

Acid Soils

Overview

Soil acidity is one of the primary fertility issues that can limit crop growth. High levels of acid can reduce nutrients available to plants, restrict root growth and increase the toxicity of some elements. Applying lime reduces soil acidity and is a source of calcium (Ca) and magnesium (Mg).

What you should know

- Soil acidification occurs naturally as the result of rainfall, plant growth, breakdown of organic matter and the application of ammonia fertilizers.
- Soil pH is a measure of hydrogen ions (H+) in the soil. Acidic soils have a pH below 7. Higher concentrations of H+ equal lower soil pH.
- Establish the target soil pH for your crop. Most agronomic crops prefer a pH between 6 and 7 for maximum availability of soil nutrients.
- Conduct soil tests to determine soil pH and lime requirement. Take samples from the surface to the depth of tillage. In no-till, sample to a depth of 2 inches.
- Ask a soil testing laboratory to provide soil pH, buffer pH and the amount of lime required to reach your target pH. Soil tests display lime requirements in terms of pure calcium carbonate. Testing will help determine your liming material application rate.

Action steps

1. **Choose a liming material:** Limestone is the most common liming material. Quicklime, hydrated lime, marl and fly ash also can be used.
2. **Evaluate lime particle size:** Smaller limestone particles dissolve faster and neutralize acid more quickly. However, fine-grinding limestone increases its cost and reduces its ability to be spread in dry form. Pulverized limestone, with its mix of fine, medium and coarse material, spreads out the time of reaction over three years.

Monitor for lime purity

Liming materials have different components and purities, so it's important to know the calcium carbonate equivalence (CCE). Most agricultural lime has a CCE of 80–95%. A limestone with a CCE of 75% is only 75% as effective as pure calcium carbonate, so it takes a higher application rate to achieve the same result.

Use this formula to adjust for CCE:

$$\text{Actual liming material required} = \frac{\text{soil test recommendation}}{\text{CCE of liming material}} \times 100$$



30-Second Summary

- Managing soil pH should be the first step in any soil fertility program and is essential to achieving maximum yields.
- Calculate the CCE of the liming product you will use.

NOTES:

For more information, contact:



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