



DR. CAITLIN YOUNGQUIST

BUILDING HEALTHY SOIL IN THE GARDEN

WITH HEALTHY SOIL, WE CAN GROW MORE FOOD WITH LESS WORK

Soil is a living system of minerals, plants, insects, worms, and microbes. Building more soil organic matter helps keep this complex and hard-working system happy and healthy.

Most farmers and gardeners understand the importance of having enough nitrogen, phosphorus, and potassium, but the value of soil carbon is often underappreciated.

THE ROLE OF CARBON IN SOIL HEALTH

Plants get carbon from the air through photosynthesis, but carbon in the soil is very important for long-term soil and plant health. Carbon is the primary ingredient of soil organic matter, which gives healthy soil its dark-brown color, good tilth, and rich, earthy smell.

Organic carbon was (or still is) part of a living organism—worm poo, compost, manure, decaying roots and leaves, and microbes.

Soil organic matter (SOM) and soil carbon are often used interchangeably, but they are not the same. SOM is about half carbon. It also contains every one of the 16 essential plant nutrients. Most fertilizers provide only a few nutrients.

Though SOM usually makes up only a small percentage of the soil (<4% in most Wyoming soils), it does most of the work!

- Provides a source of all essential plant nutrients
- Helps hold water in the soil for plants to use.
- Stimulates seed germination and plant growth.
- Increases crop yield and quality.
- Helps prevent disease and pest outbreaks.

ADDING MORE ORGANIC MATTER TO YOUR SOIL

Add organic soil amendments. Incorporate compost, manure, hay, wood chips, wool, coffee grounds, leaves, and grass clippings into your soil. These materials contain various carbon-rich compounds, including lignin, cellulose, sugars, lipids, and humic acids.

Never leave the soil bare. Always use mulch to conserve water, protect the soil, and create a more hospitable habitat for plants and worms. Wood chips and chopped leaves make excellent mulch! Alfalfa hay is another great mulch or compost addition, as well as grass hay baled before it goes to seed. And don't forget coffee grounds and vegetable scraps—these can be added to the compost pile or buried directly in the garden.

Sheet mulching and lasagna gardening are excellent ways to eliminate the need for rototilling, add carbon to the soil, prevent erosion, suppress weeds, and use water more efficiently. These methods involve layering organic materials like leaves, grass, manure, coffee grounds, straw, and hay on the soil surface, ensuring plenty of moisture. Over time, these layers decompose in place, creating rich, fertile garden beds.

Keep in mind that this process takes time and water, so starting in summer or fall is best.



BUILDING HEALTHY SOIL IN THE GARDEN

DO NOT DISTURB

Disturbance and bare soil deplete the soil organic matter and make your job in the garden more difficult. Rototillers cause long term soil compaction, kill earthworms, spread weeds like thistle and bindweed, and leave soil exposed and vulnerable.

Whenever possible, use a shovel instead of a rototiller and disturb the soil as little as possible.

Tilling in the fall is especially harmful, as it leaves the soil bare and unprotected all winter. Instead, leave plants on the surface as mulch over the winter to protect the soil and feed the underground food web. This also provides habitat and food for birds and insects. Pick up leaves with the lawnmower and spread over your garden and landscape to protect and feed the soil.

By eliminating the rototiller and incorporating mulch and compost, you will start to notice more earthworms, deeper roots, and healthier plants.

THE SOIL FOOD WEB

There is a lot going on beneath the surface!

Larger soil organisms like worms and arthropods are the "shredders." They break down organic materials such as manure and leaves into smaller pieces, aerating and mixing the soil in the process.

Next come the bacteria, fungi, protozoa, and nematodes—tiny microbes that play a crucial role in soil health. There are billions of these little recyclers in a single shovel-full of healthy soil, and they rely on organic matter for energy and nutrients. As they break down dead plant material and manure into simpler components, they release nutrients that plants need to grow.

Without these microscopic workers, plants wouldn't be able to access the nutrients locked in the soil.

SOIL HEALTH AT A GLANCE

- Add compost, manure, leaves, and grass clippings to build soil organic matter and provide plant nutrients, and feed the worms.
- Use mulch (wood chips, chopped leaves, straw) to conserve water and protect soil.
- Leave garden plants over winter to provide mulch and habitat.
- Try sheet mulching or lasagna gardening for easy, no-till soil building with fewer weeds.
- Get rid of the rototiller and try sheet mulching or use a shovel.
- Never leave the soil bare.

BUILDING BETTER SOIL FOR A HEALTHIER GARDEN

Healthy soil is the foundation of a thriving garden. By increasing soil organic matter, using mulch, minimizing tillage, and fostering a diverse soil food web, you can create a more resilient and productive growing environment. These simple practices not only improve plant health and yield but also reduce water use, and make your job easier. Gardening is a partnership with the soil—when we care for it, it rewards us with abundant harvests and a vibrant ecosystem. Start small, experiment with different organic materials, and watch your soil—and your garden—flourish!



Located in
Worland, WY
307-622-4284
dirtworkswyo.com

JOIN OUR NEWSLETTER

Scan the QR Code to get
the latest updates on
organic soil solutions
straight to your inbox.

