How-To: Amending Garden Soil

In an organic garden, healthy soil sets the stage for plant health and productivity. Soil tests may indicate that your soil needs amendments in order to provide a healthy foundation for your garden. Here are common amendments that can help improve your soil.

A COMMUNITY GARDENER PLANTS INTO A RAISED BED SHE AMENDED WITH COMPOST

YOUTH ADD A TRUCKLOAD OF COMPOST TO BEDS AT BRADDOCK FARMS

PH

The pH of the soil indicates how acidic or basic your soil is. The number 7.0 is neutral. Numbers higher than 7.0 mean the soil is basic. Numbers lower than 7.0 mean the soil is acidic. Most plants prefer pH between 6.0 and 7.0, as the most nutrients are available at that pH range. These conditions are also optimal for beneficial soil organisms.

- To lower the pH and make your soil more acidic add pelletized Sulfur.
- To raise the pH and make your soil more basic, add lime.

Both Sulfur and lime take time to affect the pH. Ideally, incorporate these amendments in the fall, so they have time to impact the pH before planting the following spring.

Primary Nutrients

Nitrogen (N), Phosphorus (P), and Potassium (K) are the primary nutrients required by plants. Your soil test results will most likely only show the amounts of P and K. N is not often measured, since its amount in the soil fluctuates easily and test results can be inaccurate. It's important to have adequate and balanced amounts of these nutrients.

Additions of compost go a long way toward increasing N, P, and K, as well as secondary nutrients and micronutrients in the soil. So if your garden needs a general boost of nutrition, add compost. But also take a look at each specific nutrient level to see if you need to address any deficiencies in particular. Please note that adding excessive amounts of nutrients does not help plant growth and can actually harm plants and the environment.

The primary nutrients are listed on commercial products in terms of their percentages in this order: N-P-K. To determine how many pounds are needed for your space, read the square foot recommendations for each product.

- To address Nitrogen needs, assume that you will need to add a source every year. Some Nitrogen is available in compost, but we recommend adding a more concentrated and easily available source when planting. Blood meal and feather meal are two good options, or try cottonseed meal for a product that is not animal based.
- To increase Phosphorus, add composted manure or rock phosphate.
- To increase Potassium, commercially available organic Sul-Po-Mag works well if you also need Magnesium. Sulfate of Potash includes Sulfur and Potassium. Or, try a small amount of wood ash, as long as your pH is somewhat acidic. Potassium leaches easily from the soil, so add it to the soil shortly before planting.

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SPREADING AMENDMENTS IN AN AREA WHERE A NEW GARDEN WILL GROW

Secondary Nutrients

Calcium (Ca), Magnesium (Mg), and Sulfur (S) are considered to be secondary plant nutrients.

- Calcium is available in the form of bone meal, gypsum, or high-Calcium lime.
- Magnesium is often a part of primary nutrient amendments, like lime. Mg (and S) can also be given to crops as a fertilizer like Epsom salts, which are approved for use in organic gardens.
- Sulfur is available directly in pelleted form. It is also a part of many primary nutrient amendments, like gypsum and sulfate of potash.

Microorganisms and Soil Structure

In organic gardening systems, the soil is not only the foundation of the garden - it is filled with life. Microorganisms diversify the garden ecosystem and assist plant growth in a variety of ways, including by improving soil structure. Gardens with good soil structure hold water and nutrients longer than compacted soils, and create an ideal area for root growth. If your soil is compacted, thin, or lacks fertility, try the following amendments in addition to addressing specific nutrient deficiencies.

- Compost adds living microorganisms along with organic matter, to improve soil structure.
- Humic acids (found in Humate) stimulate plant enzymes and increase beneficial soil organisms.

Beyond soil testing and adding fertilizers, the most important thing you can do for your soil is to avoid compaction. Plant roots, worms, and microorganisms thrive when there are pockets of air in the soil. Walking on the soil or compacting it with machinery, smashes the soil and destroys these necessary air pockets. Be especially careful not to compact the soil when it is wet, as this causes significant damage to the soil structure.

To protect your valuable, fertile soil, use mulch (like leaves or straw) throughout the gardening season and over the winter. Mulch keeps soil from eroding (washing away) and helps preserve the soil's structure. Mulch also helps to delineate the walkway, so the soil in the bed is not compacted.