



Acidic Soils Suit Some Plants!

By Haiying Tao, Ph.D., UConn Home & Garden Education Center

Soil acidity or alkalinity can be measured using pH. A pH of 7 is neutral. Values below 7 are considered acidic while those above, alkaline. Soil pH is an important characteristic for soil health because it affects many other soil characteristics, such as nutrient availability, cation exchange capacity, and base saturation, all of which in turn affect a soil's capacity to provide and hold nutrients for plants.

Although the optimum soil pH for both plant growth and soil fertility is between 6 to 7, many plants can tolerate a soil pH as low as 5.5. Some like rhododendrons, azaleas, blueberries and others in related families prefer the soil pH to be 5.5 or lower. Sometimes, the soil needs to be acidified to a lower pH in order for plants to thrive.

As a garden lover, I have always admired those beautiful hydrangeas that come in many different varieties and colors. The bigleaf hydrangea (*Hydrangea macrophylla*) or mountain hydrangea (*H. serrata*) flowers open a beautiful blue when the soil pH is below 5. As the soil pH increases, the flowers turn pink or somewhere in between depending on how much higher the soil pH is. This is because the plant requires aluminum in the tissue of the hydrangea flowers in order for them to show their heavenly blue color. Although our soils in CT have plenty of aluminum, it is not available to the plants when soil pH is high.



Blue hydrangea. Photo by Haiying Tao

Another plant that we commonly have in our gardens are blueberries, which provide both beauty and food for us. The ideal pH for blueberry plants is around 4.5 to 5.5, where iron is more available in the soil. When soil pH is high, iron availability is low and iron chlorosis can occur in blueberry plants, which can significantly reduce blueberry plant health and yield.

Most soils in Connecticut naturally have a low pH but occasionally we may have to acidify our soil for specific plants. One of the cheapest ways to acidify soil is to apply sulfur. The soil bacteria will convert the sulfur to sulfate and lower the soil pH. To acidify soil for growing blueberry plants, iron sulfate, also called ferrous sulfate, is a good choice since it will also provide a soluble source of iron to the plants while also acidifying the soil. When acidifying the soil for blue hydrangea flowers, aluminum sulfate is a better choice because it provides the aluminum that the flowers need to turn blue.

Keep in mind that most of agricultural crops prefer a slightly acidic to near neutral soil pH (6.5 – 7.0). To learn the optimum range of soil pH for common crops, please refer to this publication by UConn Soil and Nutrient Analysis Laboratory: <https://soiltesting.cahnr.uconn.edu/wp-content/uploads/sites/3514/2022/06/Plant-pH-Preferences-List.pdf>. Many soils in CT have a soil pH lower than the optimum range for plants like vegetables and lawns. For better soil and plant health, the soil pH may need to be increased. Soil amendments, such as calcitic or dolomitic limestones, can be used to increase soil pH. Applying the right amount of limestone is key to increasing the soil pH to the target level for a particular plant while avoiding over-liming. Wood ashes and compost can also raise the soil pH.

The easiest way to determine if limestone or sulfur are necessary and how much to apply is by submitting a soil sample to the UConn Soil Nutrient Analysis Lab (www.soiltesting.cahnr.uconn.edu). Whenever collecting a soil sample, be sure to take a representative one. This is done by taking several subsamples from the top to about 6 inches down, placing these subsamples in a clean container, mixing them up and then scooping up a cup of soil. This would give you a more representative sample than if you just collected soil from one spot.

There are some home pH testing kits, and they vary in their accuracy. One might try collecting a sample, mixing it thoroughly and dividing it in half. Send half to a lab and test the other half yourself to see if the results are comparable.

If you have questions about soil pH or other gardening queries, feel free to contact us, toll-free, at the UConn Home & Garden Education Center at (877) 486-6271, visit our website at www.homegarden.cahnr.uconn.edu or contact your local Cooperative Extension center.