Video of the Week:
Growing Vegetables in Containers

TURFGRASS

Time to Fertilize Warm-Season Grasses

| Image of person fertilizing a lawn with a spreader. |

June is the time to fertilize warm-season lawn grasses such as bermudagrass, buffalograss, and zoysiagrass. These species all thrive in warmer summer weather, so this is the time they respond best to fertilization. The most important nutrient is nitrogen (N), and these three species need it in varying amounts.

Bermudagrass requires the most nitrogen. High-quality bermuda stands need about 4 lbs. nitrogen per 1,000 sq. ft. during the season (low maintenance areas can get by on 2 lbs.). Apply this as four separate applications, about 4 weeks apart, of 1 lb. N per 1,000 sq. ft. starting in early May. It is already too late for the May application, but the June application is just around the corner. The nitrogen can come from either a quick- or slow-release source. So any lawn fertilizer will work. Plan the last application for no later than August 15. This helps ensure the bermudagrass is not overstimulated, making it susceptible to winter-kill.

Zoysiagrass grows more slowly than bermudagrass and is prone to develop thatch. Consequently, it does not need as much nitrogen. In fact, too much is worse than too little. One and one-half to 2 pounds N per 1,000 sq. ft. during the season is sufficient. Split the total in two and apply once in early June and again around mid-July. Slow-release nitrogen is preferable but quick-release is acceptable. Slow-release nitrogen is sometimes listed as “slowly available” or “water insoluble.”

Buffalograss requires the least nitrogen of all lawn species commonly grown in Kansas. It will survive and persist with no supplemental nitrogen, but giving it 1 lb. N per 1,000 sq. ft. will improve color and density. This application should be made in early June. For a little darker color, fertilize it as described for zoysiagrass in the previous paragraph, but do not apply more than a total of 2 lb. N per 1,000 sq. ft. in one season. Buffalograss tends to get weedy when given too much nitrogen. As with zoysia, slow-release nitrogen is preferable, but fast-release is also OK. As for all turfgrasses, phosphorus and potassium are best applied according to soil test results because many soils already have adequate amounts of these nutrients for turfgrass growth. If you need to apply phosphorus or potassium, it is best to core aerate beforehand to ensure the nutrients reach the roots. (Ward Upham)
FRUIT

Remove Blossoms on Newly Planted Strawberries

Spring-bearing strawberry plants that were set out this spring should have blossoms pinched off. New plants have a limited amount of energy. If blossoms remain on the plants, energy that should go to runner development is used to mature fruit instead. Plants that are allowed to fruit will eventually produce runners, but those runners will not be strong enough to produce a good crop of berries the following year. For an adequate strawberry plant population and a good crop next year, early runner development is necessary. Early runners will produce far more strawberries than runners that form later in the season.

Newly planted everbearing plants also should have fruits removed for the first 4 to 6 weeks after planting so they develop a strong root system. (Ward Upham)

PESTS

Colorado Potato Beetle

Overwintering females usually emerge in late April and lay a cluster of bright, yellow eggs on recently emerged potato plants. Larvae mature in about 3 weeks and pupate in the soil. After another 10 days, adult beetles emerge, mate and lay more eggs.

Both larvae and adults of this insect feed on potato (as well as tomato, eggplant, and pepper), causing extensive loss of foliage and reducing yields. Control strategies are varied and include:

Hand picking: Useful for small gardens where plants can be checked a couple of times a week. Dropping beetles and larvae in a container of soapy water will lead to their demise.

Floating row cover: This material can be placed over the planting and act as a physical barrier to the insects. Be sure to seal the edges. It is sometimes suggested to leave the floating row cover in place during the growing season because potatoes do not need to be pollinated to produce tubers. Often, this is not practical because it interferes with weed control.

Insecticides: A number of products are registered including spinosad (Captain Jack’s Dead Bug Brew, Bonide Colorado Potato Beetle Beater Concentrate) and permethrin (Eight Vegetable, Fruit & Flower Concentrate, Hi Yield Lawn, Garden, Pet and Livestock Insect Control). (Ward Upham)
Pine Tortoise Scale

It is time to be aware of the presence of pine tortoise scale, *Toumeyella parvicornis*, on pine trees. We have already received samples of pine tortoise scale with the crawlers (nymphs) emerging from the eggs. Pine tortoise scale feeds on many different types of pines, including: Scots, Austrian, and red. Immature females are round, brown, and wrinkled in appearance, and overwinter on twigs. Eggs are laid underneath the body of adult females. In general, eggs hatch into red crawlers (nymphs) from May (RIGHT NOW) through June. The crawlers eventually find suitable locations and start feeding. Crawlers can spread to other pines via wind currents or by attaching to birds. Females can produce up to 500 crawlers within a generation. Males, like most scale species, develop into winged individuals that fly and mate with females. Males do not feed and eventually die. In Kansas, there is typically one generation of pine tortoise scale per year.

Pine tortoise scale feeding results in yellowing of needles, stunted needle growth, and under extensive populations can result in death of pines. Young pine trees, in general, are more susceptible to pine tortoise scale than older (mature) trees. In addition, foliage closer to the ground tends to support higher populations of pine tortoise scale than foliage higher in the tree canopy. Pine tortoise scale also produces copious amounts of honeydew, a clear sticky liquid that serves as a growing medium for black sooty mold. Entire pine trees may appear black from black sooty mold under heavy infestations of pine tortoise scale.

A forceful water spray applied twice per week will quickly dislodge/remove the crawlers and mature females from infested pine trees. Insecticides that are useful in suppressing populations of pine tortoise scale crawlers include: acephate (Orthene, Bonide Systemic Insect Control), acetamiprid (TriStar), bifenthrin (Talstar, Hi-Yield Bug Blaster Bifenthrin), cyfluthrin (Tempo, Bayer Vegetable & Garden Insect Spray), dinotefuran (Safari), imidacloprid (Merit), insecticidal soap (potassium salts of fatty acids), and horticultural oils (petroleum, mineral or neem-based). These insecticides must be applied when crawlers are active…which is RIGHT NOW…in order to obtain maximum suppression of pine tortoise scale populations and alleviate future problems. (Raymond Cloyd)

Bagworms: They Have Arrived…and Not From Outer Space!

We have received notice from Jeff Otto (Wichita, KS) that bagworms, *Thyridopteryx ephemeraeformis*, are emerging from eggs, and the young caterpillars are out-and-about feeding on plants. Eventually bagworms will
be present throughout the rest of Kansas feeding on both broadleaf and evergreen trees and shrubs. Therefore, now is the time to initiate action against this insect pest. Bagworms are primarily a pest of conifers but have expanded their host range to include a number of broadleaf plants, such as; rose, honeylocust, and flowering plum. Hand-picking small caterpillars (along with their accompanying bag) and placing them into a container of soapy water will kill them directly. This practice, if feasible, will quickly remove populations before they can cause substantial plant damage.

For those not really interested in enjoying the nice hot weather and hand-picking, a number of insecticides are labeled for use against bagworms including those with the following active ingredients (trade name in parentheses): acephate (Orthene), *Bacillus thuringiensis* subsp. *kurstaki* (Dipel), cyfluthrin (Tempo), lambda-cyhalothrin (Scimitar), trichlorfon (Dylox), indoxacarb (Provaunt), chlorantraniliprole (Acelepryn), and spinosad (Conserve). Most of these active ingredients are commercially available and sold under various trade names or as generic products. Several insecticides, however, may not be directly available to homeowners. The key to managing bagworms with insecticides is to apply early and frequently enough to kill the highly susceptible young caterpillars that are feeding aggressively on plant foliage. Older caterpillars that develop later in the season are typically more difficult to kill with insecticides. Furthermore, females feed less as they prepare for reproduction, which reduces their susceptibility to spray applications and any residues. The bacterium *Bacillus thuringiensis* subsp. *kurstaki* is active on young caterpillars but the active ingredient must be consumed or ingested to be effective. Therefore, thorough coverage of all plant parts and frequent applications are required. The insecticide is sensitive to ultra-violet light degradation and rainfall, which reduces residual activity. Spinosad is the active ingredient in a number of homeowner products, including: Captain Jack’s DeadBug Brew and Monterey Garden Insect Spray. The insecticide works by contact and ingestion (stomach poison); however, activity is greatest when ingested. Products containing spinosad can be used against older or larger bagworm caterpillars later on in the season. Acephate (Bonide Systemic Insect Control), cyfluthrin (Bayer Vegetable & Garden Insect Spray), gamma-cyhalothrin (Spectracide Triazicide), trichlorfon, chlorantraniliprole, and indoxacarb can be used against both the young and the older caterpillars. However, thorough coverage of all plant parts, especially the tops of trees and shrubs, where bagworms commonly start feeding, and frequent applications are essential in achieving sufficient suppression of bagworm populations. The reason multiple applications are needed is that bagworm eggs do not hatch simultaneously but hatch over a certain period of time depending on temperature, and young bagworms can ‘blow in’ (called ‘ballooning’) from neighboring plants on silken threads. If left unchecked, bagworms can cause significant damage and ruin the aesthetic quality of plants. In addition, bagworms can actually kill plants, especially newly transplanted small evergreens, since evergreens do not usually produce another flush of growth.

If you have any questions on how to deal with bagworms in your garden or landscape, contact your county horticultural agent, or university-based state extension entomologist.

I want to acknowledge Jeff Otto as he has been very helpful in providing me information on the activity of insect and mite pests in south-central KS. If anyone is interested in helping me determine insect and mite pest activity throughout the growing season in KS, please let me know.

(Raymond Cloyd)
VEGETABLES

How to Make Tomato Cages

Commercial tomato cages are often too wimpy for Kansas conditions. Fortunately, you can make your own cages from concrete reinforcing mesh (wire). This material is normally 5' high with the “mesh” forming 6" squares. The shortest rolls are usually 50' long, but some lumber yards will cut off just the amount you need. Figure 6.5 feet of mesh to complete one cage that is 2 feet in diameter. You will need to cut the mesh in order to make the cages. Small bolt cutters work well for this. Be careful when cutting as the mesh comes in rolls that will spring back into a cylinder as the last cut is made.

Count off 13 squares but cut each horizontal wire at the end of the 13 square. This will leave a series of 12 complete squares horizontally with prongs left on the 13 square. Use these prongs to make a cylinder by bending the prongs over the vertical wire on the first square. Cages using this method will be about 2 feet in diameter. Tomatoes with large, rangy vines need all five feet of the mesh, but those with shorter, semi-determinate vines can get by with a shorter cage.

Also, cut off the bottom horizontal wire to leave prongs that can be pushed into the ground to help with stability. In windy locations, a T-post will likely need to be driven near the cage. Tying the cage to the T-post can help prevent the cage from toppling in windy conditions.

These cages will last for years, but do take up a great deal of storage space when not in use. (Ward Upham)

MISCELLANEOUS

Helping Roundup (Glyphosate) Products Work
Though glyphosate products (Roundup, Killzall, Pronto Weed & Grass Killer) are non selective and will kill most plants the spray contacts, these herbicides are not taken up by the roots of nearby desirable plants. This is because the active ingredient is neutralized when it contacts the soil due to being tightly bound to soil particles. Unfortunately, this binding effect can also take place in hard water that is high in magnesium and calcium, which reduces its effectiveness. To avoid this, mix ammonium sulfate with your spray water before adding the glyphosate product. The ammonium sulfate ions tie up the calcium and magnesium ions so that the glyphosate remains at full strength. Also some of the glyphosate will form a compound with the ammonium that weeds will more readily absorb, thus increasing effectiveness.

Note that this binding effect takes place in hard to very hard water (above 7 grains or above 120 ppm). Adding ammonium sulfate to softer water will not help. So if you have your water tested and find you have hard water, how much ammonium sulfate should you add? As a general rule, add 8.5 pounds per 100 gallons. This would equal about 1.4 ounces per gallon or four tablespoons per gallon. (Ward Upham)

**Walnut Wilt**

Tomato, potato, blackberry, apple, lilac, asparagus, chrysanthemum, peony, and other herbaceous and woody plants can be afflicted with a disorder known as walnut wilt. Other plants, such as black raspberry, corn, bean, carrot, dandelion, and zinnia are resistant. This malady is associated with root uptake of a chemical called juglone that is produced by several species of trees in the walnut family, including black walnut, Persian walnut, butternut, and pecan. Juglone is formed in the leaves, fruit hulls, inner bark, and roots of the walnut and is leached or released into the soil. This chemical has fungicidal and insecticidal properties. It also is quite toxic to many plant species and induces wilting and stunting. The ability of plants to produce and release chemicals that are toxic to other plants is called allelopathy. The severity of the juglone toxicity partly depends on the proximity of the plants to a walnut tree.
Generally, tomatoes growing next to a walnut tree abruptly wilt and die in early to mid-summer. Those plants growing a short distance away may not be killed but become flaccid and stunted. The woody stem tissue of affected plants turns brown. The symptoms of walnut wilt closely resemble those of Fusarium and Verticillium wilt, but the disorder may be distinguished from the other wilts by the constant association of walnut trees with the wilting symptoms.

Juglone may be leached from leaves and nuts into the soil during rain or released from roots. The chemical is highly reactive and quickly inactivated in the soil. The major uptake of the toxin occurs when tomato roots make contact with the roots of the walnut.

Tomatoes or other susceptible plants should not be grown near black walnut or other trees that produce juglone. The removal of walnut trees may not have an immediate effect because the toxin can persist in the inner bark of roots for several years. Do not plant tomatoes for at least two years after removing walnuts. (Ward Upham)

Why are Soils Important?

"Soil health" and "soil quality" are terms that are used frequently, but do you know what they mean? What does it mean to have good soil? We are developing a series of articles and references to share here in the Horticulture Newsletter to answer those questions.

Soil might seem simple, but it is a complex, living system. Soil is comprised of solids, water, air, and organic matter. On top of that, soil is home to vast numbers of microbes, small animals, large animals, and of course plant roots. In the book, *Building Soils for Better Crops*, which we will cite from time to time here, it states that in a teaspoon of soil there are an estimated 100 million
to 1 billion bacteria, several yards of fungal threads, and a couple dozen nematodes. What? Read that again. First, imagine taking a teaspoon of soil, then review those numbers. Soil is amazing. We can't live without soil. In this series we will go through some topics including basics about organisms that live in soil, soil organic matter, soil health measures, and more.

Curious to learn more? With each brief article we will try to provide some quick additional references. To start, here is fun 3-minute video called "Soils Sustain Life" (http://bit.ly/2IhiK98). The video is from the Soil Science Society of America as part of their 2015 Year of Soils effort. For further reading, you can check out this page called "What kind of soil do you want?" (https://bit.ly/2KYz6oV) (This educational series is made available partially by the North Central SARE Program). (Megan Kennelly)

Contributors: Megan Kennelly, Plant Pathologist; Ward Upham, Extension Associate

To view Upcoming Events: http://hnr.k-state.edu/events/index.html
The web version includes color images that illustrate subjects discussed. To subscribe to this newsletter electronically, send an e-mail message to cdipman@ksu.edu or wupham@ksu.edu listing your e-mail address in the message.

For questions or further information, contact: wupham@ksu.edu

Brand names appearing in this publication are for product identification purposes only.

No endorsement is intended, nor is criticism implied of similar products not mentioned.

Knowledge for Life

K-State Research and Extension is committed to making its services, activities and programs accessible to all participants. If you have special requirements due to a physical, vision or hearing disability, or a dietary restriction please contact Extension Horticulture at (785) 532-6173.