

# Comprehensive Assessment of Soil Health

## Soil Sampling Protocol Field Sheet

For more detailed instructions please see page 31 of our Manual at: <http://soilhealth.cals.cornell.edu/training-manual/>

### Materials list

- 1 large bucket for each sample and one for supplies
- 1 one-gallon freezer storage bag for each sample
- Clipboard and Submission Form ([soilhealth.cals.cornell.edu](http://soilhealth.cals.cornell.edu))
- Permanent marker and/or pen
- Straight shovel (sharpshtooter or trenching spade style)
- Penetrometer (optional); [Contact lab](#) to borrow (see back)
- Cooler for in-field sample storage and transfer



### Prior to sampling a field

- **ASK YOUR BEST QUESTION!** Clearly define sampling goals and number of necessary samples.
- **Define sampling goals;** i.e. to assess the current status of a management unit, to identify and troubleshoot constraints in a particular problem area, to compare between different areas on a farm, etc.
- **Determine the number of samples to be taken.** Decide whether one sample will adequately represent a management unit, or whether an area should be split to compare multiple units. Fields should be divided into sampling units with differences in soil type, management practices, crop growth, yield, etc.

### Soil Sampling Considerations

Soil Health sampling guidelines are similar to those of standard nutrient analysis. Samples should be taken when soils are at field capacity. Avoid irregular areas.

#### 1. Field Sampling for General Purposes

- Ideal for sampling uniform fields or areas where you want to assess general needs
- Baseline assessment before applying treatments
- Random soil sub-sample collection

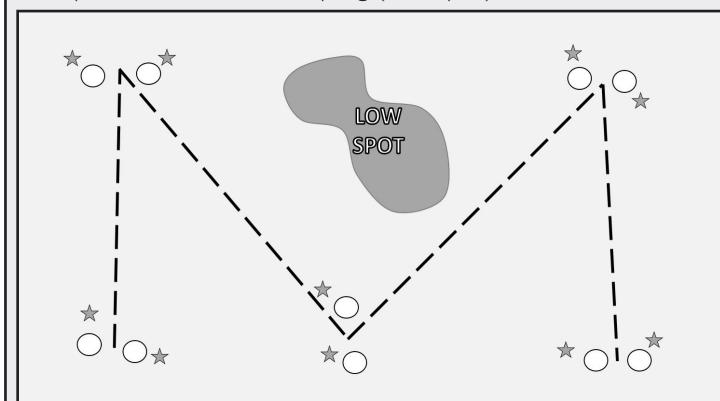
Example 1: In this instance identify 10 locations within the area you would like to test that are representative of the field or plot. Borders and irregular areas should be avoided, unless a sample is specifically being collected from those areas to identify constraints.

#### 2. Field Sampling for Troubleshooting

- Ideal for areas with uneven crop performance
- Targeted soil sampling from representative areas of each zone
- Comparing zone "A" with zone "B"

Example 2: In this instance identify multiple locations within the two or more areas you would like to test. You don't need to sample the entire field. With targeted sampling, focus on representative areas that will answer a particular question. For example, how is the 2nd year of no-till affecting the soil health status?

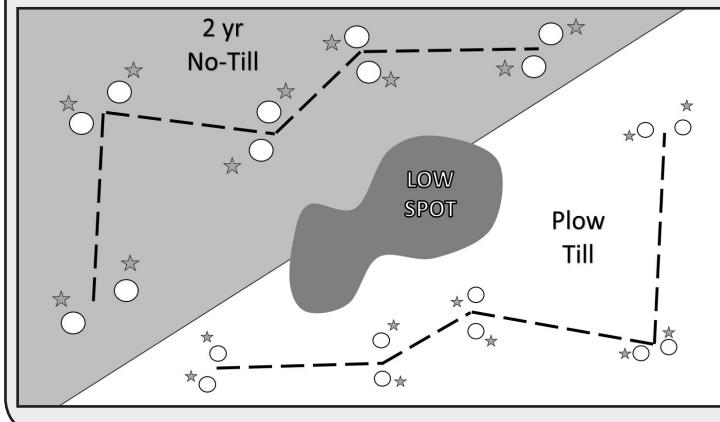
Example 1: General field sampling (1 sample)



Sub-sampling and Penetrometer Locations:

- Soil sub-sample Placed in bucket
- ★ Penetrometer readings Recorded at 2 depths

Example 2: Troubleshooting (2 or more samples)



## Steps for soil sampling

From 10 representative locations in the sampling area:

**A.** Remove surface debris.

**B.** Use a spade to dig a small hole about 8" deep. From the side of the hole take a vertical, rectangular slice of soil 6" deep and about 2" thick.

**C1.** Remove any extra soil to ensure that the sample is the same width at the top and bottom of the slice. You want a rectangular, 6" deep x 2" thick slice of soil, the width of the shovel. It is important to collect the same amount of soil through the 6" sample profile so that it is not biased with more soil from the surface compared to the subsurface.

**C2.** Place into clean pail.

**D.** Optional - At each of the 10 sub-sample locations, [collect soil hardness](#) information with a penetrometer. Record maximum hardness (in psi) from the 0-6" and at the 6-18" depth ranges on the Submission Form.

**E.** Repeat steps A – D to collect the remainder of the subsamples. Mix thoroughly and transfer 3-6 cups of soil (depending on the [analysis package](#)) into a clearly labeled one-gallon re-closable freezer bag:

Basic Package - 3 cups

Standard Package - 4 cups

Extended Package - 6 cups

[Visit our website](#) for a complete description of each analysis package.

### **A complete sample will consist of:**

- a clearly labeled bag containing 3 to 6 cups of well mixed soil. Err on the side of including extra soil.
- a completed submission form with penetrometer readings clearly recorded

### Soil sample storage requirements

- Always keep samples out of direct sunlight, and if possible, store in a cooler while in the field.
- **IMPORTANT:** When collecting a large number of samples and if you have particular sampling considerations regarding storage or pre-processing, please contact [Soil Health Lab personnel](#) prior to sampling - <http://soilhealth.cals.cornell.edu/about/who-to-contact/>

### Soil sample submission form and shipping

- Visit our website and download the submission form: [soilhealth.cals.cornell.edu](http://soilhealth.cals.cornell.edu). Save the submission form file for your records and email it as an attachment to: [soilhealth@cornell.edu](mailto:soilhealth@cornell.edu)
- Make sure to include your penetrometer measurements
- For 1 sample, use a small USPS Flat Rate Box
- For multiple samples, use a USPS Priority Mail Medium Flat Rate box (up to 6 samples per box)



**ABOVE.** The steps of taking a soil health sample.

NOTE: Keep samples out of the direct sunlight and keep as cool as possible during sampling. Store samples in a cold place after returning from the field and ship to Cornell as soon as possible.

### Send samples and submission forms to:

#### **Cornell Nutrient Analysis Lab**

c/o Soil Health Lab

G01 Bradfield Hall

306 Tower Rd.

Ithaca, NY 14853

[soilhealth@cornell.edu](mailto:soilhealth@cornell.edu)

607-227-6055

