

Soil Health Indicator Measurements – Starter Kit

Goal - Establish a baseline to both characterize soil health (SH) but also serve to quantify changes over time within and between crop production systems.

The following represents a prioritized list of measurements for practitioners and Extension educators to characterize soil health. These were developed with the idea in mind to be simple, economical, and repeatable. If you are interested in conducting research that leads to publications, it is highly recommended to review your sampling protocol with a state specialist prior to starting your project since more detailed sampling and analyses may be required.

1. **Soil OM**
 - Standard LOI (Loss on Ignition) Test.
 - OM has been correlated to several soil health tests and other SH metrics.
 - \$6-\$8 per sample (can run soil fertility + OM)
2. **“Active” Carbon Test**
 - Permanganate Oxidizable Carbon (POxC) test.
 - Characterizes biological activity including active carbon.
 - Correlated to several soil health tests and other SH metrics
 - \$10 per sample (Waypoint, Culman’s Lab, Brookside)
3. **Aggregate Stability**
 - Wet aggregate stability test
 - Reflection of water infiltration. Ability of soil aggregates to resist disruption when acted upon by applied forces.
 - <https://agcrops.osu.edu/newsletter/corn-newsletter/2018-02/soil-aggregate-stability-%E2%80%93-soil-health-physical-indicator>
 - \$15 per sample (Brookside)
4. **Water Infiltration**
 - Requires significant sampling (12 – 20 samples per plot or field) due to inconsistency and highly variable test.
 - Test Info
 - NRCS Info - https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052494.pdf
 - YouTube Demo - <https://www.youtube.com/watch?v=iz415J3AOI4>
 - **Minidisk Infiltrometers** to calculate infiltration rates in the field.
 1. <https://www.metergroup.com/environment/products/mini-disk-infiltrometer/>
 2. Approximately \$180/each
 - Double ring infiltration tests - <http://www.fao.org/3/S8684E/s8684e0a.htm>
 - Costs = time commitment + supplies

SAMPLE TIMING

- Consistency- same time of year, same depth, and sampling densities and frequency.
- Sampling Depth – the simplest is to align sampling depth to your soil fertility sampling depth. Tri-State recommends 8” sampling but for no-/never-till plots or fields one may consider to sample at 6” depth.
- Manure – sample at least 6 months after application.

For questions, please contact the Digital Ag team at digitalag@osu.edu.