

# Missouri Environment & Garden

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## Soil Testing for Lead for Garden and Landscape Soils

Recently, numerous requests with varying motivations have been received from homeowners to test for lead in garden and landscape soils. Most of these requests have been received from Jasper, Jefferson, Camden, Iron, Reynolds, Madison and East St. Louis Counties where lead smelting has occurred, and also from community gardens concerned about contamination in city lots. We have also received requests to test for lead in soil from concerned parents worried about their children playing in the yard or vegetable garden. However, of these samples, none have been at contaminated levels, so I thought it would be useful and informative to write an article on soil testing for lead to bring awareness and education to homeowners and gardeners.

Lead is a heavy metal that is hazardous if found in high levels in soils. The natural level of lead in soils ranges 10–50 parts per million (ppm). There are several sources of lead in soils. In urban areas, contamination can be caused by industry, and in older homes (built before 1978) it can be the result of chipping and peeling paint or due to extensive home renovations or lead in gasoline. Even though lead in paints and gasoline have been removed and are no longer in use, contamination that occurred during years of use can still remain. Lead can also be a problem in areas near existing smelters, tailings from metal and ore mines, fossil fuel-fired electrical plants, or cement factories. Historic records show Missouri was the largest lead producer in the country. Lead mining, smelting and milling has contributed to lead contamination in soils in various locations in the state. Since lead moves very little and is not easily dispersed or

broken down, it can persist in the soil for a long time. As a result, lead contamination of soils from these sources continues to be a concern. Therefore, the federal and state programs have responded by cleaning up of residential soils to eliminate the problem.

Higher levels of lead in soil and environment in contaminated areas can result in important health problems. Children can come into contact with soil that is contaminated with lead by playing in the soil and by putting soiled hands and toys into their mouths. Lead from

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Soil test lead in ppm	Recommendations
Less than 50 ppm	Little or no lead contamination in soil.
50 to 400 ppm	Some lead present from human activities. Grow any vegetable crops. Choose gardening practices that limit dust or soil consumption by children.
400 to 1200 ppm	Do not grow leafy vegetables or root crops. (These crops carry the highest risk of lead contamination.) Choose gardening practices that limit dust or soil consumption by children.
Greater than 1,200 ppm	Not recommended for vegetable gardening. Mulch and plant perennial shrubs, ground cover, or grass. Use clean soil in raised beds or containers for vegetable gardening.

Source: Angima, S.D. and D.M. Sullivan. 2008. *Evaluating and Reducing Lead Hazard in Gardens and Landscapes*. Extension Guide EC-1616-E. March 2008. Oregon State University Extension Service.

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# Dealing With Those Pesky Moles

While most people have never seen a mole, they are well aware of the damage they cause to lawns and flowerbeds. Most individuals think moles feed primarily on the roots of plants and cause them to die. The truth is, moles feeding on plant material is very limited. It's the air pockets they create around roots and flower bulbs that cause them to dry out and die. Others will swear by a number of home remedies to control or repel moles. These include such things as human hair, Juicy Fruit gum, poison peanuts, mothballs, flooding tunnels with a garden hose and water (flooding tunnels creates a moist environment favorable for earthworms), a hose connected to a car's exhaust and finally, pets (some dogs and/or cats can be effective).

A mole lives most of its life underground and are highly specialized animals for their subterranean way of life. The Eastern Mole is a small, sturdy animal, 5 ½ to 8 inches long, with a somewhat cylindrical body and elongated head. The Eastern Mole is grayish-brown on the back to pale or more brown on the belly. Their velvety fur often has a silvery sheen. Occasionally bright orange or cinnamon-yellow marking will occur. Their fleshy snout serves as a highly sensitive organ of touch and smell to seek out numerous food sources. Their tiny eyes are concealed in fur and covered by fused eyelids; sight is limited to distinguishing light from dark. The greatly enlarged front feet are normally held with the soles vertical and pointing outward. They possess well-developed claws that have a specialized bone attached to the wrist, which aids in digging.

Moles construct networks of tunnels in the soil surface. Many of these are built after rains when the mole is in search of new sources of food and are usually not re-used. Digging of surface tunnels normally proceeds at a rate of

1 foot per minute. They tend to feed and rest on two-hour cycles, 24 hours a day. Animal foods constitute about 85 percent of their diet. This includes earthworms (their main source of water) and grubs, primarily; however millipedes, centipedes, spiders, sow bugs, snails and slugs are taken in considerable amounts. Moles are insatiable eaters and can consume 70 to 80 percent of their body weight daily. Moles generally move up or down within the soil profile to follow food sources such as earthworms, which move with soil moisture.

Moles also create mounds (called molehills) of soil in the lawn by pushing up soil developing deeper, permanent tunnels and nesting cavities. Mating occurs in the spring with a single annual litter of 2 to 5 young being produced in March, April or the first week of May. High infestations consist of 2 to 3 moles per acre.

## Management or Control:

There are products on the market that are available to homeowners and can be purchased at local nurseries or garden centers.

Most products tend to work as a repellent based on castor bean oil as the active ingredient. Many have been tested on the Eastern mole and appear effective on that species, which is our predominant species. These products need to be sprayed (garden hose-end applicator) or granule applied (through a spreader) at regular intervals to maintain a barrier that repels these small mammals to your neighbor. The repellent type products are marketed as natural and safe, but information about effectiveness is mixed. Mole-Med may have changed its name to Chase due to new ownership and is available in both liquid and granular form. Other repellents include Scoot Mole, Shotgun Mole & Gopher Repellent, Mole Max, Mole-Out, Whole Control, Schultz Garden Safe Mole Repellent, and

many others. All are based on some percentage of castor bean oil as the active ingredient. Formulations vary with each, sprayable or granular. These products will generally treat 5,000 to 10,000 square feet and last one to three months. Many of the ready-to-use products are costing around \$15 to \$20 per item.

More recent products include several baits that seem to be very effective if applied properly to active feeding runways. See below on how to locate active feeding runways. Wear rubber gloves whenever handling and placing baits in tunnels.

Two products called "Kaput Mole



ABOVE: Kaput® Mole Gel Bait

Control" (Lescro) and "Moletox Baited Gel" (Bonide) are water-based gels containing warfarin (0.025%) as the active ingredient and flavored like their primary food, earthworms. It is best to locate the active runways as you would for trapping (see below) before placement of the bait. They are both packaged in syringe-type applicators with which the bait is injected into the tunnels. Usually figure around \$20 per syringe.

The latest mole bait registered



ABOVE: Talpirid™ Mole Bait

is "Talpirid" (Bell Laboratories), a bromethalin-based product that actually looks, feels and tastes (so they say) like earthworms. Each worm contains a

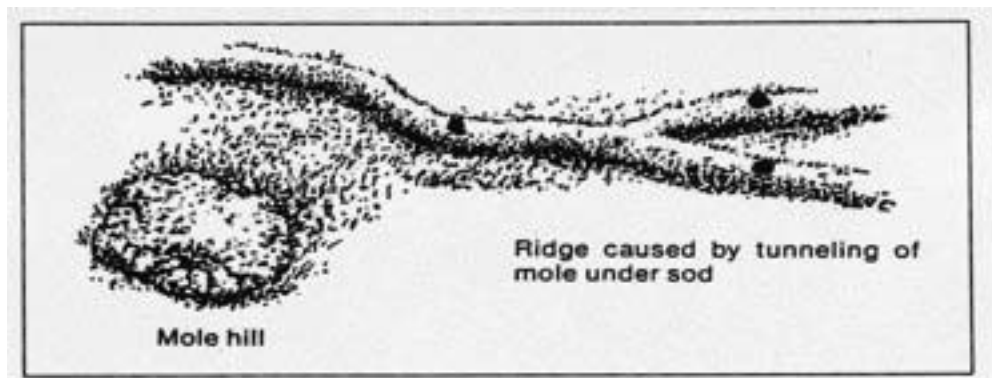
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lethal dose of bromethalin. It is the only mole bait that has submitted efficacy studies to EPA.

MOTOMCO Mole Killer is a bait similar to Talpirid, but in a more affordable package of eight worms for around \$18 to \$22. Gemplers, QC Supply and MFA are carrying this product.

We can also find some poisonous granular baits of a different class as compared to the previous baits mentioned. These include “Moletox II” and “Mole-Nots”, both of which are cracked corn baits laced with 2% zinc phosphide. One teaspoon of material will treat an active tunnel. While some results indicate excellent control with these products, keep in mind that moles do not prefer grains in their diet.

Another granular bait is “Mole Patrol Bait.” Mole Patrol is a ready-to-use, pelletized bait highly palatable with unique attractants. This product contains chlorophacinone, a historically sound anticoagulant of the rodenticide industry. Some studies indicate 100% control of moles. A one-pound container can be purchased for less than \$10.



Trapping is still one of the most efficient means of controlling moles and anyone can be successful by following a few simple steps. If you have the network of shallow runways used for feeding, then you can do some effective trapping. First, you need to locate active feeding runways. Second, select a tunnel to set your trap. There are several types of traps to choose from and simply follow the instructions of the manufacturer to set the trap. The Nash trap (wire hoop type) do work, but seem to be more difficult to set. The Victor “Harpoon or Gig” type trap and the Victor “Out O’ Sight” trap (scissors type) have been the most successful.

### Identifying Active Feeding Runways:

First, with a small stick or broom handle, poke holes in various runways

over the entire network. Come back two to three hours later and inspect those holes. Find the tunnels with the holes plugged back up. This will indicate to you which runways are active feeding tunnels at that time. These are the tunnels that you want to set your traps on or place baits in.

Controlling and trapping moles requires a little time and patience. Your success with controlling moles is dependent on locating active runways and the proper placement of a trap. Additional information on moles can be found in MU Guide #9440, “Controlling Nuisance Moles.”

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## Soil Testing for Lead for Garden and Landscape Soils continued from page 23

soil can also be carried into homes on shoes or clothing or by pets digging in the contaminated soils, attaching particles and dust to their paws and fur. Lead is also found in airborne dust. If you are living in a home built before 1978, you can incur lead contamination from chipped and peeling lead-based paints. The older the home, the higher the likelihood of lead contamination due to more coats of paint applied over time. Properties adjacent to heavily travelled streets and roadways also bring a higher susceptibility and occurrence of lead contamination.

If you suspect the possibility of lead contamination in your garden or landscape soil and you have young children who

might be exposed to contaminated soil, it is wise to test your soil for lead. According to the U.S. Environmental Protection Agency, a tested soil level of 400 ppm in garden soil is considered contaminated (EPA URL: <http://www.epa.gov/lead/>). The soil should be sampled by taking 6 to 12 random subsamples from the surface 3 to 4 inches. Since lead doesn't move significantly in soil, it stays in the surface unless the soil has been tilled or mixed in land preparation. Mix the subsamples well and send 1 ½ cupfuls to the lab for lead analysis. Provided is a table adopted from the Oregon State University Extension Guide on Evaluating and Reducing Lead Hazard in Gardens and Landscapes, authored by S. D. Angima and

D. M. Sullivan for interpretation of lead soil tests for gardens.

The MU Soil and Plant Testing lab located at 23 Mumford Hall, University of Missouri, Columbia, MO 65211, offers lead and heavy metals testing. If you would like your garden or landscape soil tested please contact the lab by calling (573) 883-0623 or by visiting the lab's website at <http://soilplantlab.missouri.edu/soil/>

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# Pretty Invasive

At this time of year, it is easy to see why 'Bradford' pear and newer cultivars of *Pyrus calleryana* are among the most widely planted urban trees in the Midwest. They are fast-growing, have a spectacular bloom display and pleasing, symmetrical form. The summer foliage is glossy and attractive and they can get an eye-popping crimson fall color if conditions are right. Despite their more upright forms, some of the newer cultivars have wider branch angles than 'Bradford' and are somewhat less susceptible to storm damage. However, some recent developments have begun to make some people re-think their plans for extensive plantings of ornamental pears.



Fire blight is a bacterial disease that commonly affects pears. Until recently, *P. calleryana* was considered

highly resistant to this problem. However, in the past ten years there have been increasing reports of dieback and disfigurement of trees of many of the *P. calleryana* cultivars. While fire blight can be managed by pruning and spraying with streptomycin, improper use of either of these measures can have disastrous effects, including development of antibiotic resistant organisms.

In the past few years, there have been numerous reports of invasion of natural areas by *P. calleryana* seedlings. 'Bradford' and other cultivars have generally been considered self sterile and, therefore, not likely to produce seed. However, recent evidence indicates that cross pollination between trees of different cultivars can lead to development of fruit with viable seeds. Since fruits are relatively small, they can be eaten by birds, which then distribute the seeds widely. Since seeds seem to germinate



readily and trees grow quickly, there are currently some alarming populations of *P. calleryana* that are showing their potential to shade out plants in native areas and create power disruptions from limbs falling on power lines in unmanaged areas.

This is yet another example illustrating the need for more diversity in urban landscapes. There are good reasons why Mother Nature rarely creates a pure stand of any plant. We should follow her example more often.

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## Native Plant Sale

**Saturday, April 11, 10AM–2PM**

**MU Bradford Research and Extension Center**

Once established, native plants require less water and fertilizers than non-natives. Join us for a perfect opportunity to find all the native plants you need for your home garden, and support Missouri businesses.

### featuring:

- Four Missouri native plant and shrub vendors
- Native plant themed books and items made by local artists for sale
- Many learning opportunities through informative booths and demonstrations!

**This event is free for everyone to attend rain or shine!**

### Bird Watch Tour

**7:00 a.m. – 10:00 a.m.**

Please R.S.V.P. with Thresa at 884-7945 or by email: ChismT@missouri.edu

Bradford Research and Extension Center is located east of Columbia at 4968 Rangeline Road. See our website for detailed directions: [www.aes.missouri.edu/bradford](http://www.aes.missouri.edu/bradford). Phone: 573-884-7945. Ask for Thresa Chism or Tim Reinbott

# Flowering Dogwoods: Candelabra of Color

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In April, flowering dogwood trees provide a candelabra of color in the Missouri landscape. Native trees in the woods of central and southern Missouri produce a spectacular display of layers of white “blossoms” in the spring. In the fall, these trees have beautiful scarlet foliage and produce ruby red fruits. These fruits are also a food source for birds during the winter. Because of these aesthetic qualities, the flowering dogwood (*Cornus florida*) was declared Missouri’s state tree in 1955. While the true yellowish-green flowers clustered in the middle of bracts are not showy, the four petal-like white bracts form a beautiful inflorescence. On close inspection, there is often a distinct notch on the margin of each bract.

Pink and red flowering dogwood trees are often used to provide color in home landscapes. Some of the recommended pink cultivars include Prairie Pink and Cherokee Brave. If you prefer deep red bracts, Cherokee Chief is a good choice. Cloud 9 is a cultivar that produces a profusion of white bracts. A mixture of these cultivars

produces a spectacular display of color after a dreary winter. Most dogwood cultivars produce a 20 to 25 ft. tree height at maturity.

Establishing flowering dogwood trees in the home landscape can be a bit tricky. Dogwoods are best suited to shady areas or on the north or east side of a house. These trees favor a slightly acidic, well-drained soil. The application of a bark mulch underneath the tree helps maintain cool soil temperatures needed for tree establishment. Dogwoods also require watering during droughty periods, especially when the temperature exceeds 90°F. In cool, wet springs, symptoms of anthracnose may be observed on the floral bracts (“petals”) and on the leaves later in the season. Symptoms of anthracnose include circular lesions with purple borders and lighter, almost white centers. During late spring or summer, the centers of the spots fall out, leaving a “shot-hole” appearance on the leaves. Dogwood borers can also be problematic in some years. The larvae feed on tissue underneath bark

scales or on injured bark on the trunk of the tree. Symptoms of feeding include reddish-brown frass pushed outside a small tunnel held together with silk on the trunk. Usually control measures are not warranted for dogwood borers or anthracnose.

Another option would be to plant a hybrid cultivar of *C. florida* x *C. kousa*. Celestial, Arora, Constellation, Stardust, and Ruth Ellen produce white bracts, while Stellar Pink has pale pink ones. All of these cultivars are purportedly resistant to anthracnose and dogwood borers. Thus, with a bit of care, dogwoods provide an interesting tree form and color in the landscape throughout the year.

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## Clinic Update: Early Spring Samples Submitted to the Plant Diagnostic Clinic

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The growing season is just beginning and our sample volume has been limited until recently. We have received several pines samples with needle browning and needle drop this spring. Many of these pines have been infected with *Dothistroma* needle blight. Symptoms are very apparent right now on Austrian pine, although a recent Jeffery’s pine submission also had high levels of infection. Information on this disease can be found at <http://www.oznet.ksu.edu/library/plant2/1722.pdf> Some of the Austrian pine samples have also had *Diplodia* tip blight. Control measures for these diseases are fairly disease specific, and insects such as pine tip moth can cause similar damage. By

sending a sample to the plant diagnostic clinic for confirmation of the problem you can ensure proper treatments are being applied during the crucial periods of the season to protect your pines in the future.

We have also had some houseplant samples. Commonly submitted problems seem to be insect infestations that have built up over the winter. Many insect pests can build up indoors in a protected environment that often excludes insect predators that may help reduce the pest populations outdoors. Common submissions have included aphids, whiteflies, soft scale and spider mites. Some of these pests are first discovered when a sticky

material is noted coating leaves, pots, or materials surrounding the plants. The sticky material is a “honeydew” excreted by some of these pests. More information can be found at <http://extension.missouri.edu/explorepdf/agguides/pests/g07274.pdf>

We have had a number of greenhouse ornamental submissions as well. We have had *Pythium* root rot submissions from tomato and geranium, especially where sanitation has been inadequate, temperatures are cool and overwatering is occurring. Another geranium sample also had *Botrytis* blight and a *Fusarium* stem rot. There are a variety of disease causing pathogens that can cause

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# Gardening: Reasons To “Dig It”

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April is National Garden Month. The warmer temperatures and lengthening days of this verdant time of the year signals the awakening of nature from a deep winter sleep. After months of daydreaming about plants and poring over garden catalogs, gardeners everywhere anxiously await the opportunity to exercise their “green thumbs”. As we wait for the soil to dry and temperatures to warm a bit more, now is an ideal time to consider the many benefits of gardening.

## 1. Economic.

At a time when our nation is in the throws of a deep recession, saving money is on the mind of most people. Vegetable gardening is an excellent way to save on the family food bill. The National Gardening Association estimates that a well-maintained vegetable garden yields an average return of \$500 per year. Multiplied by the number of vegetable gardens in the country (36 million), the NGA estimates that American food gardeners are producing more than \$21.6 billion of produce a year.

Roger Doiron, founding director of Kitchen Gardeners International, weighed and recorded each vegetable harvested last year from his 1,600-square-foot garden outside Portland, Maine. At the end of the growing season he found he had saved about \$2,150 by growing produce for his family instead of buying it. Is it any wonder that garden seed companies are reporting record sales in an era when many business are failing.

You don't have to spend \$500 on a raised bed filled with an artificial growing medium to benefit economically from gardening. A study by Burpee Seeds revealed that \$50 spent on gardening supplies can be multiplied into \$1,250 worth of produce annually. This twenty-fold return on investment also was documented by a national survey conducted a number of years ago. Simply put, if vegetable gardening does

not reduce your food bill you are doing something wrong.

## 2. Health.

It has been well documented that physical activity is important for maintaining good health, both physical and mental. The digging, hoeing, raking, etc. associated with gardening are great forms of exercise while doing something productive. The average gardener burns between 300 and 400 calories per hour while gardening. That same person would have to walk about four miles at a fairly brisk pace to use up the same number of calories. Someone once remarked, “gardening is a labor of love; a treadmill is just labor.” Also, research has shown that gardening reduces stress which is all too much a part of our daily lives and can lead to health problems of various types.

Gardening offers nutritional health benefits as well. Eating fresh vegetables and fruits is known to be important for good health. Some suggest it may even reverse the aging process. The availability of fresh, inexpensive produce from the family garden is conducive to maintaining good dietary habits and (at times) forces greater vegetable consumption. When shopping at the supermarket, you might purchase one zucchini. Plant zucchini in a garden and you suddenly are looking for new recipes to make good use of the bounty of your harvest.

## 3. Psychological.

Gardening is “good medicine” for one's inner self. By allowing people to connect with nature and other living things, gardening tends to restore our spirits and make us feel good about ourselves. Research has shown that next to the marital role, accessibility to nature is the most important factor in life satisfaction.

Simply being surrounded by growing plants and blooming flowers is a way to become immersed in another world

and a diversion from the stresses and demands of life. Working with plants tends to divert one's attention from other trials and tribulations of life and affords people the opportunity to achieve a level of serenity and enjoyment that often escapes us in our technologically-based society.

Humans need to feel needed and successful in life. Planting and caring for a flourishing flower or vegetable garden imparts a sense of accomplishment without unreasonable expectations often placed upon us by society. For this and other reasons Plant Therapy is a therapy modality many hospitals and health care facilities now offer. Plant Therapy recognizes the healing power of plants whether people are suffering from physical, psychological or emotional problems.

## 4. Environmental.

Gardens benefit our planet in many ways. They reduce our “carbon footprint” by growing food locally instead of having it shipped in from distant locations. Plants take in carbon dioxide as they manufacture food thus helping to reduce the concentration of greenhouse gasses. The latter have been linked to global warming and climate change. Gardens help to reduce soil erosion by slowing rainfall runoff and allowing it to infiltrate more slowly into the ground. Additionally, gardens tend to serve as a food source and gathering place for many types of wildlife such as butterflies and birds.

## 5. Social.

Working together strengthens the bonds between people. Gardening represents a universal language that can strengthen family relationships and is a wonderful way for generations of family members to interact. The most valuable “produce” from a garden just might be the joy derived from working with family and friends.

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Gardening also can help bring communities closer together, ameliorating differences between socioeconomic, racial and ethnic groups. For example, research has shown that community gardens and urban forests lead to a lower level of crime and domestic violence in cities. Even corporate America is considering the advantages of surrounding people with plants as it emphasizes the importance of landscaping places of business.

### **6. Educational.**

Gardening is a learning experience; every year provides different challenges from which one can learn. Gardening can encourage children and adults

alike to be more curious about their surroundings and nature. It is a great way to teach youngsters the joy that can come from work and that positive results are not always instantaneous in life. Gardens make us more aware of our senses through stimulation of sight, smell and touch. They have the ability to motivate people in many different ways and serve as a creative inspiration.

In short, gardens and gardening remind us of everything that is good about life—the beauty of nature, the feeling of pride and sense of accomplishment for having done something productive and the realization that our efforts are helping

to improve ourselves, our society and our physical/biological environment.

The bottom line, then, is not how you garden; it's if you garden. Organic or non-organic, raised bed or conventional, hydroponic or soil-based probably make very little difference. Ultimately, there probably isn't a best way to garden, as long as you garden. For those of you who are gardeners, best wishes for the upcoming growing season—relish it while it lasts. For those of you who are not, there is no time like the present to start.

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## **Clinic Update: Early Spring Samples Submitted to the Plant Diagnostic Clinic**

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root and stem rots as well as blights in the greenhouse. Specific fungicide treatments will frequently only be effective for a few of these, consequently confirmation of specific problems can be very important to ensure treatments are effective.

A petunia sample was recently submitted with a blotchy mosaic pattern on the leaves. We were able to confirm

The means of spread from plant to plant is also very virus specific. Because plants cannot be treated once infected, it is important to remove all infected plants and apply proper treatments to prevent spread to healthy plants. Information on the efficacy of various greenhouse disinfectants in a recent university study to reduce the spread of TMV can be found at <http://www.greenhousegrower.com/magazine/?storyid=1809>

In the diagnostic clinic we can do testing to confirm the presence of some of the common viruses of ornamentals and vegetables.

Another recent submission has been rednecked cane borer damage in blackberry. This insect pest develops inside the blackberry canes, girdling the cane. Damage from this pest can look

can help a blackberry grower prevent serious damage to a planting. See <http://www.ca.uky.edu/entomology/entfacts/ef209.asp> for more information on this pest and control measures that will help prevent serious losses in the future.

Sample submission can provide you with an accurate diagnosis to allow you to effectively manage your plant problems, as well as allow us to provide comprehensive updates in the newsletter. Please refer to the sample submission section of our website <http://soilplantlab.missouri.edu/plant/index.htm> or contact us for more information on sample submission.

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*Petunia plant infected with a virus. Courtesy of Simeon Wright.*

tobacco mosaic virus (TMV). Viruses can be very tricky to diagnose visually because the symptoms can be variable.

similar to injuries or galls caused by different types of pests or diseases. Knowledge of this pest and the lifecycle

# May Gardening Calendar

## Ornamentals

- **Weeks 1-4:** Apples, crabapples and hawthorns susceptible to rust disease should have protective fungicidal sprays applied beginning when these trees bloom.
- **Weeks 1-4:** Pinch azaleas and rhododendron blossoms as they fade. Double flowered azaleas need no pinching.
- **Weeks 1-4:** If spring rains have been sparse, begin irrigating, especially plants growing in full sun.
- **Weeks 1-2:** Canker worms (inch worms) rarely cause permanent damage to ornamentals. Use B.T. if control is deemed necessary.
- **Weeks 1-2:** Don't remove spring bulb foliage prematurely or next year's flower production will decline.
- **Week 1:** Begin planting gladiolus bulbs as the ground warms. Continue at 2 week intervals.
- **Week 1:** Continue monitoring pines, especially scotch and mugo, for sawfly activity on the new shoots.
- **Week 1:** Plant hardy water lilies in tubs or garden pools.
- **Weeks 2-4:** Scale crawlers are active now. Infested pines and euonymus should be treated at this time.
- **Week 2-3:** Plant summer bulbs such as caladiums, dahlias, cannas, and elephant ears.
- **Week 3-4:** Trees with a history of borer problems should receive their first spray now.

## Lawns

- **Weeks 1-4:** Keep bluegrass cut at 1.5 to 2.5 inch height. Mow tall fescue at 2 to 3.5 inch height.
- **Weeks 2-4:** Mow zoysia lawns at 1.5 inch height. Remove no more than one-half inch at each mowing.
- **Weeks 2-4:** Apply post-emergence broadleaf weed controls now if needed
- **Weeks 3-4:** Zoysia lawns may be fertilized now. Apply no more than 1 pound of actual nitrogen per 1000 square feet.
- **Week 4:** Watch for sod webworms emerging now.

## Vegetables

- **Weeks 1-4:** Place cutworm collars around young transplants. Collars are easily made from cardboard strips.
- **Week 1:** Begin planting sweet corn as soon as white oak leaves are as big as squirrel ears.
- **Week 1:** Thin plantings of carrots and beets to avoid overcrowding.
- **Week 1:** Set out tomato plants as soils warm. Place support stakes alongside at planting time.
- **Week 2:** Watch for striped and spotted cucumber beetles now. Both may spread wilt and mosaic diseases to squash and cucumber plants.
- **Weeks 3-4:** Set out peppers and eggplants after soils have warmed. Plant sweet potatoes now.

## Fruits

- **Weeks 1-4:** Mulch blueberries with pine needles or sawdust.
- **Week 1:** Don't spray any fruits while in bloom. Refer to local Extension publications for fruit spray schedule.
- **Week 4:** Prune unwanted shoots as they appear on fruit trees.

## Miscellaneous

- **Weeks 1-4:** Birds eat many insect pests. Attract them to your garden by providing good nesting habitats.
- **Weeks 2-4:** herbs planted in average soils need no extra fertilizer. Too much may reduce flavor and pungency at harvest.
- **Weeks 3-4:** Take houseplants outdoors when nights will remain above 50 degrees. Most prefer only direct morning sun.
- **Weeks 3-4:** Watch for fireflies on warm nights. Both adults and larvae are important predators. Collecting may reduce this benefit.
- **Weeks 3-4:** Sink houseplants up to their rims in soil or mulch to conserve moisture. Fertilize regularly.