



Lawn

maintenance

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Maintaining a beautiful lawn can be an enjoyable recreation and add significant value to your home. The amount of time spent will determine the quality, with results ranging from high-maintenance lawns that are lush, watered throughout the summer, and virtually weed free to medium-maintenance lawns that have some weeds and may be allowed to go dormant during the summer to low-maintenance lawns that receive little to no fertilizer and are mowed infrequently. This bulletin describes the basics of lawn maintenance for each level of input.

Mowing

Mowing is the most important factor in keeping a lawn healthy. There are a few considerations for good mowing technique:

Cutting height and the $\frac{1}{3}$ rule

Keep the lawn mowed to between 2½–3½ inches tall. Use the lower mowing heights for higher quality lawns and the higher heights for lower input lawns.

Follow the “ $\frac{1}{3}$ rule” for mowing: never remove more than one-third of the leaf tissue at any one mowing.

For example, if the turf is 4 inches tall, set the mower to cut it no lower than 2½ inches tall. Removing more than one-third of the leaf tissue at one time makes the turf more susceptible to environmental stresses and pest damage, slows regrowth, and exposes the soil to light, which promotes germination of weeds.

Mowing frequency

A plant's rate of growth is constantly changing depending on temperature, time of year, water, and soil fertility. As a result, it's better to mow when needed rather than on a fixed schedule. In the spring, lawns may need to be mowed two or even three times a week; during hot, dry weather mowing may only be needed every 7–10 days.

Keep mower blades sharp

Properly balanced and uniformly sharpened blades give a clean cut. Dull mower blades tear the grass rather than cut it. The frayed tips of torn leaves dry out quickly, giving the lawn a brownish to whitish appearance. The turf loses more water from the frayed leaf tips and becomes more susceptible to diseases and environmental stresses.

Depending on the amount and roughness of use, mower blades need to be sharpened every 1–3 years. Many hardware stores and turf equipment dealers offer this service for a nominal charge.

Mow when the turf is dry

Cutting wet turf causes the clippings to form clumps on the lawn and can be dangerous for the operator, especially on wet slopes.

Mulch lawn clippings in place

Do not collect grass clippings unless they are needed for composting or mulching, or are so thick on the ground that they may smother the turf. Leaving the clippings in place has several advantages. First, the clippings contain nitrogen and other important nutrients; leaving them in place returns the equivalent of about 1 pound of nitrogen per 1,000 ft² each year (this is equal to one normal fertilizer application) to the soil. Second, it saves time since you don't have to stop frequently to empty the bag. And third, many communities have laws that prohibit the disposal of yard waste in public landfills.

Lawns and the environment

Recent research has demonstrated that properly fertilized lawns have considerably less water runoff and nutrient loss than many fields planted with agronomic crops. However, precautionary measures need to be taken to make sure that the nutrient loss from home lawns remains low. There are some simple steps you can take to help minimize the amount of nutrient runoff from your lawn.

- Fertilize your lawn every year. Research has shown that even a single season without fertilization can reduce grass stand density, increasing water runoff by as much as 70%.
- Select fertilizers with at least 25–50% of the nitrogen in slow-release form. This provides a consistent nitrogen source for the turf between applications.
- Sweep up spilled fertilizer. No matter how much care is taken when fertilizing lawns, some inevitably lands on sidewalks, driveways, or in the street. Failure to sweep it up may cause much of it to eventually enter lakes and streams via storm water.
- Water lawns after applying fertilizer. This practice increases the effectiveness of the fertilizer and greatly reduces the potential for nutrient losses during the time of year when short-duration, intense rain storms are a common occurrence.

If you follow the 1/3 rule for mowing, the clippings will be small enough that they will decompose rapidly. Grass clippings are more than 90% water and do not contribute to thatch production. If the turf becomes too tall or thick and clippings do need to be collected they can be composted. The high nitrogen content (2–5%) of grass clippings stimulates microorganisms in compost piles and accelerates the compost process. Clippings can also be used as mulch. However, do not use clippings as mulch in ornamental beds or gardens if you've applied herbicides to the grass within the preceding 3 months.

Usually any mower can be used as a “mulching” mower. The simplest mulching mowers don't have an exit chute, while sophisticated units may have two sets of blades to help cut clippings into smaller pieces.

Fertilizing

Lawn fertilizers generally contain nitrogen (N), phosphorus (P), and potassium (K), the primary nutrients used by turf. Of these, nitrogen is most often needed, with some phosphorus and/or potassium occasionally required. Most soils in Wisconsin contain sufficient phosphorus and potassium for established turf, though phosphorus is often useful

for promoting germination and establishment of seedlings. An inexpensive soil test will determine the amounts of phosphorus and potassium needed. Nutrients such as sulfur, calcium, magnesium, and others are also used by turf but are plentiful in most soils in Wisconsin so they are rarely added to fertilizer.

Rate

Most lawns require an average of 4 pounds of nitrogen per 1,000 ft² annually. This is equivalent to four applications using the “normal” rates listed on most fertilizer bags, approximately 1 pound of nitrogen per 1,000 ft². Use a fertilizer source containing at least 25–50% slow-release nitrogen, often listed as methylene urea or water-insoluble nitrogen on the packaging. Do not exceed 1 pound of nitrogen per 1,000 ft² at any single application as the turf will not be able to use all of

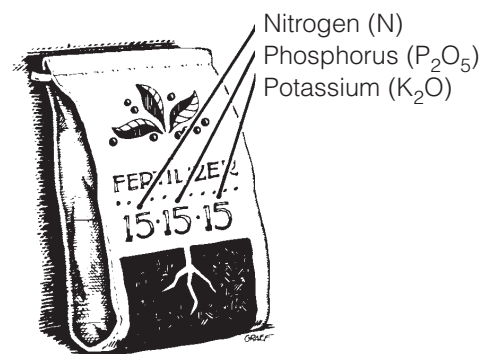


Table 1. Suggested fertilization periods for Wisconsin lawns.

Maint. level	Fertilizer application dates	“Holiday schedule”	Rates (lb/1,000 sq ft) sun	shade
Low	mid- to late October	Halloween	1	1/2
Medium	late May/early June	Memorial Day	1	1/2
	early to mid-July	Fourth of July	—	1/2 ^a
	early September	Labor Day	1 ^a	1/2
	mid- to late October	Halloween	1	—
High	late May/early June	Memorial Day	1	1/2
	early to mid-July	Fourth of July	1 ^b	1/2 ^b
	early September	Labor Day	1	1/2
	mid- to late October	Halloween	1	1/2

^aSkip this application if you're mulch mowing a lawn that is at least 10 years old.

^bSkip the July application if you're mulch mowing or if the grass is dormant due to hot, dry weather.

the nitrogen. Excess nitrogen can cause exorbitant leaf growth, reduce the root growth, encourage some diseases, and “burn” the turf leaves.

Timing

Avoid early spring fertilizer applications (April) as they stimulate leaf growth at the expense of root growth. For high-quality turf, an easy way to remember when to fertilize is to use the “holiday schedule,” fertilizing around Memorial Day, the Fourth of July, Labor Day, and Halloween. Low- and medium-quality turf are fertilized less frequently. Table 1 lists the recommended application dates and rates.

If a low- or medium-maintenance (and quality) lawn is desired, few fertilizations are needed. The most important time to fertilize is mid- to late October, or after the grass leaves have stopped growing for the year. This is known as a “dormant” application. The roots will continue to grow until the soil freezes although the leaves have stopped growing. Supplying nitrogen at this time will encourage root growth and the

development of new leaf shoots from buds, which will begin to grow the following spring.

Refer to *Lawn Fertilization* (A2303) for additional information.

Equipment and technique

There are two types of spreaders, the drop spreader and the broadcast, or rotary, spreader. Each has advantages and drawbacks.

Drop spreaders. As the name indicates, fertilizer falls through holes in the bin of a drop spreader. Drop spreaders allow excellent control of fertilizer placement and are a good choice for small yards and near landscaped beds and open water. The drawback to this precision placement is that any skipped areas will appear lighter green than fertilized areas. To prevent “striping,” make two applications at right angles to each other, using the half-rate setting on the spreader for both passes.

Broadcast spreaders. Broadcast, or rotary, spreaders typically throw fertilizer distances of 10 feet or more. This type of spreader is good for large lawns because you can cover

large areas quickly. Rotary spreaders do not apply fertilizer evenly, though, and the majority of the fertilizer is placed within 70% of the actual spread width. To apply fertilizer evenly with a broadcast spreader, either use half the rate and apply in two directions at right angles to one another, or overlap the applications by 30%. Broadcast spreaders should not be used near open water in ditches, ponds, or streams to prevent fertilizer from being applied directly into the water. Also, exercise caution around flower gardens and ornamental plants with this type of spreader.

Irrigating

Do I need to water?

Irrigate the turf during the summer if a high-quality lawn is desired. Low- and medium-quality turf may be allowed to go dormant. The leaves will stop growing and turn brown during extended periods of drought but dormant plants can remain alive for 2–3 months. New leaves will grow

Timing lawn maintenance

Spring

- Rake the dead leaves and debris from the lawn to help it green up faster.
- Reseed any bare areas.
- Begin mowing for the season, 2½–3½ inches tall, and use the ⅓ rule.
- Apply crabgrass preventer if needed.
- Apply fertilizer in late May (use Memorial Day as a guide) for medium- and high-quality lawns.

Summer

- Irrigate high-quality lawns to keep them green and growing.
- Medium- and low-quality lawns can be allowed to go dormant.
- Apply fertilizer around July 4 unless the weather is hot and dry and the lawn is not irrigated.

Fall

- Core aerate if the soil is severely compacted or thatchy.
- Overseed bare areas if needed, especially if it can be done along with core aeration.
- Fertilize around Labor Day for medium- or high-quality lawns.
- Apply a “dormant” feeding of fertilizer mid- to late October for all lawns.

once sufficient water is supplied for an extended period of time (10 days and longer).

Long stretches of extremely hot, dry weather may kill some of the turf. If large areas do not recover, you may need to overseed or renovate. To determine if the plants are still alive, check the crowns of several plants at soil level. The crown is the growing point from which the roots and leaves originate. The crown tissue of living plants is firm, shiny, and green and white; on dead plants it is brown and often soft or disintegrating.

How often should I water?

Rainfall alone is often sufficient to sustain lawns. Occasionally, irrigation is needed to maintain a high-quality lawn during dry periods. To keep lawns green throughout the growing season, they should receive approximately 1 inch of water each week, either from rainfall, irrigation, or a combination of both.

Avoid light, frequent watering sessions as it encourages shallow rooting of the grass plants, making them more susceptible to environmental stresses.

How do I measure an inch of water?

To measure the amount of water your sprinkler or irrigation system provides, set a series of several coffee cans, quart-sized jars or similar sized straight-sided containers at 5- to 10-foot intervals from the base of the sprinkler to the end of the irrigation pattern or width. Use the average amount of water collected in each container during a specific time period (e.g., 30 minutes) to determine the amount of water provided by the sprinkler.

When's the best time to water?

Irrigate the lawn in early morning. This minimizes water loss from evaporation yet allows the sun to dry the leaf surfaces before many diseases can become active. Do not irrigate

in the late afternoon or early evening as leaves remain wet longer, which may stimulate disease.

What to do if water runs off

If water begins to run off from your lawn before the sprinkler has applied a full inch of water, split the watering into two or more shorter sessions. Wait a day or two for the soil to fully absorb the water before applying the remainder. Watering to the point of runoff wastes water and may remove nutrients and pesticides from the turf.

Low-maintenance lawns

Low-maintenance lawns require little if any mowing, fertilization, irrigation, or pest control. Such lawns give many people the enjoyment they desire from a turf without the time required for upkeep. Realize, though, that low-maintenance lawns do not fit everyone's idea of a lawn turf. They may be prone to weeds, attract rodents such as field mice and ground squirrels, and the higher height of the turf may prevent the area from being useful for recreation.

Plant a seed mixture of at least 50–70% fine fescue species for best results. The mixture should contain one or more varieties of red fescue, Chewings fescue, hard fescue, and sheeps fescue. The rest of the mixture should contain no more than 50% of common or low-maintenance types of Kentucky bluegrass and no more than 15% perennial ryegrass. Table 2 lists recommended cultivars of Kentucky bluegrass and fine fescues. Fine fescues are slow-growing grasses adapted to low fertility and dry soils.

Mow the lawn once every 2–4 weeks to approximately a 3- to 4-inch height. Fertilize the lawn once or twice annually with a complete fertilizer containing nitrogen, phosphorus, and potassium to delay weed invasion. The lawn may be left unfertilized but will be more susceptible to weed invasion. Mixtures containing only fine fescues are sometimes sold as “low-maintenance” mixes. These grasses can be left unmowed and will grow about 2 feet tall. The orange to reddish seedheads, present from early to late summer, can often be beautiful. Weed the area as needed to remove noxious weeds or woody plants.

Table 2. Selected cultivars adapted for low-maintenance lawns.

Kentucky bluegrass	Hard fescue	Chewings fescue	Red fescue	Sheeps fescue
America	4001*	Ambassador	Dawson	Azay
BlueChip	Attila*	Banner III	Jasper II	Quatro*
Caliber	Bighorn	Intrigue	Seabreeze	
Chicago II	Defiant	Sandpiper		
Julia	Discovery*	Shadow II		
Liberator	Heron*	Tiffany		
Livingston	Minotaur	Treasure		
Merit	Nordic*			
Nassau	Osprey*			
NuBlue	Oxford*			
Rambo	Reliant II*			
Rugby II	Rescue 911*			
Unique	Scaldis			
Washington				

*Cultivars with good resistance to dollar spot disease at cutting heights above 2 inches.

Miscellaneous problems

Compacted soils (poor roots, thin turf) and thatch

Soils become naturally compacted through weathering and traffic. When this happens, plants have difficulty growing because less oxygen is available for the roots and thatch production may be increased. Compacted soils cause thin (low density) turf and can lead to increased weed problems. The remedy is to remove plugs of soil to loosen compacted soils. This procedure, known as core aeration, improves turf rooting and growth by opening spaces in the soil. It also solves thatch problems by creating a good environment for microbes that degrade thatch.

Core aerators are available for rental at many hardware stores and equipment suppliers. Use self-propelled units with vertically operating tines when possible; tines mounted on drum rollers are less effective because they pull shallower cores. Aerate in the autumn or spring when turf is actively growing. Two to four passes with the core aerator are sufficient. Extension publication *Lawn Aeration and Topdressing* (A3710) describes equipment options and technique in greater detail.

Shaded lawns

Successfully growing turfgrass in the shade can be difficult. Turfgrass plants are naturally adapted to grow in full sun to partial shade. Heavily shaded grass often thins or dies, allowing invasion by moss, algae, and shade-loving weeds such as wood violet (*Viola* spp.) and creeping charlie (*Glechoma hederacea*). Shady areas require special management practices to keep turf healthy. The following information outlines the key differences. For more details, refer to Extension publication *Growing Grass in Shade* (A3700).



You can significantly reduce the need for herbicides by following a good soil fertility program. No herbicides were used in any of these plots, yet the plot that was fertilized in fall and spring is nearly weed free.

Plant grass mixtures adapted to shade. For best results, plant mixtures containing at least 50% fine fescues for dry, shaded conditions. For moist, shaded conditions plant mixtures with at least 20% rough bluegrass (*Poa trivialis*) or 10% supina bluegrass (*P. supina*). Do not rely solely on Kentucky bluegrass cultivars listed as shade tolerant. Even the most shade-tolerant of these cultivars prefer more sun than fine fescues, rough bluegrass, or supina bluegrass.

Water deeply when needed. Irrigate shaded sites only if the grass begins to turn bluish green or show other signs of wilt. Irrigate deeply to thoroughly wet the soil to a 3- to 4-inch depth similarly to grass grown in full sun. Avoid light, frequent waterings as this may promote turfgrass disease.

Use less fertilizer. Apply fertilizer at the same time as for turf in sunny areas but cut the rate in half. Using the full rate on shaded turf temporarily increases leaf growth and prevents vigorous root growth; eventually the turf dies as the root system can no longer deliver enough water and nutrients to the leaves.

Rake or mulch fallen leaves promptly. To maximize the amount of sunlight reaching turf, promptly remove or mulch fallen tree leaves in the autumn. Research shows the leaves can be mulched into the lawn without

harming the grass, as long as the blades of grass remain 1–2 inches above the mulched tree leaves.

Consider alternatives to grass for difficult areas. For some areas, shade-tolerant groundcovers or mulches may be a better choice than turfgrass. Refer to *Growing Grass in Shade* (A3700) for a listing of plants adapted to low-light areas.

Weeds

Weeds are typically the top problem in lawns. They invade wherever turf is weak or thin. Good cultural management practices (mowing, fertilization, and irrigation) will encourage growth of dense, healthy turf and crowd out and prevent weeds. In fact, with proper mowing and timely fertilization alone you can avoid between 70 and 90% of all weed problems. Herbicides should be used only as a last resort to curb a weed problem. A little herbicide, properly applied, can go a long way. When combined with good management practices, a herbicide application may only be needed every several years.

Select a herbicide based on its ability to control the target weed(s). Factors to consider include the type of weed and the life cycle of the weed (annual, biennial, or perennial). Make sure you have the proper application equipment. Some herbicides are sold in pre-mixed bottles

which can be sprayed directly onto weeds. Other herbicides are packaged to be applied using a garden hose. Herbicide concentrates are usually meant to be applied with a hand-held, backpack, or tractor-mounted sprayer, though some may include directions for applying with a hose-end sprayer. Do not purchase more herbicide than you will use within 1 year.

Use herbicides safely to prevent injury to yourself and the environment. Follow the instructions on the herbicide label for proper clothing, handling, and application procedures. If you plan to overseed, follow the directions on the label to make sure the herbicide application does not prevent germination of the seed. See Extension publications *Lawn Weed Prevention and Control* (A1990) and *Lawn Weeds and Their Control* (NCR026) for further information.

Types of herbicides. Many herbicides are specific for only certain types of weeds; these are termed selective herbicides. Nonselective herbicides (e.g., Roundup, Kleenup) will kill any plant that absorbs the herbicide. Exercise caution when using nonselective herbicides as these will kill both weeds and turfgrass.

Types of weeds. Weeds are classified as grasses, sedges, or broadleaves. Most herbicides control only weedy grasses or broadleaf weeds, not both. Read the label on the herbicide container to determine if the product will control the type(s) of weeds in your turf. Common grassy weeds in turf include crabgrass, foxtail, and quackgrass. Common broadleaf weeds include creeping charlie (sometimes referred to as ground ivy), dandelion, and clover.

Timing. Pre-emergent herbicides are used to control weeds before they are visible, usually in early spring. Pre-emergent herbicides are used mostly for control of annual weeds (weeds that live only 1 year) such as

crabgrass. Use postemergent herbicides when weeds are visible. Postemergent herbicides can control annual, biennial (2-year life cycle), or perennial weeds (live indefinitely). Perennial weeds are best controlled in the fall or in spring when the target weeds are in bloom.

Weed and feed products. Weed and feed products contain both a herbicide and a fertilizer. The herbicide may be for either pre-emergent or post-emergent weed control. Because these products contain a herbicide they should be stored and handled with the same level of care as any pesticide.

Weed and feed products are attractive because it seems as if both weed control and fertility requirements can be achieved with one application. In reality, the pre-emergent weed and feed products generally cause fertilizer to be applied too early in the year for optimal turf response. The post-emergent products often fail to sufficiently control weeds because the weeds absorb too little of the herbicide.

For best results, do not rely on weed and feed products. Instead, fertilize with fertilizer alone according to the schedules listed in table 1. When necessary, use stand-alone pre-emergent herbicides to prevent infestations of annual weeds such as crabgrass. Existing weeds are best controlled with a liquid herbicide, because a higher concentration of active ingredient can be absorbed by the weeds.

If using weed and feed, apply product equivalent of no more than 1 pound of nitrogen per 1,000 ft²; this application will substitute for one of the fertility applications in the recommended schedule described in the bulletin.

Diseases

The practices described in this publication—proper mowing, fertilization, and irrigation—are the best tools to use to minimize damage from diseases. Some diseases are more common when the turf is overfertilized, others are more common when the turf is underfertilized. Improper mowing (dull mower blades, removing too much of the leaf) and insufficient water will stress the turf and make it more susceptible to disease. Watering in the early evening encourages many leaf diseases by keeping leaves moist for long periods. Other fungi may survive in the soil and cause root rots which go unnoticed until periods of drought or other stresses.

Occasionally diseases occur even when good management practices are followed. Well-managed turf has a better chance of recovery than turf that may have been struggling to stay alive before the infection. Proper identification is essential to determine if the disease requires a fungicide treatment or if the turf will recover without fungicide. While there are many diseases of turf, only the most common are described here.

Necrotic ring spot. Necrotic ring spot is caused by a fungus which rots the roots and crowns of turfgrasses. Initially, 3- to 4-inch necrotic, or brown, patches appear in the turf. The areas enlarge to 5–12 inches as the disease develops. Turf or weeds may grow in the center of older patches, producing a phenomenon referred to as a “frog-eye” pattern.

The fungus grows on the roots during cool, wet weather in spring and autumn. Dead patches become noticeable during hot, dry weather because the grass is unable to absorb enough water to stay green. The patches usually disappear after several years even if no steps are taken for treatment.

Table 3. Kentucky bluegrass cultivars with apparent resistance or tolerance to necrotic ring spot.

Able 1	Majestic
Adelphi	Merit
Admiral	Midnight
America	Monopoly
Barzan	Nassau
Challenger	Parade
Classic	Rugby
Eclipse	SR 2000
Freedom	Trenton
Glade	Vantage
Haga	Wabash
Kelly	

Light, frequent irrigation during hot, dry periods may help the affected turf survive. Adequate fertilization is important: use a complete fertilizer with at least 35% slow-release nitrogen plus phosphorus and potassium.

Fungicides have limited effectiveness as they must be applied in the spring and/or fall, before damage occurs. They also must be sufficiently watered in to the soil to reach the fungus.

Kentucky bluegrass is particularly susceptible, although other bluegrass and fescue species may also be affected. If you reseed dead patches, refer to table 3 for Kentucky bluegrass cultivars that appear to be less susceptible to the fungus.

Rust. Rust occurs primarily on perennial ryegrass although all grass species are susceptible. The fungus grows inside the plant, often turning the leaves yellow or causing yellow spots. Spores from the fungus eventually erupt through the leaf surface, giving an orange cast to the turf. The spores easily rub off on shoes and clothing. This disease occurs during periods of slow turf growth in the summer and fall.

The spores may be blown for hundreds of miles, so little can be done to keep the disease out of an area. Turf usually outgrows this disease without any treatment. To hasten

recovery, apply a small amount of fertilizer (half rate as listed on retail fertilizer bags) and irrigate. Deduct the amount of nitrogen from the amount to be applied from the next fertilization, unless the next fertilization is to be in October or May, when the full rate should be applied.

Leafspot. Leafspot diseases are caused by a number of closely related fungi. All turfgrass species are susceptible, although heavily fertilized, overwatered turf is most susceptible. Two phases of the disease, each caused by a different fungus, occur during the year. The melting out phase occurs during cool, wet weather in the spring. Crowns and lower stems turn brown or purple and “melt out” or rot away, leaving only a few stems and severely thinned turf. The leaf spot phase occurs during hotter periods in the summer. Both phases may cause chocolate brown spots on the leaves which may be surrounded by a chlorotic (yellow) zone. In severe cases entire leaves turn chlorotic and die. Occasionally entire plants may die, but this is rare.

Leafspot disease can be found in almost any lawn at any time of the growing season and generally does not require fungicide treatment. In severe cases, mancozeb, maneb, and chlorothalonil fungicides can be used to control the disease.

Powdery mildew. Powdery mildew is caused by a fungus which forms a white powder-like growth on the surface of the leaf. This disease is more prevalent in shady, damp areas and is seen mostly on Kentucky bluegrass.

Occasional mildew is common and will not permanently injure otherwise healthy turf so treatment is usually not needed. If large areas of turf are affected, plant a mixture of fine fescues or other shade-tolerant grasses. Alternatively, improving air movement and light to the area by judiciously pruning or removing trees or shrubs may help. ‘Glade’ and ‘NuGlade’ Kentucky bluegrasses are

more tolerant to the disease than other cultivars but are not completely resistant.

Fairy ring. Fairy rings are dark green rings or arcs in turf, ranging in size from several inches to over 10 feet in diameter. Caused by a group of fungi known as basidiomycetes, fairy rings may appear and disappear throughout the year and over the course of a few to many years. All turfgrasses are susceptible. Occasionally, mushrooms grow along the edge of the ring, but the main portion of the fungus is usually deep in the soil.

Fairy rings develop as fungi decompose organic matter, such as buried stumps, branches, or construction debris. To eliminate fairy ring the organic matter must be dug up and removed. In some cases there is no single piece of organic matter to remove. Replacing the soil in the affected area is a debatable solution because it is impossible to know the necessary depth of soil to replace. Fungicides are ineffective. Apply fertilizer to the entire turf area to mask the symptoms. As the organic matter is degraded the fairy rings eventually disappear.

Snow molds. Several fungi cause snow mold disease, a disease that typically appears as patches of dead turf in the early spring as the snow melts. Depending on the fungus, snow may or may not be required for infection. Snow mold disease is most prevalent on turf heavily fertilized shortly before winter dormancy. On turf cut no lower than about 2 inches, the disease usually kills only the leaves, and the turf grows back by mid-spring. Mow or rake lawns in early spring to encourage new growth. Severely damaged patches may need to be overseeded. Although all turfgrasses are susceptible, Kentucky bluegrass is more likely to recover than perennial ryegrass or tall fescue.

“Dog” patch. This is not a disease, but the symptoms—patches of dead turf surrounded by dark green grass—may be mistaken for one. It is caused by dog urine, which contains high concentrations of salts and nitrogen. Symptoms are more apparent on poorly fertilized lawns. (Fairy ring has similar symptoms, but grass within the ring remains green.) Dead spots larger than 2–3 inches in diameter require overseeding. First, water thoroughly to leach the salts. Loosen the soil with a rake and spread seed (refer to *Lawn Establishment and Renovation*, A3434). Use a seed mix of the same composition of the rest of the lawn to avoid patches of non-uniform grass. To prevent damage, either water thoroughly to dilute the urine or train the dog to use a mulched area or less-conspicuous location in the yard.

Insect pests

Insect pest problems are rare in Wisconsin lawns compared to many neighboring states because the long winters reduce overwintering insect populations. The most common problems are white grubs and chinch bugs.

White grubs. Grubs are the immature stage of various types of beetles, including Japanese beetles, recent arrivals to the state. The grubs feed on turfgrass roots. Their presence often goes unnoticed until drought stress causes plants to die from lack of roots or until animals, primarily

skunks, dig up the turf to get at the grubs. Damaged turf looks droughty even though there may be adequate moisture. As the populations of Japanese beetles grow, we can expect to see more grub damage.

Chinch bugs. Chinch bugs feed on the base of turfgrass shoots, causing tan patches of dead turf. Adult chinch bugs are about 1/6-inch long and are black with a characteristic white hourglass design on their backs. Immature bugs (nymphs) are smaller than adults and have a broad white line across the back.

Several insecticides are available which will control these and other pests. Since different insecticides may be required for specific insects, make sure the pest is properly identified, then select an insecticide which is labeled for control of the pest. Always be sure to read and follow the directions on the label for proper use. For more information on these pests, consult *Turfgrass Disorder: White Grub* (A3275) and *Turfgrass Disorder: Chinch Bug* (A3237).

Diagnosing lawn problems

There can be many reasons for poor turf performance and it is not uncommon for a variety of problems to interact. You may need to seek outside expertise for help identifying the problems. One of the best steps is to contact your local county Extension office. You may need to

bring in a sample for identification. Many lawn and landscape companies can also help identify pests and suggest appropriate management options.

Samples may also be sent to the Turf Diagnostic Lab of the University of Wisconsin or a private lab for diagnosis and recommendations. These labs charge a nominal fee for their services. To submit a sample, cut a circular or square area of the turf, at least 6 x 6 inches, which includes both affected and apparently healthy turf or weed. Keep about an inch of soil at the bottom of the sample. Do not moisten the sample! Wrap the sample loosely in newspaper, followed by aluminum foil. Place the sample in a cardboard box. Include a complete description of the problem; when it started; the size, shape, and location of the affected areas (e.g., irregular patches alongside the driveway, in the shade, etc.); and if the problem is new or occurs annually. List the formulations, dates, and rates of any fertilizer or pesticide applications from the past year. Also include information about any other management practices such as irrigation (frequency, approximate amounts applied each time). Turf samples may be shipped or taken to the labs for diagnosis. If mailing your sample, send it early enough in the week so it arrives no later than Thursday. Send the samples by express or overnight mail so there is less chance of the sample rotting in transit.

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