

CHAPTER1 : Lime amendments

Are calcium-rich products used to improve soil structure and pH, particularly in acidic soils. They play a physical role by making the soil looser, a chemical role by regulating acidity, and a biological role by promoting microbial activity.

Examples include calcium carbonate, quicklime, dolomite, and crushed oyster shells.

You can watch this video to understand the usefulness of limestone amendments and their impact on soil:

Roles and benefits

- Physical: They improve soil structure, making it looser and more stable, and promote water and air circulation.
- Chemical: They correct the pH of overly acidic soils, bringing it closer to neutral, which is essential for plants to absorb nutrients.
- Biological: They promote microbial life in the soil, which is disrupted by acidity.
- Nutrient supply: They provide plants with calcium and sometimes magnesium, which are essential elements for their growth.

Common examples

- Calcium carbonate: Improves soil structural stability, often comes in powder or granule form.
- Quicklime: Raises soil pH quickly and neutralizes aluminum that is potentially toxic to crops. Use with caution as it is powerful.
- Dolomite: A limestone and magnesium amendment that adjusts pH and adds magnesium to the soil.
- Crushed oyster shells: Useful for improving the structure of heavy soils.
- Maerl: A red calcareous algae rich in calcium and magnesium, often micronized for greater effectiveness.

Lime amendments (like crushed limestone) are added to acidic soil to raise its pH (make it less acidic/more alkaline), improving nutrient availability (P, K, Mg), boosting beneficial microbial activity, and enhancing soil structure for better plant growth, with common forms including pulverized and pelletized options, but a soil test is crucial before applying to avoid over-correction.

How it works

- ✓ **Neutralizes acidity:** Lime (calcium carbonate/magnesium carbonate) chemically reacts with acids in the soil, reducing acidity.
- ✓ **Increases nutrient availability:** Raising the pH makes essential nutrients like phosphorus, potassium, and magnesium more accessible to plants.
- ✓ **Provides nutrients:** It adds calcium (Ca) and magnesium (Mg) to the soil, which are vital for plant health.
- ✓ **Improves soil:** It can improve soil structure, aeration, and microbial activity, aiding organic matter decomposition.

Types of lime

Agricultural Lime/Garden Lime: Ground limestone, available in fine powder or easier-to-spread pellets.

Dolomitic Lime: Contains both calcium and magnesium; preferred if magnesium is also needed.

Calcitic Lime: Primarily calcium-based; used when magnesium isn't required.

Application

Test first: Always test your soil to confirm it's acidic and determine how much lime is needed.

Timing: Apply a few months before planting for best results, as it works slowly (months to years), needing moisture and heat.

How much: Amounts vary; a general guideline for a 1-point pH rise is about a ton per hectare, but consult local recommendations.

Caution: Avoid applying hydrated lime or slaked lime to soil; they are for construction.

Key takeaway

Lime is an effective amendment for acidic soils, but **testing is essential** to ensure you're not over-liming and harming plants by making the soil too alkaline.

Best practices for use

- **Soil analysis:** It is advisable to conduct a soil analysis to determine the pH and the type of amendment required.
- **Application:** The amendment is generally applied to the soil in the fall or early spring and must be thoroughly incorporated to ensure its effectiveness.
- **Caution:** Fast-acting products such as quicklime may be necessary for emergency correction, but slow- or medium-acting products are more appropriate for basic liming.