



Soils

Liming

YOUR KEY TO A BETTER PASTURE NEXT SPRING

Applying lime to your fields is one of your smartest land management decisions. It can result in improved soils, better forage yields, and improved forage palatability, all at a relatively inexpensive cost.

Most of our western Washington soils are mildly to strongly acidic. This is caused by several factors. One is that our high rainfall amounts are constantly removing those elements which neutralize acidity, called bases, from the soils. Another cause is the type of rocks from which the soils formed. Also, soils which formed under conifer trees, common in this area, tend to be acidic from the breakdown of conifer needles. Certain management practices, such as fertilizing, while beneficial, acidify soils. Finally, plants remove bases from soil as they grow.

Liming neutralizes acidity in your soil. This enables certain elements which are crucial to plant growth, such as Phosphorus, to become available for use by plants. These elements, even if present in large amounts or added by fertilizers, can't be used if the soil is too acidic. Liming also adds Calcium (and sometimes Magnesium), two other crucial elements, to your soil and makes them available to plants.

Plants are adapted to growing best at certain levels of soil acidity. Although they may survive higher levels, they will definitely perform better if the acidity is at the correct level. This is especially true of clovers.

Liming also improves certain physical properties of soils. This will result in improved water and air relationships in the soil and help plants to grow better.

The level of acidity in your soil and the amount of lime needed to correct it can be determined by sending a soil sample to a testing laboratory. Along with the sample, you also provide the lab with basic information such as where you are located and what you are growing. The lab will send you back a report telling you the present level of soil acidity (called pH) and the amount of lime to add to make your soil less acidic.

Recommendations are not intended to neutralize all of your soil acidity, only to correct it enough for your plants to grow better.

There are 3 things to consider when buying lime. These include neutralizing value, efficiency, and cost.

Neutralizing Value is a measure of how much acidity the lime can neutralize. Standard agricultural limestone, also called Calcium Carbonate, has a NV of 1.00. Calcium Oxide and Calcium Hydroxide have NV's higher than 1.00 while materials such as NWI (ground-up shells) have an NV less than 1.00.

Efficiency is related to the size of the lime particles. The finer the particles, the more effective they are in reacting with acidity. To be 100% efficient, all lime particles must be smaller than 0.25 millimeters in size. Particles larger than 2 millimeters in size are rated as 0% efficient because they take too long to break down and start neutralizing acids.



Soils

Liming

To determine your best liming deal, you should balance the cost of the material versus its NV and Efficiency. Materials which cost more may actually be a better deal than cheaper lime if they do a better job of neutralizing acidity.

Many materials are sold for liming. Advantages and disadvantages of each are summarized below:

Calcium Oxide: Also called Quick Lime, Unslaked Lime, and Burned Lime. High NV of 179 makes it most effective liming material. Unpleasant and difficult to handle, must be well-mixed with soil to be effective.

Calcium Hydroxide: Also called Slaked Lime, Hydrated Lime, and Builder's Lime. NV of 136. Unpleasant and difficult to handle.

Calcium Carbonate: Also known as standard agricultural limestone. NV of 100 if pure, less if impurities are present. Easy to handle.

Dolomite: Agricultural limestone with Magnesium in it NV of 109. Easy to handle.

Marl: Softer and wetter form of Calcium Carbonate. NV of 70 to 90. Takes longer to react with soil, more difficult to apply evenly because of softness.

Industrial Products: There are various by-products from industrial processes which are potentially useful for liming. The NV's and efficiencies will vary widely. Some may contain large amounts of sand, which will reduce the effectiveness of the material; you are also paying for hauling and spreading of sand. Also, some of these materials may contain hazardous elements in them from the industrial process, which may contaminate your land.

Lime loses its effectiveness over time. A typical application lasts approximately 3 years. If you haven't had a soil test but want to apply lime, a typical application is 5 tons of Calcium Carbonate per acre.

Liming changes the balance of nutrients in your soil. You should take soil samples and have a complete nutrient analysis done within a year of liming to ensure that the nutrient balance is not adversely affecting your plants.

Lime needs soil moisture to become active in your soil and neutralize acidity. Fall is a good time to apply it. Fields are usually dry and you can get on them with equipment to spread it. The winter rains then start it working.

Lime is typically broadcast onto a field. You can either let it slowly work its way downward or disc it in to a six inch depth. Both methods work well.

When considering ways to improve your land, liming should be one of your first choices. It has many benefits and is relatively inexpensive.

If you have questions about anything in this article or about the soil on your property, please call the King Conservation District at (206) 764-3410.

Fall 1996, by Rick Blanke, CPSSc, Certified Professional Soil Scientist