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Summer Pruning Apple Trees

Most pruning for apple trees is done during the winter months and before new growth is produced in the spring. However, additional summer pruning can be an effective way to manage young apple trees when used appropriately. It is used primarily to control unwanted growth and to establish a central leader tree structure for apple trees during year of planting and the subsequent two years. Summer pruning involves pinching off young, competing lateral shoots in the upper portion of the central leader (Figure 1). The removal of these competing shoots directs growth into a single shoot and keeps the leader dominant. With a dominant central leader, the desired narrow pyramidal shape of the tree is maintained and shading in the lower portion of the canopy is minimized. This type of summer pruning can be done in late June and July after the potential for fire blight infection is past. If pruning is done too early, fire blight can be spread by pruning.

For mature trees, summer pruning can be used to reduce the height of a tree, and allows more light into the canopy to improve fruit color. With the reduced leaf area, trees produce less root growth than those not summer-pruned. Thus, summer pruning mature apple trees should be done after terminal bud set. If pruned earlier, multiple shoots may be produced near the cuts. It is only recommended in late July for early-maturing cultivars (Gala, Liberty,

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Figure 1. Summer Pruning

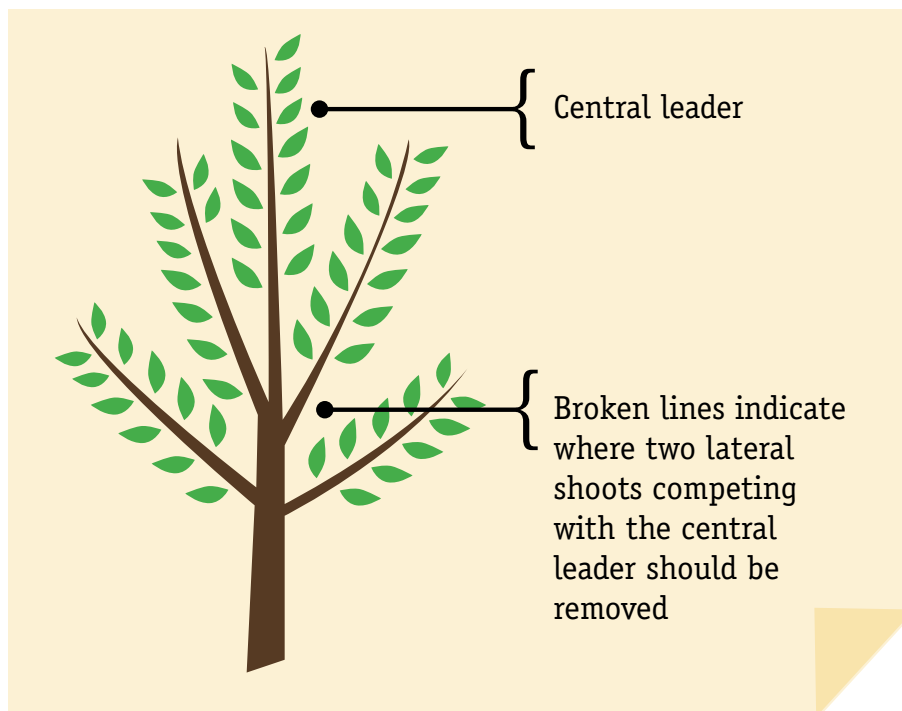


Figure 1. Summer pruning of lateral shoots immediately below the central leader will promote the development of a dominant central leader in young apple trees.

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Reducing the Risk of Turfgrass Diseases

Turfgrass disease is one of the serious and costly reasons for injury and death to grasses used in home lawns, golf courses, sport fields, and other areas where grasses are desired. Plant pathogenic fungi are the main cause of lawn diseases. Other organisms, such as nematodes, and several non-parasitic problems are also sources for diseases. An accurate diagnosis of the problem is essential to any successful control program. Diagnosis of lawn diseases can be performed at diagnostic clinics, such as the Plant Diagnostic Clinic on the MU campus at 23 Mumford Hall, Columbia, Mo. 65211.

Disease identification and control involve more than just waiting for diseases to appear, then trying to make a rapid diagnosis and applying a fungicide. Most disease identification guides show only the symptoms of developed diseases. This is helpful, but it is more important to know the conditions that can lead to a disease, and to follow basic cultural practices that can reduce your potential for a disease. Knowing when and under what conditions to anticipate various turfgrass diseases, an individual can prepare for what to do about them, saving time and achieving better results in disease control. See MU Extension Guide Sheet G6756 - Turfgrass Disease Control.

Managing turfgrass diseases

Environmental conditions strongly influence disease occurrence. Although many of the causal agents are always present in turf, diseases do not occur until conditions are favorable for pathogen development. For example, brown patch disease requires wet, humid conditions during warm to hot weather. Being aware of the conditions that increase disease potential is important in taking preventive measures such as applying fungicides before symptoms appear. But before fungicides are considered, there are several turfgrass

management practices that need discussion in hopes of reducing the potential for disease.

Selecting grass species and cultivars

Several diseases can be avoided by selecting grass species that are not susceptible to certain pathogens. For example, summer patch is a severe problem on Kentucky bluegrass but has little effect on tall fescue. An area historically prone to summer patch disease can be planted to tall fescue to reduce that potential. Likewise, within species of grasses, selected cultivars can offer more disease resistance than others. A cultivar of Kentucky bluegrass may show a higher level of tolerance to rust disease and perhaps be selected as part of a blend or mixture. Even though these grasses are termed "disease resistant," it does not mean that they are 100 percent disease free. Selecting cultivars with higher disease resistance will reduce your potential for turfgrass diseases and becomes the first step in a line of cultural practices to manage turfgrass diseases.

The National Turfgrass Evaluation Program was organized to test species and cultivar performance in several locations of the United States. Most of the data and information generated by this program can be accessed through their web site at <http://www.ntep.org>. You can also contact your local MU Extension center for grasses that have been recommended for Missouri.

Soil fertility

Soil fertility is an important factor in disease development. High nitrogen levels increase the susceptibility of cool-season grasses (Kentucky bluegrass, tall fescue, perennial ryegrass, fine fescue and bentgrass) to leaf spot, Rhizoctonia brown patch and Pythium blight. Low nitrogen levels increase turfgrass susceptibility to dollar spot and red thread. Low potassium levels in the

soil reduce turfgrass tolerance to high temperatures and drought stress, which can increase the potential of diseases such as summer patch. Low pH is often associated with diseases such as brown patch as well.

Knowledge of soil fertility as it relates to turfgrass diseases can help guide an individual in deciding how to manage a lawn. A tall fescue lawn can receive two or three fertilizer applications throughout the fall and perhaps receive no additional fertilizer in the spring to reduce the potential for brown patch. Like tall fescue, Kentucky bluegrass can receive fall fertilization but can also receive fertilizer in the spring to help keep dollar spot from infecting the bluegrass.

To minimize the potential for disease, supply enough nitrogen that proper mowing is required on a weekly basis. Sometimes a light application of nitrogen will produce enough active leaf growth that disease symptoms are no longer visible.

Mowing

Turfgrass plants mowed shorter than their optimal height of cut are, in general, more susceptible to diseases. Optimal cutting heights for cool-season grasses range from 2.5 to 4.0 inches, depending on the species. Warm-season grasses can range between 1 and 2 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). We also know that cool-season grasses mowed a little taller in the spring and fall compete more successfully against weeds. Therefore, select the tallest, acceptable mowing height for your species of grass and maintain that height during the entire season. This

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provides benefits throughout the season -- competition against weeds as well as reduced summer stress.

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 growth is removed during a single mowing.

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. A dull mower blade inflicts more and bigger wounds that increase potential for infection by turfgrass diseases. Observe leaf tips 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 blades.

Watering

Nearly, all turfgrass diseases require water for their development. Some disease problems such as Pythium blight, brown patch, and dollar spot are accentuated by extended periods of free moisture. Extended periods of free moisture in turfgrasses can be caused by dew, guttation and frequent irrigation or rainfall. Guttation is the formation of water droplets at the tips of grass leaves. These droplets contain exudates of sugars and proteins and serve as an excellent food source for pathogens. Remove dew and guttation from grass leaves by dragging a hose across the surface of the lawn, using a whipping pole or briefly irrigating only long enough to wash the dew from the surface of the leaves. Following these methods will spread the concentrated dew or guttation over a larger surface area, causing the turf canopy to dry faster.

Improper irrigation alone can create a disease problem. Avoid frequent irrigation that results in extended periods of free moisture. Avoid late evening watering that extends the free moisture period throughout the night.

Cool-season grasses can be allowed to have drying periods (near wilting) to disrupt the growth cycle of fungi favored by free moisture.

Irrigation in the early morning not only limits extended periods of dew and guttation but also applies water at a time of the day when temperatures are low (reduced evaporation) and winds are calm (better distribution). A rule of thumb is to avoid puddles and runoff during irrigation, put the water where it is needed, and irrigate only as much as your particular soil type can absorb in one cycle.

Thatch control

Essentially, all turfgrass diseases are reduced by good thatch control.

Thatch is a layer of dead and living plant material located between the soil surface and green turf canopy. It is excellent habitat for active and dormant stages of disease-causing organisms. When environmental conditions are optimum, fungi can rapidly grow and infect living turf tissue.

Remove excess thatch when turf is actively growing to promote quicker recovery from power-raking or verticutting. Remove thatch in the spring before application of crabgrass preventer, or in the fall for cool-season grasses and midsummer for warm-season grasses. Core aeration (removing soil plugs) is a slower process of thatch control but will cause less direct stress on the turf. Breaking up soil plugs and filtering soil into the turf canopy allows soil microbes to breakdown dead organic matter in the thatch layer.

Remove excess thatch when it accumulates to a half inch or more in taller-mowed turf (1.5 to 4 inches) and one-quarter inch in lower-mowed turf (less than 1.5 inches).

Soil aeration and drainage

Good exchange of air between the soil and atmosphere is necessary for vigorous turfgrass growth. Turf areas that stay constantly wet because of poor soil conditions are prime targets for water-favoring, soil-borne diseases such

as Pythium blight and brown patch. Surface contouring and subsurface drainage can be costly but permanent solutions to wet soils.

Core aeration and slicing are turf management practices that can be repeated during the season to temporarily increase air exchange and soil drying. You can also increase light penetration and air movement by selectively pruning your trees and shrubs. This will speed the drying of poorly drained areas and also reduce the humidity in localized turf areas. By implementing some of the cultural practices outlined above, turfgrass managers can reduce their risk of turfgrass diseases. However, in extended conditions favorable to the development of particular diseases, cultural practices alone are usually not enough to maintain disease free turf. If you can tolerate a few patches of disease without the use of fungicides, then so be it.

See MU Guide Sheet 6756 for commercial fungicide controls. Be sure to properly identify the problem before selecting a control product. Turf managers can help to narrow down possible diseases by first, determining the species of grass infected, the time of year, levels of fertility and water, and finally present environmental conditions. Always read the entire label of the product chosen. Remember, difficult problems can be diagnosed at the Plant Diagnostics Lab at the University of Missouri – Columbia. Go to <http://soilplantlab.missouri.edu/soil> or call 573 882-0623.

For further information about turfgrass diseases, contact Brad Fresenburg at 573 442-4893 or fresenburgb@missouri.edu.

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Clinic Update: June Samples at the Diagnostic Clinic

We have had a number of interesting submissions to the plant diagnostic clinic during June. What follows is a summary of some of the samples we have worked with over the past month.

We have had several tree samples with a large variety of issues. Anthracnose has been common on several different types of shade trees during wet spring weather in Missouri, and during June we continued to have a few maples and an oak sample with anthracnose. We were able to confirm *Verticillium* wilt from a maple sample, and various gall species on a number of oak samples, especially jumping oak gall. From other species, we had bagworms on juniper and arborvitae, some leaf spots and leaf scorch on dogwoods, including a bacterial leaf spot, and magnolia scale on magnolia. A “Harry Lauder’s walkingstick” contorted filbert had extensive cankering consistent with Eastern filbert blight. Ornamental pear with extensive leaf blistering had eriophyid mites consistent with pear leaf blister mite. Other samples of interest include a continuation of *Diplodia* tip blight samples, including both Austrian and Scotch pine, an elderberry rust, spruce spider mite

on a spruce sample and a few black walnut samples from SW Missouri with granulate Ambrosia beetle trunk infestations.

Samples from a variety of ornamentals have also been submitted. Several rose samples had black spot. A rose with black spot resistance had a *Cercospora* leaf spot. An additional rose sample had symptoms consistent with rose mosaic virus. Phlox samples had powdery mildew and *Fusarium* crown rot. We also had samples of hollyhock rust on hollyhock and *Rhizoctonia* stem rot on impatiens. Boxwood with extensive dieback had a *Pythium* root rot.

A few turf samples have been submitted, and the primary issue has been brown patch on tall fescue at the end of June. Some zoysia was submitted with large patch, and there were some submissions with abiotic issues involving dog urine as well.

Finally, a number of fruit and vegetable samples have been submitted. Fruit samples have included grapes and grape vine with black rot, strawberry with *Phomopsis* leaf blight and tarnished plant bug feeding injury, cherry with brown rot, and additional apple samples with cedar apple rust. For vegetables, a wide range of samples

have been submitted. Several corn samples had a *Pythium* root and crown rot. Another corn sample had anthracnose on the foliage. A green bean sample had common bacterial blight. A couple onion samples had extensive bacterial soft rot infections. Garden peas had powdery mildew and potatoes had *Fusarium* wilt. A few tomato samples had bacterial canker, while other tomato samples were positive for *Fusarium* crown and root rot, *Sclerotinia* white mold, *Septoria* leaf spot, and walnut wilt. Green bell peppers also had *Sclerotinia* white mold, and a zucchini sample had blossom end rot.

Sample submission can provide you with an accurate diagnosis to allow you to 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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Critter Control in the Garden

Pest control in the garden usually conjures up images of fighting a season-long battle with insects, diseases and weeds. As troublesome as the latter three might be the damage they inflict often pales in comparison with that caused by some of four-legged “friends”. It is extremely frustrating to put time, effort and money into establishing an attractive garden only to have it decimated by the likes of deer, rabbits and squirrels. An abundance of wildlife coupled with a shift in human population to more rural and suburban settings makes the control of wildlife in the garden more of a challenge today.

Wildlife biologists suggest that motivation and habituation are two important factors that dictate the likelihood of garden damage by wildlife and probability of their successful control. The more highly motivated wildlife is to feed the more difficult it will be to prevent damage to cultivated plants. Hunger is a tremendous stimulus. During periods of dry weather when food in the wild is sparse wildlife will be highly motivated to feed on garden plants. Additionally, once wildlife become accustomed to using the garden as a food source it becomes more difficult to prevent future deprivation.

Early intervention is important if control is to be successful.

Controlling wildlife damage is best accomplished using Integrated Pest Management (IPM) strategies starting (when possible) with planting resistant species. Plants that have pubescent or hispid leaves, pungent aromas or a bitter taste usually are shunned by wildlife. For example, the following table is a partial listing of popular ornamental plants that deer tend to shun because of texture, odor or taste.

Devices or techniques that frighten wildlife can be effective deterrents when used properly. Propane exploders and

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Brown Patch Galore

Excess moisture and recent high temperatures have turned many beautiful lawns into a disease paradise. Brown patch is a sheath- and leaf-blighting disease caused by the fungus *Rhizoctonia solani*. When conditions favor brown patch disease, it is particularly severe on tall fescue. Increased use of tall fescue in home lawns and landscapes have presented a flush of inquires about the disease and control.

Brown patch develops rapidly when night temperatures exceed 70 degrees F and duration of leaf wetness exceeds 10 hours. Brown patch can be severe following extended periods of hot (70 to 90 degrees F), rainy, humid weather. High levels of available nitrogen and excess irrigation increase disease severity in tall fescue lawns.

Brown patch in tall fescue is first noticed as areas of turf resembling moisture stress, turning purple to gray-green in color. These areas quickly fade to light tan or brown as infected leaves dry out. The symptoms usually occur as discrete circular patches ranging from a few inches to several feet in diameter. More commonly symptoms occur in large thinned out areas.

Foliar symptoms are easy to see. Straw-colored foliar lesions with dark brown borders are apparent at the transition zone between healthy and diseased turf. Once the lesions have completely girdled the leaf sheath or leaf blade, the entire leaf quickly fades to tan or brown.

First reactions by many homeowners, is to apply more water. Others include

additional fertilizer. Both of these practices only compound the issue making the severity of the disease worst.

Decreasing your potential for brown patch disease includes the selection of disease resistant varieties of tall fescue, maintain height of cut at 3.5 to 4 inches, maintain low to adequate levels of nitrogen applying the majority of nitrogen in the fall, maintaining adequate levels of phosphorus and potassium, and avoid excess and late afternoon or evening irrigation.

Brown patch usually infects only the leaves and leaf sheaths, so there is a high potential for recovery with moderating environmental conditions. The turf often recovers from blighting in two to four weeks without the use of fungicide. But many homeowners are unwillingly to accept the unsightly appearance of their lawn during this time. However, with extended periods of favorable weather for brown patch, the crown may also be killed.



Figure 1. Brown patch on turf (left) and grass leaves (right).

Another option is to apply a fungicide as soon as symptoms appear. Fungicides will suppress growth and development of brown patch, but the turf will not recover from brown patch until temperatures are less favorable for the fungus and more favorable for the growth of tall fescue. Several over-the-counter lawn disease control products are available to homeowners. These products are formulated for patch-type diseases, such as brown patch, dollar spot, summer patch, etc. Be sure to follow the label for recommended preventative or curative rates of the product you choose.

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Summer Pruning Apple Trees continued from page 47

Jonathan, Red Delicious) or four weeks before harvest for late-maturing cultivars (Red Fuji, Winesap, York, Granny Smith). There are also adverse affects of summer pruning mature apple trees. As shoots are removed from trees, there is a reduction in fruit yield and sugar content in the apples. Also, if excessive wood is removed early in

the summer, flower bud initiation for next year's crop can be delayed or inhibited.

Summer pruning cannot remedy excessive crowding and should not be substituted for planting trees at correct spacing. Crowded, excessively pruned trees will never reach their full yield potential and will have poor quality fruit. However, summer pruning during the first three years

after planting is a useful tool in developing a strong tree structure and maintaining productivity.

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White Grubs: A Common Turfgrass Insect

White grubs are the primary insect problem many homeowners face annually. Damage is usually noticed in late July to early August. The earliest symptoms of white grub feeding on turfgrass roots is a gradual thinning and weakening of the stand. Damage may progress from sudden wilting of the grass, even with adequate moisture, to patches of dead grass. Small or large patches of dead or dying grass will have roots pruned so that sod can be pulled up or rolled back like a loose carpet. Numerous C-shaped whitish larvae with a brown head will lay in the upper soil directly below the dead sod. Mammals, such as skunks, or birds digging for grubs can also cause additional turfgrass damage.

Adults are scarab beetles, May/June beetle, masked chafer, Japanese beetle, green June beetle, black turfgrass ataenius, and billbugs. Identification of white grub species can be made by: time of the year the grub is present, size of the grub and raster patterns on the abdomen of the grub (see diagrams).

May/June Beetles

Damage is typical wilting and small dead patches of sod. These beetles have a 3-year life cycle. Adult beetles can be damaging to trees and ornamentals. White grubs should be treated during late July to early August to control any newly hatched larvae. However, during the second year of the grub's life cycle, treatments can be made from April through September.

Masked Chafer

Turfgrass infested with this species exhibits the typical white grub damage. Wilting, irregular dead patches of turf are the symptoms. These beetles have a 1-year life cycle. Treat grubs about four weeks after the adult beetles start to emerge when egg deposits begin to hatch in late July to early August.

Japanese Beetles

These beetles are now considered to be state-wide in Missouri. Grubs feed on roots of turfgrasses and cause a wilting

appearance and gradual thinning, however we generally do not see large amounts of turf damage specific to Japanese beetle grubs. Adult beetles can be damaging to about 400 host plants of both turf and ornamentals. Adult females will lay about 200 eggs per season, throughout the summer months. Therefore, we do not have a single egg laying time frame. Using a long-term residual product will work best to cover multiple egg laying episodes. Adult beetles can be treated at any time. If large numbers of adult beetles are noticed defoliating trees and shrubs, a preventative long-term residual product may be warranted.

Green June Beetles

Feeding activity of these grubs rarely causes severe turf damage. Rather, the damage to a lawn generally is mechanical in nature. The grubs burrow in and out of the turf, which produces mounds. These beetles are attracted to soils with high organic materials. The decaying organic matter in the soil is the primary food for this grub. This white grub is large, 1 ½ inches in length.

Black Turfgrass Ataenius

Early damage from black turfgrass ataenius grubs appears as a wilted spot in the turf. Heavy infestation will kill the turf in irregular patches. Grubs (1/4 inch in length) primarily feed on the roots of annual bluegrass, Kentucky bluegrass and bentgrass (used on golf courses). Black turfgrass ataenius has two generations per year (May and August). Applications can be made in April or May to control over-wintering, egg-laying adults. Since this grub is so small, 25 to 30 per square foot is considered a treatable threshold.

Billbugs

Turf damage due to billbugs can be confused with damage by drought, disease, chinch bugs or other white grubs. Symptoms of billbug injury are spotty, dead patches of turf that are easily pulled up, with the stems

breaking off at the crown. In addition, the stems are hollowed out or filled with a light brown frass. Adult billbugs may be noticed crawling over sidewalks and driveways. Adults are about 1/4 inch long, grayish in color, and have a snout. The best time to control billbugs is in May to kill the over-wintering adults before egg laying begins.

Control

The major factor influencing white grub density in turfgrass appears to be soil moisture; that is, in years with normal or above normal precipitation, grub populations tend to increase. This is because all white grub species require moist soil for their eggs to hatch. Young grubs are very susceptible to desiccation.

This dependence on soil moisture by white grubs can be exploited as a type of cultural control option. In areas where turf can stand some moisture stress, do not water as much in the hot summer months, particularly July and August when adults are laying eggs and young grubs are present.

In recent years, several strains of insect parasitic nematodes in the genera *Steinernema* and *Heterorhabditis* have offered somewhat effective biological control of white grubs. For these beneficial organisms to be most effective in managing white grub populations, it is critical that the labeled application instructions are followed exactly (e.g., time of day, soil moisture, size of grub, rates).

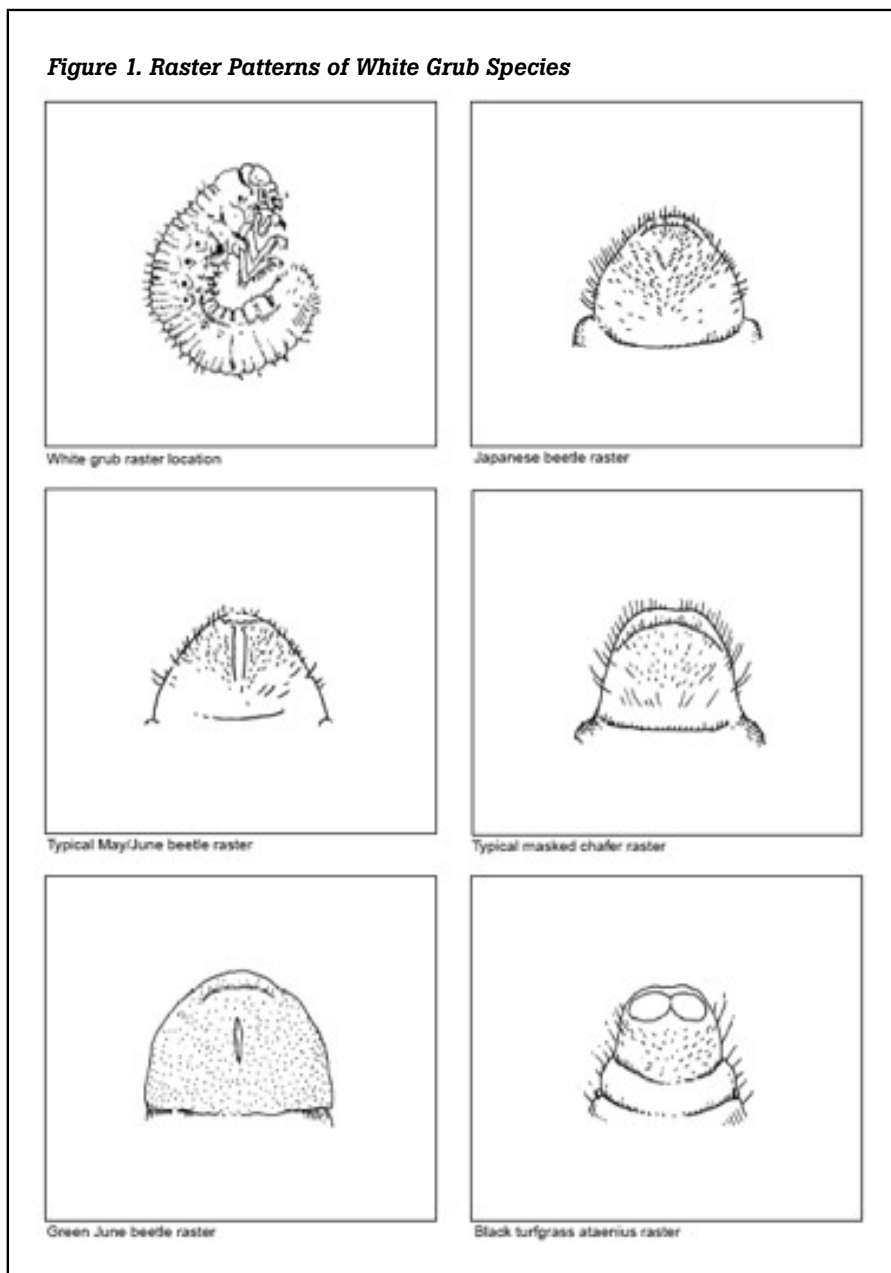
Because damaging white grub populations tend to be sporadic from year to year, preventative chemical control applications are not really justifiable. But in areas where moderate to damaging levels of grubs have been perennial, preventative applications made in late May or June may be warranted. Some products that seem to have extended activity are imidacloprid (e.g., Merit), and halofenozide (e.g., Mach 2).

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Insecticides that have shorter residual periods (3 weeks or less) or must be ingested (preferably by small grubs) to be most effective are best used in a curative chemical control program. The successful use of these materials depends to a large degree on the proper timing of the applications (reapplication often necessary). These products must be applied shortly after egg hatch when the grubs are small and actively feeding. Remember, the smaller (younger) the grub, the easier it is to control. As a general rule, the recommended time to treat for grubs is about 4 weeks after the adult beetles start to emerge, the time when the eggs begin to hatch. For the Masked Chafer, this period is around late July to early August. Because emergence of May/June Beetle adults can last for several weeks, chemical treatment for May/June Beetle grubs is also recommended during late July to early August. Insecticides that appear to be effective as curative treatments include trichlorfon (e.g., Dylox), halofenozide (e.g., Mach 2), and carbaryl (e.g., Sevin).

Chemical applications can be rendered useless if the material has not been thoroughly watered-in (0.5-inch). The water not only moves the chemical down to the thatch layer (the final destination for most of the chemical), but it will often stimulate the grubs to move upward in the soil, closer to the thatch and toxicant. However, if the thatch layer is 0.75 inch to 1 inch thick, the grubs probably will not come into contact with lethal doses of the insecticide. It may be necessary to remove some of the thatch before a chemical application.

To determine if a chemical treatment is necessary, a sampling of the grub population is necessary. To do this, cut a 1 square foot piece of sod in each of several areas of the lawn, pull it back, count the number of grubs, and inspect their rastral patterns to identify the species. Replace the sod



squares back on the soil. If you have on average more than 10 Masked Chafer grubs or more than 5 May/June beetle grubs per square foot, then a chemical treatment is recommended. Remember, it is not unusual to have more than one species of white grub infesting the same lawn.

All chemical information is presented with the understanding that no endorsement of named products is intended, nor criticism implied of similar products that are not mentioned.

Before using any chemical please read the label carefully for directions on application procedures, appropriate rate, first aid, and storage and disposal. Make sure that the chemical is properly registered for the intended use.

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pyrotechnic devices such as noise bombs, screamer shells and firecrackers are examples of auditory repellants. The result (of their use) is not permanent and their effectiveness depends on the frequency of use as well as the ability of wildlife to become acclimated to

are sprayed (brushed) on vegetation and may contain a sticker of some sort to make them more rain-fast. Their effectiveness depends on a number of factors including motivation of the animal to be repelled, habituation of the animal(s) in question, concentration of

toxicity to plants, and expense should be considered.

Fencing, netting, cages or other methods that exclude wildlife from garden plants can be very effective in controlling damage. However, depending on their nature and the building material used, they can be expensive. The use of 36 inch high chicken wire buried six inches in the soil is effective in controlling small animals such as rabbits or squirrels. A fence eight feet in height is considered to be an effective barrier for deer and wildlife other than birds. Woven wire (chain link) fences are most effective; synthetic netting (mesh) can be used but represents less of a physical barrier to highly motivated animals. Placing small cages of wire or netting over individual plants to deter wildlife can reduce expense but detracts from the aesthetic value of a garden.

Electric fences represents somewhat of a compromise between initial expense and effectiveness in wildlife control. The number and spacing of fence wires depends on the species of wildlife to be controlled. For small animals such as rabbits, electrified wires located two and four inches above the soil surface should be sufficient. For deer, a series of three wires located 18, 36 and 54 inches above ground has proven to be effective. Baiting the fence by hanging strips of aluminum foil coated with peanut butter on the wires will help “educate” deer on the nature of electric fences and keep them from charging through them on first encounter. In all cases electric fences should be clearly labeled for safety purposes and monitored on a daily basis.

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Table 1. Ornamental herbaceous plants considered to be deer resistant

| | | | |
|----------------|--------------------|-------------------|-----------------|
| Ageratum | Gaillardia | Marigold | Salvia |
| Asclepias | Geranium | Morning glory | Shasta daisy |
| Barronwort | Hardy ferns | Nasturtium | Siberian squill |
| Bergenia | Herbs | Nicotiana | Snapdragon |
| Bleeding heart | Heliorope | Ornamental onion | Statice |
| Canna | Hyacinth | Pansy | Sunflower |
| Cleome | Japanese anemone | Petunia | Sweet alyssum |
| Coral bells | Japanese spurge | Phlox | Sweet William |
| Columbine | Lamb's ear | Plumbago | Tickseed |
| Daffodil | Lamium | Poppy | Verbena |
| Dahlia | Larkspur | Purple coneflower | Vinca |
| Dusty miller | Lavender | Ranunculus | Yarrow |
| Foam flower | Liatris | Rudbeckia | Yucca |
| Foxglove | Lily-of-the-valley | Russian sage | |

the noise. Variables such as timing and diversity of noise also must be considered. For example, once in place, nuisance animals such as birds are less likely to respond to noise once they have habituated an area. Additionally, a variety of noises is more effective than a single noise used repeatedly.

Visual devices that frighten animals such as scare crows, predatory bird figures, tin foil or pie plates and mirrors can be helpful. As with noise, the tendency for wildlife to become acclimatized to these deterrents lessens their effectiveness. Relocating them on a regular basis is recommended.

Chemical wildlife repellents usually are classified as gustatory (taste) or olfactory (odor) in their action. These repellents most often

the repellent, palatability of the plant being protected, rainfall and number of applications. Suffice to say the hungrier an animal is the less likely it will be deterred by a chemical repellent.

An easy “home-made” repellent consists of a mixture of 20 percent whole eggs and 80 percent water (by volume). It reportedly is quite effective against deer. This mixture tends to withstand weather but should be reapplied on a monthly basis. Commercial repellents are widely available and vary with regard to active ingredients. Several newer products contain capsaicin, the chemical that imparts the “fire” to hot peppers.

When choosing chemical repellents, factors such as human (or pet) safety,

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August Gardening Calendar

Ornamentals

- **Weeks 1-4:** Continue spraying roses that are susceptible to black spot and other fungus diseases.
- **Weeks 1-4:** Annuals may appear leggy and worn now. These can be cut back hard and fertilized to produce a new flush of bloom.
- **Weeks 1-4:** Deadhead annuals & perennials as needed.
- **Weeks 1-2:** Feed mums, asters and other fall-blooming perennials for the last time.
- **Weeks 1-2:** Roses should receive no further nitrogen fertilizer after August 15th.
- **Weeks 1-2:** Powdery mildew on lilacs is unsightly, but causes no harm and rarely warrants control, though common rose fungicides will prove effective.
- **Weeks 1-2:** Prune to shape hedges for the last time this season.
- **Weeks 2-4:** Order bulbs now for fall planting.
- **Weeks 2-4:** Evergreens can be planted or transplanted now to ensure good rooting before winter arrives. Water both the plant and the planting site several days before moving.
- **Weeks 2-4:** If you want to grow big dahlia flowers, keep side shoots pinched off and plants watered and fertilized regularly.

Lawns

- **Weeks 1-2:** Zoysia lawns can receive their final fertilizer application now.
- **Weeks 1-2:** Apply insecticides now for grub control on lawns being damaged by their activity.
- **Weeks 3-4:** Lawns scheduled for renovation this fall should be killed with Roundup now. Have soil tested to determine fertility needs.
- **Week 4:** Dormant lawns should be soaked now to encourage strong fall growth.

Vegetables

- **Weeks 1-4:** Compost or till under residues from harvested crops.
- **Weeks 1-3:** Sow seeds of beans, beets, spinach & turnips now for the fall garden. Spinach may germinate better if seeds are refrigerated for one week before planting.
- **Weeks 1-3:** Cure onions in a warm, dry place for 2 weeks before storing.
- **Week 1:** Broccoli, cabbage & cauliflower transplants should be set out now for the fall garden.
- **Weeks 2-4:** Begin planting lettuce and radishes for fall now.
- **Weeks 3-4:** Pinch the growing tips of gourds once adequate fruit set is achieved. This directs energy into ripening fruits, rather than vine production.

Fruits

- **Weeks 1-4:** Prop up branches of fruit trees that are threatening to break under the weight of a heavy crop.
- **Weeks 1-3:** Protect ripening fruits from birds by covering plants with a netting.
- **Weeks 1-3:** Continue to spray ripening fruits to prevent brown rot fungus.
- **Week 1:** Thornless blackberries are ripening now.
- **Weeks 2-4:** Watch for fall webworm activity now.
- **Weeks 2-4:** Cultivate strawberries. Weed preventers can be applied immediately after fertilizing.
- **Weeks 2-3:** Spray peach and other stone fruits now to protect against peach tree borers.
- **Weeks 2-3:** Fall-bearing red raspberries are ripening now.
- **Weeks 2-3:** Sprays will be necessary to protect late peaches from oriental fruit moth damage.

Miscellaneous

- **Weeks 1-4:** Once bagworms reach full size, insecticides are ineffective. Pruning off and burning large bags provides better control.
- **Weeks 2-3:** Watch Scotch & Austrian pines now for Zimmerman pine moth damage. Yellowing or browning of branch tips and presence of pitch tubes near leaf whorls are indicative. Prune and destroy