farms implementing soil health practices to establish a baseline of soil data through soil analysis using the Cornell Comprehensive Assessment of Soil Health (CASH) Test. Soil samples were collected before and after implementation of soil health practices to measure the changes in the soil. Soil core samples are taken in a way that allows researchers to monitor change in topsoil organic matter and change in carbon content of subsoil layers over years. Once a baseline is established, soil health testing can help to determine changes in soil carbon, water holding capacity, compaction, nutrient levels, and other important soil health indicators. This is critical to understand the GHG reduction potential of these projects both because of increased soil sequestration and avoided fertilizer application. The duration of this pilot project did not allow enough time to show a change in soil data, but rather allowed a baseline to be established that the SWCD and farmer can use to track change moving forward. The analysis from soil health testing can be a useful tool for both the farmer's management and to understand soil nutrient, carbon levels, and other important soil health indicators. SWCDs will continue to use the CASH Test for documented trends and improvements in soil carbon and other indicators as they continue to work with the farms involved in this project.

Project Descriptions

Twenty farms varying in size and production type implemented regenerative BMPs through the HVCF project. Projects varied in size and the type of practices implemented. The following is a list of farms and projects implemented along with specific project information from three farms involved, including links to video highlights of their projects, created in partnership with Scenic Hudson.

Participating Farm Types

- Sweet corn and vegetable farms
- Apple and stone fruit orchards
- Organic field crops
- Dairy farms, including an organic dairy
- Small and larger scale organic vegetable farms
- Farms in the Orange County Black Dirt Region
- Mixed small livestock farms

BMP Systems Completed

- Soil Conservation Systems
  - Cover crops – single species 298 acres
  - Cover crops - multi-species – 270.30 acres
  - Reduced tillage management 72 acres
  - Residue management – 25 acres
  - Mulching natural material and purchase of a row mulcher to continued implementation of the practice – five (5) acres
  - Conservation crop rotation – 28 acres
  - CASH Soil Tests – 45+
- Soil carbon amendment – compost application two (2) acres
- Composting facility – two (2) units
- Water table management
  - Drainage water management - 18 acres
  - Subsurface drainage – 4,000 feet
  - Structure for water control – two (2) units
- Prescribed grazing – 78 acres
- Forage harvest management – 20 acres
- Forage biomass planting, native perennials - 10 acres
- Riparian forest buffer – three (3) acres

Water table management on farm in Black Dirt Orange County. Improved water management on farms through the implementation of conservation systems can significantly enhance a farm's resiliency to the impacts of climate change, including both drought and flood while enhancing soil health.

Farm Case Studies

Chaseholm Farm

Chaseholm Farm is an organic dairy farm in Dutchess County that implemented cover crops and forage harvest management in the form of "bale grazing" on 20 acres. **Forage harvest management** is the timely cutting and removal of plant material to be grazed by livestock. Perennial grasses, legumes, and other forbs in pastures and hay fields maintain a healthy root system in the ground year-round, providing a carbon sink in addition to many other co-benefits. Proper forage harvest management can optimize yield and quality of forage; promote

vigorous plant re-growth for continued carbon sequestration; promote uptake of nutrients; control insects, diseases, and weeds; and maintain or improve wildlife habitat.

Specifically, bale grazing is a winter-feeding strategy that promotes soil health in pastures during the following annual growing season. Soil health in pastures depends greatly on the contributions of livestock including manure, urine, and what is left in the form of decaying hay residue. All of this adds up to nutrients for the soil for the following season's pasture grasses. Bale grazing can be used to build soil organic matter on hillside pastures and other areas where soil resources may be degraded and pastures marginal. After bale grazing cattle on Chaseholm' s hillside pasture, pasture yields and soil health began to improve.

Willowbrook Farm

Willowbrook Farm is a dairy farm that has diversified livestock and direct to market vegetables in Dutchess County. For the HVCF Project, they implemented a riparian forest buffer on three (3) acres. A **riparian forest buffer system** is a portion of land planted with vegetation like trees, shrubs, and grasses between agricultural lands and a stream or watercourse. The vegetation in a riparian forest buffer system holds soil in place and filters run-off, resulting in decreased erosion and a reduction of sediment and other pollutants entering the water. Riparian buffers also provide carbon storage in plant biomass and soils; increase water storage on floodplains, reducing flood impacts; and provide habitat. This buffer system incorporates on-farm **agroforestry** with value-added varieties of berry and nut producing trees as well as sugar maples that can be harvested in the future. Multiple measures were taken to ensure the success of the buffer, including installation of fencing and utilization of mature plant stock.

Smiley Farm

The Smiley Farm is a dairy in Orange County that has worked with the Orange County SWCD to implement soil health practices. The farm implemented **multi-species cover crops and residue management,** which leaves plant material after harvesting to keep a vegetative cover on the soil. **Cover crops** are planted in fields instead of leaving bare soil exposed to rain, snow, and wind, which leads to erosion and run-off. The result is increased soil organic matter and soil carbon sequestration, decreased erosion, and reduced need for carbon intensive synthetic fertilizers.

GHG Reductions

Based on the COMET Planner tool, practices that were implemented are estimated to reduce GHG emissions by **265 metric tons of carbon dioxide equivalent (MTCO2e) per year**.

Outreach and Education

Outreach and education activities and videos were developed by Scenic Hudson to inform landowners and elected officials of the benefits of regenerative farming and soil health practices implemented through the Hudson Valley Carbon Farming Pilot Project. Two virtual outreach events were held that built awareness and provided updates on the HVCF projects. The events also promoted regenerative farming and provided soil health

education through presentations from the Cornell Soil Health Team and a panel of farmers involved in the project discussing soil health. A final in-field event at the Chaseholm Farm was held in October 2024 to provide a recap of the pilot project, tour the farm's pilot project areas, and discuss important lessons learned, next steps, and future goals for climate and farming programs, as well as workforce needs to assist farms in the effort to adopt regenerative farm practices.

- **Video Outreach Partnerships – produced by Scenic Hudson**
  - **Chaseholm Farm, Smiley Farm, and Willow Brook Farm Projects** – video link
  - **Composting at Keith's Farm –** video link
  - **Cover Crops at Prospect Holl Orchards** – video link
  - **Cover Cropping at Davenport's Farm** – video link

Project Outcomes

The successful projects from this regional pilot can be applied to farms across New York to help meet the State's climate goals. Providing technical and financial support along with outreach and education has helped expand the number of regenerative farming practices implemented on farms. The farms involved in this pilot expressed positive outcomes and continue to work with the SWCDs. In partnership with Scenic Hudson and the SWCDs, the virtual public outreach events and the final on farm event helped connect the work of this regional pilot to Cornell's soil health analysis and the goals set by New York State's Climate Act.

Lessons learned from this regional pilot project have been applied across the state through various Department of Agriculture and Markets (AGM) and New York State Soil and Water Conservation Committee (SWCC) programs including AEM and Climate Resilient Farming (CRF) to help meet Climate Act goals. For instance, soil health testing is now eligible to be cost shared with every project, focusing on soil health practices. This includes the more comprehensive CASH Tests. In addition, the pilot focused on bringing new farms into SWCD programs, including an emphasis on outreach. As a result of this clear objective and legislative request to broaden CRF participation, SWCDs in the pilot region and beyond have done more outreach to new, beginning and previously underserved farmers. The SWCC began focusing on beginning and underserved farmers in the CRF and AEM programs. This is done through the AEM Base Program, which provides non-competitive implementation funding to farms who may not have otherwise competed well in cost-shared competitive programs. This has also been accomplished through adding scoring criteria that incentivizes new farm participants and beginning farmers in the CRF Program. This resulted in over half of the 70 projects in the latest Round of CRF programming involving new farm participants or beginning farmers.

Thanks to this pilot, SWCDs and farmers in the Hudson Valley Region continue to work together through Department of Agriculture and Markets and SWCC programs. For example, through the CRF Program, county SWCDs in the pilot project area have been awarded nine contracts implementing practice systems for soil health, greenhouse gas emission reduction, and climate resiliency on 11 farms, totaling over $4.2 million.