



Forage Management

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January 2003

Reduce the Potential for Grass Tetany

Grass tetany, a form of hypomagnesia tetany, occurs when a cow has a low level of magnesium in the blood. Grass tetany is caused by a very low content or availability of MG in pasture or hay. The availability of MG is reduced if the forage is high in nitrogen (N) or potassium (K).

Farmers who practice “good” pasture and forage management may experience grass tetany more often than farmers who do not fertilize or use “improved” management methods. Another factor identified in grass tetany is that the plant uptake and animal availability of MG are reduced when soil phosphorus’s (P) availability is low. This occurs on pastures testing low in P. It also occurs when P uptake is reduced in the spring when soils are cool.

Other reasons Mg is deficient are that the limestone quarried in West Virginia contains little or no MG and mixed fertilizers contain little or no Mg. Soils low in Mg occur on many West Virginia farms especially in a belt from Preston County in the north to Mercer County in the south. It is prudent to apply high-Mg limestone when soil tests show Mg deficiency. Application of Mg over time will correct the deficiency.

One solution to preventing grass tetany is to use dolomite or high-Mg limestone and include legumes in your forage stands. Low soil pH indicates the need for lime. Since dolomite is not quarried in West Virginia (except in Jefferson

County), this material may not be readily available. Ask your WVU Extension agent or fertilizer dealer to help you find a source.

If your fields need Mg, ask for a high-quality dolomite, which contains 12%-13% of actual Mg or 20%-22% Mg oxide equivalent. The increased cost of this high-quality lime is justified by the long-term advantages in livestock nutrition and health. One ton of dolomite (12% Mg) per acre would add 240 pounds Mg to the soil. If your soil already has enough Mg (over 250 pound/acre), you are generally safe to use calcitic lime. Since legumes contain more Mg than grasses, this is readily accomplished by correcting the soil pH by using limestone, providing phosphorous and potassium (according to soil test), and frost seeding clovers in the winter.

Legumes pay for themselves! Well-managed grass legume stands will produce as much forage as a straight grass pasture fertilized with 150 pounds of nitrogen per acre. Yearling steers grazing grass legume pastures will gain 0.25 to 0.33 pounds more per day than similar steers grazing straight grass pastures fertilized with nitrogen. Dairy cows will produce 6-10 pounds more milk per day under the same conditions. It is well documented that cattle and sheep can eat more forage when it contains legumes. Increased consumption accounts for the increase in performance when the livestock have the genetic potential for higher production.

Dolomite or high-Mg limestone will increase the pH of the soil (decrease the acidity) while adding the necessary Mg. Because it is a rather slow process, it will not solve an immediate Mg deficiency. To prevent grass tetany, you should supplement winter hay and early spring pasture with Mg oxide (60% Mg) in a mixture with salt, other minerals, and grain. Ensure that each animal gets about 2 ounces of Mg oxide (about 50 grams) each day. Commercial mineral mixes or soft molasses blocks containing Mg can also be used.

The value of limestone depends on its neutralizing value and fineness (see WVU-ES Fact Sheet 3212 “The Value of Agricultural Limestone”). The minimum standards of quality agricultural lime are that it has an 85% neutralizing value and is sufficiently fine to pass through a 20-mesh sieve. Fifty percent should pass through a 50-mesh sieve and at least 35% through a 100-mesh sieve. If you need dolomite, buy a good grade (actual Mg content of around 13% Mg oxide equivalent of 20%, Mg carbonate equivalent of 45%). Apply enough to raise the soil Mg level to 200-250 pounds per acre. If your Ph is already 6.2-6.5 and no lime is called for, but yet both K and Mg are needed, you can use Sol-Po-Mag or K-Mag which contains about 11% Mg, as well as about 22% K₂O and 22% sulfur.

Summary

Do not apply heavy rates of nitrogen, potash, or manure in early spring. Instead, make late spring, summer, or fall applications of potash or cattle manure when correcting low soil potassium levels.

If the soil is low in Mg (less than 100 pounds per acre), the potential for grass tetany is high. Application of dolomite limestone will help reduce the risk of grass tetany. If the soil test does not call for lime, application of Mg oxide (60% Mg) at 250 pounds per acre or dolomite (13% Mg) at 1,200 pounds per acre will add 150 pounds of Mg without adversely affecting soil pH.

For soils testing low in P, develop a soil fertility program to raise the soil test P into the low end of the high range. Early spring applications of phosphorous alone (triple super phosphate, 0-46-0) can reduce grass tetany risk on soils with high Mg levels since phosphorous is needed for plant uptake of Mg.

If your soil is high in Mg (over 250 pounds per acre) and your soil test calls for lime, the use of calcitic lime is appropriate. Monitor your soil's nutrient status through soil tests. For optimum crop production, soil tests should indicate a base saturation of 70%-80% Ca, 12%-15% Mg, and 3%-5% K. Some legumes such as birdsfoot trefoil and soybeans benefit from levels of Mg up to twice as high.

It is recommended that forage samples be taken regularly and analyzed for nutrient content. This will prove your suggestions for mineral supplementation to optimize livestock nutrition and health. Supplementation with Mg oxide is necessary to avoid grass tetany in cattle fed forages under management that makes them high risk for grass tetany.