



# NEWSPAPER ARTICLES

## How Important is Soil Health? (November 16, 2024)

By Rosie Bonar, Tulare/Kings Counties Master Gardeners

Our planet is covered with soil and water. We should consider soil as the backbone of our gardens, as it is the foundation for everything that grows. Healthy soil leads to healthy plants-- and healthy plants produce 98% of the oxygen we breathe and 80% of the food we eat. So, what is soil, and how can we make sure it remains healthy?

### Soil is Alive

Soil is much more than just dirt. Dirt is a lifeless mixture of minerals, air, and water. Soil is a living thing--a mixture of dirt along with living and dead organisms and their waste products. When it is healthy, soil allows water to flow so it is accessible to plants, transporting nutrients to the roots of the plants. Healthy soil can retain water without runoff and keep plants healthy even during dry periods. Plants that we grow to sustain us with their produce depend on soil for the mineral nutrients they need. Healthy soils can store plant residues that contain carbon and, in that way, help keep carbon out of the atmosphere. Keeping carbon out of the atmosphere is vital to combat climate change, protect ecosystems, and ensure food security.

### Soil Texture & Structure:

Soil texture tells us the size of the particles or aggregates that make up the soil. Soil can be classified as sand, clay, or silt, and mixtures of these. The space between these different soil particles is the space available for water, roots, and air. (Imagine a jar of small, medium, and large marbles and the space between them.) The space in healthy soil is large enough to have room for water, air, and roots but small enough to hold water so it does not just drain through.

### Life within the soil:

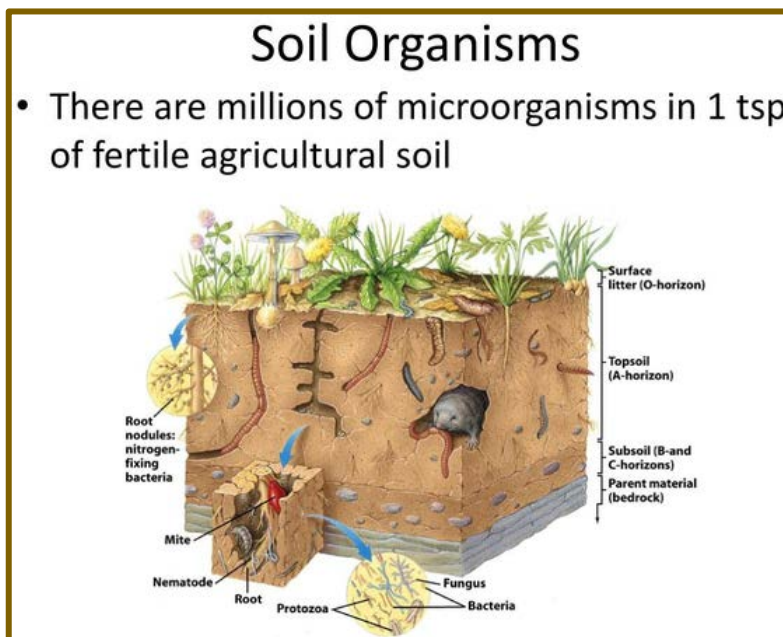
Millions of microorganisms live within a teaspoon of healthy soil. These organisms, mostly invisible to the human eye, are bacteria, fungi, nematodes, insects, earthworms, spiders, and more. These organisms, known as soil organic matter, all function in ways that enrich the soil and give the plants what they need to thrive. When we act in ways that harm or destroy these organisms, we do harm to the soil. Chemicals that we add to the soil, such as fertilizers, herbicides, and pesticides, disrupt the balance that living soil organisms have created.

### Regenerative Farming Practices:

Regenerative farming is a relatively new practice for farmers. It aims to help reverse climate change through practices that restore degraded soil and return it to a more natural state. There are features of regenerative farming that can also be used by the home gardener on a smaller scale. Regenerative farming practices include no-till or reduced tillage. Instead of plowing fields and leaving them fallow (or rototilling your garden), no-till methods include using cover crops to cover the soil in the off-season. Using a cover crop improves soil structure, reduces erosion, and reduces soil compaction. It increases organic matter in the soil and improves water infiltration. As a home gardener, this is a new concept. I always liked the look of fluffy soil after rototilling. But breaking the soil up disturbs the soil structure and the life within the soil, releasing stored carbon back into the air. Planting a cover crop instead adds organic matter to the soil and replenishes it without too much disturbance.

### How can the home gardener improve the health of their soil?

The plants we use in our landscapes thrive on healthy soil. A healthy soil will provide what the plants need without too much help from us. How we treat our soil can affect its health.



- **Avoid compacting the soil.** Compaction reduces the available space between the particles of soil and leaves less space for air, water, roots, and the exchange of nutrients between the soil and the plants. Soil compaction is caused by walking or using equipment on soil in the same spot over and over, especially when the soil is wet. You can observe soil compaction on trails that people and animals walk on and in areas where heavy equipment is used. Compacting soil changes the texture and makes those air pockets smaller, which reduces the amount of air and water available to plants (effectively smothering them).
- **Avoid using chemical herbicides and pesticides on soil.** Poisons harm more than their intended victims. Herbicides kill plants, and pesticides kill animals. Herbicides are used to kill weeds, but they can also cause harm to the microbes in the soil. Microbes help to make nutrients available to the plants by interacting with the roots of the plants. When we kill the microbes (bacteria) in the soil, we end up with soil that is nutrient-poor. Pesticides, which kill animals, will harm insects that pollinate and worms that help aerate the soil.
- **Add organic matter to the soil.** Organic matter increases the living material in the soil and helps the soil retain moisture and fertility. The homeowner can add organic matter to their soil by using compost as a soil additive. Compost has living organisms in it that can directly interact with the soil to add fertility, and using compost decreases the need to add chemical fertilizers. Feed the soil with organic matter, and it will feed you and your plants.
- **Add a layer of mulch** to the top of the soil to help prevent unwanted weeds, cut down on water loss, and mitigate heat damage to the soil. Too much heat and not enough water will kill soil organic matter. Mulch, in combination with drip irrigation, can decrease the need for herbicides. Mulch can be organic (such as bark) or inorganic (such as rocks). Organic mulch will decompose and need to be replaced periodically, but the decomposition process will add nutrients to the soil. Inorganic mulch will not decompose. Decomposing mulch also helps give the soil the preferred texture.

For more information on cover crops and regenerative agriculture, visit:

Cover Crops Database <https://sarep.ucdavis.edu/covercrop>

Chico State Center for Regenerative Agriculture <https://www.csuchico.edu/regenerativeagriculture/ra101-section/index.shtml>

As a home gardener, knowing what makes soil healthy will help your plants and, in turn, help our planet

**The Tulare-Kings Counties Master Gardeners will answer your questions in person:**

Visalia Farmer's Market, 1st & 3rd Saturdays, 8 - 11 am, Tulare Co. Courthouse

Nov. 16, 10 am – 1 pm, Hofman Nursery Plant Clinic, Hanford

**Questions? Call the Master Gardeners:**

Tulare County: (559) 684-3325, Tues & Thurs, 9:30-11:30;

Kings County: (559) 852-2736, Thursday Only, 9:30–11:30 am

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