

A quick history of our soils

The word 'soil' is defined as "the top layer of the earth's surface, consisting of rock and mineral particles mixed with organic matter." To one who grows plants, whether the plants are vegetables, flowers, trees, shrubs or grass, soil is much more than that definition.

To this person, soil is a complicated physical, chemical, and biological system. In addition to the rock, minerals and organic matter, it is a host to living organisms of both plants and animals. It is a true ecosystem that is fragile yet rewards us with food and beauty.

Our local soils took tens of thousands of years to build, either through the disintegration of Adirondack rocks into our acidic sandy soils or the breakdown of sedimentary limestone laid down in the Champlain Sea thousands of years ago into our pH neutral clay soils .

Keep in mind that our soil...

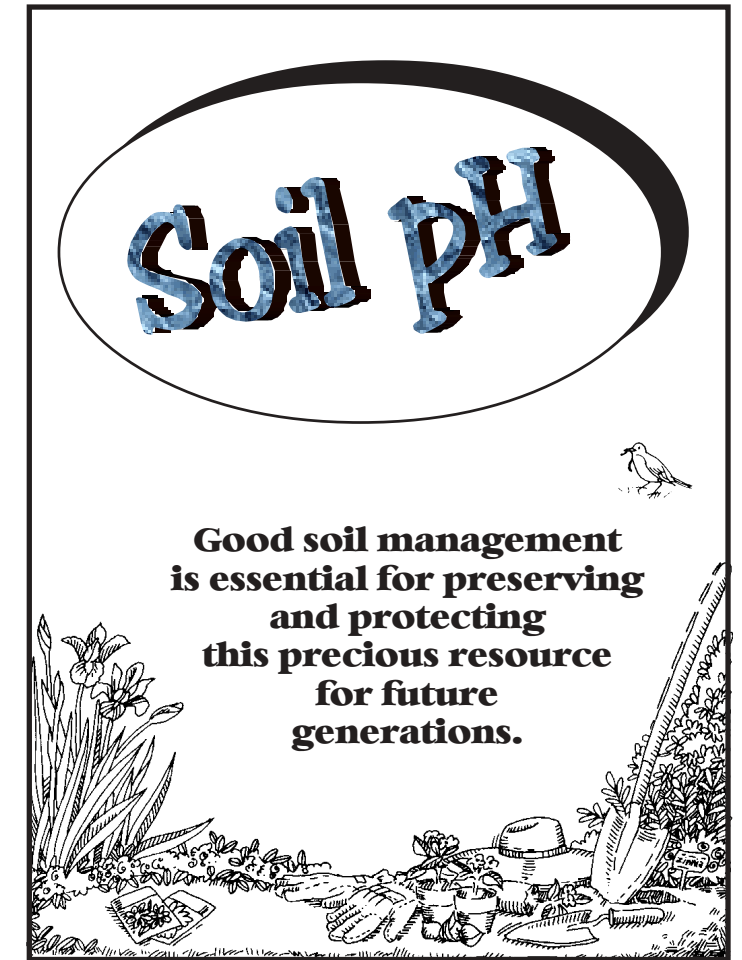
- provides water and nutrients to plants
- supports plants, helps keep them upright
- provides a home to soil organisms
- stores and purifies water

Cornell University Horticulturist, Joann Gruttadaurio tells us that, "Good soil management means preserving and encouraging the natural systems and reactions that take place in the soil." Sound words for passing a thriving environment on to our children.

"pH facts" to consider

- ❑ Fall is traditionally the best time to get your soil tested. If the pH is low and you decide to add lime to correct it, the lime will have several months to break down before the next growing season.
- ❑ Even if you use the correct fertilizer and follow all the proper gardening techniques, if your soil pH is not in the proper range, your plants will not do as well as they could.
- ❑ The most important factor determining the effectiveness of lime is placement. Lime is only slightly soluble and does not move through the soil.
- ❑ Spreading lime on top of the ground will not affect pH very much. It is important to work the lime into the top 4-6 inches of soil *before planting*.
- ❑ Acid rain, the use of conventional chemical fertilizers, and using mulches like peat moss and pine needles will lower the soil pH over time.
- ❑ Azaleas, rhododendrons, blueberries and conifers thrive best in acid soils of pH 5.0 to 5.5. Vegetables, grasses and most ornamentals do best in slightly acidic soils of pH 6.0 to 6.8.
- ❑ Wood ashes can be used in place of lime but twice as much has to be applied to change the pH. Coal ashes or ashes from charcoal (e.g. your barbecue grill) should not be added to your soil.
- ❑ Sometimes your soil pH is too high. The addition of sulfur can lower the pH. Get specific recommendations from your local Cornell Cooperative Extension office.

Just adding lime each year may not be the best practice. Get a soil test, then follow the recommendation by your garden center or Cornell Cooperative Extension office.



Cornell Cooperative Extension of Clinton and Essex Counties

For more information on soil pH and other topics, call your Cornell Cooperative Extension office!

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Taking a soil sample

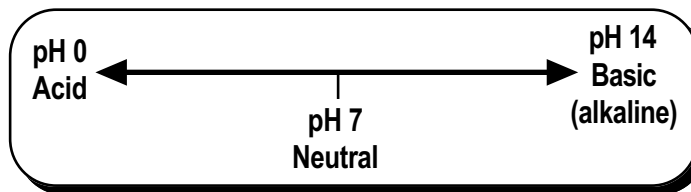
Remember that your pH test results can be no better than the soil sample provided for the test. Less than 1/4 cup of soil is needed for the test so care should be taken to obtain a sample that best represents the area in question. Here are some suggestions when taking your soil sample.

- ❑ Visually survey the area you want tested. If you have more than one section (e.g. a vegetable area, foundation planting, flower bed, lawn) provide a separate sample from each section. You generally treat each section differently and they may have different pH levels.
- ❑ If one section has an area that is "different", then each section should be tested separately. It is better to have two accurate soil tests than one that will provide questionable results for you.
- ❑ When you have selected the section to be tested, take several samples. Thoroughly mix them together in a plastic pail and then take 1/4 cup of this mixture to be tested.
- ❑ Your sample should include soil from a depth of 4-6 inches. This is the area where plant roots obtain the nutrients they need.
- ❑ Try not to handle the soil with your hands. Oils from your skin can cause the pH reading to be lower.
- ❑ Ideally, the soil sample should not be too wet. If you suspect the sample is too wet, allow it to air dry overnight before bringing it in. A sample can not be too dry for an accurate test.
- ❑ If you bring the sample to a garden center or Cooperative Extension office for testing, place it in a plastic bag or plastic container. Glass works well but can break. Do not put the sample in a metal can.

— when you get your soil pH test results back —

The meaning of "pH"

The pH is a chemist's measure of the amount of hydrogen ions in a solution. The measurement is set up on a scale that goes from pH 0 to pH 14 with pH 7 neutral as shown below.



pH and your soil

You can not change the basic properties of soil. If it is sandy, it will always be sandy. If you have a clay soil, it will always be clay. The same thing goes for pH. If your soil is derived from a limestone base, it will always be neutral and if your soil is derived from the acid Adirondack bedrock, it will be acidic. You can raise the pH by adding lime but it will slowly return to what it is "meant to be".

- ❑ Gardeners know that in order to maintain a proper soil pH, they sometimes will have to apply lime more than one time.
- ❑ Many gardeners are in the habit of adding a little lime each year to their garden. This may or **may not** be a good idea. The only way to know if you should add lime is to test your soil.
- ❑ You can buy a pH test kit from your local Cornell Cooperative Extension office or garden center. Your Extension office will also test your soil for you and make recommendations for your specific situation. Call your County Extension office for details.

Proper pH is important

Gardeners should strive to maintain a soil pH between 6 and 7. When the soil pH is in this proper range...

- ❑ Major nutrients such as nitrogen, phosphorus and potassium are available to plants. At high and low pH levels, some of the essential nutrients are chemically "locked up" and are unavailable to plants.
- ❑ Beneficial soil microbes are more active. These microbes are needed to break down organic matter making the soil "rich and loamy" and to help aerate the soil. Microbial activity is greatly reduced at very high and very low pH levels.
- ❑ Overall soil quality is improved. An experienced gardener knows that the soil looks better, feels better and is better for plants when the proper soil pH is maintained.

Adjusting your soil pH

To raise the soil pH some form of lime is used. Ground limestone is most common, but pulverized, granular or pelletized lime may also be available from your garden center.

- ❑ Apply lime in the fall. Lime is slow acting and this will provide time for the pH to increase.
- ❑ Work the limestone thoroughly into the top six inches of your soil.
- ❑ No more than 5 pounds of lime per 100 sq. ft. should be applied at one time. If more is needed, apply part in the fall and the rest in the spring.