

FACTS ABOUT LIME

Answers to Commonly Asked Questions
By Farmers and Homeowners

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1. What is lime?

According to chemical definition, lime is calcium oxide (CaO). In agriculture, lime is usually defined as calcium or calcium-magnesium containing compounds capable of reducing harmful effects of an acid soil by raising the soil pH.

2. What are the benefits of using lime?

Liming improves crop yields. It reduces concentrations of soluble aluminum and manganese. When excessive, these elements are harmful to plants. Increasing the soil pH by liming increases the availability of several plant nutrients. Proper liming increases the efficiency of applied fertilizer.

3. Will liming pay?

Yes. Where needed, lime will return \$5 to \$10 for each dollar invested in lime.

4. How much lime should I apply?

Use a soil test to determine the amount of lime needed, or *lime requirement*. A soil pH measurement alone is not sufficient to determine lime requirement. Most soil testing laboratories use a special method to determine the amount of lime needed. Michigan State University uses the SMP or Ohio-buffer method.

5. How long will it take for lime to react with the soil and how long will it last?

The lime will react completely with the soil in 2 to 3 years after it has been applied. If you test your soil again during this period, don't expect to see all the lime needs satisfied. How long lime lasts will depend on the kind of lime used, total soil acidity, amount of organic matter, kind and amount of clay, and cropping and management systems used. A soil test 3 to 4 years after lime application will help provide the answer.

6. Should I lime my soil to pH 6.0, 6.5 or 6.8?

In most cases, liming to pH 6.5 is recommended. If alfalfa is grown, liming to pH 6.8 is required. For gardens, potatoes or low maintenance grass

pasture, liming to pH 6.0 will be satisfactory. Some acid demanding crops, such as blueberries, should not be limed to such high levels.

7. What is soil acidity?

Soils are acid because of hydrogen ions dissolved in soil solution (water in the soil) and held on the clay and humus particles. The degree of acidity is known as pH. A value below 7 is acid, 7 is neutral and above 7 is alkaline. In soils, a value less than 6.5 is considered acid.

8. What is active soil acidity?

This is the hydrogen which is dissolved in soil solution. Active soil acidity is determined in a soil pH measurement. It is used to suggest when to apply lime or, in the case of high pH, micronutrients.

9. What is reserve acidity?

This is the acidity which is adsorbed on the surfaces of soil and organic matter particles. This portion of the soil acidity accounts for over 99% of the total acidity which is also lime requirement. Therefore, an accurate determination of lime requirement requires measuring this reserve acidity. The special method referred to in question 4 measures the reserve acidity.

10. What is meant by neutralizing value (NV)?

All liming materials do not react the same on a pound-for-pound basis. Thus, it becomes necessary to establish a standard. Pure calcium carbonate is given a value of 100. All other materials are chemically compared to this standard. Most liming materials contain impurities, so lime recommendations are made on the basis of a neutralizing value of 90%. If a liming material has an NV other than 90%, make a correction in the amount of lime to apply.

11. What is calcium carbonate equivalent?

This means nearly the same as neutralizing value. If a source of marl has a calcium carbonate equivalent of 1,200 pounds this means one cubic yard is as effective as 1,200 pounds of pure calcium carbonate.

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12. What are the neutralizing values for commonly used liming materials?

Calcic limestone	less than 100
Dolomitic limestone	less than 108
Calcic hydrated limestone	less than 135
Dolomitic hydrated limestone	less than 170
Marl	less than 100

13. What is calcic limestone?

Calcic limestone is a naturally occurring rock composed primarily of calcium carbonate. It is sometimes referred to as high calcium or calcitic limestone. It usually contains less than 5% magnesium carbonate and more than 95% calcium carbonate.

14. What is marl?

Marl is a soft calcitic material which has settled out of water. It is fine textured.

15. What is dolomitic limestone?

Dolomitic limestone is a rock composed primarily of calcium-magnesium carbonate ($\text{CaCO}_3 \cdot \text{MgCO}_3$).

16. How much magnesium does dolomitic limestone contain?

You need an analysis of the material to determine this answer. The limestone analysis report usually expresses magnesium as percent magnesium carbonate. To convert to the elemental form, multiply the percent magnesium carbonate by 0.29. For example, a dolomitic limestone having 30 percent magnesium carbonate contains 174 pounds of elemental magnesium per ton (0.30 times 0.29 times 2,000).

17. When should I use dolomitic lime?

Dolomitic lime should be used when the soil test indicates a magnesium deficiency may occur. However, if the soil test doesn't indicate a need for magnesium, there is no evidence that dolomitic lime is harmful.

18. How finely should lime be ground?

Nearly all of the lime should pass an 8-mesh sieve and 50% should pass a 60-mesh sieve. An 8-mesh sieve has openings approximately 1/8-inch in size.

19. Will fertilizer replace the need for lime?

No. When soil pH falls below 5.5, large concentrations of aluminum and manganese accumulate in the

soil. These are toxic to plants. Since many fertilizers are acid forming, regular liming reduces the hazard of creating an acid subsoil, increases the efficiency of fertilizer used and gives greater yields.

20. Should I topdress lime on my established lawn?

Check the pH of the 0-3 inch soil depth and if it is below 5.5, topdress at a rate of 25 to 50 pounds of lime per 1,000 square feet. When establishing a lawn, test the soil and apply lime at the recommended rate and mix it with the soil.

21. Are wood ashes good for liming?

Yes. Check the soil pH first. If the soil pH is 6.5 or above, don't apply wood ashes. When lime is required, apply up to double the lime requirement every 3 years. For example, if the lime requirement is 3 tons/acre, limit the application of wood ashes to six tons in a 3-year period. (On a garden this would be 275 pounds of ashes per 1,000 square feet). Check the pH before you apply more.

22. What are the materials called fluid lime, liquid lime or lime suspension?

Finely-ground limestone is suspended in water or a fertilizer nitrogen solution. The suspension usually contains 50 to 75% limestone.

23. Are these materials better than dry lime?

Yes and no. In order to suspend lime it has to be finely ground. This makes it faster reacting. In that way, they may be better. The drawback may be that the total amount of lime which can be applied is usually less than with dry limestone. This would require more frequent lime applications. There is nothing magical about lime suspensions.

24. Is there additional information available?

Yes. The following bulletins are available at your county office of the Michigan State University Cooperative Extension Service, or from the MSU Bulletin Office, P.O. Box 231, East Lansing, Michigan 48824.

- E-471 — Lime for Michigan Soils (Free)
- E-486 — Secondary and Micronutrients for Vegetables and Field Crops (being revised)
- E-550 — Fertilizer Recommendations for Vegetables and Field Crops for Michigan (for sale only, 65 cents)
- E-994 — Magnesium (free)
- E-996 — Calcium (free)

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