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## Soil Health Report (2022)

Farm:  
 Crops: Strawberries  
 Soil Sampling date: 8/16/2022  
 Report compiled date: 11/21/2022

<b>Synopsis</b>		Low	Target	High	Comments
<b>Soil Health Test Results</b>					
<i>Chemical</i>	pH				
	EC				
	Nutrient Content	K, B	Mg, Fe, Mn, Zn, Cu	P	See Table 2 for specific data
<i>Physical</i>	Aggregate Stability				
<i>Biological</i>	Organic Matter				Slightly below recommended amount
	Total Soil Carbon				
	Total Soil Nitrogen				

**Soil Health Building Practices Currently In-use on Farm:**

Cover Cropping	Crop Rotation	Compost Use	Soil Test	Liming	Reduced Tillage	Other		
			x					

**General comments:** For a fallow site, much of the soil characteristics near their target levels. There are some nutrients that are below recommended ranges, and there is an excess of soil phosphorus. Check report specific details. One last comment is that the soil organic matter is low. This could be increased by utilizing cover crops and maintaining crop residue in-tact. Crop rotation will be a key practice to implement for strawberry production.

## What is soil health?

**Soil Health** is the ability of a soil to support plant growth and agricultural crop production, without negative consequences to the environment or to soil degradation. Soil health is determined by the collection of biological, chemical, and physical soil properties which enable soils to support plant, animal and human health.

This soil health report assesses the chemical, physical, and biological characteristics of your soil to help guide the selection of specific practices that can both help protect the environment and maintain productivity of your farm operation.

## Soil Chemical Properties

The chemical properties of your soil include the pH, total nitrogen content, and nutrient content. These properties of your soil are very affected by nutrient applications and the use of lime to raise soil pH. Your soil texture (sand, silt or clay) also has a large impact on the soil chemical properties and can impact how often you will have to apply lime and how easily nutrients may be washed out of the soil. Certain soil management practices like the use of compost, crop rotations, and cover cropping regimes can be used to improve the inherent fertility of the soil.

- Soil pH is a measure of soil acidity or alkalinity. Soil pH impacts the availability of nutrients in the soil to be taken up by plants. A soil pH of 6.0-7.0 is suitable for most fruit and vegetable production.
- Soil EC is electrical conductivity, which is a measure of salt content in the soil. High salt content can injure crops and some crops are more sensitive to high salt than others.
- The remaining items in the table are the plant-available phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), sodium (Na), iron (Fe), manganese (Mn), zinc (Zn), copper (Cu) and boron (B) content of the soil. These nutrients are important to crop production. Notice that we described this as “plant available” which means the test measures how much each nutrient is available for a crop to take up from the soil and this value is different from the “total” nutrient content of the soil. Plants need P, K, Ca, Mg and S in larger quantities while the other nutrients are needed in smaller quantities.

Sample ID	pH	EC umhos/cm	Mehlich-3 extractable nutrients										
			P	K	Ca	Mg	S	Na	Fe	Mn	Zn	Cu	B
			Mg/kg										
Strawberry Patch #1	6.6	127	203	98	946	145	12	5.0	113	91	7.2	9.2	0.6
Low <sup>1</sup>	>6.0	0-2,000	<35	<130		<30	<10		<50	<25	<1.0	<1.0	>1
Adequate	6.0-7.0		36-50	131-175	Varies <sup>2</sup>			Varies <sup>3</sup>	Soil pH dependent <sup>4</sup>				1-10
Excessive	<7.0	>2,000-4,000	>50	>175					>100-400		>8.0		>20

<sup>1</sup> Refer to [“Understanding the Numbers on your Soil Test Report”](#) for more information on these ranges

<sup>2</sup> Maintain adequate soil pH between 6.0-7.0 for most crops, except blueberry;

<sup>3</sup> Consider soil texture (clay soils will have higher Na content than sandy) generally values below 400-1000 are desirable

<sup>4</sup> Low soil pH (below 5.2) can sometimes result in the appearance of micronutrient toxicities due to Mn; raising the pH can resolve this issue. High levels of Fe and Zn are sometime observed, but more rarely result in toxicity symptoms. By contrast high soil pH (above 7.0) may result in a Zn deficiency.

### What do your results mean?

- Your soil pH is **within** the recommended range for most fruit and vegetable crops.
- Your soil is **below** recommended limits of EC and is at **low** risk for salt injury for most crops.
  - High soil EC is usually caused by an over application of fertilizers or manures. Flushing the soil with rainfall or irrigation can be helpful to reduce salt content.
- **Your soil is sufficient for many key nutrients, including: phosphorus, calcium, magnesium and sulfur**. You can expect to have around 406 lbs/ acre of phosphorus (P) and 196 lbs/ acre of potassium (K) available to the next crop. Most crops need less than 100-150 lbs. of each of these nutrients per season, but some crops have higher requirements. Additional Potassium (K) may be needed prior to the next crop
- **Soil calcium content is related to soil texture (see section 2)**. Clay soils have higher calcium content than sandy soils.
- **Your soil is deficient for boron, consider making a soil or foliar application in spring.**

### Recommendations:

Consider implementing the recommendations provided above. Continue to monitor your soil pH yearly.

Most crops have specific nutrient demands, so it may be beneficial to check a regional guide, such as the [2022 Southeastern U.S. Vegetable Crop Handbook](#) for detailed recommendations for your crop. Major additions of soil nutrient amendments are most easily applied prior to planting when the crops are not present in the ground.

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## Soil Physical Properties

Physical properties of the soil include the soil texture, soil structure, and aggregate stability. Soil texture cannot be changed but certain soil management practices like the use of compost, crop rotations, and cover cropping regimes can be used to improve the inherent fertility and other properties of the soil. Practices like reduced tillage and anything to increase organic matter (cover cropping, compost and no-till practices) generally help soil structure.

### Soil Texture

You have a **silt loam** at Strawberry Patch #1 (red) (Figure 1)

Soil texture can impact how water movement in the soil and as a result can impact how irrigation should be applied most efficiently.

Soil Texture					
Sample ID	Sand	Silt	Clay	Dot Color	Aggregate Stability
	————— % —————				%
Strawberry Patch #1	14.3	71.9	13.8	Red	46

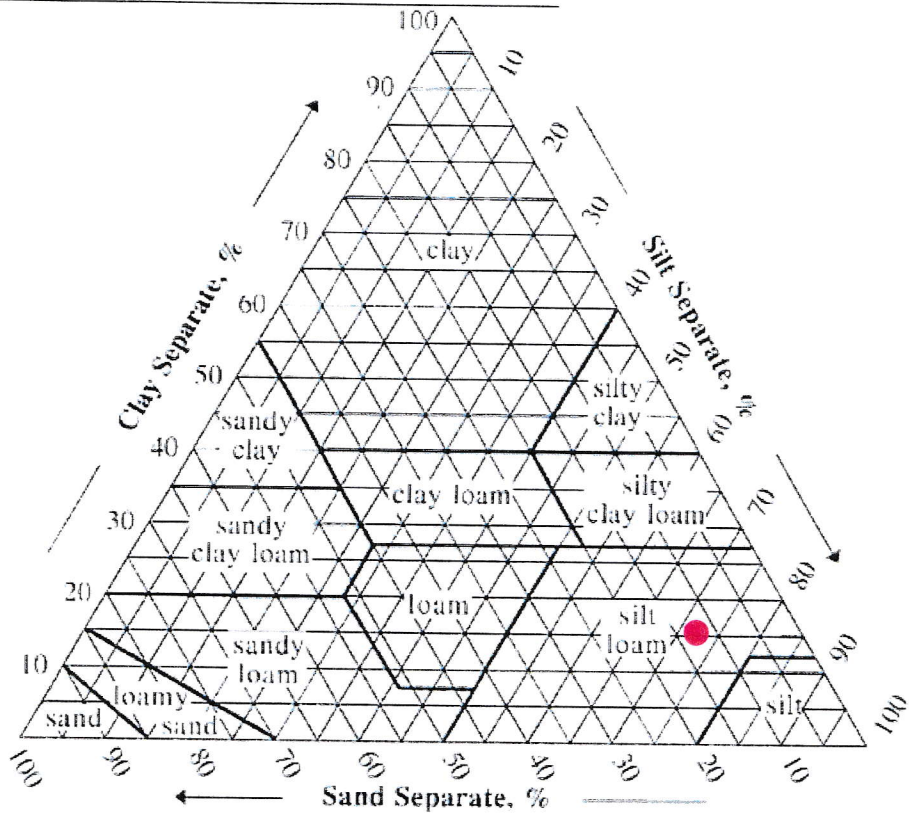


Figure 1 Soil Textural Triangle

## Impacts of Soil Texture on Soil Properties

	Sand	Silt	Clay	Soil Organic Matter
Water Infiltration	Fast	Medium	Slow	Improves soil structure
Water-holding capacity	Low	Medium	High	Improves water holding capacity water
Tillage Ease	High	Medium	Low	Improves soil structure
Response to Lime	Fast	Medium	Slow	May slow response
How Often Lime Required	Frequent	Medium	Less Often	
Nutrient-holding Capacity	Low	Medium	High	Increases nutrient holding capacity

Source: Amanda McWhirt

### Recommendations:

*You have a silty soil, which is ideal for most crop production. However the soil can lose fertility over time if not well managed.*

Your wet aggregate stability is **high** for your soil texture.

Soils with high wet aggregate stability is more likely to maintain its structure in events of heavy rainfall or excessive water flow. Relative to low stability soils, it should have better infiltration and reduced risk of crusting on the surface.

Wet aggregate stability can be improved by reducing tillage, reducing bare ground fallow periods, leaving crop residues in place on soil surface, or by increasing soil organic matter.

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## Soil Biological Properties

Soil biological activity is important to the soil for a multitude of reasons. Soil organisms like bacteria and fungi have been found to be important for: nutrient cycling, nutrient retention, disease suppression, degradation of pollutants, improving soil structure and water infiltration of the soil.

Soil organic matter content of 2-3% is common in the Southeast, and values above this reflect good soil management practices that limit soil organic matter losses. Organic matter is important because of its impacts on soil physical, chemical and biological properties.

Soil biological activity is measured by a 24-hour respiration test and total soil carbon. These measurements give a general idea of the biological activity of the soil and are heavily tied to the organic matter content of the soil. Crop residues, cover crops, and use of compost amendments are all practices that can enhance soil biological properties.

Sample ID	Organic Matter*	Total Soil Carbon	Total Soil Nitrogen
	%		
Strawberry Patch #1	1.96	1.72	0.163

*\*Organic matter is calculated by loss on ignition. Samples are weighed, combusted at 500°C, then weighed again. The lost material is calculated as % loss on ignition, which is converted to the % organic matter of the sample.*

- **Your soil organic matter is below standard ranges for the region.**
  - Soil organic matter can be slowly increased over many years through the implementation of cover cropping, reducing tillage, and increasing compost additions.
- **Your soil carbon and total soil nitrogen are within standard ranges**
  - Total soil carbon and total soil nitrogen are both closely tied to the amount of organic matter in the soil.
- Total soil carbon is another indicator of the amount of organic and mineral carbon compounds in the soil. It is another way to look at the amount of organic material in the soil. However it is important to realize that a high value here can also indicate a high amount of mineral carbon (calcium carbonates) which are often present in soils with high pH.
- Total soil Nitrogen is an indicator of how fertile the soil is because it is a measure of all the nitrogen present in the soil. This measurement includes both nitrogen available for plant uptake and nitrogen that is not available for plant uptake that may be stored in organic materials.
- **Total soil nitrogen describes your soil's ability to supply nitrogen from what is held primarily in organic matter, this process of nitrogen release is very slow.**
  - A soil with 0.10 to 0.15 percent N, can supply approximately 5,000 lb N/acre, however only a small percent of this (1-4%) is released for plant uptake in a single growing season.
- Please note that the results from soil respiration tests are still forthcoming.

#### **Recommendations:**

Your soil is low in organic matter. Implementing practices that conserve or add soil organic matter, like applying high quality compost, planting cover crops and reducing tillage passes can over time increase soil organic matter content.