CONSERVATION EVALUATION AND MONITORING ACTIVITY

Soil and Source Testing for Nutrient Management

DEFINITION

A sampling strategy for nutrient management measuring nutrient levels in soil and or nutrient source.

CRITERIA

General Requirements

A Conservation Evaluation and Monitoring Activity (CEMA) is the assessment, monitoring, or recordkeeping activities required to plan, implement, or determine the effectiveness of conservation practices as described herein.

The CEMA includes the performance of work and documentation of the tasks, results, interpretations, and other activities described herein.

Qualified Individuals as stipulated in this section perform environmental site assessments and soil test collection.

Prior to initiation of the CEMA, the client will schedule a conference with the Qualified Individual as stipulated in this section and Natural Resources Conservation Service (NRCS) field office staff to ensure an understanding of the client objectives, required deliverables, and characteristics of the CEMA tasks. The meeting between all parties may take place in person or electronically.

The Qualified Individual will complete tasks as described in the **DELIVERABLES** section.

The Qualified Individual will maintain an ongoing record of CEMA related discussions with the client documented on a conservation assistance notes form (CPA-6) or other format that includes all components of the CPA-6 (client objectives, dates of assistance, all parties present, notes of significant information, alternatives considered, and decisions reached). Any correspondence related to the development of the CEMA will be included in the record.

The Qualified Individual may use any of the Conservation Practice Documents, such as tools, guidance, templates, etc. located in the state's Field Office Technical Guide.

Technical Requirements

A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; collect manure, compost, irrigation water and other nutrient source materials and prepare for laboratory testing; interpret soil nutrient needs.

A qualified individual has appropriate training and experience in soil, water, or other nutrient material sample collection. Individuals qualified to develop the CEMA 217 include:

- The individual may be credentialed, such as the American Society of Agronomy Certified Crop Advisor (CCA) or Certified Professional Agronomist (CPAg).
- Individuals may be recognized through the NRCS Registry as a Technical Service Provider.
- Agricultural retailers and crop consultants with 4R certification.
- Persons performing sample collection under the guidance of a qualified individual, consultant or retailer are recognized as qualified.

Soil and tissue testing and analysis

Collect, prepare, store, and ship all soil and tissue samples following Land Grant University (LGU) guidance or industry practice. The test analyses must include pertinent information for monitoring or amending the annual nutrient plan. Follow LGU guidelines regarding required analyses and test interpretations. To make sure test results are as accurate as possible, always follow protocols specified by the laboratory.

Common sampling strategies include Whole Field Composite, Zone and Grid.

When the soil test strategy is to sample by the Whole Field, collect composite samples. Composite samples are a mixture of individual samples, or subsamples (10-20), generally collected from multiple locations and mixed together to form a single composite sample. One composite sample should represent no more than 20 acres.

Zone and Grid strategies are known as spatially explicit management. Zone or Grid sampling can identify areas of the field with specific fertilizer of liming needs and provides a map of a field's nutrient and liming requirements. Spatially explicit management is an essential part of precision agriculture. In spatially explicit management, variable-rate technology can be used to alter fertilizer and lime applications so that each zone receives a targeted, zone-specific fertilizer or lime application.

For soil test analyses, use laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program under the auspices of the Soil Science Society of America and NRCS or use an alternative NRCS- or State-approved certification program that considers laboratory performance and proficiency to assure accuracy of soil test results. Alternative certification programs must have solid stakeholder support (e.g., State department of agriculture, LGU, water quality control entity, NRCS State staff, growers, and others) and be State or regional in scope.

Manure, organic by-product, and biosolids testing and analysis

Collect, prepare, store, and ship all manure, organic by-products, and biosolids following LGU guidance or industry practice when recognized by the LGU. In the absence of such guidance, test at least annually, or more frequently if needed to account for operational changes (e.g., feed management, animal type, manure handling strategy, etc.) impacting manure nutrient concentrations. Follow LGU guidelines regarding required analyses and test interpretations. Analyze, as a minimum, total N, total P or P2O5, total K or K2O, and percent solids.

For manure analyses, use laboratories successfully meeting the requirements and performance standards of the Manure Testing Laboratory Certification program under the auspices of the

Minnesota Department of Agriculture or other NRCS-approved program that considers laboratory performance and proficiency to assure accurate manure test results.

Water nutrient sources

Irrigation water contains organic and inorganic compounds that influence plant health, soil health and structure, and irrigation system longevity. It is important to regularly test the quality of the irrigation source water. The frequency of testing depends upon use. The analysis should be conducted in the same laboratory over time to create a record of changes in water quality. Keep the reports to create a baseline of stability or seasonal changes in water quality to compare to future reports.

General water sampling guidance:

To ensure test results are as accurate as possible, always follow protocols specified by the laboratory.
Allow the water to run at least five minutes before collecting a water sample.
Preferably, collect the water sample after completion of an irrigation run or filling a large water tank. Before collecting water sample, be sure the nozzle of the hose or faucet is clean, rinse out a clean plastic pail and the sample bottle with the water to be sampled.

DELIVERABLES

These deliverables apply to Conservation Evaluation and Monitoring Activity (CEMA) 217 - Soil and Source Testing for Nutrient Management.

Two copies (hardcopy or electronic) of the plan must be developed—one for the client and one for the NRCS field office. At the client's request, Technical Service Provider (TSP) or agricultural professional can deliver NRCS's copy to the NRCS Field Office. The client's copy must include all sections unless the client requests other documents from this section. The NRCS copy must include all items identified herein. An additional electronic copy of the plan should also be uploaded on NRCS Registry.

1. **Cover Page**

Cover page reporting the following information:

a) Client information: Name, farm bill program, contract number, and contract item number.
b) Qualified Individual information: name, address, phone number, email, appropriate license number, and county of service.
c) Farm identification:
    i. Farm name, owner name, street address, and county/state.
    ii. Primary phone number of the client.
d) Statement that services provided:
    i. Comply with all applicable Federal, State, Tribal, and local laws and requirements.
    ii. Meet applicable NRCS program requirements.
    iii. Are consistent with the conservation program goals and objectives for which the program contract was entered into by the client.

e) Qualified Individual printed name, signature and date.
f) Client acceptance statement:
    i. A statement that the information represents existing conditions.
    ii. Signature of the client and date the client received the report.
g) Block for NRCS reviewer acceptance (to be completed by NRCS).

2. Correspondence

a) Conservation Assistance Notes (NRCS-CPA-6) or other format that includes all components of the CPA-6.
    i. Brief overview of the client's objectives.
    ii. Document each interaction with the client, include notes and results of that interaction, date, and initial.
    iii. Document each site visit, activity in the field, results of each site visit, all parties present, date, and initials.
b) Any correspondence relating to the development of the CEMA.

3. Maps

a) Maps developed from the CNMP CPA 102 or the CNMP DIA 101 can be used with CEMA 217 if available. New maps to include but not limited to:
b) At a minimum, all maps developed for the CEMA will include:
    i. Title block showing:
        - Map title.
        - Client's name (individual or business).
        - Prepared with assistance from USDA – NRCS
        - Assisted By [name].
        - Name of applicable conservation district, county, and State.
        - Date prepared.
    ii. Map scale.
    iii. Information needed to locate the assessment area, such as geographic coordinates, public land survey coordinates, etc.
    iv. For soil sampling, plot the sample point(s) on the field map based on the sampling strategy.
    v. North arrow.
    vi. Appropriate map symbols and a map symbol legend on the map or as an attachment.

4. Documentation

a) Develop a sampling strategy for nutrient management measuring nutrient levels in soil and or nutrient source.
b) Describe soil sampling methodology used to collect other materials including details such as liquid manure agitation time or sampling depth.
c) Prepare soils or source materials for transport to accredited laboratory for analysis.
d) Provide laboratory analysis results, include nutrient analysis for manure or compost

provided if imported.

References

Purdue Extension. Soil Sampling Guidelines AY-368-W
https://www.extension.purdue.edu/extmedia/AY/AY-368-w.pdf

Michigan State University Extension. Extension Bulletin. Sampling Soils for Fertilizer and Lime Recommendations. E498S
https://archive.lib.msu.edu/DMC/extension_publications/e498/E0498S.pdf

University of Nebraska Extension. Soil Sampling for Precision Agriculture EC 154
https://extensionpublications.unl.edu/assets/pdf/ec154.pdf

University of Nebraska Extension. Manure Testing for Nutrient Content G1450
https://extensionpublications.unl.edu/assets/pdf/g1450.pdf

Clemson College of Agriculture. Collecting Samples for Agricultural Irrigation Water Quality Testing. LGP 1084 https://clemson.app.box.com/s/986mfucdero8uedeshmzqnisihyualsu

North Dakota State University Extension Service. Developing Zone Soil Sampling Maps SF-1176-2
file:///C:/Users/TIM~1.PIL/AppData/Local/Temp/sf1176-2.pdf

USDA Natural Resources Conservation Service. Field Office Technical Guide.
https://efotg.sc.egov.usda.gov/#/

USDA Natural Resources Conservation Service. National TSP Website.
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/

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