

FAQs about Liming in Wisconsin

by John Peters

Beginning in 2007, Wisconsin has a new lime recommendation program. Will this increase or decrease the lime rates that are being recommended?

Neither. In some cases the recommendations may be a bit lower and in some cases higher, but the new system will more accurately assess the level of acidity in the soil and lead to more accurate recommendations.

What about lime allows it to neutralize acidity?

Contrary to what many people think, the calcium and/or magnesium found in most liming materials are not the components of lime that react with acidity. It is the negatively charged component of the liming compound, typically the carbonate (CO_3^-) that neutralizes acidity. Typically, calcium and/or magnesium are bound to the carbonate in nature making it a stable compound that is mined from limestone deposits.

How is lime quality evaluated in Wisconsin?

In Wisconsin, we use a system called the Neutralizing Index (NI). This NI value is based on both purity and fineness factors. The assessment of lime quality is run in a laboratory and a neutralizing index value is calculated for the sample. Typically, lime is sold by neutralizing index zones of 10 units. An example of this would be the two grades commonly listed on Wisconsin soil test reports, 60-69 grade and 80-89 grade. The higher the index zone the higher the quality of the lime. This means that it is either ground finer or contains more carbonate.

How long does it take for lime to react with the soil?

In calculating the NI of a liming material, three years is allowed for complete reaction of the lime particles with soil acidity. The finer the particle size, the faster the

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lime will react with soil acidity. However, thorough mixing with the tillage zone is very critical in achieving more complete neutralization of the acidity in the soil.

Is one grade "better" than another?

The higher the neutralizing index, the more effective the liming material will be based on a three year period for complete equilibration with the soil. Typically, higher NI lime grades cost more due to greater grinding costs to produce a finer mesh product, but less will be needed to do the same job of neutralizing soil.

Should I only use high calcium liming materials?

Over 30 years of Wisconsin research conducted by the Soil Science Department at UW-Madison would suggest that there is no advantage to having specific calcium to magnesium ratio in Wisconsin soils. Our recommendation is to select lime based on its neutralizing index and cost per ton, and not on the percentage of calcium or magnesium present.

How do I decide which product to purchase?

Compare the total cost per acre when taking into account the rate needed and the cost per ton. For example, a field may require about 4 tons/acre of 60-69 grade lime costing \$20/ton, but will only require 3 tons/acre of 80-89 grade lime. Therefore, if the 80-89 lime costs less than about \$27/ton it may be a better choice. Here is how to compare cost per acre.

4 tons/acre x \$20/ton = \$80/acre
3 tons/acre x \$27/ton = \$81/acre

How do you convert the recommendation from one grade of lime to another?

All WDATCP Certified Labs will give lime recommendations in both the 60-69 and 80-89 neutralizing index grades on their soil test reports. If you want to convert to a different grade you simply multiply the lime recommendation in the grade you have been given, by the ratio of the mid point of that grade over the midpoint of the grade you want to use. For example if you have a 4 ton/acre recommendation

for 80-89 lime and want to use 50-59 lime, multiply 4 tons/acre (80-89 grade recommendation) x 85/55 = 6 tons/acre of 50-59 lime.

In summary, what are the key points to consider in your liming program?

1. Purchase the product that will be the most economical based on its neutralizing index and corresponding rate per acre required for that grade of lime.
2. Incorporate thoroughly throughout the tillage zone.
3. If possible, apply lime at least one season before planting an acid sensitive crop such as alfalfa.

References

Peters, J. B., K. A. Kelling, and E. E. Schulte. 1996. Choosing between liming materials. University of Wisconsin-Extension Publication A3671. Madison, WI.

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