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Correcting Soil pH

What Is Soil pH?
The term pH refers to the acidity or alkalinity of the soil. A pH of 7.0 is neutral while that above 7.0 is alkaline, sweet or basic. Soil with a pH of 6.9 or below is acidic or sour.

Why Is the Soil pH Important?
The degree of acidity or alkalinity of a soil will determine whether nutrients may be absorbed by plants from the soil. For instance, as soil becomes increasingly acidic (pH of 5.5 and below), the nutrients, phosphorus, potassium, and others become tightly bound to the soil and are not absorbed by plant roots.

Most plants grow best in soils with a pH of 6.0 or 6.5 to 7.4. Many needled evergreens such as pine, spruce and fir will tolerate a slightly acidic soil pH of 5.5 to 6.0. Broadleaved evergreens and acid-loving plants such as rhododendron, azalea, mountain laurel, heath, heather and blueberry prefer a pH range of 4.5-6.0.

Most native Rockland soils are acidic (pH of 4.8-5.5). These soils may require the addition of powdered agricultural limestone to raise the pH above 6.0 for lawns, vegetables, flowers and some trees and shrubs.

How to Collect a Soil Sample
A soil pH test should be taken every two or three years. For a nominal fee, Cornell Cooperative Extension will determine the pH of your soil. To collect a sample for testing, take five or six random samples from different areas of the lawn or garden; this will give you a representation of the whole plot. Use a hand trowel to remove soil from a depth of four to six inches in each spot. Combine the samples in a container or plastic bag and bring them to Cornell Cooperative Extension's diagnostic lab to be tested. You will be advised if your lawn needs lime or sulfur to adjust the pH according to the needs of you plants.

What Can Be Done to Correct Poor Soil pH?
Overly acidic soil is neutralized with the addition of limestone (available at garden centers). Powdered or pelleted agricultural limestone is most commonly used. **Don't overdo lime** - it is much easier to raise pH than to lower it.

Alkaline soils are neutralized with the addition of elemental sulfur, iron sulfate or aluminum sulfate.

When Should Amendments Be Applied?
Lime may be applied to lawns, gardens, or shrub beds any time of the year that the ground is not frozen or the plants are not under stress from drought, insects, disease or heat. The best time to apply lime is just after a rain in spring or fall so that the lime does not wash off the site. Although lime and fertilizer may be applied at the same time, it is best to apply lime at least three weeks before applying fertilizer.

Sulfur-based materials that lower pH require heat to react with your soil, so are best applied in spring.

For new lawns and gardens, lime (if required) should be mixed into the soil to a depth of six inches before planting.

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The chart below shows the recommended amounts of lime or sulfate required to correct soil pH. Note that all rates are given per 100 square feet, except for lawn rates which are given per 1,000 square feet. For lawns, no more than 50 pounds of lime per 1,000 square feet should be used per application. The rates listed are for typically heavy, Rockland soils. Sandy soils require half-rate applications to achieve the desired pH change.

Wood ashes may be used to raise pH, but must be applied at twice the rate of lime to achieve the same effect.

pH Adjustments for Lawns		
	4.9 or below:	add 200 pounds of lime per 1,000 square feet; four applications of 50 pounds each
	5.0-5.5:	add 100 pounds of lime per 1,000 square feet; apply half in spring, half in fall
	5.6-6.0:	add 50 pounds of lime per 1,000 square feet
	6.1-7.4:	no lime is needed
	7.5-7.9:	add 10 pounds of sulfur **or** 50 pounds of iron sulfate **or** 50 pounds of aluminum sulfate per 1,000 square feet
	8.0-8.9:	add 20 pounds of sulfur **or** 100 pounds of iron sulfate per 1,000 square feet
pH Adjustments for Trees, Shrubs, Flower And Vegetable Gardens		
	4.9 or below:	add 20 pounds of lime per 100 square feet. Incorporate well into new garden bed **or** make four applications of 5 pounds each to established gardens
	5.0-5.5:	add 10 pounds of lime per 100 square feet. Mix half in and rake the other half into the surface of a new garden bed **or** apply half in spring, half in fall to established gardens
	5.6-6.4:	add 5 pounds of lime per 100 square feet
	6.5-7.4:	no lime is needed
	7.5-7.9:	add 1 pound of sulfur **or** 5 pounds of iron sulfate **or** 5 pounds of aluminum sulfate per 100 square feet
	8.0-8.9:	add 2 pounds of sulfur **or** 10 pounds of iron sulfate per 100 square feet
pH Adjustments for Acid-Loving Plants		
	6.0 or below:	no adjustment is needed
	6.0-6.9:	add 1 pound of sulfur **or** 5 pounds of iron sulfate **or** 5 pounds of aluminum sulfate per 100 square feet
	7.0-7.9:	add 2 pounds of sulfur **or** 5 pounds of iron sulfate **or** 10 pounds of aluminum sulfate per 100 square feet
	8.0-8.9:	add 3 pounds of sulfur **or** 15 pounds of iron sulfate per 100 square feet; apply half in spring and half in fall