DECEMBER 5TH IS WORLD SOIL DAY

We have some unique soils in Orange County

The 2024 World Soil Day theme is "Caring for Soils: Measure, Monitor, Manage". **Orange County Soil and Water Conservation District** does our fair share of the 'three M's' when it comes to soil conservation efforts. This is especially relevant on the Black Dirt, or organic, soils of the Pine Island farming region. These soils, which formed from vegetation in an ancient 16,000 acre glacial lake which is now completely filled in, are exceptionally well suited to farming but also require special care. Unlike most soils in our area, fine-textured organic or 'muck' soils are extremely susceptible to wind erosion. Being derived from decaying plant material, they are also subject to degradation from oxidation – these soils literally burn up when exposed to aerobic conditions.

Fortunately, there are soil management practices available to help farmers control these processes while taking advantage of the muck soil's ideal properties for farming. Cover crops, sometimes referred to as 'green manure crops', help control wind erosion and add valuable organic matter to partially offset what is lost to oxidation. Water table management practices, while less widely used than cover crops, are practiced by some farmers to further reduce soil subsidence resulting from oxidation.

The Hudson Valley and surrounding area is fortunate to have this nearby source of a plethora of fresh vegetables and other crops. Imagine the carbon emissions that are avoided by accessing locally grown food as opposed to trucking fresh vegetables here from California or Florida.

Soils and their role in Carbon Sequestration

Large-scale transportation of produce has been proven to be one major source of carbon dioxide in the atmosphere. The carbon dioxide released from burning coal, oil, and natural gas absorbs infrared radiation emitted from the earth, then acts as a blanket to trap that warmth within the atmosphere. It can be argued that these practices are what contribute to the widely-acknowledged climate change, which can be observed through the unusual weather patterns within the last twenty-plus years. As society continues using non-renewable fossil fuels, the role of soil becomes more important as a means to get carbon dioxide out of the atmosphere.

The process that plants go through to assimilate carbon into the soil is called *carbon sequestration*. Through photosynthesis, biomechanics within plants absorb carbon dioxide from the atmosphere. That carbon can meet one of two fates: immediate use within the plant for other metabolic processes or release into the soil for later use. Plants convert atmospheric carbon dioxide into organic compounds, which are then excreted through the roots. From there, the carbon becomes part of the "soil organic matter." Soil organic matter is then used to boost productivity by improving the soil structure, nutrient availability, aeration, and water infiltration/retention.

A particular soil's ability to withhold its structure and filter or retain water is a concern often faced by farms in the Orange County area. Without suitable soil structure, crop life cannot be sustained, soil particles can be lost due to erosion, or land can become flooded and unable to sustain life. The

Soil and Water Conservation District assists farmers in addressing soil health and management concerns through numerous funding opportunities from the State of New York.

The first step to improving soil health anywhere is understanding the soil types of the area. There are several tools available for public use, such as Web Soil Survey and the Orange County GIS Website, that outline basic and in-depth soil information on any given property.

What kind of soil do I have?

Web Soil Survey

The USDA-Natural Resources Conservation Services, NRCS, created and maintains the Web Soil Survey (WSS.) The WSS provides valuable information pertaining to the characteristics of the native soil types for a specific area of land. WSS offers soil maps and data for more than 95% of the nation's counties. WSS gives an overview of the basic physical and chemical properties of the soil. This provides information on the soil resources, property's limitations, as well as its uses. Farmers utilizes this data to determine which crops would fare best in their soil. However, farmers are not the only professions that benefit from this information.

Additionally, soil compositions are taken into consideration by engineers when constructing buildings. For example, loam, which is combination of clay, sand, and silt, is regarded as one of the best soils for building. This is due to its ability to absorb water and dry out at a steady rate. Additionally, compared to clay, loamy soils expand and contract less. Clay soil that is not stabilized can lead to cracks in a building's foundation, as well as structural damage. As a result, this means there is less pressure exerted on the foundation. Engineers assess a soil's bearing capacity, permeability, and compressibility.

WSS allows the user to export the selected data in digital format which can be imported directly into a geographic information system (GIS.) The first step when using WSS is establishing an area of interest (AOI). The user can enter the address of their desired AOI in the search bar provided. After the site prompts the aerial map, the rectangle or polygon tool is used to select a certain area. Once the AOI is determined, you can view and download the soils information and maps. The information provided is free and available for download. WSS can be accessed online at https://websoilsurvey.nrcs.usda.gov/app/.

Attached is an example of an AOI selected in WSS and its accompanying soil map and properties. This property is in Orange County and is actively farmed by a local family farm. Per the WSS, the soil on the property is Mardin gravelly silt loam & has a 3 to 8 percent slope.

Visit ocsoilny.org to learn more about what the Conservation District does to support agriculture and protect natural resources. The public is always welcome to call us at 845.343.1873 with questions about soil or other natural resources management matters.