

## Importance of Liming Soils

The ideal soil pH range for most crops grown in Missouri is 6.0-6.5. A soil pH in this range results in the maximum availability of the nutrients in the soil needed by most crops. Fortunately, most soils in Missouri naturally have a pH that falls in the ideal range. Unfortunately, many things that people and nature do to the soil increases soil acidity, or causes the pH to lower. Lowering of soil pH can cause issues for farmers. At a pH of around 5.0 excessive amounts of aluminum are available in the soil. Aluminum toxicity interferes with root growth, inhibits nodule initiation, lessens the amount of available phosphorus in the soil, and interferes with the uptake of water and other nutrients. At a pH of around 4.5, hydrogen toxicity begins to effect the growth of both plants and bacteria in the soil.

Liming an acidic soil reduces the amounts of hydrogen and aluminum in the soil. Liming also increases the amount of phosphorus in the soil, increases the activity of organisms responsible for nitrification and nitrogen fixation, improves the overall condition of the soil, and decreases the incidence of some disease. University research indicates that increasing the pH of a soil from 4.5 to 6.0 through liming can increase soybean yield by as much as 15%. Considering the benefits of liming and the fact that it is one of the cheapest products farmers add to the soil, there should be no reason why the pH of all agricultural soils doesn't fall in the ideal range.

A regular University of Missouri Extension soil test will indicate the pH of a soil. The soil test will also indicate the amount of lime needed to neutralize the soil acidity. The amount of lime needed is expressed using the term ENM, or effective neutralizing material. All lime sold in Missouri is tested for purity and fineness. Those two factors determine the ENM of a lime product. A soil test may indicate that a soil is acidic and needs 1200 ENM applied to increase the pH. If lime from a dealer tested at 400 ENM, then the farmer would need to apply 3 tons to correct the soil pH.

The main problem with lime is that it requires a significant amount of time to correct soil acidity, especially if it is not incorporated. Research has indicated that 10 to 14 years were required for surface-applied lime without incorporation to raise the soil pH at a depth of 6 inches. All applied lime should be incorporated if possible. Even with incorporation, it still may take several months for the lime to correct the soil pH. Because of this, lime should not be applied in March in attempt to correct the soil pH for a crop that is planted in April. An ideal situation would be to take a soil sample right after harvesting and then apply and incorporate the recommended amount of lime that fall. There should be enough of a correction in soil pH by the following spring to have a positive impact on crop growth. University of Missouri Extension guide G9102 *Liming Missouri Soils* goes into more detail. More information is available by contacting your county extension center of Travis Harper by phone (660)885-5556 or e-mail [harpertw@missouri.edu](mailto:harpertw@missouri.edu).