



10-10-2011

AgroLab, Inc.
Soil Fertility Recommendations

LIME RECOMMENDATIONS

Lime is applied to soils to reduce soil acidity. Soil acidity is determined by soil pH. If soil acidity warrants, a buffer pH reading is made to determine lime requirements. The buffer pH measures the reserve acidity that is held on the soil clays and colloidal organic matter.

At a given soil pH, soils higher in clay and organic matter will require higher amounts of lime to neutralize the reserve acidity. Lime recommendations are made to neutralize the reserve acidity and raise the soil pH to about 6.5. Soils having a low total acidity or a low lime requirement will show a more rapid soil pH decline in future years.

Liming materials differ in their neutralizing value. Two factors affect this value. One factor is the calcium carbonate equivalence (CCE), which is an expression of the purity or percent calcium carbonate. The other factor affecting the neutralizing value of lime is the fineness of grind. Limestone ground to pass a 60-mesh sieve is considered to be 100 percent effective; limestone passing through an 8-mesh sieve *but* held on a 60-mesh sieve is considered to be 50 percent effective. Limestone products larger than 8-mesh is not effective in neutralizing soil acidity.

The effectiveness of limestone in reducing soil acidity is based on its purity and fineness, which is called Effective Calcium Carbonate (ECC). Coarse lime is not effective and powdered lime is no better than its percent ECC. Fluid lime or suspension lime effectiveness must be based on its ECC value after the water has been added which is 40% to 50% of the total weight.

The rate of application of lime is determined by dividing the suggested ECC rate per acre by the percent ECC of the lime being applied. The equation is:

$$\text{Ag Lime Application} = \frac{\text{ECC/A Recommended}}{\% \text{ ECC of Ag Lime}} \times 100$$

The lime should be applied well enough in advance of the planting season to give the lime enough time to neutralize the soil acidity. The rates of lime suggested on the soil test report are large enough to neutralize all of the soil acidity. A grower must consider this application a long-term investment of usually 8 years. The cost of the lime, interest and application should be prorated over this period of time.

The suggested rates of lime at a given buffer pH value are based on neutralizing 8 inches of soil. With reduced tillage and no-till systems being adopted by growers, lime recommendation rates should remain the same.

The lime recommendations are based on the soil pH value, buffer index value and the kind of crop. The desired pH levels of various crops are shown in the following table:



Crop	Desired pH	Crop	Desired pH
Corn	5.7-7.0	Sm. Gr. Hay	5.5-6.5
Milo	5.7-7.0	Alfalfa	6.1-7.5
Seed Corn	5.7-7.0	Grass-Alfalfa	6.1-7.5
Corn Silage	5.7-7.0	Clover	6.1-7.5
Sorghum Silage	5.7-7.0	Bermudagrass	5.5-7.2
Feed-Hay	5.7-7.0	Fescue	5.5-7.2
Sudan Hay	5.7-7.0	Native Grass	5.5-7.5
Soybeans	6.1-7.2	Lovegrass	5.5-7.2
Pinto Beans	6.1-7.2	Cool Grass	5.5-7.2
Gr. No. Beans	6.1-7.2	Sunflowers	5.7-7.5
W. Wheat	5.5-6.5	Cotton	5.8-7.5
Oats	5.5-6.5	Millet	5.5-7.0
Rye	5.5-6.5	Onions	5.5-7.0
Feed Barley	5.5-6.5	Melons	5.5-8.0
Malting Barley	5.7-7.0	Garden	6.1-7.5
Sm. Gr. Silage	5.5-6.5		

When the soil pH is less than that shown for the crops in the above table, lime application should be considered. The following SMP buffer table may assist in these decisions:

6.5 Target Soil pH

Buffer pH	100% ECC Tons/Acre	60% ECC Tons/Acre
7.0	0	0
6.9	.4	.7
6.8	.8	1.3
6.7	1.2	2.0
6.6	1.6	2.7
6.5	2.0	3.3
6.4	2.4	4.0
6.3	2.8	4.7
6.2	3.2	5.3
6.1	3.6	6.0
6.0	4.0	6.7

Note: Most Agricultural grade limestone products are 60-80% ECC.