

Soil Health

Soil health is a common theme talked about with agriculture today, but what is soil health? The common definition of soil health is the ability of a soil to function as an ecosystem that sustains plants, animals, and humans. This means the soil is considered healthy when it performs essential functions for living organisms by providing clean water, abundant crops, and diverse ecologies.

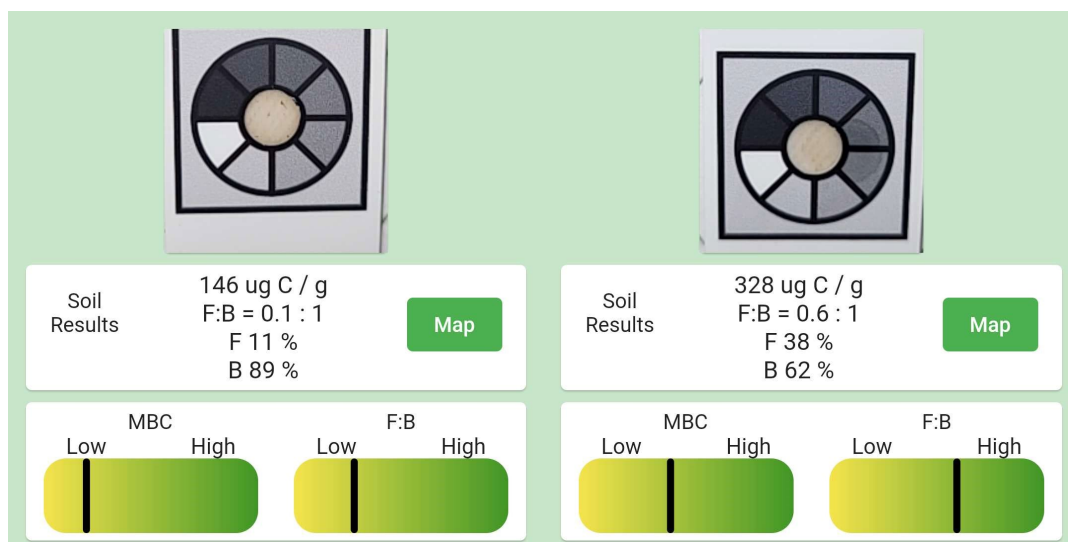
- Soil can regulate water from snow, rain, or irrigation by controlling how the water flows over the land and through the soil. This can be dependent on the plants that are currently in the soil or on the soil structure.
- Minerals and microbes in the soil are responsible for filtering, degrading, immobilizing, and detoxifying the soil. This breakdown of natural or man-made chemicals keeps the soil productive and allows humans to eat the crops grown on the soil.
- Soil is a source of nutrients such as carbon, nitrogen, phosphorus, and many other nutrients that are needed by plants. These nutrients are stored, transformed, and cycled in the soil.

How do we measure soil health?

One factor of soil health that many growers measure is crop yield, however this is not the only determining factor of soil health. Since it cannot be measured directly, other indicators are evaluated. Indicators are aspects that can be measured such as physical, chemical, and biological properties of the soil or physical features of plants.

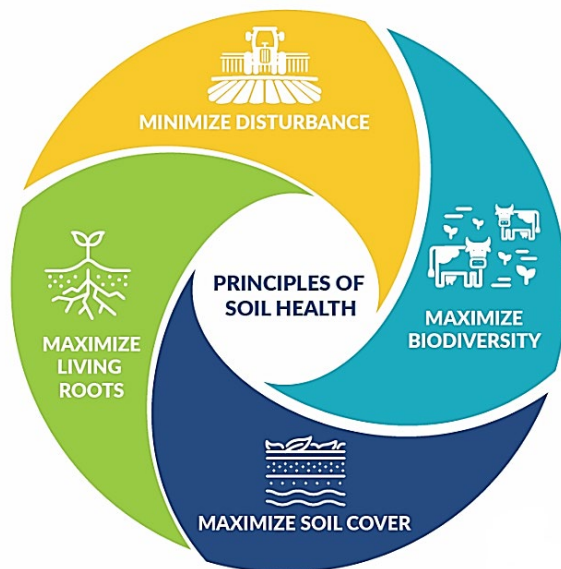
- Physical measurements of the soil can be observed by bulk density of the soil, evaluating the soil structure, or the water holding capacity.
- Chemical measurements can be electrical conductivity, nutrient analysis, and soil pH.
- Biological measurements can be expressed as soil enzymes, soil respiration, or microbial biomass.

Show below are biological measurements of microbial biomass in the soil. On the left is a control sample, and the right shows a sample treated with Worm Power Liquid Extract.



Other factors when evaluating soil health would be how the soil is how the crop functions when pathogens are present, how the plant handles stress such as drought, or the quality of the crop harvested.

How do we improve soil health?



Shown above are the USDA's principles for soil health. These are suggested management practices that can improve soil function.

- Maximizing the living roots helps hold the soil in place while plants also take up water from the soil. The soil structure is affected by the roots and can alter water infiltration through the soil.
- To maximize the living roots in the soil, farmers can rotate in cover crops to keep roots in the soil and maximize the soil coverage when fields are not being used for a current crop.
- Minimizing disturbances can consist of practices such as no till or reduced tillage in the soil. This can also include making fewer passes in the field with heavy equipment. Reducing the amount of machinery on the field can also reduce the amount of compaction in the soil.
- Maximizing biodiversity is important to rotate crops that depend on the soil for different nutrients. This also can reduce the disease and insect pressure that overwinter in the soil or plant debris.

Worm Power Liquid Extract (WPLE) plays an important role in soil health by introducing microbes back to the soil. These microbes are naturally occurring in nature because they are derived from earthworms. The addition of WPLE enhances the plants root zone and increases the microbial biomass, which is an important factor in soil health.

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