

Soil Health Nutrient Tool (Haney Test)

CSP Enhancement **SQL15-Utilize the Soil Health Nutrient Tool to assess soil nutrient pools** requires the use of the Soil Health Nutrient Tool (also known as the Haney Test) to measure various nutrient pools in the soil. This test was developed by Dr. Rick Haney a Soil Chemist and Microbiologist at the ARS Grassland, Soil and Water Research Laboratory in Temple, TX.

The Soil Health Nutrient Tool (SHNT) is an integrated approach to soil testing using chemical and biological soil test data. It is designed to mimic nature's approach to soil nutrient availability as best as can be done in the lab. This tool is the culmination of nearly 20 years of research in soil fertility and represents the next step in soil testing for the 21st century.

The SHNT is designed to answer three simple questions about your soil:

1. What is your soil's condition?
2. Is your soil in balance?
3. What can you do to help your soil?

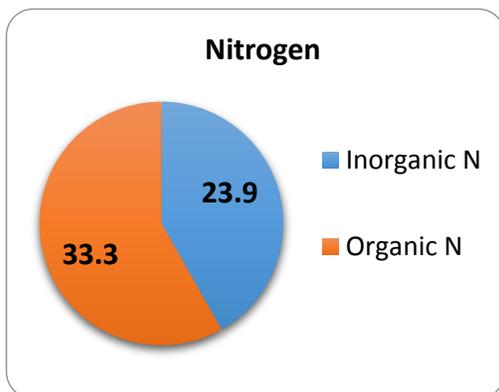
How does it work?

- SHNT is designed to work with any soil under any management scenario because the tool asks simple, universally applicable questions.
- It uses natural biological and chemical processes to measure plant available nutrients by:
 - Soil respiration as an indicator of soil microbial activity.
 - Soil water extract (nature's solvent), and the H3A extractant to measure plant available nutrients.
 - These solvents mimic the production of organic acids by living plant roots to temporarily change the soil pH thereby increasing nutrient availability.
 - The organic acids are then broken down by soil microbes since they are an excellent carbon food source, which returns the soil pH to its natural, ambient level.
- This integrated approach to soil testing, reflects the complex ecosystem of the soil, instead of depending upon the narrow measurement of inorganic N, P, and K.
- The integrated approach is naturally controlled so that N or P will not exceed what is available from the organic N and organic P pools.

What does it Measure?

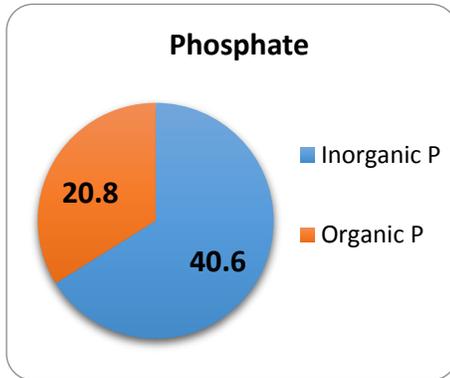
The test measures Carbon, Nitrogen, Phosphorous, Potassium, Aluminum, Iron and Calcium along with soil respiration. It also provides a nutrient recommendations for N, P₂O₅ and K₂O for a variety of crops. Recommendations (units of nutrients per unit of yield) can be adjusted by the user.

Total Nitrogen



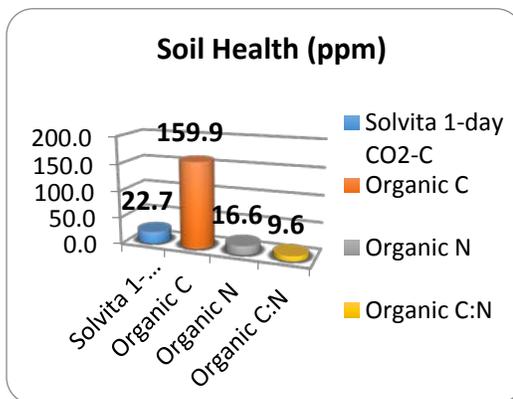
This measurement is the total N from the water extract in lbs./ac. It includes both the inorganic ($\text{NO}_3\text{-N}$ & NH_4) forms plus a portion (and all) of the organic N depending on the health of the system. Organic N should easily be broken down by soil microbes and released to the growing plants. This pool represents the amount of mineralizable N in your soil that has previously not been tested for. In some cases it can account for more N than what is available inorganically, allowing producers to adjust their application rate accordingly. How much organic N that can be made available to plants during the growing season is determined by the C:N ratio and microbial activity (Solivita reading-see below).

Total Phosphorous



This measurement includes both the inorganic and organic forms of P_2O_5 . Typical soil tests do not test for the organic forms of P. These tests use the results from 2 instruments from the H3A extract. The first is total P from an Agilent microwave plasma and second is inorganic P from a colorimetric instrument; both instruments measure the same sample. Total P minus inorganic P reveals the organic P that soil microbes will eventually breakdown for use by the plant.

Soil Health Calculation



This calculation looks at the balance of the soil Carbon and Nitrogen (C:N ratio) and their relationship to microbial activity (Solvita respiration). The soil health calculation number can vary from 0 to more than 30. We like to see this number increase over time. This number indicates the current soil health and helps us identify what it needs to reach its highest sustainable state. Keeping track of this Soil Health number will allow you to gauge the effects of your management practices over the years.

- Solvita – measurement of soil microbial respiration, a low number <30 indicates low microbial activity
- Organic C – measurement of the carbon available as a food source for soil microbes, it is not a measurement of soil organic matter.
- Organic N – measurement of organic N that will be available to the plant

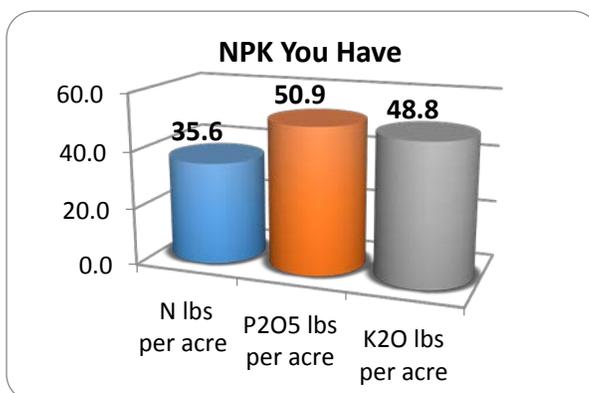
as a result of the current condition of the soil

- Organic C:N ration – measurement of the organic C and N that are extracted from the soil using water. A high C:N ration >20 means that the organic N will not be mineralized and is unavailable to the plant

Cover Crop Mixture Recommendation

- This is a suggested cover crop planting mix based on your soil test data that can help to increase your Soil Health number
- It is designed to provide your soil with a multi-species cover crop of grasses and legumes to help you improve soil health and thus improve the fertility of your soil.

Nutrient Available in the Soil



These numbers represent the nutrients that are available in the soil. They include both the inorganic and organic forms. Healthy soils are more biologically active resulting in more robust nutrient cycling, releasing higher levels of organic forms of N & P.