

Lime Cost-Effective In Correcting The pH Of Acidic Soil

BLUE SPRINGS, MO.

Liming is an inexpensive way to boost crop yields in fields with overly acidic soils, said a University of Missouri Extension agronomy specialist.

A soil pH of 6.0 to 6.5 is optimum for most crops in Missouri, said Travis Harper, a University of Missouri Extension agronomy specialist.

Soil pH affects the availability of soil nutrients to plants. An increase in soil acidity (lower pH) reduces the amount of available phosphorous in the soil while increasing the amount of available aluminum and hydrogen. At a pH of 4.5, available aluminum and hydrogen are at toxic levels, he said.

To counter these effects, an application of lime can reduce soil acidity. Liming increases the activity of organisms responsible for nitrification and nitrogen fixation and improves the overall condition of the soil.

"MU 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 percent," Harper said. "Given the benefits of liming, and the fact it is one of the cheapest products farmers add to the soil, there should be no reason the pH levels of Missouri agricultural soils don't fall within the ideal range."

A soil test, available through local MU Extension centers, can measure soil pH and indicate the amount of lime necessary to neutralize soil acidity.

The amount of lime to apply is expressed in terms of "effective neutralizing material" (ENM).

All lime sold in Missouri is tested for purity and fineness, the two factors that determine the ENM of a lime product.

"For example, a soil test may indicate that a soil is acidic and needs 1,200 ENM to increase the pH," Harper said. "If lime from a dealer is 400 ENM per ton, the farmer would need to apply three tons to correct the soil pH."

The main disadvantage with lime is that it can take a long time to correct soil acidity, especially if it's not properly incorporated. MU research indicated it would take 10 to 14 years for surface-applied lime without incorporation to raise the soil pH to a depth of 6 inches. All applied lime should be incorporated for maximum effectiveness.

Even with incorporation, it may take several months for lime to correct soil pH. For this reason, don't apply lime in March in an attempt to correct the soil pH for a crop you are going to plant in April.

"An ideal situation would be to take a soil sample right after harvest, then apply and incorporate the recommended amount of lime that fall," Harper said. "There should be sufficient correction in soil pH by the following spring to have a positive impact on crop growth."

The MU Extension guide "Liming Missouri Soils" (G9102) is available online at extension.missouri.edu/publications/DisplayPub.aspx?P=G9102.

For information about MU Extension soil and plant testing services, see soilplantlab.missouri.edu/soil/. Δ