



United States Department of Agriculture



Connecticut NRCS Soil Health Strategy 2020 - 2024



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Connecticut Soil Health Strategy

Background

Soils are connected to all USDA Natural Resources Conservation Service (NRCS) identified natural resource concern categories. Soils are the basic, vital resource that drives farm production and risk, as well as conservation. Functional soils as healthy soils secures national food production and reduces the affect from natural disasters, weather extremes and contributes to our society's well-being.

In 1993, soil quality was identified as an emphasis area of the USDA NRCS with the establishment of the Soil Quality Institute. The USDA NRCS Soil Quality Institute published the Guidelines for Soil Quality Assessment in Conservation Planning (USDA NRCS, 2001), Soil Quality Card Design Guide (USDA-NRCS, 1999), and the Soil Quality Test Kit Guide (USDA-ARS and NRCS, 1998). The guide provides suggested guidelines for assessing soil quality in the conservation planning process. The card provided instructions and interpretations for field tests and locally adapted soil quality assessment cards. The strength of the soil quality cards is from the active participation of farmers and locally led conservation activities.

In 2008 the Soil Change Guide - Procedures for Soil Survey and Resource Inventory was designed by the Soil Survey Division. This guide was developed for soil scientists and other inventory specialists involved with soil survey, vegetation, and ecological site or unit inventory work. The guide will help collect data to interpret soil change within the human time scale and describes a sampling system to measure dynamic soil properties (DSP) for all major land uses. This work has transitioned into what is currently a national effort of the USDA NRCS and Universities called the *Dynamic Soil Properties 4 Soil Health* (DSPs4SH) project and the development of Soil Health Technical Note No. 450-03, Recommended Soil Health Indicators and Associated Laboratory Procedures (USDA NRCS, 2019).

By 2010, a Soil Quality and Site Assessment Card was developed for Connecticut as a tool for people to assess soil quality on a site themselves, to assess the current status of soil quality and over time determine changes in soil quality affected by management, to communicate issues relating to soil quality and management options, and display locally selected soil quality and site assessment indicators and associated descriptive terms.

During this time, the Soil Survey Division, now Soil and Plant Science Division, was at the forefront of developing a series of information sheets for physical, chemical and biological indicators available to help conservationists and soil scientists with soil health assessment. Soil indicators were divided into physical, chemical and biological categories depending on how they affect soil function. Depending on the indicator and the method used to evaluate it, properties are assessed with no special equipment required in the field, laboratory, or even in an office.

In 2013, NRCS developed the Soil Health Division to provide leadership, vision, training, assistance, applied science and technology to integrate soil health efforts across the country. The new Division, in collaboration with partner organizations and stakeholders, lead to NRCS strategies and training to help producers implement science-based, effective, economically viable soil health management systems on

agricultural lands. The agency has supported technical and financial efforts towards soil health and provided leadership to a diverse range of partners.

The soil health effort continues to grow. Partners from universities, state agencies, agriculture and food industry and conservation groups among others are charging ahead to implement strategic actions within their respective scopes. The 2018 Farm Bill has provided the agency with a significant opportunity to integrate soil health throughout agency and departmental programs and services for our stakeholders.

The benefits of soil health include opportunities for both conservation and production as soil health management system focus on better soil function across a variety of soil types and growing regions:

- improved infiltration and reduced runoff
- increased soil water availability and resilience to extreme weather
- reduced erosion and flooding
- improved water and air quality
- improved nutrient cycling and retention
- improved habitat for soil organisms, biodiversity, and pest suppression
- reduced input costs and often improved yield and crop quality
- reduced risk to the producer and to society
- increased security and sustainability toward long-term food, fiber, and fuel production

Mission, Vision and Outcomes for Soil Health

Vision: To enhance the soil's capacity to function as a vital, living ecosystem capable of sustaining plants, animals, and humans.

Mission: To support the USDA mission and provide soil health science, training, guidance, and technical resources to landowners and partners to improve the function and vitality of our soil health across all landscapes.

Outcomes:

- Outreach and Education to increase the basic understanding of soil health.
- Sharing or Mentoring between producers, partners, organizations, and States the successes and failures of methods to improve soil health.
- Educate staff, partners, and producers to be familiar and comfortable teaching practices to benefit soil health.
- Collect science-based data on soil health management systems on all landscapes, including cropland, pastureland, forests, and urban land.

Strategic Goals

Connecticut will use this plan to coordinate efforts, and update as conditions change or information becomes available, over a period of five years (2020-2024) to work towards the following strategic goals.

1. Increase soil health management systems implementation
2. Build technical expertise of Connecticut NRCS employees and partners.
3. Advance and expand partnerships around soil health.
4. Expand education and outreach of soil health.
5. Evaluate, Quantify, and Share Benefits and Outcomes of soil health

1. Increase Soil Health Management Systems Implementation

Soil health is the foundation of many aspects in conservation planning and implementing NRCS technical and financial assistance programs. Connecticut NRCS will prioritize the successful implementation of soil health conservation practices with farmers and landowners through the following objectives and actions:

- I. **Science and Technology Development & Integration: Provide updated Soil Health science & technology used by agency that is relevant for our partners and landowners**
 - a. Connecticut NRCS will identify a Soil Health Team consisting of different disciplines within the office, which may include, but not limited to Soil Conservationists, Agronomists, Resource Conservationists, Soil Scientists, and MLRA Soil Survey Office Staff.
 - b. State Resource Conservationist (SRC) Staff and the Soil Health Team will identify and update conservation practice standards and financial assistance program guidelines to meet producer needs and address Soil Health systems.
 - c. Soil Health Team staff with assistance from Soil and Plant Science Division and the Soil Health Division, will participate in meetings, emails, or conferences with leading research institutions and scientists, key innovative or successful producers and others to analyze the latest soil health information, research, and technologies related to SHMS. This information will be incorporated into guidance and technical resources to help conservation planning efforts address which address soil health.
 - d. Soil Health Team staff will coordinate efforts to collect, evaluate, and share data with the Soil Health Division and Soil and Plant Science Division. This includes collaboration on the soil health database and soil health management systems documentation in the Ecosystem Dynamics Interpretive Tool (EDIT), technical documents, or other initiatives related to soil health.
 - e. Soil Health Team staff will evaluate annual financial, programmatic, and technical efforts in the field offices and engage conservation planners and technical employees for feedback regarding implementation soil health management systems in the field.
 - f. Soil Health Team staff will evaluate and adopt Soil Health assessment tools as they become available and relevant for use within the State.

- II. **Planning and Program Delivery: Soil health principles should be integrated and evaluated as part of the conservation planning process and used to encourage new program applications related to soil health systems implementation.**
 - a. Soil Health Team staff should maintain communication with the Soil Health Division regarding the four national goals of training, assessment, planning and implementation of soil health management systems.
 - b. Soil Health Team staff will contribute toward regional soil health agreements, projects, and related datasets to support soil health program delivery. Existing efforts include:

- i. UConn Soil Health Agreement sampling dates open to interested staff, as conditions warrant or provide training related to sampling techniques and science behind the test analysis.
 - ii. Connecticut Agricultural Experiment Station Dynamic Soil Properties sampling dates open to interested staff, as conditions warrant or provide training related to sampling techniques and science behind the test analysis.
 - iii. Other projects that are developed within the 5 year time frame.
- c. State will evaluate the financial assistance opportunities annually with the State Technical Advisory Committee.
- d. State will use financial assistance programs to encourage adoption of new technologies and systems of practices to improve soil health.
- e. Soil Health Team staff will update resource concerns, planning criteria, and practice standards to adequately provide for soil health management system planning and implementation.
- f. Soil Health Team staff will evaluate annual financial agreements and programmatic contracting results to deliver and implement soil health management systems.
- g. Soil Health Team staff will review and evaluate an annual summary of integration and implementation of soil health management systems or practices across State programs.

2. Enhance Technical Expertise and Capacity

Educate staff and partners to become proficient in soil health management systems. Encourage collaborative efforts towards training, implementation and sharing information. All conservation planners and applicable staff will work to maintain skill, knowledge, and ability of soil health practices with regular trainings or materials to remain knowledgeable of new technologies.

Objectives and Actions

III. Soil Health Training Resources and On-the-Job Training:

- a. Supervisors will ensure employees communicate their Soil Health training needs as early in the fiscal year as reasonable, and throughout the year as applicable, to be added to the State training plan.
- b. Supervisors will work towards having all Certified Conservation Planner staff receive Soil Health training.
- c. Supervisors will promote or encourage relevant field and state staff attendance at soil health workshops to improve practical knowledge of local cropping and grazing systems.
 - i. RC&D Soil Health Agreement: Composting and Soil Health (Fall 2020)
 - ii. SARE/UConn Animal Systems and Grazing: spring 2020 classroom (3) and summer 2020 field days (3)
 - iii. Southern New England Grazing Network: summer 2020 webinars (4)
 - iv. NRCS interstate Soil Health Training for Soil Conservationist Certification: spring 2021
 - v. Other training opportunities as identified

- d. State Soil Health Team staff and Partners will recruit skilled educators to provide training in presentation, media and instruction related to soil health.
 - i. Soil Health Division webinars or trainings
 - ii. AgLearn soil health modules
 - iii. RC&D Soil Health Agreement
 - iv. American Farmland Trust potential trainings or demonstrations specific to soil health
 - v. NOFA potential trainings or demonstrations specific to soil health
- e. Soil Health Team staff will look for On-the-Job (OJT) opportunities between soil scientists and field staff.
 - i. Soil test pits and ground penetrating radar investigations to be made prior to requested programmatic contract practices to describe historical land use and evaluate soil properties and characteristics.
- f. Soil Health Team staff will coordinate field teaching activities with staff and partners for regional soil health agreements and Soil Survey Office (SSO) Dynamic Soil Properties (DSP) projects.
 - i. UConn Soil Health Agreement DSP for Soil Health (DSP4SH) sampling dates open to interested staff, as conditions and needs warrant. Provide training to field office staff related to the In-field Rapid Soil Health Assessment method, along with full soil characterization sampling techniques and science behind the test analysis.
 - ii. Connecticut Agricultural Experiment Station DSP sampling dates open to interested staff, as conditions and needs warrant. Provide training related to full soil characterization sampling techniques and science behind the test analysis.
 - iii. Other projects that are developed within the 5-year time frame.
- g. Soil Health Team staff and Supervisors will look for opportunities to cross train disciplines – engineers, foresters, soil conservationists, agronomists, biologists, soil scientists, or other disciplines to understand the importance of soil health and how soil health affects common resource concerns for better integration of systems across disciplines.

IV. Building Soil Health Expertise amongst Connecticut NRCS Soil Health Team

- a. State will encourage State and area soil health specialists to obtain training towards professional certification and continuing education (e.g. American Society of Agronomy Certified Crop Advisor: Sustainability Specialty (ASA-CCA-SPP)).
- b. State will identify and promote attendance at annual regional or national level conferences and meetings, pending budget availability, to provide continuing education and technical exchange.
- c. State will explore/create MOU's and agreements with key partners to help host and deliver introductory and advanced soil health events and training. States will assist with current soil health agreements and soil survey projects.
 - i. RC&D Soil Health Agreement (existing)
 - ii. Soil and Plant Science Division and UConn Soil Health agreement (existing)
 - iii. Soil Survey Office DSP project (existing)

3. Build Partnerships

Connecticut’s soil health successes are the direct result of strong partnerships between conservation groups, agriculture groups, government groups, and institutes of higher learning. To further support and build a soil health network among our partners Connecticut NRCS will work to maintain and expand these partnership opportunities to increase the learning of soil health systems and share the learning and knowledge of soil health systems across different landscapes. Important partnerships within the state include, but are not limited to:

CT RC&D	Conservation Districts
Council on Soil & Water Conservation	Governor’s Council
American Farmland Trust	Working Land Alliance
Northeast Organic Farmers Association (NOFA)	UConn College of Agriculture, Health & Natural Resources
UConn Extension	Connecticut Ag Experiment Station (CAES)
UConn Forestry	Sustainable Ag Research and Education (SARE)
Northeast Organic Farmers Association (NOFA)	Yale Forestry
New England Grazing Network	Certified Crop Advisors – Northeast Region
Soil & Water Conservation Society – Southern New England Region	Northeast Cover Crop Council

Objectives and Actions

- V. **Engage local, State, and National partners to ensure opportunities for a joint focus on soil health are captured for the State**
 - a. State will include partner staff in agency training opportunities to further their knowledge of soil health.
 - a. RC&D Job Jump-Start employees integrated with NRCS offices
 - b. Conservation Districts working in cooperation with NRCS offices
 - c. Technical Service Providers (TSPs) related to ag or forested planning
 - b. Soil Health Team staff will enlist the help of Soil Health Division and Soil and Plant Science Division specialists to provide support to local, regional, and national stakeholders, when needed.
 - c. Soil Health Team and Partner staff will communicate with private agricultural business entities regarding their current efforts towards soil health and sustainable agricultural production and look for collaborative opportunities to work with NRCS to promote or encourage soil health.

- a. Communicate with local businesses or consultants such as, but not limited to: V-Town Ag Supply, Johnny's Ag Services, Kings Agri-Seed dealers, Nutrient Ag Solutions (former CPS)
- d. Soil Health Team and Partner staff will work to engage stakeholders to hear their concerns and engage stakeholders in soil health opportunities.
 - a. On-farm site visits
 - b. Farmer meetings
- e. Soil Health Team and Partner staff will promote available programs or demonstrations with stakeholders to encourage and promote soil health.

4. Expand Education and Outreach

Support soil health education, collaboration and outreach efforts to help communicate a consistent message and key mechanisms of soil health to help educate stakeholders. Stakeholders include but are not limited to producers, conservationists, decision-makers, lawmakers, and the general public. Expand education and outreach about soil health systems and programs, demonstrations, or examples within the State.

Objectives and Actions

VI. Leadership communicates soil health as an agency priority

- a. Communicate timely information on soil health during recurring calls or meetings with stakeholders, boards and partners.
 - a. Quarterly Soil Health Division updates to states
 - b. Announcements for upcoming training opportunities
- b. Provide staff time and resources to soil health outreach to external opportunities (Ag Fairs, Job Fairs, School or College Events)
 - a. SARE Animals & Grazing education events: 3 classroom and 3 field events in 2020
 - b. NOFA summer meeting (2020)
 - c. UConn NRCA summer training
 - d. RC&D CT CIG soil health roller/crimper trial and demonstration
- c. Share the State soil health strategies with State Technical Advisory Committee (STAC), stakeholders, partners, and producers.
 - a. Quarterly STAC meetings
 - b. Quarterly District meetings
 - c. Invited programs (NOFA, RC&D, SARE)
- d. Provide outreach and education regarding soil health principles to agricultural producers throughout State.
 - a. RC&D Soil Health Agreement Compost and Soil Health (Fall 2020)
 - b. RC&D CT CIG soil health trial and demonstration (ongoing)

VII. NRCS and Partner employee's participation in educational and outreach opportunities to promote soil health

- a. State and Area Specialists are available and supported as presenters and trainers at soil health events.
- b. Provide education and promote use of soil health demonstrations (e.g. aggregate stability, infiltration, the small, and in-field rainfall simulators that can demonstrate soil function).
- c. Have soil health-focused educational resources on-hand and provide when asked.
- d. Support staff time and efforts to provide soil health presentations and assistance at local events when practical (e.g. SWCD workshops, poster contests, Earth Day activities, Envirothon competitions, Future Farmers of America meetings, agricultural fairs, field days, pasture walks).

5. Evaluate, Quantify, and Share Benefits and Outcomes

Evaluate soil health management practices to better describe and promote soil health management systems with local research institutions and stakeholders. Follow-up and evaluate effects and programs related to soil health management systems with our customers, stakeholders, and partners. Work to make adaptive changes or assure the soil health management systems are practical, logical, and relevant, as new science and technology emerges.

Objectives and Actions

VIII. Develop mechanisms for quantifying soil health outcomes with agency tools - assess soil health benefits

- a. State will adapt national In-Field Assessment tools for planners to capture and document relevant field conditions and soil health resource concerns.
- b. State will promote use of soil health sampling methods to assess and track soil health outcomes.
- c. State Soil Health Team will update the regional Soil Health Division on local use of USDA and NRCS Tools, models, and reporting system to capture adoption trends and progress in soil health management systems.
- d. State Soil Health Team and Partners will facilitate input and feedback from producers and stakeholders on best methods to measure changes in soil function using programs or teams such as State CIGs, producer roundtables, or the State Technical Committee.
- e. Support regional and national data collection for soil health with Soil and Plant Science Division and local partners, UConn researchers, on common landscapes and soils within the state, over a variety of land cover types including corn fields, hay fields, forest, and urban areas.
- f. Assist SSO and CAES with collection of Dynamic Soil Properties data on forest lands to support development of meaningful Forest Soil Health practices.