Reducing Soil pH: Lawns, Landscape & Gardens

FACT SHEET

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Lawns:

Adjusting the soil pH in established lawns is very difficult under most circumstances. Turf grass readily tolerates a pH range of 6.0 to 7.5. It is difficult to apply sulfur or other acidifying materials at a rate that will successfully decrease the pH without injuring the grass. It is often best to increase the overall fertility program (moderate increase over normal rates of nitrogen, phosphorus and potassium along with adding some iron) to compensate for pH related stresses.

It is best to adjust the soil pH prior to seeding and establishment of the lawn. Apply and thoroughly incorporate sulfur or equivalent rate of another acidifying material into the soil before seeding of the grass. *Table 1* provides suggested sulfur application rates based on soil texture (proportions of sand, silt and clay) to adjust the soil pH to 6.5. Other acidifying materials may be used if sulfur is not available (*Table 2*) - adjust the rate accordingly.

Soil pH changes will occur gradually after application of sulfur, often taking several months to realize. Sulfur must be oxidized by bacteria, which produces sulfuric acid that lowers the soil pH. Soil moisture and temperature conditions will influence the rate of oxidation.

Relatively high rates of sulfur or other acidifying materials can also increase soluble salts to levels that can could injure grass seedlings. Keep the soil from becoming excessively dry to help minimize soluble salt injury.

Table 1. Quantity of sulfur required to reduce soil pH for a depth of 7 inches

Current Soil pH	Desired Soil pH	Soil Texture		
		Sand	Loam	Clay
		Pounds of Elemental Sulfur Per One Hundred Square Feet		
8.5	6.5	4.6	5.7	6.9
8.0	6.5	2.8	3.4	4.6
7.5	6.5	1.2	1.8	2.3
7.0	6.5	0.3	0.4	0.7

Source: Western Fertilizer Handbook, 8th Edition.

Table 2. Common acidifying materials

Material (100% basis)	Chemical Formula	Pounds of Material Equivalent to 1 Pound of Sulfur*
Sulfur, Elemental	S	1.0
Aluminum Sulfate	$Al_2(SO_4)_3 \cdot 18H_2O$	6.9
Ammonium Sulfate	$(NH_4)_2SO_4$	2.6
Ferric Sulfate	$Fe_2(SO_4)_3 \cdot 9H_2O$	5.9

* Based on 100% materials. Adjust rate accordingly.

Landscape:

It is best to select landscape plants that do well in the native soil pH. If pH adjustment of the existing soil must be done, it should be done well before planting. It takes a relatively long period of time (several months) for sulfur and most other acidifying materials to fully react with the soil. Refer to *Table 1* for suggested rates of sulfur based on the initial and desired soil pH.

Some landscape plants (Azalea, etc.) require a relatively low soil pH. *Table 3* provides sulfur application guidelines to lower the soil pH to 4.5. Caution: significant changes in soil pH can significantly affect nutrient availability. Most micronutrients will be more available while phosphorus will become less available. Periodic soil testing is suggested to monitor changes in soil pH and nutrient availability.

Table 3. Amount of Elemental Sulfur to Lower Soil pH to 4.5

Current Soil pH	Sand	Loam	Clay
	Pounds of Elemental Sulfur per 100 Square Feet		
7.0	2.0	6.0	9.0
6.5	1.5	4.5	7.0
6.0	1.2	3.5	5.3
5.5	0.8	2.5	3.7
5.0	0.4	1.2	2.0

Source: PNW215, Oregon State University.

Gardens:

Most plants grown in home gardens require a soil pH between 6.0 and 7.0 for good growth. If the soil pH is too high, refer to *Table 1* for rates of sulfur to apply. Apply and thoroughly incorporate in the fall after harvest for best results.

For those crops that require a very low soil pH (blueberries, etc.), *Table 3* provides sulfur application rates to reduce the soil pH. Apply and thoroughly incorporate well in advance of planting as it may take several months for the sulfur to fully react.