WHY DOES SOIL HEALTH MATTER? STARTING WITH SOIL ORGANISMS

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By now, everyone involved with gardening or growing plants has heard the term "soil health" thrown around. What is soil health, and why is it important?

Soil Health refers to multiple soil characteristics that work in unison to create favorable growth conditions for plants. One of those characteristics involves the living organisms found in the soil surrounding a plant. Each specific underground inhabitant and its complex functions warrant a unique, in-depth look in general, all healthy soils contain a profile of bacteria, fungi (mycorrhizae), protozoa (single-celled organisms), nematodes (tiny non-segmented worms), arthropods (invertebrates with segmented bodies), and earthworms.

Mycorrhizae, pronounced mai·kor·rye·zee, form relationships with plants via their root system and increase the plant's reach into the soil to obtain water and nutrients.
Photo credit Mayne Nature Conservancy: https://mayneconservancy.ca/mycelium-the-highway-under-the-soil/]

All soil organisms help decompose nutrient rich organic material (decaying plants, animals, and animal waste), which increases soil organic matter (SOM) that feeds plants. Larger soil organisms, such as earthworms and arthropods, add nutrients to the soil through their waste as they shred and feed on SOM. They also improve soil texture, root penetration, water infiltration, and spread beneficial bacteria by their movement in the soil.

As plants collect and convert carbon from the atmosphere into sugars, they will deliver some of these life-sustaining sugars to smaller organisms or microbes, such as bacteria and fungi, via their roots. In exchange, these microbes provide services to the plant, such as converting atmospheric nitrogen to

usable forms and mining minerals and other nutrients from the surrounding soil for use by the plant. Much of the soil microbial activity happens within millimeters of the roots**;** however**,** some microbes create extended networks of fibers able to harvest and deliver water and nutrients from well beyond the reach of the plant's roots. A third important soil microbe, protozoa, feeds on both bacteria and fungus, keeping those populations in check and cycling nutrients back to the plant.

These are just a few examples of the extensive role of soil organisms. When present and balanced, they provide a myriad of benefits to plants and are an essential part of soil health. Please stay tuned for more information on additional characteristics that contribute to soil health in future postings.

For more information on improving soil health, see **HGIC The Role of Organic Matter in Healthy Soils** and **HGIC 1655, *Soil Conditioning- Establishing a Successful Gardening Foundation***.

If this document didn't answer your questions, please contact HGIC at **hgic@clemson.edu** or 1-888-656-9988.

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