

Soil Carbon Amendment CPS 336

Instructional Guide & Lesson Plans for Training Modules – 2025 Official Course

NRCS Soil Health Division

The Soil Health Division is committed to providing quality training materials and guidance related to the execution of our training courses.

This Instructional Guide is intended to provide instructors with a course summary and key information to aid in the selection of field sites, classroom and field materials, references for each module within the lesson plans, and other pertinent information to ensure smooth and professional delivery of the content to participants.

All Module presentations and supporting materials are provided by the Soil Health Division for this course. If hosting entities would like to augment presentation materials with photos or details applicable in their geographic area, they are encouraged to do so via collaboration and approval by their assigned Regional Soil Health Specialist.

The materials for this Soil Carbon Amendment CPS 336 training were developed by the following individuals, all of whom are affiliated with the NRCS Soil Health Division.

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Overall Course Objectives:

This class seeks to support participants as they evaluate and manage soil health as a component of conservation planning for soil carbon amendment. The training will build knowledge and skills to evaluate soil health and plan for the application of carbon-based amendments derived from plant materials or treated animal byproducts.

Overall Course Duration: 1-day course: Combination of in-class and in-field.

Overall Course Description:

This is an in-person training course which serves to expand the knowledge and application of soil health practices and soil health management systems in response to exacerbating effects of drought, reduced soil moisture, and other factors as integral parts of the conservation planning process on crop, pasture, range, forest, associated agricultural lands, developed land, and farmstead. Key focal areas of the course will be on utilizing this conservation practice to improve or maintain soil organic matter, sequester carbon and enhance soil carbon (C) stocks, improve soil aggregate stability, or to improve habitat for soil organisms. Current science on soil health metrics, soil health principles, use and management principles to enhance soil health, and key course design and implementation considerations will be covered. All content is designed to convey knowledge, confidence and expertise to participants.

Overall Course Program Learning Outcomes:

Upon completion, participants will be able to:

1. Locate and understand language contained in national and state specific CPS 336 documents.
2. Utilize Soil Carbon Amendment planning tools to assist with conservation planning efforts.
3. Identify various sources of soil carbon amendments.
4. Determine adequate application methods of soil carbon amendments.
5. Complete conservation planning activity to enable implementation of CPS 336.

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Summary of All Course Modules:

1. Introductions
2. Soil Carbon Amendment CPS 336 overview
3. Soil Carbon Amendment Planning Tools to identify resource concerns
 - a. Cropland Infield Soil Health Assessment
 - b. Pasture Condition Score Sheet
 - c. Rangeland Infield Soil Health Assessment
 - d. Forestland Infield Soil Health Assessment
4. Interpreting Soil Carbon Amendment analysis
 - a. Biochar
 - b. Compost
 - c. Other Soil Carbon Amendment
5. Soil testing options and strategies
 - a. Conventional soil test
 - b. CEMA 216
 - c. CEMA 217
6. Utilizing the Soil Carbon Amendment Calculator
7. Determining appropriate application methods of SCA
8. Practical Application of Soil Carbon Amendment and supporting practices.
Complete the following during field portion:
 - a. Appropriate assessment to identify resource concern(s)
 - b. Discuss producer objectives
 - c. Inventory and assess SCA and equipment to be used
 - d. Determine logistics of hauling, mixing, and application of SCA

Actions Prior to Training:

1. Course assignments: All course enrollees must complete any pre-course assignments identified before course start date.
2. Classroom Equipment and Supply Needs:
 - a. PowerPoint projector and screen that accommodate 4:3 (standard) presentation format.
 - b. Printed copies of any required handouts or reference materials.

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- c. Flipchart paper and stand to take notes and create a parking lot for topics or questions. Also, for use in breakout group activities.
 - d. Arrange tables and chairs in a manner that allows for optimal viewing of content, and small group breakouts.
 - e. Ensure lighting can be dimmed adequately to enhance slide viewing.
 - f. If there are attendees with accessibility needs, sort that out respectfully and with discretion beforehand to ensure any reasonable accommodations are provided. This includes both the classroom and field (and travel to field) portions of the class.
 - g. Email participants with program agenda, directions for clothing and gear suited for outdoor activities, expectations for full attendance, and available travel accommodations.
 - h. The lead instructor should provide direction to participants to thoroughly review specific conservation practice standard Soil Carbon Amendment (336).
 - i. Collaborate with partner instructors (i.e. landowner and or operator, agronomist, soil conservationist, etc.) and decide on roles during the program sessions.
 - j. Obtain binders, flash drives, and other course materials for each participant.
 - k. Collect soil samples to be sent to laboratories for testing. Both basic nutrient test and soil health test will be gathered (organic matter, soil respiration, aggregate stability, bulk density). Follow guidance in CEMA 216, 217 for testing procedures and indicators. Complete testing that aligns with course and producer objectives and comparison site.
 - l. Obtain analysis from local sources of proposed Soil Carbon Amendment to be used with planning activities.
 - m. Visit working farm operation to be used with the course and arrange for “farmer” to be interviewed and or involved with the program; collect information about the farm that help students.
3. Field Equipment and Supply Needs:
- a. Travel to and from field sites must be in accordance with Federal Travel Regulations and NRCS Vehicle/Fleet use policies. Refer to General Manual, Title 120, Part 405 and various Subparts.
 - b. If there are attendees with accessibility needs, sort that out respectfully and with discretion beforehand to ensure any reasonable accommodations are provided. This includes both the field (and travel to field) and classroom portions of the class.

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- c. Map with clear directions to field site(s) provided to driver(s). Can be electronic or paper maps and directions, depending on the preference of the driver(s).
- d. Basic field assessment tools including:
 - i. Printed copies (or SoilWeb app connectivity) of Soil survey data for the site(s).
 - ii. Printed copies of the appropriate In-Field Soil Health (or other) Assessment(s).
 - iii. Shovels and soil knife.
 - iv. Buckets/Pails.
 - v. Reagents for any in-field chemical tests.
 - vi. Pen, pencil, markers, note paper.
 - vii. Computer tablet(s) preloaded with necessary software, spreadsheets, or other tools, if any of the field data can be recorded electronically (e.g., using the Vegetation GIS Data System (VGS), Excel, or other software).
 - viii. Field-appropriate clothing, footwear, bug spray, etc.
 - ix. Shoe covers, gloves, face masks if necessary, particularly in areas with potential for animal, soil or plant contaminant presence.

Actions After Training is Completed:

1. At the end of session, the instructor cadre should facilitate a question and answer period for informal feedback after each module and at the conclusion of each day.
2. Site Cleanup:
 - a. For all field and classroom sites used, ensure that they are returned to the condition they were in prior to the course, or in better condition. Basic etiquette: Remove all trash; restore tables and chairs to “normal” locations; thank the hosts, producers and collaborators; fix anything that may have broken during the class; remove any food from a common refrigerator; ensure bathrooms are tidy; clean any vehicles inside/outside as necessary; etc.

Additional Notes:

1. Program environment:

Site requirements-The course needs to be held near an operation(s) that is currently utilizing or planning to use a Soil Carbon Amendment to maximize the soil health benefits. Soil analysis for basic chemistry as well as soil health tests will be

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needed for both planned application sites. Additionally, analysis for the proposed Soil Carbon Amendment(s) will be needed to support planning activities.

Module 1: Soil Carbon Amendment Conservation Practice Standard

Materials – Power Point Slide Presentation – *CPS 336 C Amendment for Training_WA1*

Time – 45 min

Rationale: A planner needs to know where official guidance for conservation practices is stored. The instructor will discuss locations of stored materials and discuss in specific detail about state maintained conservation practice standards and additional planning resources.

Objectives:

1. Provide a comprehensive review of the conservation practice standard for Soil Carbon Amendment (336)
2. Identify and discuss state specific changes
3. List additional planning resources (IR, state guidance documents)

Learning Activities: instruct/practice/feedback/assess

1. Define soil carbon amendments
2. Provide details to enable access to current guidance materials
3. Review general criteria for the standard
4. Discuss limitations and prohibited actions
5. Review tables within the CPS and specific details to each report measure
6. Discuss planning considerations and develop plan
7. Review planning scenarios that are available

Evaluation, Practice & Feedback – Give Affirming or Corrective Feedback

Assessment and feedback on Class Exercise activity and from discussion during presentations.

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Module 2: Soil Carbon Amendment Planning Tools

Materials –

Power Point Slide Presentation – Resource Concerns and Indicators with emphasis on 336 purposes

Time – 90 min

Rationale: Conservation planners will need to be able to access and utilize planning tools when working with CPS 336. This module will cover the necessary planning tools to adequately assess and plan CPS 336. A break is provided during this module.

Objectives:

1. Review Cropland Infield Soil Health Assessment (30 min)
2. Review SCA analysis (preferably local or intended source)
3. Review current soil test results (conventional, CEMA 216)
4. Review SCA Calculator (Group 2, 3, 4) (60min)

Learning Activities: instruct/practice/feedback/assess

1. Review Cropland Infield Soil Health Assessment – deliver the Soil Health Indicators and Resource Concerns powerpoint with emphasis on addressing the purposes of CPS 336. Tailor the presentation to the specific purposes of CPS SCA 336. Highlight why they are connected to IFSHA
2. Utilize current soil test results for a local scenario in the region. Discuss how to utilize conventional soil test in conjunction with CEMA 216 Soil Health Testing to determine practice implementation and establishing benchmarks.
3. Utilize relevant SCA analysis for Biochar, Compost, and Other SCA categories. Discuss the differences and provide a complete review of the analysis report measurements.
4. Demonstrate the use of Soil Carbon Amendment Calculator https://www.pnwbiochar.org/tools/tools_336/ to identify if the SCA meets NRCS Standards

Evaluation, Practice & Feedback – Give Affirming or Corrective Feedback

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1. Instructors request verbal assessment and feedback from participants on demonstration of planning tools.

Module 3: SCA 336 Implementation and Application Methods

References –

Materials – Student Power Point Slide

Time – 60 minutes

Rationale: Conservation planners will need to be able to access and utilize planning tools when working with CPS 336. This module will cover the necessary planning tools to adequately assess and implement CPS 336

Objectives:

1. Mixing amendments (scenario discussions) (100% biochar, %biochar, %compost, 100% Compost, Small Scale)
2. Application limitations and considerations (slope)
3. Application methods and equipment
4. Discussion of application frequency and timing

Lesson Topics:

Learning Activities: instruct/practice/feedback/assess

Evaluation, Practice & Feedback – Give Affirming or Corrective Feedback

Assessment and feedback on Class Exercise activity and from discussion during presentations.

Assessment:

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Module 4: Field portion

References – Web Soil Survey reports for field sites that are visited

Materials – Appropriate infield assessment for specific landuse (cropland, pasture, range, forest, urban). Associated tools required to complete each applicable assessment per landuse.

Time – 3 hours

Rationale: Set up field visits to make efficient use of participants and producers' time. Coordinate with local producers that are interested utilizing conservation practice standard 336 Soil Carbon Amendment.

Objectives: Visit as many local producers as practical to meet the needs of the training participants. If possible, coordinate site visits to take place on farms with different managements to expose and challenge the training participants.

Depending on number of participants, work in groups to complete appropriate assessments to inventory and identify existing and potential resource concerns. Course instructors should lead a conversation at each field site and facilitate a conversation with the producer to gain insight into their objectives.

If possible, coordinate to visit a location that processes, handles or distributes SCA's.

Course instructors should coordinate with a representative from those locations to spend time to discuss how the product is made and what it is made from. Tour those locations to see the complete process.

Lesson Topics:

Learning Activities: instruct/practice/feedback/assess

Evaluation, Practice & Feedback – Give Affirming or Corrective Feedback

Assessment:

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