

# eFields

## Ohio State University Extension Soil Health Indicator Measurement Protocols

### Overview

These soil health measurements are recommended to be used with on-farm trials where improved soil health is a desired outcome. The goal of collecting and analyzing these samples is to establish a baseline to both characterize soil health (SH) but also serve to quantify changes over time within and between crop production systems. Information from these measurements will be used to improve recommendations for various management practices that may impact soil health.

### Soil Sampling Procedure

- Select the area(s) within a field that where you want to quantify soil health (whole field or plots)
- Collect 10-15 soil cores in a zig-zag or “W” pattern across the sampling area to ensure a representative aggregate sample (See Figure 1 for whole field samples and Figure 2 for plot samples)
  - Keep samples from different treatments separate
- Mix sample well and transfer to sample bag
- Label sample bag with field ID
- Send to preferred lab or air dry completely to preserve samples to send later.

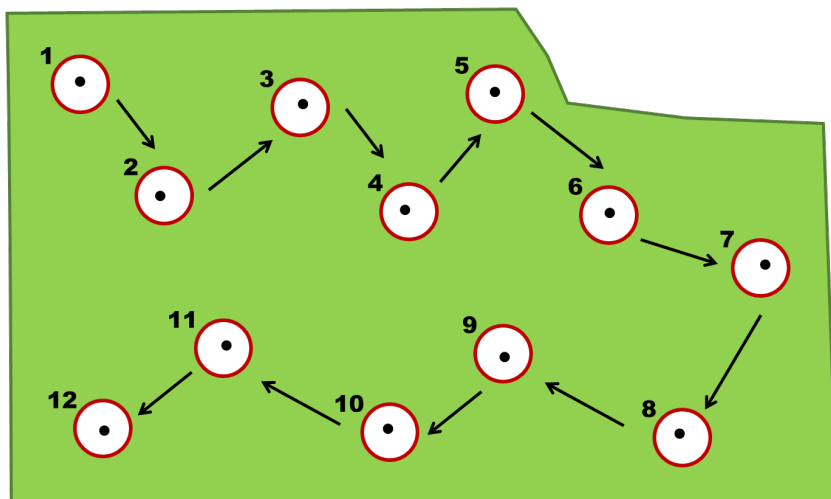


Figure 1. Example sampling pattern for a whole field with 12 samples.

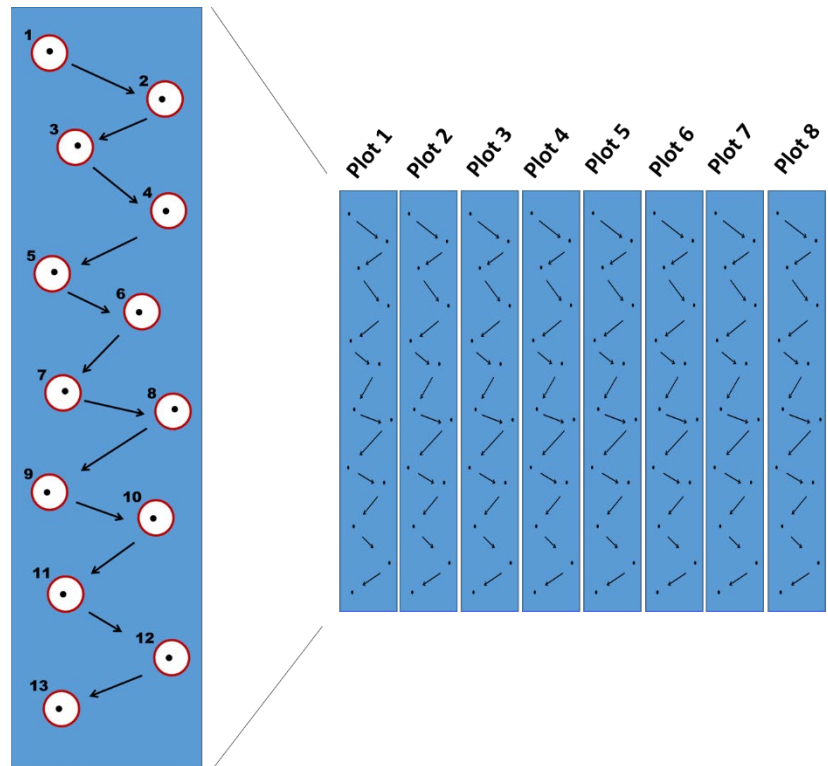


Figure 2. Example sampling pattern for individual plots with 13 samples each.

## Recommendations for High Quality Data

The accuracy and repeatability of the results will be dependent on the quality of the samples collected. The following tips will help you collect the best possible samples:

- Sampling timing
  - Natural cycles occur seasonally in soils and can cause differences in measurements, therefore it is a best practice to sample fields at the same time each year.
  - For eFields studies, please collect samples at the initiation of the trial, ideally before major tillage or fertilization. Best times to sample would be early spring or late fall after harvest.
    - Soil sampling date should be recorded in the eFields data collection sheet in BuckeyeBox.
  - If a farmer is interested in these tests, samples can be collected and sent with their normal soil samples for fertility recommendations, for convenience.
  - Avoid pulling samples immediately following fertilizer or manure applications.
    - 6 months following manure applications
- Sampling depth
  - Changes in sampling depth can increase the variability in these measurement results. Each core should be pulled from the same depth.
  - There are 3 common soil sampling depths:
    - 0-4" cores
    - 0-6" cores
    - 0-8" cores

- The simplest is to align sampling depth to your soil fertility sampling depth. Tri-State recommends 8" sampling.
- These tests will be most sensitive to changes when shallower sampling depths are used. The trade off with shallower sampling is there can be higher variability.
- For eFields, a sampling depth study is being conducted to enable us to select the best depth for reporting going forward. For more information about this study, please contact Elizabeth Hawkins, hawkins.301@osu.edu.

### **Soil Organic Matter – Loss on Ignition Test**

Lab based test. This is the most commonly used test for estimating organic matter in soils. This test is typically run with routine nutrient analysis, but can be requested as an additional analysis otherwise.

Follow the sampling procedure outlined above.

### **Active Carbon Test**

Lab based test. The Permanganate Oxidizable Carbon (POxC) test estimates the portion of the organic matter in the soil that is readily available to microorganisms.

Follow the sampling procedure outlined above.

### **Aggregate Stability Test**

Lab based test. An aggregate stability test can provide a metric for understanding how susceptible a soil may be to water erosion.

Follow the sampling procedure outlined above.

### **Sample Submission**

To send samples to the Culman soil lab:

1. Please put a copy of the field plot map in the box to return to Wooster and keep one for your records.
2. Ship soil immediately to: Bethany Herman (eFields Soil Health), 1680 Madison Ave, Wooster OH, 44691. Do not ship on Friday or soil will sit in warehouse over the weekend. If sampled on Thursday or Friday store soil in refrigerator.
3. When samples arrive in Wooster, we will process them.

Private labs can also run these analyses.

- Contact the lab for submission instructions and to confirm they offer the desired test.
- Remember, OSU requires you have a purchase order in place prior to submitting samples.