AGRONOMY

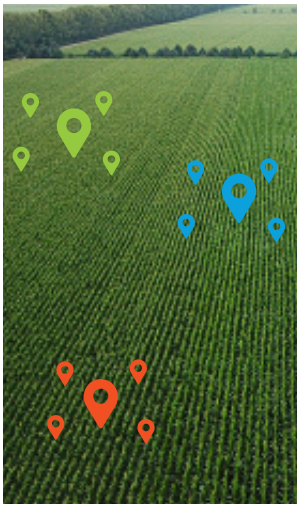
Sampling Guidelines for the Conservation Evaluation and Monitoring Activity (CEMA 216)

Soil Health Testing is a tool that can provide you with reliable measurements of changes in your soil that come from your management practices. The CEMA 216 program is part of the national Regenerative Agriculture Pilot Program and has specific sampling and testing requirements to follow. Below you will find sampling guidelines and instructions on how to submit samples to AgSource Laboratories for testing that meets these requirements. Some of the details and examples are taken from the NRCS.USDA.gov CEMA 216 publication from January 2026.

Planning a Sampling Strategy

Each field selected for sampling will have at least three separate, composite samples collected for testing. How you select those locations depends on the variability of the field and on your objectives. Sample locations should be carefully recorded (drop a pin on your phone map) and the date and soil conditions noted as well. These samples are used for monitoring change over time, so it is important to sample the same locations at the same time of year and under similar conditions each time that field is sampled.

Avoid sampling in soil that is obviously different from the general field conditions such as in wheel tracks, depressions or spots where manure or lime were piled, and areas that are historically more or less productive (unless that is part of the sampling strategy). Wait at least 2 – 3 weeks after tillage and fertilizer applications, and avoid very wet or very dry field conditions. The following descriptions will help with planning your sampling strategy.



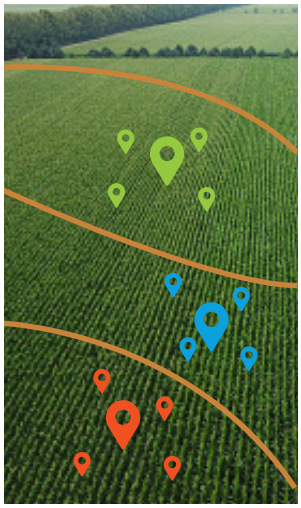
Random Sampling

Random – If the field is level with uniform soil characteristics throughout (texture, drainage and management practices, etc.) then randomly selecting sampling points is acceptable. The test results will help you measure general trends over time.

In this picture the field is judged to be uniform, so the points of sampling (large red, blue and green pins) are randomly chosen in the field. At each point there are four other sampling locations around the central point. These five samples from the central and surrounding points are mixed together as one composite sample. (More details on sample collection are below.) The area represented by each sample can be up to 20 acres but not more. Add more sampling points if needed.

Stratified (zone) – If the field has areas that are visibly different (because of slope, erosion, drainage, or management practice) or are mapped as different types of soil then these areas, or zones, should be sampled separately. In this picture in each of the three areas, separated by lines, sampling locations are randomly selected (big pins) and samples collected at each pin in each area. If one area is larger than 20 acres, then two sampling locations should be selected for that area.

This sampling strategy is most useful if the different zones in the field will be managed differently so that responses to the management practice can be tracked for each zone.



Stratified Sampling

Problem Sampling – If there are areas of the field that have uneven or poor crop performance compared to the rest of the field they should be sampled separately. Some careful selection of sampling locations will help the soil tests reveal the specific causes and responses to management practices.

Problem Sampling

In this case the field boundary has been extended to include the fence row (green pins) and the field has only two sampling locations. For example, the production records indicate that the problem area (blue pins) has lower yields than the rest of the field. The fence row sample provides reference data from undisturbed soil adjacent to the field. Results from all three samples will help with understanding why the one area performs poorly.

Taking Soil Samples

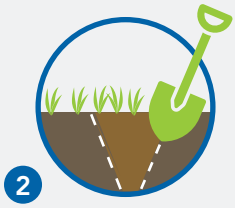
When soil sampling it is good to be prepared before you enter the field.

- Once you know your strategy and how many samples you will collect you can pre-label sample bags for each location and record the same information on a submission form for the lab. Take a few extra bags and a marker with you in case you need them. Bags and forms are available for free from the laboratory.
- You will need a clean plastic bucket, a straight shovel, tile spade or sharp shooter, and clean rags to wipe the equipment between sampling locations. Alternatively, a large diameter probe (at least 1 inch ID) can be used.
- A map or phone with a map where you can mark the exact sample location (central point from above) for future reference. And a way to record the date and general conditions when you collect the samples, as well as the sampling method used.

At each identified location in the field record the main location point and begin sampling:

(If a sampling probe is used be careful that the cores are not compressed while pushing into the ground and when removing them from the sampling tube.)

1. Clear crop residue or vegetation from the soil surface and insert shovel to a depth of 6 – 8 inches deep.



2. Reinsert shovel to create a slice of soil.

3. Remove the intact soil slice.

4. Remove the edges of the slice leaving a central core 1 inch wide and 1 inch thick.

5. Remove plant residue and place the core in the clean bucket.

6. Collect 4 more cores in a similar manner from locations 20 – 30 feet around the central point. Add each core to the bucket with the central point core.

7. Gently mix the soil cores together, breaking up large clods and removing any stones, roots or debris. Pour the soil into the pre-labeled sample bag to the full line and close the bag, being careful not to compress the soil in the bag while handling it. The soil in the sample bag is one composite sample from that location. Wipe clean the bucket and sampling equipment before moving to the next location.

Submitting Samples to the Lab

The CEMA 216 required tests have "Preferred Methods" and "Alternative Methods". AgSource Laboratory has a package of tests that is cost effective while using the preferred methods as much as possible. The methods used are indicated on the submission form.

Samples should be submitted to the lab as soon as practical after collection in the field. If samples are stored overnight, they should be kept cool but not frozen until delivery or mailing. If samples must be kept for longer than a day or two, they can be air dried by spreading them out on paper for a few days and then placed back in the sample bags.

Samples can be mailed directly to the lab in Lincoln, NE. Please call ahead to order bags and submission forms and to arrange for shipping to the lab.

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