



Reducing Soil pH: Field Crops

Attempting to reduce the soil pH for production of field crops is often not economically feasible. However, it can be done on small areas and for special purposes by adding acidifying materials, such as elemental sulfur.

High soil pH is often a natural condition and repeated sulfur applications may be necessary to maintain the desired pH. Availability of soil nutrients will be affected by changes in soil pH. High application rates of acidifying materials though can also increase soluble salts to levels that will injure plants.

Elemental sulfur is the material most commonly used to reduce soil pH. Care should be taken in handling the material due to its highly corrosive nature. Table 1 shows the amount of sulfur required in various soil and initial pH situations. The reaction of sulfur in the soil is relatively slow and may take a year before the full effect on soil pH is realized.

Table 1. Approximate amounts of elemental sulfur required to reduce soil pH for a depth of 7 inches of a carbonate-free soil.

Desired Soil pH Change	Sand	Loam	Clay
	Pounds of Elemental Sulfur Per Acre		
8.5-6.5	2,000	2,500	3,000
8.0-6.5	1,200	1,500	2,000
7.5-6.5	500	800	1,000
7.0-6.5	100	150	300

Source: Western Fertilizer handbook, 8th Edition.

Other acidifying materials that may be used to lower soil pH are listed in Table 2. Adjust the material application rate based on the amount equivalent to elemental sulfur. Be aware of other nutrients and elements that may be added in excessive amounts.

Table 2. Common acidifying materials.

Material (100% basis)	Chemical Formula	Pounds of Material Equivalent to 100 pounds of Sulfur
Sulfur, Elemental	S	100
Aluminum Sulfate	$Al_2(SO_4)_3 \cdot 18H_2O$	694
Ammonium Sulfate	$(NH_4)_2SO_4$	260
Ferric Sulfate	$Fe_2(SO_4)_3 \cdot 9H_2O$	585

Based on 100% materials. Adjust rate accordingly.

Blueberries and Acid-Loving Crops:

Blueberries and other acid-loving crops require a very low soil pH (~4.5) for optimum growth and production. Suggested amounts of sulfur to lower the soil pH are presented in Table 3.

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

Current Soil pH	Sand	Loam	Clay
	Pounds of Elemental Sulfur Per Acre		
7.0	840	2550	3830
6.5	660	2020	3030
6.0	530	1540	2310
5.5	350	1050	1600
5.0	175	530	800

Source: Highbush Blueberry Production, PNW215, Oregon State University

Ammonium sulfate will react faster than elemental sulfur. Multiply the rate of elemental sulfur from Table 3 by 6.9 for the rate of ammonium sulfate:

$$1,050 \text{ pounds sulfur} \times 6.9 = 7,245 \text{ pounds of ammonium sulfate}$$

Acidifying materials should be incorporated and thoroughly mixed with the soil to obtain the quickest reaction.