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Proper Mowing is the Key to Healthy Lawns

Even proper mowing is considered a stress to turfgrasses. Removing leaf tissue reduces leaf area therefore reducing photosynthetic capabilities of the plant. Carbohydrate production and storage is reduced. Mowing creates ports of entry for disease infection and increases water loss from cut leaf tips until they seal off. Turfgrass plants improperly mowed are under greater stress. Greater stress means a lawn can be more susceptible to weeds, diseases and insects. Therefore, less stress from proper mowing practices equals fewer inputs (\$) for a home owner or professional grounds manager.

Optimal cutting heights for cool-season grasses, such as blends of turf-type tall fescues and mixtures of turf-type tall fescues with a little bluegrass, should range from 3.0 to 4.0 inches. Warm-season grasses, like zoysia, can range between 1.5 and 2.5 inches.

Seasonal variation in mowing height was once thought to be highly beneficial and is still considered beneficial by some. We know that mowing cool-season grasses a little taller in the summer months can have benefits through summer stress periods (deeper roots, better cooling effect). Taller grasses will also conserve moisture, giving some reduction in irrigation requirements. We also know that cool-season grasses mowed a little taller in the spring and fall compete more successfully against weeds (up to 80 % control of annual weeds). Therefore, **select the tallest, acceptable mowing height for your species of grass and maintain that height during the entire season.** This provides benefits throughout the season — competition against weeds as well as reduced summer stress.

Clippings should be uniformly distributed rather than deposited in clumps. Mowing the lawn **when the grass is dry** and using a **properly sharpened mower blade** will spread clippings evenly. If some areas produce excess clippings, simply mulch those in with a second passing of the mower.

Mowing creates wounds through which fungi can enter the plant and infect it. **Leaf cuts made by a sharp mower blade are cleaner and heal faster** than the tearing and shredding caused by a dull mower blade. Dull mower blades inflict severe wounds that increase potential for infection by turfgrass diseases. **Having a sharp, spare mower blade allows you to switch blades when needed and prevents delays in mowing when getting your mower blade sharpened.**

Observe leaf tips in your lawn or grass clippings collected on your mower deck immediately after a mowing to determine the quality of cut. Use this as an indicator of when to sharpen mower blades.

During hot summer months it is best to mow later in the day to minimize additional stresses on your grass.

It is also best to change directions of mowing each time you mow. This avoids patterns being pressed into a lawn improving aesthetics and quality of cut.

Frequency of cut should be determined by the “one-third rule” of mowing. You should make sure that no more than one-third of the leaf blade is removed during a single mowing. During the spring and fall, cool-season grasses can be mowed every 5 to 6 days when conditions are favorable for rapid growth.

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2011: Year of the Tomato

The National Garden Bureau selects one flower and one vegetable to showcase each year. This year the tomato is the vegetable of their choice. While the author has written several articles on tomato in recent years it hardly seems fitting to allow the notoriety bestowed this year on this staple of the home garden to go unnoticed. April is the month most avid gardeners in Missouri initiate the annual ritual of tomato production and a good time to give added homage to America's most popular home garden plant.

When contemplating this year's tomato planting one of the first things to consider is their growth habit. Determinate tomatoes are relatively compact, and reach a predetermined height or number of fruit clusters. Each short branch ends in a flower cluster, and plants do most of their growing before setting fruit. Determinate tomatoes tend to ripen in a short period, so that the main harvest is concentrated into a few weeks. This may be ideal for gardeners who wish to preserve fresh tomatoes for winter soups and sauces.

In contrast, indeterminate tomato plants grow, blossom, and produce tomatoes throughout the growing season. They can grow to over 10 feet tall and, if unpruned, produce many side stems, all of which are capable of flowering and fruiting. As shoot tips continue to grow, flower clusters are borne in the leaf axils of the elongating shoot. An example of an indeterminate variety is 1994 AAS winner 'Big Beef'. To help manage the robust growth of indeterminate varieties and keep their fruit off of the ground, supporting plants with cages, stakes or trellises is recommended. Staked plants should be pruned to remove all but one or two growing stems, which are tied loosely to the stakes and trained for vertical growth. Because this system allows air to circulate around the plants, it can help prevent disease infestation. Pruning also tends to produce larger (but fewer) tomato fruit. The process of pruning simply involves removing shoots (suckers) that grow from the point of leaf attachment (nodes) on the main stem.

There is a third type of tomato growth habit called semi-determinate. Varieties with this type of growth produce plants which are bushy like a determinate type, but will set and ripen fruit over a longer period of time. The 1984 AAS Award Winner 'Celebrity' is an example of a semi-determinate variety. The best way to grow determinate or semi-determinate plants is to not prune and place a cage around the tomato while still small. Alternatively, short stakes can be driven into the ground between every other plant in a row of tomatoes. Twine can then be "woven" between the tomatoes and wrapped around the stakes for support.

Tomatoes are sun-loving plants and need as much direct sunlight as possible to produce the highest yield. Native to South America, tomatoes require warm temperatures for good growth, so wait until the nighttime air has warmed to about 55 degrees F before transplanting them. Planting tomatoes too early will only slow their growth. Tomatoes are not frost hardy and will die if exposed to freezing temperatures without

protection. If temperatures drop at night, keep young plants warm with a cloche or other type of cover.

Tomato plants grow well in many types of soil. Work the soil only when it is dry enough so it will not stick to tools. Improve garden soil by adding organic matter such as peat moss, leaf mold, well-rotted manure or compost. Tomatoes grow best in nearly neutral soil with pH of 6.5 to 7.0. If soil test results indicate the need for lime, add it in late fall or early spring.

Tomatoes are heavy feeders and need adequate amounts of nitrogen, phosphorus, and potassium for optimum performance in the garden. Start by supplying plants with an ample amount of these nutrients as a "pre-plant" fertilizer. Fertilizers relatively low in nitrogen but high in phosphorus and potassium (e.g. 6-24-24) are ideal. Use a maintenance rate of 1 pound per 100 square feet after the proper fertility level has been developed from previous soil tests and fertilizations. Organic sources of fertilizer also may be used.

No matter what type of fertilizer is selected, always follow the directions on the label and do not over fertilize. The latter this will cause lush vegetative growth with poor fruit set. Once tomato plants have set fruit additional nitrogen is needed in the form of a "side-dressing". The application of calcium nitrate every 10 days to two weeks after the first fruit are the size of a golf ball is a practice many gardeners follow. About 3.5 pounds of calcium nitrate can be side-dressed per 100 feet of row.

Tomatoes are subject to a number of diseases that can limit yield and reduce fruit quality. Most authorities recommend rotating tomatoes and other crops in the garden on a four-year cycle. This means not to grow the same crop (or a crop in the same family) in the same place more often than every fourth year. Tomato, pepper, eggplant and potato all belong to the same plant family. Crop rotation helps to prevent the build-up of disease inoculum in the area immediately surrounding the tomato plant.

Additionally, when browsing through tomato seed packets or reading the care tag on a started plant the letters V, F, N, or T might be included on the description. These letters indicate the plant is genetically resistant to certain diseases, making further control unnecessary.

The letter 'V' stands for *Verticillium* wilt which is caused by a soilborne fungus. The symptoms of infection are wilting of older leaf tips, yellowing and browning of leaves in a V-shaped pattern and leaf drop beginning with the older foliage. As the fungus moves throughout the plant, all leaves curl upward and the stunted plant will not respond to water or fertilizer. Cool weather conditions encourage this disease.

The letter 'F' indicates the variety is resistant to *Fusarium* which also is a soil-borne fungal disease. Infection commonly occurs when the soil is above 75 degrees F. and plants located in light sandy soils, or soils with low pH, are most susceptible to *Fusarium* wilt. Symptoms of this disease are yellowing,

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curving and dying leaves; infected plants are stunted and fruits are small or deformed.

The letter 'N' stands for nematodes which are tiny round worms that live in the soil. Most nematodes are beneficial, but a few, including root knot nematodes, are plant parasites that cause stunted growth, wilting, and dieback. To verify this problem, pull the tomato from the soil. If the roots have growths or galls on them, root knot nematodes are the problem. Be sure to plant resistant varieties in the future.

Finally, the letter 'T' indicates the variety is resistant to tobacco mosaic virus which is a widespread tomato virus. Weeds harbor the virus and insects that feed on the weeds can transmit the disease to tomato plants. Symptoms are light and dark mosaic patterns on leaves, or yellow mottling. Tobacco, a close relative of the tomato, is the source of the virus, which can also be spread when smokers handle plants.

Other problematic tomato diseases for which resistance has not been found include early blight and *Septoria* leaf spot, either of which can be devastating to a crop of tomatoes. Early blight, caused by the fungus *Alternaria solani*, can be recognized by dark concentric rings on older leaves. Although spotted leaves usually die prematurely, the disease will not kill the entire plant. Because the fungus overwinters in residue, be sure to dispose of diseased plants properly.

Septoria leaf spot is caused by the fungus *Septoria lycopersici*. Symptoms include small, roughly circular spots with dark-brown borders and gray centers on leaves. Leaves may die and drop off if heavily infected. To prevent these two diseases start by avoiding crowding to promote good air circulation between plants. Also, when plants require water, keep foliage dry by watering the soil, not the leaves. Finally, the use of fungicides labeled for *Alternaria* and *Septoria* is usually required to keep plants blight-free.

There are a few minor fruit disorders that tomato growers often encounter. One of the most common is blossom-end rot. It begins with tan lesions on the blossom end of the tomato,

which eventually enlarge into dark, sunken areas. This rot appears during periods of high growth or when soil moisture is alternately high and low. The direct cause is the fruits' inability to take up sufficient calcium. Maintaining uniform soil moisture by watering regularly and supplying the plant with adequate calcium will help to prevent this disorder.

Cracking is another disorder that occurs more in some varieties than others. Changes in conditions, such as high temperatures and irregular moisture levels can cause tomatoes to crack near the stem end. To prevent cracking, choose from among the many varieties that are more resistant to the disorder and keep soil moisture levels adequate and constant.

Problematic insect pests of tomato include tomato hornworm, cutworm, flea beetle, whitefly and aphid. Regular inspection followed, if necessary, by early intervention can minimize insect damage on tomato plants and fruits. If infestation levels warrant chemical control, use only those pesticides labeled for use on food crops and start with those having lowest mammalian toxicity. When using any pesticide, always read and follow label directions.

In addition to being very tasty, tomatoes are an excellent source of vitamins and minerals. One cup of cherry tomatoes will provide 25% of daily recommended Vitamin A, 32% of Vitamin C, and a substantial amount of Vitamin K and potassium. Tomatoes are also an excellent source of lycopene, a powerful antioxidant that has been linked to a reduced risk of cancers. For the best tasting, most nutritious tomatoes, grow them yourself and allow them to ripen on the vine.

Credit: National Garden Bureau

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Proper Mowing is the Key to Healthy Lawns...continued from page 19

Many homeowners believe **grass clippings** need to be removed to have a healthy, vigorous lawn. By following the steps in the "**Don't Bag It**" lawn care program, you can have a beautiful lawn without collecting your grass clippings (MU Guide G6959 – "Don't Bag It" Lawn Care: How to Recycle Your Grass Clippings, Leaves and Branches). Returning grass clippings can return as much as 30 percent nitrogen and 50 percent potassium. Grass clippings also contribute to organic matter levels of your soil improving water and nutrient holding capacity of the soil.

When is it OK to bag clippings? 1) when mowing is delayed due to rain; 2) when you wish to make compost (Refer to: MU Guide G6956 – Making and Using Compost & G6958 – Grass Clippings, Compost and Mulch: Questions and Answers); and 3) when preparing for aeration and over-seeding in late

summer to early fall. Avoid using grass clippings in compost when chemically treated with herbicides.

A word of caution about weed-eating: Weed-eaters typically scalp turfgrasses when edging along sidewalks, curbs, and driveways. This promotes weeds! Best edging practices include a power edger or weed-eater (rotated) with a vertical blade preventing any scalping of turfgrasses. Vertical cuts, along sidewalks and driveways, with a hard blade provide the best edging technique.

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Cicadas, Itch Mites and Welts, Oh My!

It won't be long until we can hear the distinctive mating call of the periodical cicada in eastern Missouri. Periodical cicada nymphs have been underground in the soil at a 2 to 18 inch-depth feeding on plant roots since 1998, when both "13-year" and "17-year" broods emerged in the same year. When soil temperature reaches 67°F at a 4-inch soil depth (usually in May), nymphs emerge from the soil and climb up weeds, vines, shrubs, tree trunks, fence posts, buildings, or other vertical structures where they molt to adults. During this molt, they shed their exoskeletons, frequently leaving them attached to tree trunks and limbs. In some cases, nymphs also build 2 to 4 inch turrets of soil when air temperature is warm and soil moisture is high. For a 4 to 6 week period, the male periodical cicadas vibrate membranes on the sides of their abdomen, producing a courtship "song" to attract females for mating from sunup to sundown. As daytime temperatures increase, the mating call can become deafening, especially in wooded areas with a high cicada population.

The plant damage begins when females oviposit in small-diameter (usually less than quarter-inch-diameter) branches of trees and shrubs. A female slits the twig, depositing 24 to 28 eggs beneath the bark. Moving forward, she can make as many as 5 to 20 slits before going to another twig. Each female can lay 400 to 600 eggs, which remain on twigs for 6 to 10 weeks before hatching. Newly hatched nymphs then fall to the ground and burrow into the soil to feed on roots for 13 years.

Slits in the bark from ovipositing females cause the shoots to snap and dangle from the branch tips, where they wilt, and die. These wounds can become points of entry for other insects. Damaged shoot tips are especially detrimental in young plants. In the following growing season, damaged shoot tips are much like heading cuts made when pruning. Because the shoot tip was removed, three to five new terminal shoots will be produced, causing "bushier" growth around the perimeter of shrubs. This proliferation of new growth shades lower interior branches and can cause dead areas in the plant. On fruiting shrubs and trees, such as blueberry, currants, gooseberry, peach, plum, apricot, and cherry, a portion of fruiting wood may be lost. For one or two-year-old apple or pear trees, fruiting is delayed as new vegetative growth develops behind the injured shoot tips. Spring flowering may also be reduced on ornamental trees, shrubs, and vines. Recently planted ornamental trees and shrubs may be disfigured by heavy cicada oviposition damage, requiring remedial pruning to restore them to good form.

Small plants can be covered with a layer of spun row cover fabric to protect them from damage. When covering plants, secure the material around the base of the trunk to exclude the nymphs before emergence and remove it in late June. For uncovered plants, remove the damaged shoot tips

immediately to reduce the nymphs that will establish on the roots. Chemical control in home landscapes is generally not recommended. While periodical cicada damage can make ornamentals temporarily unattractive with dead twig tips, mature trees or shrubs rarely suffer sufficient damage to warrant control. Applications of Sevin (carbaryl) repeated at 7 day intervals can kill pollinators and in some instances, increase spider mites on blooming plants. Sevin used within 30 days after full bloom will thin apples. For commercial nurseries and orchards, labeled insecticides can provide limited control of cicadas, as new ones infest the plants after spraying.

Periodical cicadas are often called locusts. However, the term "locust" can also refer to migratory grasshoppers that plague crops. They are also different than the dogday cicada, which appear during long, hot days of July and August. These cicadas have 2- to 5-year life cycles, but appear annually because of overlapping broods. They are also larger than the periodical cicada. Dogday cicadas are generally found on mature ornamental trees and usually do not cause much damage, as they are controlled by predatory birds.

While those in eastern Missouri will enjoy the chorus of the 13-year cicadas this year, the northern part of the state will hear the mating calls of the 17-year cicadas in 2014. Yet another brood of 17-year cicadas will emerge in west-central Missouri in 2015.

In addition to the plant damage they cause, periodical cicadas may also promote an outbreak of itch mites (*Pyemotes herfsi*). These small mites (0.2 mm in length) are believed to feed on cicada eggs. As the population of mites increases, they fall from trees and can bite humans and pets, causing itchy welts. These bites are not dangerous, but can be intensely itchy. One study indicated that more than 300,000 mites per tree fell per day from pin oaks in Kansas. People who spent considerable time outdoors in urban areas were most affected by the itch mites in early August. However, those who rarely went outside were also bitten, indicating that the mites can enter homes through screen doors and windows.

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Pine Straw: A “New” Mulch for Missouri

Pine straw, the accumulation of naturally shed needles of pine trees, is an excellent landscape mulching material. It is commonly harvested in 20-30 pound bales and sold in the southeastern U.S., where it is the primary mulching material used in landscape plantings. However, loblolly pine, the predominant species used for pine straw plantations in the south, may not be tolerant to Missouri winters. Shortleaf, the only pine species native to Missouri, is not well suited to pine straw production because its needles are too short to bale.

That said, many sites in Missouri are suitable for pine straw production. Work is underway in the MU Center for Agroforestry to evaluate the potential of cold-tolerant selections of loblolly pine and pitch x loblolly hybrid pines for production of pine straw in Missouri. These trees have cold hardiness for Missouri with a similar needle length to loblolly.

Pine straw is a multi-million dollar industry in the U.S. A well-managed plantation in full production can gross up to \$1,000 per acre from the sale of pine straw bales. While a tree can only give its bark once, it can give needles every year; pine straw production is sustainable agriculture. However, from a tree health standpoint, it is best to harvest only a portion of the plantation in a given year to allow trees to benefit from needle accumulation between harvests. Since pine straw is actually a leaf (needle), it benefits the landscape in much the same way as decomposing leaves benefit the forest floor by recycling nutrients and maintaining soil organic matter. In contrast, hardwood bark mulch, if overused, can cause a buildup of calcium and potassium in the soil, increasing pH and causing an imbalance in soil minerals that can interfere with nutrient uptake. The minerals in pine needles are balanced and therefore, their decomposition does not create an imbalance

in the soil. Hardwood and pine bark mulch can wash away in a strong rain. Pine straw knits together and holds in place during heavy rain, helping to prevent soil erosion. Contrary to popular belief, mulching with pine straw does not make the underlying soil too acidic to grow most landscape plants.

The University of Missouri Center for Agroforestry is working toward creating a pine straw industry in the state of Missouri through research, product development and education, designed to encourage producers, retailers and consumers to adopt the use of this renewable, sustainable, natural mulch material. Numerous pine genotypes have been evaluated at the Horticulture and Agroforestry Research Center (HARC), in New Franklin, Mo for their potential for pine straw production. Ultimately the goal is to establish a seed orchard from trees shown to be superior. Then, Missourians will be able to use the seed created to plant their own pine straw plantations.

At present, Missourians who wish to try mulching with pine straw will have some difficulty locating vendors. Some nurseries in St. Louis, Kansas City and Columbia are selling pine straw. However, this is mostly being shipped in from suppliers in Florida. Hopefully, some of the Missouri landowners who have already planted hardy loblolly and pitch x loblolly hybrid pines will be harvesting needles in the not too distant future.

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Grass and Mulch Molds - What's that Funk and Will it Do Something Funky to Me?

The time for spring mowing and mulching is almost upon us, and with that our labor and attention starts leaning heavily towards the outdoors and the myriad of organisms that inhabit our backyards. The arrival of flowers, honeybees, and butterflies may be comforting and welcome sights, but we may also find unfamiliar organisms that can startle or frighten.

Fungi are the most commonly encountered organisms that call our grass and mulch beds home. They are everywhere in your landscape (and your home), mostly living as saprophobes (eating dead material and organic matter). By doing this, the fungi serve a critical role in our ecosystem and if it weren't for them we would be walking on logs and tree limbs. Other fungi can be plant pathogens, causing diseases in our gardens, trees, ornamentals, and (my discipline) turfgrass. Some fungi can also cause human disease, but they are rare and normally afflict immuno-compromised individuals or those with severe allergies. For this reason, if you smell or see fungal molds in

your garden mulches there is not much need for alarm. They are just enjoying the buffet you put out for them!

The most familiar fungi produce mushrooms, of which some are edible and commonly adorn our pizzas, pastas, and other dishes. Mushrooms found in your backyards, however, can be poisonous and should never be ingested unless identified by an expert. One of the more common mushrooms found in landscapes during the mid to late summer is *Chlorophyllum molybdites*, which has green spores and usually sends the ingester to the hospital with considerable gastrointestinal upset. If that phrase doesn't stop you from eating unidentified mushrooms, nothing will. If you have mushrooms in your lawn, and particularly have children or pets that could venture a nibble, simply remove them with disposable gloves or immediately wash your hands afterwards.

One of the more striking inhabitants of our grass and mulch beds may be a member of what are termed “slime molds”. The

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Managing Annual Weeds in Lawns

When caring for your lawn and trying to keep it 'weed free', keep in mind that perceptions of a perfect lawn may still include a few weeds. We often receive questions across the state about identifying various weeds. The most common question following that weed identification is, "What can I buy to kill it or get rid of it?" A better question to ask about weeds is, "Why is it there?"

Weeds have been defined as plants out of place – plants growing where they are not wanted. Weeds disrupt turfgrass uniformity and aesthetics. While some individuals dislike weeds and try to do what they can to control them, others grow and mow weeds as the green canopy in their lawns.

The old saying that "the best defense is a good offense" holds true. Weeds are opportunistic and invade weakened lawns, thus the best weapon to fight weeds is a dense, healthy stand of grass. There are several management practices that give lawns a fighting chance against weeds, such as planting the appropriate grass for our location and then maintaining good turf density with fall over-seeding. Proper mowing, fertilizing, and irrigation are additional practices that provide an excellent defense against weeds. Lawns, with good density, mowed tall (3 to 4 inches) can provide up to 80 percent control of annual weeds alone. The height of the mow has the greatest effect on reduction of annual weeds.



Figure 1. Tall fescue mowed at 3.5 inches (left) and 1.5 inches (right) - notice large amounts of crabgrass in the photo to the right.

By following good fertility and irrigation practices, essentially all annual weeds can be controlled, and a great reduction in perennial weeds, like dandelions and plantains, can be seen. Single fertilizer applications in the fall or early spring can improve turfgrass density sufficiently to provide 50 percent control of crabgrass. Optimum watering practices with less frequent "deep-soak" watering encourages a deep, healthy root system and maintains a drier soil surface where weeds get their advantage. Frequent light sprinkling encourages shallow-rooted weeds and weed seed germination.

A good alternative to synthetic fertilizers or the use of crabgrass preventers, is the use of corn gluten-based organic fertilizers. Corn gluten is a by-product of ethanol production that is composed mostly of plant proteins. It serves as an excellent organic fertilizer with an extra kick. As corn gluten

breaks down, it releases a natural allelochemical (toxin) that works like a crabgrass preventer. Corn gluten organic fertilizers can provide up to 60 percent control of annual weeds, including crabgrass, when applied at 10 to 15 lbs per 1,000 square feet in late March or early April. Combining this type of product with a taller mowing height and dense lawn can provide nearly 100 percent control of annual weeds without applications of synthetic fertilizers or pesticides.

Crabgrass, goosegrass, foxtails, and barnyardgrass are summer annual grassy weeds. They tend to be coarse, textured grasses that germinate in the spring, growing well throughout the heat of the summer. Knotweed, spurge, purslane, and annual lespedeza are the more common summer annual broadleaf weeds. These broadleaf weeds also emerge throughout the spring and can persist during the entire summer. Summer annuals (grasses and broadleaves) mature by late summer and begin to slow-down in growth. They die off with the first hard frost of fall. In spring, new weed seedlings emerge around the previous year's plant, unless better turfgrass competition exists or pre-emergence herbicides are used. Pre-emergence herbicides control both annual grasses and broadleaf weeds. Check product labels for the weeds controlled.

Pre-emergent herbicides are so-named because they must be in place before crabgrass seedlings and other weeds begin to emerge. As a general rule, crabgrass may begin to germinate when daily high temperatures begin to reach 70°F or above. In southern Missouri, this may occur as early as mid-March; in central and northern Missouri, this may not occur until late March or early April. Highest crabgrass emergence begins to occur as daily high temperatures reach 80°F. A soil temperature of 55°F in the top inch of soil for five consecutive days will provide crabgrass seed germination and provides the optimum timing for applications of crabgrass preventers.

A natural guide, specific to each year's fluctuating weather patterns, is to have pre-emergent herbicide in place before the yellow blooms of the Forsythia have all dropped.

Pre-emergent herbicides will not kill annual weeds that have already emerged. A pre-emergent herbicide barrier must be present in the soil surface to kill seedlings when its first root contacts the soil. Therefore, it is imperative that the pre-emergent be applied at the right time and watered down into the soil surface by light irrigation (0.25 to 0.5 inches) or rainfall. Many effective products are available, almost all of which are combinations of fertilizer with the pre-emergent herbicide in the same bag.

Many over-the-counter products are available at several garden centers, hardware stores, farm centers and nurseries.

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Crabgrass preventers containing Dimension (dithiopyr), Pre-M (pendimethalin), Barricade (prodiamine) or Ronstar (oxadiazon) are excellent choices for the control of crabgrass, other summer annual grassy weeds and summer annual broadleaf weeds. Products are usually designed for 5,000, 7,500, or 10,000 square feet.

Prior to applications of lawn care products, measure the area being treated to determine the total square footage of your lawn. This will enable the homeowner to purchase the proper amount of product required to treat the lawn. Before applying weed control products, always read the label directions carefully. Applying too much product can result in damaged turfgrass roots and environmental concerns. Determine the effective application width of your rotary spreader and space

out each spreader pass to ensure uniform coverage with minimal overlap. It is also recommended to apply one-half of the rate required in two directions. This provides better distribution of particles and avoids striping. Do not spread crabgrass preventers into flower beds or vegetable gardens; they will restrict rooting of new plantings.

For more information, refer to IPM Guide 1009 – “Turfgrass and Weeds,” through the MU Extension website @ <http://extension.missouri.edu/>.

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Grass and Mulch Molds - What's that Funk and Will it Do Something Funky to Me?...continued from page 21



Figure: Slime molds in the landscape

- A) Slime mold sporulation on Kentucky bluegrass. Slime molds cause no damage to turfgrasses (or humans).
- B) Early brilliant yellow stages of the slime mole *Fuligo septica* infesting both grass and mulch.
- C) Later dried stage of *Fuligo septica*, referred to as the dog vomit stage.
- D) “The Blob” (1958) starring Steve McQueen was inspired by slime molds. Just a touch of over-dramatization...

slime molds are not related in the least bit to fungi, which we characterize as having mycelium with cell walls made of chitin (like in a lobster shell). The slime molds have no cell walls, which makes them more like us than plants or fungi. However, a slime mold is a multinucleate mass, called a plasmodium, that is not divided into cells. It moves like an amoeba, with internal protoplasm streaming internally from one direction to another. Slime molds are actually taxonomically placed most closely to protists, a group containing amoebas.

A select few slime molds can be plant pathogens, the most famous (to us plant pathologists) being *Plasmodiophora brassicae*, which causes a disease called “clubroot of cabbage.” For the most part though, they simply are predators of other microbes that they absorb through their cell membrane. Interestingly, they also reproduce by spores and some slime molds can produce fantastic spore-bearing structures that can mimic fungal structures. Slime molds that frequently sporulate on turf do no harm to the grass, and no control measure is necessary (Figure A).

The most common slime mold that is brought to our attention by alarmed homeowners is *Fuligo septica*, the “dog vomit” slime mold (Figures B & C). Some call this a fungus,

which is incorrect. It is a common inhabitant of bark mulch where bacteria and moisture are in ample supply, and normally first appears after frequent rains in spring or early summer. In its early growing stage, *F. septica* can be a brilliant yellow color. In Mexico, it is gathered at night when the plasmodium is active and eaten like scrambled eggs! However, this mass shortly develops into a hardened structure called an aethalium, which holds large amounts of dusty spores. At this stage, it appears as if the neighbor dog lost his lunch near your petunias.

There is absolutely nothing that could or should be done to chemically control slime molds (or mushrooms) in the landscape. If the sight of “the blob” offends you on turf, simply water the organism off the turf leaves. Removing or eradicating slime molds from your mulch is an arduous task, so just cover it up with surrounding mulch. Or learn to appreciate them, because there is certainly no need to be as afraid of them as Steve McQueen was.

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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:** Fertilize azaleas after bloom. Use a formulation which has an acid reaction.
- **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:** Continue monitoring pines, especially scotch and mugo, for sawfly activity on new shoots.
- **Week 1:** Begin planting gladiolus bulbs as the ground warms. Continue at 2-week intervals.
- **Week 1:** Plant hardy water lilies in tubs or garden pools.

Lawns

- **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 1,000 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.
- **Weeks 1-4:** Growing lettuce under screening materials will slow bolting and extend harvests into hot weather.
- **Weeks 1-4:** Slugs will hide during the daytime beneath a board placed over damp ground. Check each morning and destroy any slugs that have gathered on the underside of the board.
- **Weeks 1-2:** Plant dill to use when making pickles.
- **Weeks 1-2:** Keep asparagus harvested for continued spear production. Control asparagus beetles as needed.
- **Weeks 1-2:** Begin planting sweet corn as soon as white oak leaves are as big as squirrel ears.
- **Week 1:** Isolate sweet, super sweet and popcorn varieties of corn to prevent crossing.
- **Week 1:** Thin plantings of carrots and beets to avoid overcrowding.
- **Week 1:** Control caterpillars on broccoli and cabbage plants by handpicking or use biological sprays such as B.T.
- **Week 1:** Set out tomato plants as soils warm. Place support stakes alongside at planting time.

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.
- **Weeks 2-4:** Protect bees and other pollinating insects. Do not spray insecticides on fruit trees that are blooming.
- **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.

Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri. (www.GardeningHelp.org)