Purpose & Measures

This report developed by Truterra LLC. contains soil health results and insights for samples collected on your land. The results reported should be interpreted as a snapshot of soil health at the time of sampling relative to the soil health potential.

Soil Health Concepts

Many management decisions you make impact soil health, like implementing cover crops or conservation tillage. Generally, all soil health improving practices focus on one or more of the five soil health principles:

1) Maximize soil cover
2) Minimize soil disturbance
3) Maximize presence of living roots
4) Maximize biodiversity
5) Integrate livestock/manure
6) Understand local context

Differences in soil types with varying inherent soil properties (e.g. soil texture and mineralogy) can also impact soil health. Understanding what levels of soil health are possible for different soil types requires distinguishing between natural variability and the effects of management. Truterra has partnered with the Soil Health Institute (SHI) to establish optimal ranges of soil health indicators for different soil types and climate zones. These values are designed to help you set ambitious yet realistic goals to guide management decisions and track progress over time.

In this report

Soil health indicators for your soil are presented and compared with values for similar soil types under different management systems. Soil health values for these systems serve as benchmarks of soil capability as determined by its texture, mineralogy, and climatic zone, while also providing insights into your soil's sensitivity to management. It is important to note that soil health values presented in this report may not represent the maximum attainable soil health. Long-term adoption of soil health practices (e.g. > 10 years) may increase soil health beyond levels shown in this report, therefore use the soil health targets (dark portion of the charts bars) in this report as a guide, not a limit.

Soil Health Assessment. To assess the health of your soil and how much healthier it could be, we compared test results for your soils to results for soils with similar inherent properties within your region. These soils have similar textures and mineralogy, so the differences in soil health indicators among them are primarily related to management (e.g., tillage, crops, cover, etc.).

Sampling and Analyses

Soil sampling locations were selected randomly as part of a statistical design intended to quantify soil health for soil types within your region. The following suite of soil health indicators were used to assess the physical, chemical, and biological aspects of your soil's health.

Aggregate Stability Index. Higher aggregate stability values indicate stronger more stable aggregates. Soil aggregates are dynamic structures formed through physical and chemical interactions between mineral particles and SOM. Improved aggregation provides benefits of reduced erodibility and enhancing water retention and soil organisms. Aggregates also play a role in organic carbon storage by physically protecting organic matter.

Soil Organic Carbon (SOC) and Soil Organic Matter (SOM) are essential components of high–functioning soils, as they build soil structure, improves water retention, improves plant–available nutrients, and sequesters carbon from the atmosphere. SOC was measured because it produces consistent results than SOM.

Penetrometer Resistance is a measure of the force required to push down through the soil. Plant root restriction occurs in soils with increased penetrometer resistance which limits crop growth, yields, respiration, and biomass production. Elevated resistance can also reduce water infiltration and the volume of plant available water.

Plant Available Water (PAW) is determined by the soils physical and chemical characteristics. The estimated value shown for samples in this report were calculated using a combination of the measured sample characteristics and publicly available data. Plant growth and microbial health, and therefore soil health, are highly connected to PAW.

Mineralization Potential as measured by CO_2 Respiration represents the overall activity of the microbial community by quantifying the carbon dioxide (CO_2) released, which is a direct function of microbial respiration and relates to microbial biomass, diversity, and resource availability. Soil nutrient cycling relies on a vibrant microbial community.

Texture (percent Sand, Silt and Clay) plays a key role in soil aggregation, cracking, and crusting, and affects a soil's susceptibility to erosion and compaction. The amount of clay is an important factor in determining how much organic matter (and hence, organic carbon) can accumulate over time. Texture is also key in the determining the soils potential plant available water.