



United States  
Department of  
Agriculture

Natural Resources Conservation Service



# Soil Health Updates

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# PARTNERSHIPS



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# Economics of Soil Health Systems on 30 U.S. Farms

## ECONOMICS of Soil Health Systems on 30 U.S. Farms

### EXECUTIVE SUMMARY

Improving soil health can help farmers build drought resilience, increase nutrient availability, suppress disease, reduce erosion, and reduce nutrient losses. Many soil health management systems (i.e., a suite of soil health practices) also benefit the environment by storing soil carbon, reducing greenhouse gas emissions, and improving water quality. However, investing in soil health management systems (SHMS) is also a business decision. This project was conducted by the Soil Health Institute (SHI) and the National Association of Conservation Districts (NACD) to provide farmers with the economic information they need when making that decision.

A total of 30 farms from across the U.S. with an established history of successful implementation of SHMS in crop production were selected for this project. NACD interviewed these farmers to learn about their farms and experience with adopting SHMS, and we interviewed them to acquire production information for evaluating their economic impact on partial budget analyses. Using this approach, the costs and benefits of a soil health system are compared before and after adoption of that system. A detailed description of the partial budget methodology can be found on the SHI website: <https://soilhealthinstitute.org/economics/>.

Crops for partial budget analyses included corn, soybean, cotton, wheat, sorghum, grain sorghum, milo, pea, peanut, soybean, sorghum, rice, wheat, and wheat. Cover crops were planted on 29 of the 30 farms, but not before every cash crop. Two farms produced organic crops in a soil health management system, while four farms planted additional wheat to graze their cover crop.

Recognizing that each farm is unique, and the specific economic information on each farm is provided in the corresponding fact sheet, the following generalizations were found:

- On average, after implementing a SHMS, it cost producers \$14/acre less to grow corn, \$7/acre less to grow soybean, and \$8/acre less to grow all other crops.
- Adopting a SHMS not only reduced expenses, but also increased net farm income.
- Across 29 farms, SHMS increased net farm income by an average of \$63/acre if organic farm was excluded due to high revenue from price premiums that would offset the average results.
- Yield increased due to SHMS were reported for 42% of farms growing corn, 52% of farms growing soybean, and 25% of farms growing other crops.
- Cover crop seed costs averaged \$21/acre for corn, \$16/acre for soybean, and \$25/acre when used with other crops.
- Four farms grazed cover crops, allowing them to increase revenue by an average of \$26/acre.
- Additional reported benefits of adopting SHMS included decreased erosion and soil compaction, water access to fields in wet years, and increased resilience to adverse weather, among other benefits.

Logos: National Association of Conservation Districts, SOIL HEALTH INSTITUTE, USDA

NRCS has a strong desire to understand economic and social considerations of producers with and without soil health systems. The Soil Health Division has been working with a number of partners to understand the economics of soil health and social considerations towards soil health systems. One of which is Soil Health Institute who recently released a report on the economic of Soil Health systems on 30 U.S. Farms. We realize that traditionally producers use crop yield as a metric of success. These studies show that by utilizing economic analyses that include whole farm budgets to determine the economic impact of soil health systems, we see across the board so far that when soil health systems are incorporated, producers have less ‘inputs’ and as a result, an increase in profit.



# CONSERVATION PRACTICE STANDARDS



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## CPS 336: Soil Carbon Amendment

Practice Standard 336 Soil C Amendment allows producers who have resource concerns that include Improving or maintaining soil organic matter.

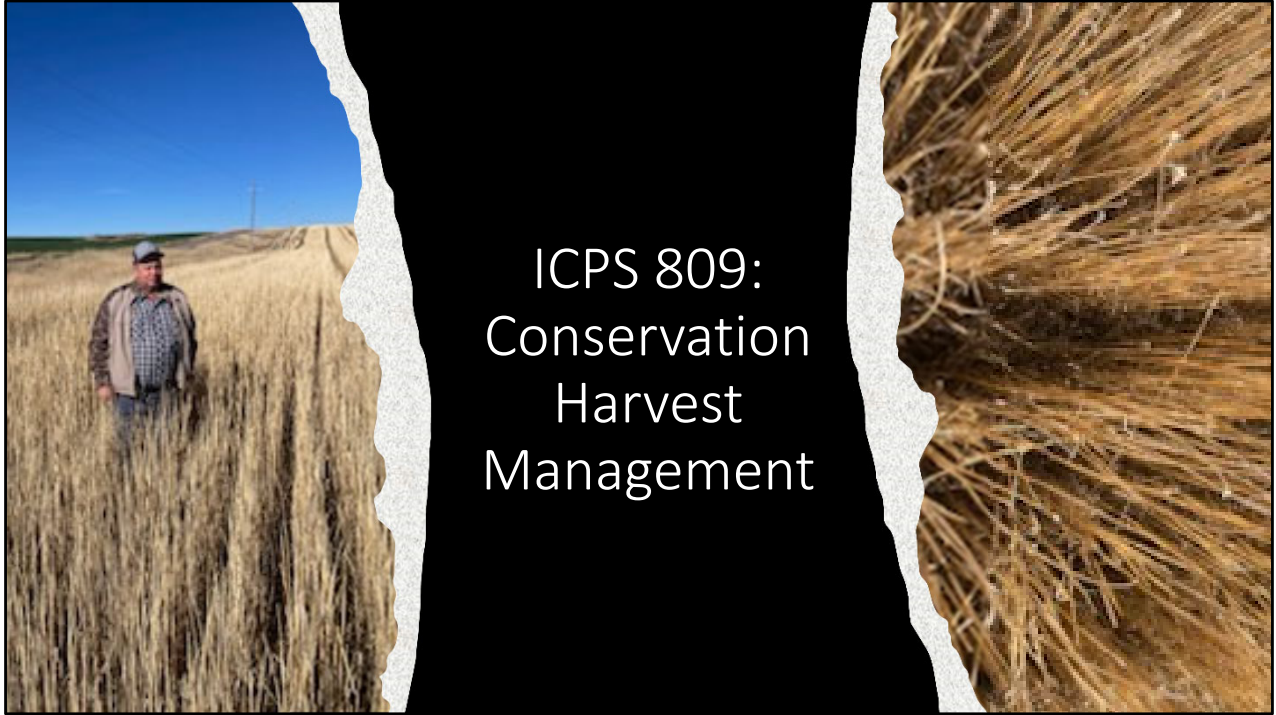
Sequester carbon and enhance soil carbon (C) stocks.

Improve soil aggregate stability, and  
Improve habitat for soil organisms,

To use amendments like biochar, compost, bagasse,

and other regional C amendments to improve soil org. matter, sequester C, and improve agg. stability and habitats for soil organisms.





Interim Practice Standard 809 Conservation Harvest Management uses a Stripper header to leave standing residue to capture snow for the purpose of

**Increasing naturally available moisture use**

**Enhancing plant productivity and health**

**Reducing sheet and rill erosion**

**Reducing wind erosion and**

**Increasing soil organic matter**

**Interim practice is not adopted yet by Nebraska.**

ICPS 825:  
Culturally  
Significant  
Plantings for Soil  
Health



Interim Practice Standard 825 Culturally Significant Plantings for Soil Health is very new. It was led by Washington State and became official 3 weeks ago.

The practice is designed to manage and improve a soil ecosystem by growing two or more culturally significant plants together using biological and cultural strategies that foster the cycling of resources and promote biodiversity.

The resource concerns it addresses include:

Improve soil organism habitat and diversity.

Maintain or increase soil organic carbon.

Improve soil aggregate stability.



Improve naturally available soil moisture use.



# IN-FIELD SOIL HEALTH ASSESSMENTS



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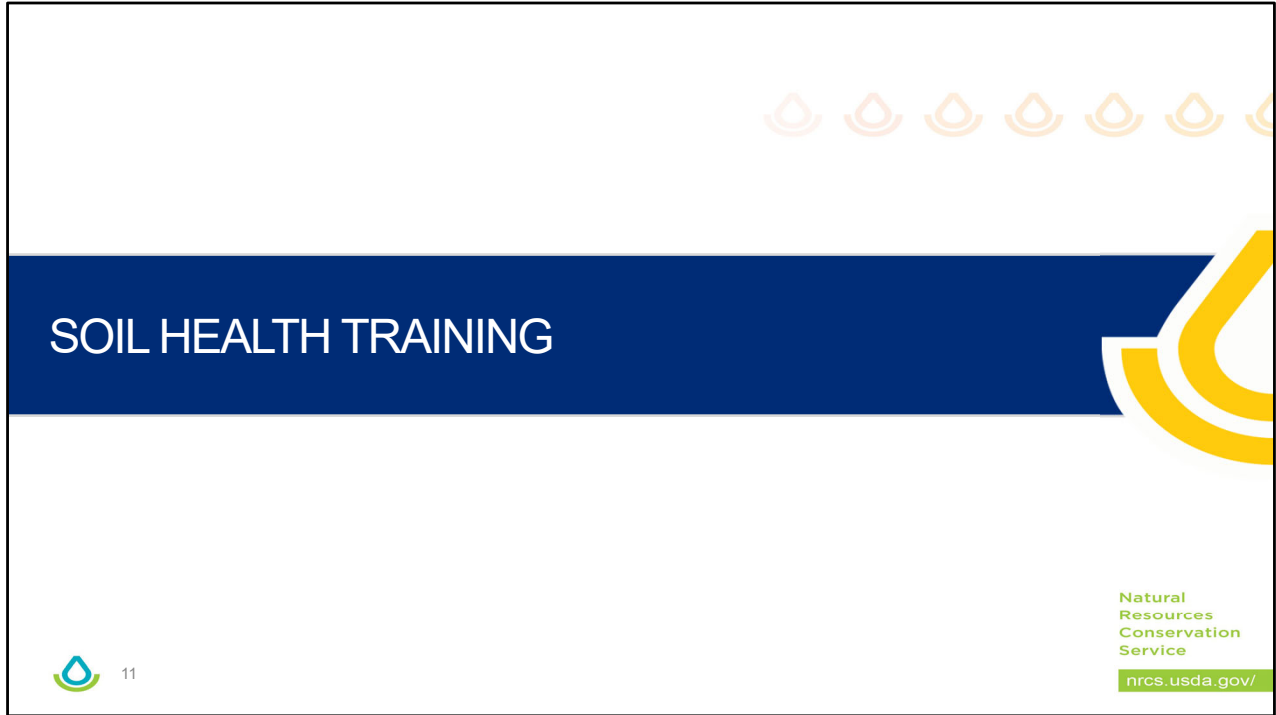
## Forest In-Field Soil Health Assessment

SHD completed the pilot for the Forest In-Field SH Assessment. Like the Cropland IFSHA, it allows a field planner and producer to walk their forest stand and evaluate for things like soil platinness, infiltration, qualitative assessments of above and below ground organic matter. This tool can be used to identify resource concerns which can assist the NRCS planner and land owner determine which conservation practices are most suitable to address the resource concern(s).



SHD will be releasing next week the Rangeland In-Field SH Assessment to the states for review. The goal is to complete the pilot and have the tool ready to release for FY2.

Like the Cropland and Forest IFSHA, it allows a field planner and producer to walk their range and evaluate for things like soil platinness, infiltration, and qualitative assessments of above and below ground organic matter, plant community establishment, to name a few. This tool can be used to identify resource concerns which can assist the NRCS planner and landowner determine which conservation practices are most suitable to address the resource concern(s).



Soil health spans all disciplines. The SH Division is excited to pilot a number of new training this year specific for our technical and field staff to better assist farmers, ranchers, and forest owners. In FY23, the SH Division provided over 300 in-field trainings, webinars, technical assistance, and other support across the U.S.



## Rangeland Soil Health

Training on Rangeland SH in conjunction with the National Grazingland Team and States are conducting multiple pilot trainings this spring. In FY25, these trainings will be offered across the U.S.





Silvopasture  
for  
Soil Health

The SH Division hired Dr. Tom Sauer, retired ARS Scientist and Greg Brann, retired NRCS Rangeland Mgt Specialist to work with our staff in partnership with the National AgroForestry Center to develop technical notes and fact sheets for both internal and external use; in addition to developing new training and provide relevant content on soil health for existing training. The Division is piloting a 3-day course this spring.



This trailer; the first of four, will be utilized by the division during trainings and presentations to show how management and land use decisions affect dynamic soil properties. These trailers will also be able to be reserved and utilized by NRCS staff from states within the regions at events and trainings they may be hosting. Outfitted with a rainfall simulator, a wind erosion simulator, and other soil health hands-on demonstrations, these trailers will allow the division to increase soil health outreach to both producers and staff.



## Advanced Cropland Soil Health Training

This year, the SH Division offered several Advanced Cropland Soil Health Trainings across the U.S. New to the Division, we offered Train-the Trainer, providing content training to state technical leads so that they can provide training to their respective staffs.





## Urban Soil Health

A few years ago, USDA stood up Urban Agriculture. To meet the needs of producers in small farms and urban agriculture, the SH Division brought on an Urban SH Specialist, Dr. Joshua Benniston. Recently, the Division released 3 technical notes specific to soil health in urban agriculture. Also, 3 courses were piloted in 3 states, and these courses now make up a 3-day course that will occur in May.

## Indigenous People's Team



The SH Division is really excited to support the Secretary's desire to develop new programs or improve existing ones to address the needs of our indigenous partners. The SH Division's Indigenous People's Team has done outstanding work to develop agreements that address the social indications of SH adoption, evaluate current practices to look for opportunities to support traditional ecological knowledge, and develop new practices that support conservation efforts of indigenous communities that spans hundreds of years. An example I mentioned earlier is the cultural plantings for soil health. I should mention that our conservation practices are program neutral meaning that all practices can be used by any participant regardless of background.

CONSERVATION EVALUATION & MONITORING  
ACTIVITIES (CEMA)





## CEMA 216: Laboratory Testing for Soil Health



Great opportunities to consider:

Conservation Evaluation & Monitoring Activities aka CEMAs are opportunities for producers to monitor and/or evaluate the conservation plans. They can be utilized at any step of the conservation planning process. They can be used to identify or validate a resource concern, determine how well a practice or suite of practices are improving soil health indicators. For example, if utilizing ICPS 825 culturally significant plantings for SH, a producer would add CEMA 216 SH Testing to their plan and would test for something like soil respiration to quantify a baseline. After implementing a new practice to address microbial activity, a producer would test the soil again using CEMA 216 1 to 3 years later for comparison. CEMAs can be planned yearly.

Producers who share their data with NRCS will receive back an SH Assessment Protocol & Evaluation (SHAPE) score for each SH indicator. What this does is compare the soil test results to soil information for similar soils within their area. The SHAPE score ranges from 0 to 100, where 0 suggests that the soil is severely degraded and has a ways to go to meet its maximum potential and 100 suggests that the soil is at its maximum potential. This information is very helpful to the producer because it helps them and the NRCS planner design the management plan in a way for the producer to meet the soil's maximum potential.



Similar to 216 is CEMA 221 Soil C Stock Monitoring. This is an opportunity for producers to have C stock data where soils are collected to a 1-m depth and analyzed for C and bulk density to calculate C stocks. The CEMA is designed in a way that the data could be used for those interested in C markets.

The design is also aligned with the USDA national effort to quantify C stocks nationally. Producers who participate in the Citizen Science option of the CEMA, agree to provide NRCS the soil test results as well as a completed management survey. The data collected will be added to the national database and aggregated to provide summaries of C stocks at the regional and national levels. Data collected will also provide the minimum dataset necessary to run the COMET –Farm and COMET-Planner models that will allow producers to simulate a variety of conservation practices on their land to determine which practice or suite of practices address the resource concerns or mitigate GHG emissions and/or sequester C.



## Virtual Soil Health Partnership Roundtable

- Initial session: September 26, 2023
- Invitation from [Carl.Koch@usda.gov](mailto:Carl.Koch@usda.gov)

In September, the SH Division began its quarterly Partnership RTs. It's an opportunity for stakeholders to learn about what we are doing within the division to address SH and an opportunity for us to learn about what you are doing to support SH and producers. Please reach out to Carl Koch if interested in joining us.