

Fall Soil Management

By: Kelly Feehan, Extension Educator

Release: Week of November 22, 2021

Gardeners ask me about soil testing during fall. They feel their garden is no longer yielding as well and wonder if something is missing from the soil.

Soil testing every few years is wise and I provide gardeners with a list of private labs. I also remind gardeners they have to tell the lab what to test for. I suggest they begin with a basic test that tests for organic matter, pH and some nutrients.

I then ask them about their soil management practices such as how often do they till and how often do they incorporate organic matter. It's not unusual to hear tillage is done too often while the addition of organic matter is not done at all or often enough.

Excessive tillage is harmful because it damages soil structure. Good soil structure has good aggregation. Soil aggregates are clusters of sand, silt or clay particles held together in tiny, irregularly shaped groups. These tiny groupings are surrounded by pore space which is where roots grow.

In soil with good aggregation, pore spaces are larger than those found in a soil with poor aggregation where soil particles are tightly packed together. Good structure allows soil to be well drained, yet have good water holding capacity and adequate pore space for root growth and oxygen exchange.

When tillage is used, tilling once a year is best. The key is to till when soil is barely moist. It should not be wet or too dry. Tilling wet soil destroys soil structure and results in hard clods that break down slowly. It also causes soil compaction making soils hard to dig and restricting oxygen and root growth.

Fall into early winter is a good time to till soil as long as it isn't frozen, too wet or too dry. It is better to till at these times than to wait until spring when cold, wet conditions limit our ability to work soil. Soils should be roughly tilled during fall.

Fall is an excellent time to add organic matter. The goal is to have five percent organic matter. On most soil tests I see, organic matter is between one and two percent. Organic matter plays a key role in soil structure as well as adding nutrients.

Almost all soils benefit from the addition of organic matter. It improves drainage in clay soils and increases water holding capacity of sandy soils. It provides energy needed by soil microorganisms to build soil structure. They, along with earthworms, create a soil glue that helps aggregates form.

The addition of organic matter is not a one-time practice as it breaks down over time. It can be increased by working plants and mulch under at the end of each season along with incorporating composted manure or compost. To avoid damaging cultivation, one to two inches of compost can be spread over the top of no-till gardens each year. Compost is decomposed organic matter.

There is a limit on how much organic material, such as tree leaves, can be added at one time. As a rule, a two inch deep layer is adequate with five to six inches being the maximum to add at one time. Shredding organic material before spreading it on the garden during fall will promote faster decomposition.

The addition of manure into garden soil is recommended to be done during fall to avoid food safety issues with bacteria. If manure is used as an organic matter source, use manure that has been composted for one year or more and incorporate it into soil during the fall.