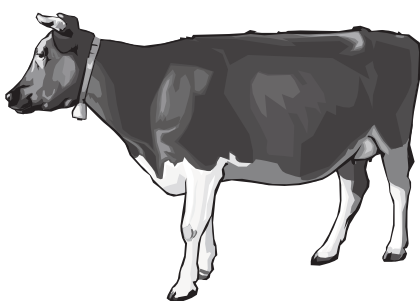


## Grass Tetany in Beef Cattle

Grass tetany is a nutritional disorder resulting from inadequate blood levels of magnesium (Mg). Conditions which increase the risk of this problem include lush, rapidly growing grass pastures, prolonged cloudy weather, older cows in early lactation that are heavy milkers, and soils that are low in Mg and calcium (Ca) and high in available potassium (K).

Pasture fertility plays a role in this problem. Phosphorus fertilization of low P containing soils has been shown to increase Mg content of tall fescue forage. Research has also shown that pastures fertilized with high levels of K and nitrogen (N) can cause a disruption of Mg absorption in grazing livestock. A balanced pasture fertility program based on soil test recommendations should eliminate these issues.



Grass tetany most often affects cattle in late gestation or early lactation, especially the heaviest milking cows. Older animals are more susceptible to grass tetany than younger animals because they cannot mobilize bone Mg as efficiently as younger animals when dietary supplies are inadequate. Additionally, older animals are generally harder to keep in good body condition which also contributes to this metabolic problem. You should give a little extra care to older, thinner animals this time of year in relation to preventing grass tetany.

Prevention is the best treatment and is most easily accomplished by providing Mg in a free choice, loose mineral supplement. Dry cows should consume 10 grams of Mg per day, while cows nursing calves should consume 20 to 25 grams of Mg daily. Mg supplements are not very palatable and Mg is quickly cleared from the blood, so it is important that animals consume Mg daily.

In order to provide this amount, a commercial mineral mix containing at least 10 percent Mg is recommended. Other mixes can be made on-farm using a variety of feed and mineral ingredients. Feeding hay containing red clover or alfalfa is also beneficial, because legumes contain about twice as much Mg as grasses.

For more information on grass tetany or on Mg containing supplements, contact your local MU Livestock Specialist.

**Source:** *Gene Schmitz, Livestock Specialist*

## Vegetable Garden Fertilization: Nitrogen May Be All You Need

An article based on a recent survey by University of Missouri soil test laboratory verified a trend *specialists reviewing soil test results have noticed*—that most vegetable garden's soil test results show that soil phosphorus (P) and potassium (K) as very high, and soil pHs high. (see Soil Test Summary for Urban Lawns and Garden Soils, Missouri Environment and Garden, January 2010)



### Why has this occurred?

For P and K, most likely because vegetable gardeners have the tendency to seasonally or annually apply 'balanced fertilizers', those that have nitrogen (N), P and K. While the N is quite mobile, leached by water or volatilized to the atmosphere, P and K adhere to the soil tightly, thus they 'build up'. Use of organic fertilizers (e.g. manure or compost) won't change a build up from occurring, as most organic fertilizers are balanced as well.

While the nature of some soils to have a high pH, usually due to significant amounts of calcium carbonate in the underlying rock, the survey revealed the situation too widespread and common for this to be the main factor. Over application of lime, or other alkaline materials like wood ashes, is the likely culprit.

### What should a vegetable gardener do?

Have your soil tested, and then focus on only supplying the needed nutrients, and increasing organic matter if less than 5 percent. For established vegetable gardens where nutrients have built up, the focus may be on just one nutrient, **nitrogen!**

Easily found synthetic choices of N without any P or K for home garden use are few- urea (46-0-0) and ammonium sulfate (21-0-0). Ammonium sulfate is a good choice when soil pH is very high or high, as the sulfur will gradually reduce the soil pH. Calcium nitrate (15.5-0-0) can be found, but it is a specialty product targeting greenhouse and hydroponic markets, where the 19% supply of calcium is desired.

Synthetic fertilizers that are slow or time release are desired by many gardeners, as they are less likely to 'burn' plant tissue (either roots or foliage). Some specialty turf products are now available with only N. However, balanced formulations are more common. An option is to select slow or time release fertilizers that are highest for 'N' and lowest in 'P & K'. Often, these fertilizers are marketed for turf applications. Formulas in the range of '22-5-6' and '25-2-5' are available.

For organic fertilizers, there are several options. First, if you have the time, grow a legume cover crop and till it

under about a week or two before planting. Legumes fix N with the root nodules and it is accumulated in the green growth, which when plowed down is sometimes referred to as 'green manure', in reference to its fertility. Good sources of N organic fertilizers without P or K are corn gluten (9-0-0), blood meal (13-0-0), and feather meal (12-0-0). There are other balanced organic fertilizers high in N like soybean and cottonseed meal (7-2-2). Organic fertilizers vary in how quickly the N is available, from slow to medium. Only fish emulsion (4-2-2) is considered 'fast'. The MU Guide 6220 'Organic Gardening Techniques' is a good source of information on organic fertilizers frequently used by gardeners (<http://extension.missouri.edu/explore/agguides/hort/g06220.htm>).

Source: James Quinn, Horticulture Specialist

## Spotted Knapweed

Spotted knapweed (SK) has not officially been located in central Missouri but it has been found in the counties bordering Audrain, Benton and Chariton Counties. Only Audrain has an infestation near enough to possibly be an immediate problem. Still as a noxious weed in Missouri, it is a plant to watch.

A native to Europe, SK was introduced to the U.S. in the late 1800's. It was first recognized in southwest Missouri in 2002. It is now found throughout southwest and south-central Missouri mostly south of I-44. It has also been found in multi-county areas in east-central and north-central Missouri.

As a short-lived perennial, SK is a thistle like plant forming a rosette the first year and grows a 2-4 foot tall flowering stalk the second year. The pale green leaves are rather sparse on the woody flowering stems. Flowers are pink to purple in color and buds are about 3/4-inch long.

A characteristic making SK especially noxious is a toxin produced by the roots that kills or suppresses nearby plants. This is called allelopathy.

Seeds are the sole means of reproduction. It is a prolific annual seed producer, with 1000 or more seeds per plant. Once established, seeds accumulate in the soil, often exceeding 5000 per square foot and remain viable for at least eight years.



Landowners are advised to be watchful for spotted knapweed, and keep it in check while it is only along roads and not out in pastures. If not controlled, it can rapidly invade pastures and fields and causes a serious decline in forage and crop production. As a weed listed in Missouri's noxious weed law, landowners can be compelled to attempt control.

Several herbicides are effective at controlling SK when used

in a timely manner. In order of effectiveness are:

- Milestone at a 5 to 7 ounce per acre rate (based on plant size)
- Tordon 22K at 1 pint per acre (restricted-use herbicide)
- Grazon P+D at 4 pints per acre (restricted-use herbicide)

They are best applied at the bud stage in the spring or at the rosette stage in the fall.

Once the plant blooms, herbicides are rather ineffective. Blooming plants should be pulled and burned. Anyone handling SK is advised to wear gloves to avoid skin irritation.

There is some good news connected with the control of SK. Biological controls were begun in 2008 and expanded in 2009. This involved the release of two host-specific weevils. They are the SK seedhead weevil and SK root borer weevil. Also, the knapweed seedhead fly is already present in Missouri.

It will take several years for populations of these insects to grow large enough to begin providing significant control of the SK.

Locations of the releases made by the Missouri Department of Transportation, Missouri Department of Conservation, and University of Missouri Extension are shown on the map found at: <http://extension.missouri.edu/webster/spottedknapweed/maps/2009-MOInfestationMapAndReleases.pdf>.

A similar weed biological control project against musk thistle in Missouri with two weevils was a huge success. Large populations of musk thistle were knocked back in southern Missouri and kept from spreading north.

Photographs of SK, the biological control insects, maps of infested areas and additional information can be found at: <http://extension.missouri.edu/webster/spottedknapweed/>

**Sources:** *Jim Jarman, Agronomy Specialist and Bob Schultheis, Natural Resources Engineering Specialist.*

## **Energize Missouri Agriculture - Energy Efficiency Cost-Share Grant Program**

In an effort to help farmers move toward more energy efficient and profitable operations, the Missouri Department of Natural Resources' Energy Center has developed a \$3 million energy efficiency cost-share grant program under *Energize Missouri Agriculture*.



The department is offering the energy efficiency cost-share grants to agricultural operations statewide for agricultural

energy efficiency improvements and renewable energy equipment. The program offers cost-share grants to farm operators, owners or renters. The energy efficiency cost-share grant program reimburses farmers up to 75 percent of the purchase cost of qualifying energy efficient equipment and systems, up to \$5,000 per applicant.

Items eligible for reimbursement include purchased energy efficient equipment and hardware, but do not include time and labor spent installing or operating the equipment. The Energy Center has identified equipment and systems that qualify for funding however; the department is also looking for new and innovative technologies that can be applied to agricultural energy efficiency.

### **Eligible Projects or Systems**

- Solar powered systems (solar powered water systems such as pumps, panels, pipe, tanks or solar powered fencers).
- Insulated tanks and frost-free waters.
- Global Positioning System, or GPS, guidance systems (GPS receiver and auto-track systems).
- Irrigation improvements (flow meters, controllers for pulse irrigation, drip emitters for drip irrigation systems, irrigation nozzle replacement, pipe upgrade to replace aluminum pipe, Tier III or IV diesel engines).
- Dairy facility improvements (variable frequency/variable speed drives for vacuum pumps, improved refrigeration efficiency (plate cooler), heat reclaimers, high volume low speed fans, compressed air improvements).
- Swine and poultry facility improvements (high volume, low speed fans).
- Upgrade or new grain dryers (both burner and fan retrofit for existing systems or total new systems).
- Lighting upgrades, motion sensors or timers (retrofit of entire lighting system in an existing building).
- Conservation tillage equipment.
- High efficiency electric motors.
- Biomass furnaces/boilers for other than poultry houses.



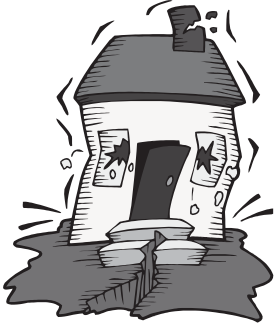
For other energy savings projects to be considered, one would provide a short narrative describing your proposed project, including cost, estimated energy savings per year, documentation/calculations for estimate, payback in years and type of equipment you intend to purchase as part of the application process.

Those interested in applying to the energy efficiency cost-share program may complete an application form located on the department's Web site at [www.dnr.mo.gov/transform/EnergizeMissouriAgriculture](http://www.dnr.mo.gov/transform/EnergizeMissouriAgriculture)

An application form is also available at all local County Soil and Water District offices or by contacting the department's Energy Center at 573-526-1723. The approved paper form is the only hard copy that will be accepted. Please do not print out the electronic version for use as a hard copy submission. Application forms must be post marked and mailed to the department or sent electronically through the web site by April 20, 2010.

Funding for the agricultural energy efficient cost share program is provided by the U.S. Department of Energy through the American Recovery and Reinvestment Act. For more information, contact the Energy Center at 800-361-4827 or 573-751-3443, visit the local Soil and Water Conservation District office, or visit the Missouri Department of Natural Resources' Energy Center's Web page at: [www.dnr.mo.gov/transform/EnergizeMissouriAgriculture](http://www.dnr.mo.gov/transform/EnergizeMissouriAgriculture)

**Source:** *Kent Shannon, Natural Resource Engineering Specialist*



### **Did you Know?**

*The most powerful earthquake to strike the United States occurred in 1811, centered in New Madrid, Missouri. The quake shook more than one million square miles, and was felt as far as 1,000 miles away.*

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