



Media Notes

for North Carolina Growers

NCDA&CS Agronomic Division

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Lime: Essential for Nursery Crops

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Lime provides many benefits for nursery crops. Although certain plants require an acid environment (low pH), they still need calcium and magnesium for optimum growth. Lime supplies these essential nutrients. The major role of lime is to neutralize soil acidity.

However, since most potting media are organic with little or no mineral matter, a pH of 5.5 is adequate for container-grown crops. Native pine bark has a pH around 4.0 and requires lime to raise the pH to 5.5. For field-grown trees and shrubs, the target pH is 6.0.

Types of Lime

The two basic types of lime used for plant production purposes are calcitic and dolomitic. Calcitic lime is composed of calcium carbonate (CaCO_3) and contains little or no magnesium. Since most container-grown media (pine bark & sand) are low in magnesium, it may be necessary to apply a magnesium fertilizer when using calcitic lime.

Dolomitic lime is composed of a mixture of calcium and magnesium carbonates (CaMgCO_3) and, by law, must contain a minimum of 6 percent magnesium. Most lime sold in North Carolina is dolomitic and exceeds the 6 percent minimum of magnesium. So, dolomitic lime should provide an adequate amount of magnesium for container-grown plants.

Lime Reaction

Lime has a limited solubility in water and reacts only when it makes contact with soil acidity. However, moisture must be present for this reaction to take place. Finely ground lime reacts much faster than coarse materials.

The rate of reaction depends on the amount of acid present (lime reacts faster at low pH), particle size, moisture content, and how well it is mixed with media. In the reaction process, the following occurs: pH increases, the amount of acidity decreases, and available calcium and magnesium increase. The degree to which these factors are influenced depends on the rate of lime applied.

The rate of lime to apply is best determined with a soil test. Ideally, lime should be mixed with the bulk media several weeks before potting plants. This allows time for reaction to occur and establishes a better environment for plants to grow.

Pelletized Lime

Pelletized lime is a finely ground dolomitic source made into a pellet with a binding agent that disintegrates when exposed to water, thus releasing the encapsulated lime. This product has the same neutralizing value and supplies the same amount of calcium and magnesium as standard dolomitic lime. Pelletized lime spreads well and is less dusty than conventional pulverized products. Since nursery growers mix their own media, most prefer to use powdered lime.

Benefits of Lime

In addition to neutralizing soil acidity and supplying calcium and magnesium, lime promotes microbial activity required for converting some nutrients to forms that can be utilized by plants. Example: microorganisms convert ammonium to nitrate-N and sulfur to sulfates. They also enhance the breakdown of certain types of slow-release fertilizers.

Microorganisms also enhance decomposition of organic matter, which provides essential nutrients for plant growth. On nursery field soils, lime improves the soil tilth—which improves air, water and root movement throughout the soil profile. No other amendment can influence the chemical, physical and microbiological properties of the soil/media as much as lime. For the cost, no other product can provide such an array of benefits.

NCDA&CS Lime Law

All limestone sold, offered for sale, or distributed in North Carolina must show a guarantee on the label of % calcium, % magnesium, % calcium carbonate equivalent (CCE) and pounds of material equal to one ton of standard lime (standard lime equals 90% calcium carbonate equivalent). The CCE measures the acid neutralizing value against pure calcium carbonate.

Each type of lime must meet the screen requirements shown in Table 1, and this information must be shown on the label. Example: for dolomitic lime, 90% must pass a 100-mesh screen. Most bagged lime distributed across the state exceeds the screen-size requirements.

Table 1. N.C. limestone size requirements †

<i>Sources</i>	<i>Percent Passing</i>	
	<i>20 Mesh</i>	<i>100 Mesh</i>
Ground Dolomitic	90	35
Calcitic / Marl	90	25
Suspension Dolomitic	100	80
Pelletized Dolomitic ‡	90	35

† Information provided by the NCDA&CS Plant Industry Division.

‡ Pelletized lime must be manufactured in a manner that causes it to slake down in the presence of water.

Table 2. Conversion factors

$$M = \text{lb}/1000 \text{ ft}^2$$

$$\text{lb}/\text{yd}^3 = [\text{lb}/1000 \text{ ft}^2] \div 24$$

$$\text{lb}/1000 \text{ ft}^2 = [\text{lb}/\text{acre}] \div 43.56$$