

AGRONOMY NOTES

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Lime: Cheapest Fertilizer

Lime seems to be a low priority subject. It is the first material that should be added to pasture, hay or row crops that have a soil test showing a pH below 6.0. Most plants grow better at a slightly acid soil test of 6.0 - 6.5. Remember pH 7.0 is neutral, pH 6.0 has 10 times the acid as 7.0, pH 5.0 has 100 times the acid as 7.0, and pH 4.0 has 1,000 times the acid as 7.0. Legumes like red clover, birdsfoot trefoil, alfalfa, and soybeans do better at pH 6.0 - 7.0. Alfalfa is very acid sensitive and needs pH of 6.7 - 7.0 for its best production. Alfalfa in particular will yield about two times as much at a pH of 6.7 - 7.0 as it will at pH 5.0 regardless of the amount of fertilizer applied. Nutrient availability ranges are the best at the pH of 6.5, MU Guide 9102 *"Liming Missouri Soils."*

Phosphorous availability drops from its highest availability at 6.5 to one fourth or one fifth that availability at pH 6.0. At pH 5.5 or below, most of the phosphorus you apply to soil in a pasture or crop field is fixed as aluminum, iron, or manganese phosphates. Once phosphorus is fixed, it does not become available for a long time, some say forever. So you need to lime soils up to 6.0 - 6.5 so that the phosphorus you apply from then on stays available. Phosphorus is now \$1.00/pound or more and you cannot afford to apply it and have it fixed forever in the soil as aluminum, iron, or manganese phosphates.

Missouri soil tests show lime needed as ENM. What is ENM? ENM means effective neutralizing material. $ENM = CCE \times \text{Fineness factor} \times 800$. CCE is the calcium carbonate equivalent. The Fineness factor comes from sifting lime through screens. All lime sold in Missouri has to have these qualifications, at least 90% must pass the U.S. No. 8 sieve or

screen and have minimum of 65% CCE (calcium Carbonate equivalent). Lime particle size courser than 8 mesh has a liming efficiency factor of zero, 8-40 mesh has a efficiency factor of 25%, and 60 mesh and finer has a efficiency factor of 100%. The ENM of all lime sold in Missouri has to be shown at the quarry. The *"Missouri Agricultural Liming Materials Report,"* list tests of lime from local and out of state quarries. Four quarries tests of lime range from 1.6-5.7% of the lime was 8 mesh, 16.7-53.7 was 8-40 mesh, 4.7-10.4% was 40-60 mesh, and 34.8-73.9% was 60 mesh or finer. CCE % was from 84.7-93.8% and the ENM range was 367-580/ton. The highest ENM lime found locally was Kelly Lime and Rock Company, Kirksville, MO. with 580. The ENM is not important, it's the cost per ENM. To evaluate the cost per ENM of lime divide the price per ton spread by the guaranteed ENM. Example: \$12.00/ton, ENM of 419, $12.00/419 = .0286$ or 2.86 cents/ENM. Compare two or more lime sources and use the one that is the cheapest per ENM. Lime can be applied anytime of the year that the fields are not muddy or soft and where soil compaction would be a problem. For row crops or renovating a pasture, lime can be tilled into the soil. When tilled into the soil, lime reacts faster and raises the pH throughout the tilled depth. For established pastures, hay fields, or no-till crops, lime can be applied to the soil surface. Lime moves into the soil at about one inch or more per year. When lime is applied to the soil surface as in a pasture, it's recommended not to apply more than two tons/acre per year. Lime application can be divided up into two sequences or it can be put on all at one time, whichever in the most economic. If a soil test calls for 4 tons of lime per acre on a pasture, apply 2 tons the first year and 2 tons the next year or whenever you can afford it, until the full 4 ton requirement is met. If soil needs lime its best to start applying now to improve production even if the lime is applied in 2 or 3 sequences to reach the full soil test

recommendation. Check out the MU Guide 9102 *“Liming Missouri Soils,”* and 9107 *Missouri Limestone Quality; What is ENM,”* for more information.

New Biotechnology for 2009

Roundup Ready 2 Yield (TM) Soybean – In 2008 a few farmers planted these soybeans from Monsanto under various brand names. These soybeans according to Monsanto were “developed through extensive gene mapping that identified specific DNA regions in soybeans that have a positive impact on yield”. They say Roundup Ready 2 Yield soybeans “consistently deliver 7 to 11 % higher yields than Roundup Ready soybeans”. Monsanto will introduce these new biotech soybeans officially in 2009 so that most producers will be able to plant several units (bags). Roundup is glyphosate.

LibertyLink Soybeans – In 2009 Bayer Crop Science will launch its LibertyLink soybeans. These soybeans are resistant to Liberty (glufosinate). Bayer will sell this biotech trait in soybeans from maturity group 1 to 4.9. The herbicide Liberty is getting a new name, its new name will be Ignite (glufosinate).

In a few years the seed companies are going to introduce dicamba resistant soybean. Dicamba is the main herbicide in Banvel, Clarity, and Distinct. This biotechnology would work well on Roundup or glyphosate-resistant weeds.

Aphid Resistant Soybeans

The Asian soybean aphid (*Aphis glycines* Matsumura) is becoming an annual pest for soybeans even in Missouri. Syngenta, who owns Northrup King, Garst and Golden Harvest Seed companies is going to market an aphid resistant soybean, dubbed RAG1. RAG1 stands for Resistance Aphid Glycines 1. Northrup King will market these aphid resistant soybeans and they will include maturity group 0 to early group 3

Soybean Marketing Changes

In 2009 soybeans are going to be priced at \$50 - \$60.00/unit. That unit is no longer a 50 pound bag unit, but a soybean count unit of 140,000 or so beans/unit. Soybeans will now be marketed as a bean count unit just like corn is a 80,000 kernel count unit or bag.

Nearly 93% of the soybeans marketed in 2009 will have the Roundup Ready trait. In the “Missouri Farmer Today” I counted 180 soybean varieties for sale in 2009. 168 were Roundup Ready and 14 (7%) were conventional, non-GMO soybeans

SOYBEAN CYST NEMATODE

Soybean cyst nematode is Missouri’s most serious soybean pest. SCN is found in Missouri’s entire soybean producing counties. Estimated losses from SCN are \$34-\$100 million a year to Missouri’s soybean producers. This microscopic wormlike pest invades the soybean roots and causes cysts. SCN was brought to the US in soil used for inoculating soybeans.

Yield losses from SCN can be as high as 100% in infested areas, with 15-40% yield loss common on an entire field basis. Yield loss can be as high as 50% without noticeable plant symptoms. SCN damage to soybeans is more severe when drought, herbicide damage, low potassium in soil, (<150 lbs/a), soybean aphid damage, and plant diseases stress soybeans.

What should a soybean grower do? Take a SCN soil sample. Samples are taken just like soil samples. Take the samples close to the soybean stubble row. SCN is not distributed evenly throughout a field so do a good job of random sampling, 2-3 samples/ acre, 6-8 inches in depth.