
Building Your Soil

Farm to Table-Guam Corp.

What is Soil?

Soil, in a farmer's sense, is alive. Alive with protozoa's, nematodes, worms and microorganisms (fungal and bacterial) that transforms mineral compounds into nutrients for plants to use to help them grow. Dirt on the other hand is the absence of life. Having healthy soil is crucial in the growth of your plant. So how can we transform dirt to soil?



One way soil is made is by mixing dirt with living organisms. You can do this by creating a compost pile and mixing the compost with the dirt/soil in your garden.

What are Microorganisms?

Think of them as chefs for plants. They are responsible for breaking down minerals and nutrients in our soil into readily available compounds for our plants to absorb. If you want your plants to grow well, then you should feed them the best food possible and that's when microbes contribute. They take the ingredients and create a five course meal for our plants.

For more information, check out these *books* "Teaming With Microbes" by Jeff Lowenfels and "The Regenerative Grower's Guide to Garden Amendments" by Nigel Palmer and John Kempf.

Tips to Improve Your Soil

1. Incorporate soil amendments
2. Add compost
3. Integrate biochar in farming practices
4. Use compost tea

What are Soil Amendments?

A soil amendment is anything added to the soil to improve its qualities or abilities so it may create a healthy environment for your plant to grow. These soil amendments, or soil conditioners, can help improve the physical texture of your soil. It may reduce compaction and allow the plants roots to spread easily to find nutrients. Some soil amendments also add nutrients and minerals to the soil (macro and micro nutrients).

Macro and Micro Nutrients are both essential for a plant's health. The plant will always require more macronutrients; **NPK** (Nitrogen, Potassium, Phosphorus). However, the plant also needs micronutrients, such as zinc, calcium, magnesium, etc., in smaller amounts. Every plant is different and requires different amounts.

For example, fruits like more potassium and leafy greens like more nitrogen. A simple search online about the plant you are trying to grow will point you in the right direction as to what your plant likes and the amount it needs.

The soil you use in your garden will always be going through changes. The plants you grow will deplete it of nutrients or the climate may affect the soil health (erosion from our heavy rains). The soil you use may continuously need amendments to stay healthy.

Ways to Amend Soil

One of the best ways to amend soil is to continuously add organic matter such as compost and earthworm castings, which are full of micro-organisms and nutrients. Mulching is also another best practice in agriculture. Not only does the mulch help with managing weed pressure, but it also breaks down into organic matter (carbon) over time.

What is Composting?

Composting is the natural process of recycling organic matter (grass clippings, vegetable scraps, coffee grounds, etc.) and is one of the most invaluable amendments to your soil.

Benefits of Adding Compost

Compost is full of living organisms that help improve soil by converting food waste and manure into food for the plants. It also changes and improves the soil texture by adding carbon (broken down leaves, branches, and twigs). Additional benefits:

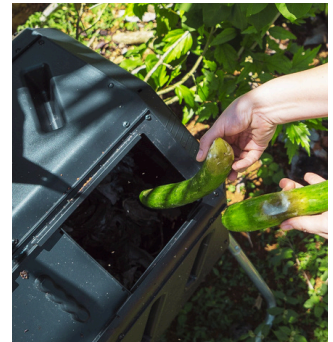
- creates a source of homemade fertilizer
- increases soil fertility
- improves soil texture
- increases pest and disease resistance

Compost can heat up to 140°F. The heat will kill disease-causing bacteria and kills most weed seeds. The heat is created by microbes activity and consumption of the food waste and carbon that you place into your pile. The microbes then release nutrients like NPK, as well as break down the matter, creating what gardeners call black gold.

How to Start a Compost Pile

1. **Decide the location of pile** and if you will make or purchase a container or bin. Using recycled pallets are a great way to upcycle, however they may deteriorate over time.

Rotary composters (see photo) are easy to use but have no contact with the ground and no indigenous microorganisms can make their way into the compost pile.



The *round chicken wire method* (see photo) lasts longer, are easy to construct, easy to keep chickens out, and can be easily hidden, although you will have to move the whole compost bin when you turn it to ensure you are encouraging the anaerobic process.



2. **Gather brown waste (carbon source).** This includes wood chips, branches, brown leaves, shredded paper, cardboard (shred to at least 2-3" pieces), shredded egg cartons, etc. This should be added to the pile first.

3. **Collect green waste (nitrogen source).** This includes cow or chicken manure, green vegetation and fruit and vegetable scraps.



4. **Mix all four basic elements of composting in your pile (Nitrogen, Carbon, Water & Oxygen).** Follow ratio of 2-3 parts Carbon to 1 part Nitrogen (2-3:1). Mix (turn) the layers together once per week with a pitchfork or shovel. Turning the compost pile is key to aerating the compost pile and accelerating the process to completion. Water periodically and do not over saturate. Make sure to not let the pile dry out. If you have an open pile, cover with a tarp to avoid pests and rain. Tear, shred or chop waste so it will break down faster. Adding worms can add increase plant nutrition to your compost.

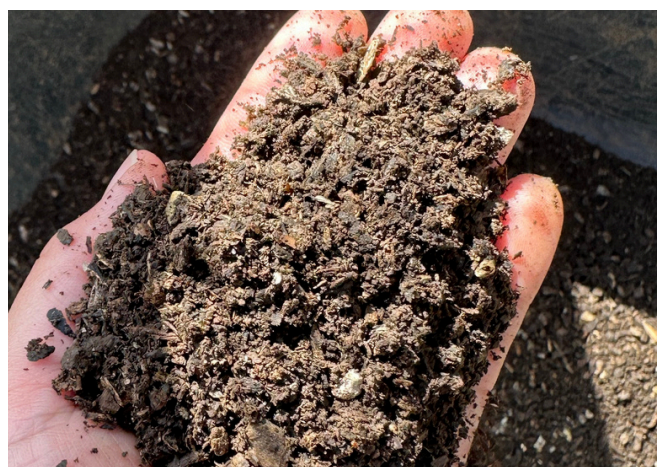
After three months of turning the compost once per week, we will bag a handful of compost and let it sit in a closed ziplock bag for a few days, open it and smell it. If it has a foul smell or smells like amonia, then it is not done (fully cooked). If it smells pleasant and has an earthy scent, then it's a good sign your compost is finished. The nose knows.

Temperature should be maintained between 110-140°F for compost. To get an exact temperature, you can purchase a composting thermometer.



TIP

Usually during the rainy season when we dig up the beds we find earthworms, especially after a heavy rain, and we relocate to our compost pile.



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