chapter 12

Lawns

In a nutshell...

- Grass grows (except under trees).
- There is no such thing as a no-maintenance lawn!
- The best defense against weeds is a thick lawn. Lawn fertilization allows the grass to grow faster and out-compete weeds.
- Regardless of your opinion about lawns, you'll need to know how to answer common lawn questions.
- Check the resources at **hort.extension.wisc.edu** for issues not covered in this chapter.

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Introduction

Many homeowners want a lush, green lawn. Establishing and maintaining a high-quality lawn can be challenging. Through proper soil preparation, seed selection, care during establishment, and appropriate maintenance activities—including fertilizing, watering, and pest management—anyone can have a healthy (if not picture-perfect) lawn. This chapter will describe how to properly establish and care for a lawn.

Learning objectives

1. Understand the basic requirements for growing a lawn.
2. Understand the proper cultural practices for turf establishment and maintenance under various environmental conditions.
3. Understand where to go for more information on identifying and managing lawn problems.

Lawns in the landscape

Lawns play a significant role in most home landscapes. They can provide a surface for a family's outdoor recreational needs or serve as a relaxing space to help reduce stress. Grassy areas provide aesthetically pleasing backdrops for other landscape plantings, and a healthy lawn can increase real estate market value and salability. In addition, a well-maintained lawn reduces runoff and prevents nutrients and sediment from entering surface waters.

Excessive management, however, can lead to nutrient and pesticide pollution and wasteful use of water.

Lawn establishment

To establish a healthy lawn, it's important to properly prepare the site. Choices you make during establishment—such as grass selection and soil preparation—cannot be easily, quickly, or inexpensively remedied, so it is important to get them right the first time. Consider the following items before starting a lawn.

- Some homeowners just want their lawn to "hold the dust down," while others want their lawn to look the best on the block. What are the expectations?
- What is the site like? Is it sunny or shaded? Is the soil moist or well drained? Is the soil type sandy, silt, or clay?

- What will the lawn be used for? Does it just need to look nice, or does it need to support children, parties, pets, or other uses?
- How much work are you willing to do to maintain it? If you'd like a high-quality lawn, you'll need to be able to spend the time and resources needed.

To establish a lawn, follow these steps whether the lawn is seeded or sodded.

Take a soil test

Soil samples should be sent to a state-approved lab several weeks before starting to establish new turf (see chapter 2, Soils and Resources at the end of this chapter for more information). The soil test results will include the soil type, pH, and fertility along with recommendations for adjusting them, if necessary.

The soil type (see box) will help determine how the site is prepared and may influence the type of grass seed or sod to purchase.

A note on soil types

There are three main types of soil in Wisconsin: sandy, silty (or loam), and clay. You can't do much to change your soil type. Fortunately most grasses can be grown on almost any soil type, though the management may vary.

- Turfgrasses grown on sandy soils will need to be irrigated and fertilized more frequently, but in smaller amounts.
- Turfgrasses grown on clay soils will need to be properly sloped (graded) to aid good surface drainage so soils are not constantly waterlogged. High-traffic sites may need core aeration.

Prepare the site and amend the soil

Kill any existing vegetation with a nonselective, systemic herbicide containing glyphosate as the active ingredient. Allow 7 to 10 days for the herbicide to completely kill the vegetation.

If testing results indicate that soil amendments are needed, add them now.

- Adding lime will raise the soil pH to increase nutrient availability, but if the pH is 6.0 or above—as with most Wisconsin soils—adding lime is generally not needed.
- DO NOT add sand to a clay or silt soil to improve its drainage. A soil must contain at least 60% sand by volume to improve the drainage. Instead, manage the existing soil.
- Sandy soils may be low in phosphorus or potassium; if so, add these now, as it is difficult to add these once the turf is established.
- Most sandy soils can be amended by adding 1 to 2 inches of topsoil or compost and tilling it into the top 4 to 5 inches to provide a 6-inch depth of root zone mix. For pure sand, a total of 3 to 4 inches of topsoil or compost may need to be added to improve moisture and nutrient retention.

After any killed vegetation and amendments have been tilled into the root zone, smooth any bumps and fill depressions to create a smooth surface. Remove all rocks larger than a peach pit. Irrigate the soil lightly, or wait for a moderate rainfall, and then lightly roll the soil to help it settle.

Apply starter fertilizer if needed

If the soil test indicates that phosphorus is required, apply a starter fertilizer to help speed the establishment of the lawn seed. Starter fertilizers have more phosphorus than either nitrogen or potassium, usually about a 1:2:1 ratio. Fertilizer bags contain instructions for how much fertilizer to use. If the soil test indicates that phosphorus is not needed, wait until the first mowing to apply a phosphorus-free fertilizer.

While Wisconsin bans phosphorus fertilization unless a soil test determines the lawn is deficient, turfgrass establishment is exempted.

Take care to limit any movement of phosphorus into waterways by properly calibrating your spreader.

Seeding or sodding

A lawn can be established from seed or by laying sod. Either can result in a high-quality lawn. Table 1 presents some advantages and disadvantages of each.

TABLE 1. The pros and cons of seeding or sodding

Seeding

+ADVANTAGES

- Less expensive than sod.
- Wide variety of turfgrass species and cultivars to choose from.
- Doesn't usually result in the "layering" effect seen with some sodded lawns.

-DISADVANTAGES

- Labor-intensive; often requires daily irrigation as well as herbicides to manage weeds.
- Susceptible to erosion in heavy rainstorms until established.
- Seedlings highly susceptible to disease in hot weather and may require fungicides.
- A mulch of some sort (straw, compost, organic seed blankets) is usually needed to retain moisture and prevent the seedlings from drying out.

Sodding

+ADVANTAGES

- An aesthetically-pleasing "instant" lawn.
- Resistance to soil erosion.
- Can be installed at most times of the year.

-DISADVANTAGES

- Usually more expensive than seeding.
- Labor-intensive to install.
- The grass selection is limited to Kentucky bluegrass, although tall fescue and fine fescue are sometimes available.
- Core aeration is often required during the first 3 to 4 years to help the sod root down into the soil.

Selecting grass seed

Kentucky bluegrass (*Poa pratensis*) is the most commonly used species for lawns in Wisconsin. There are hundreds of varieties available that differ in the darkness of leaf color, leaf width, aggressiveness, disease resistance, and other characteristics. New bluegrass varieties are brought to the market each year, so consult with a turfgrass professional or the National Turfgrass Evaluation Program for more information. There are two classes of Kentucky bluegrass: common and improved.

- Common types are the cheapest, are aggressive growers, and tend to have a lighter green color. While they are susceptible to leaf spot diseases, they are less susceptible to weed invasions than improved types. Common types are most suitable for low-maintenance sites.
- Improved types require more frequent fertilization but will perform better when a high quality appearance is required.

Perennial ryegrass (*Lolium perenne*) is commonly mixed with Kentucky bluegrass because it is affordable and germinates quickly (within 7 to 10 days in the summer). Perennial ryegrass is more susceptible than bluegrass to disease and cannot tolerate prolonged ice cover in the winter. The grass has a bunch-type growth habit, meaning it does not naturally fill in damaged areas like bluegrasses do. Select mixes with 20% or less perennial ryegrass.

Fine fescues is a generic term for several species of grasses that have narrow leaves, require less water and fertilizer, and don't need to be mowed as often as many other grass species. They include creeping red fescue (*Festuca rubra*), hard fescue (*F. longifolia*), sheep fescue (*F. ovina*), and Chewings fescue (*F. rubra var. commutata*). Fescues work well for dry, shaded sites but cannot handle significant traffic and often turn brown in the summer heat, even when irrigated. Fine fescues will not perform well in heavy clay soils. These grasses are an outstanding choice for shady, low-maintenance sites. Because of their poor heat tolerance, they are more successful in the northern part of the state. Fine fescue is available as a sod, but is often difficult to find.

Tall Fescue (*Schedonorus arundinaceus*) is a relatively new lawn grass to Wisconsin. It is a low-maintenance grass with deep roots that performs well in sun and shade. It is able to stay green without water longer than any other grass. However, it will not survive in areas where ice accumulates in winter. Wisconsin is at the northern end of tall fescue's range, so the grass will perform better in southern Wisconsin. Because it has a relatively wide leaf blade, it should be the dominant grass (more than 80%) in seed mixtures; if not, it will grow in distinctive clumps that many find unattractive. Tall fescue can also be purchased as sod, but like fine fescue its availability is limited.

Include **bluegrasses** such as rough bluegrass (*Poa trivialis*) or supina bluegrass (*P. supina*) for moist, shaded sites, adding 10 to 20% by weight to the seed mix. Both spread by stolons. Because mowing equipment can spread the stolons, don't be surprised if they eventually show up in other spots in the landscape (where they can easily be pulled out).

Seeding

Seeding is often preferred because seed is cheap to purchase—costing pennies per square foot—while sod generally costs $1 per square foot or more. Seeding also gives the homeowner the choice of grass species and even cultivars that will be used at the site (see box). Seeding has major disadvantages, however:

- Seeding is more labor-intensive in the long run than sodding because it can take a full year before the turf is mature, during which time special care is needed to ensure the grass doesn't die, leaving it susceptible to weeds.
- A seeded lawn most likely needs at least one herbicide application to help the turf achieve the quality most people desire.
- Seeded lawns need more frequent irrigation during the first few months than sodded lawns.
- Seeding works best when performed between mid-August and mid-September (depending on the location in Wisconsin). Seeding at other times of the year, while possible, often fails because the turf seeded in spring is too young to endure summer heat and drought stresses, while autumn plantings may die during the winter because plants were too young to endure winter conditions.
- Heavy rainfall or overwatering can flood a seeded site, washing away the seed and sometimes a great deal of soil.

An area can be seeded using a fertilizer spreader, by hand, or with a slit-seeder. A slit-seeder is a self-propelled machine that cuts shallow (less than ¼-inch) furrows into the ground using metal disks. Seed is dropped from a seed box on the machine into the furrows. Apply enough seed to get about 10 seeds per square inch. Lightly rake the area to mix the seed into the top ⅛ to ¼ inch of soil.

Sodding

Sod sold for retail use is usually sold in pieces 6 feet long and 1½ feet wide. Use the sod within 12 hours of delivery to avoid problems with the sod heating or drying out. Sod an area by laying the pieces in a staggered or brick-like fashion. On slopes, place the sod perpendicular to the slope. Lightly roll the sodded area when finished to make sure the sod touches the soil. Water the area thoroughly and continue to irrigate for the first 2 weeks.

Mulch

For seeded areas, apply enough clean, weed-free straw or marsh hay to cover about half of the exposed soil surface. Too much mulch will smother germinating turfgrass seedlings, while insufficient mulch will not provide the protection needed for good germination.

Post-plant care

Irrigation

Until the seeds germinate, seeded areas will need to be watered one to several times a day for best results. Unirrigated sites will result in poor turf cover and more weeds.

- Once germination occurs, irrigate the site no more than once a day.
- Within one to three weeks after germination, reduce irrigation to every few days until the turf has established a sufficient root system to extract moisture from the soil.

If it's windy, hot, and sunny, irrigate more frequently than if it's than cool and cloudy. Avoid irrigating so much that puddles develop. Keep traffic off the turf until it is fully established—up to 2 months for perennial ryegrass and up to 4 months for Kentucky bluegrass.

Note that if the mixture contains perennial ryegrass and Kentucky bluegrass, the perennial ryegrass will germinate within 7 days but the bluegrass will not germinate for 14 to 21 days. If irrigation is stopped after the ryegrass emerges, the bluegrass will die, and the lawn will be 100% ryegrass.

Irrigate sodded lawns every one to three days for the first several weeks after installation. After that, irrigate the sod as needed, but remember the root system is not fully established and sod will dry out quickly in sunny areas. Sodded lawns often do not integrate into the soil underneath, especially if that soil was compacted by construction equipment. **Core aerate** once per year for the first 3 to 4 years to encourage the sod to integrate into the soil underneath and to reduce the often significant **thatch** layer that accompanies sod.

Starting to mow

Begin mowing as soon as the turf or a significant number of weeds reach 3 inches in height.

- Make sure the mower blades are sharp and the ground is relatively firm so the mower doesn't make ruts in the soil.
- Don't set the cutting height lower than 2 inches.
- There is usually no need to remove or bag the grass clippings; leave them on the turf.
- Do not apply herbicides until after the second or third mowing; consult the label before applying as some herbicides can injure turf seedlings.

Turf management checklist

- ❑ Mow turf on a regular basis using the ⅓ rule.
- ❑ Fertilize turf appropriately, usually two to three times a year.
- ❑ If keeping it green is the goal, irrigate turf with 1 inch of water when footprints persist. If green is not the goal, most lawns can survive 4 to 6 weeks with no water at all.
- ❑ If soil compaction, layering, or thatch is a problem, core aerate turf to increase oxygen flow to the roots.
- ❑ While herbicides are not necessary to have a healthy lawn, weed control will be easier with them.
- ❑ If you are using a pesticide, be sure to read, understand, and follow the label instructions.
- ❑ Correct underlying problems such as poor drainage, improper grass selection, or shade.

Lawn maintenance

Once a lawn has been established, it needs to be maintained. Three ingredients essential to maintaining a beautiful lawn with little or no pesticides—assuming the soil is healthy and the correct type of grass was planted—are mowing, fertilization, and irrigation.

How much work is needed depends on many things: lawn quality expectations, the species selected, and the site's environmental conditions (soil type, sunlight, slope, etc.). For a quick reference, use the turf management checklist (see box). For more information, consult the following sections.

Mowing

Follow these mowing tips to keep a lawn healthy:

- Maintain a mowing height of approximately 2½ to 3½ inches for optimal turf health.
- Follow the ⅓ rule: Mow frequently enough so that no more than ⅓ of the leaf blade is removed at a time. This avoids "scalping" and will help reduce weed encroachment by keeping the turf thick and healthy.
- Keep mower blades sharp so they cut the leaf blade cleanly.
- Either leave the grass clippings on the turf, where they will slowly decompose, or bag them and use them for compost.

Leaving clippings on the lawn, or grass-cycling, does not significantly contribute to thatch development, which is generally the result of over-fertilization. Over the course of a growing season, grass-cycling will contribute approximately 1 pound of nitrogen per 1,000 square feet to the lawn, equal to one fertilizer application!

Fertilizing

Fertilization is an important aspect of lawn maintenance that can help keep turf healthy and dense. Dense turf, in turn, will naturally crowd out weeds.

Depending on the grass species and quality expectations, fertilize the turf anywhere from one to four times a year (see table 2). Each application should have approximately 1 pound of nitrogen per 1,000 square feet, with amounts of phosphorus and potassium dependent on soil test results. Note: In Wisconsin, after a lawn has been established, phosphorus fertilization is rarely needed and is in fact illegal—unless you have a soil test that demonstrates a phosphorus deficiency.

TABLE 2. Lawn fertilization schedule for Wisconsin

Type of lawn	Fertility schedule
Low maintenance	Early September
Medium maintenance	Late May, early September
High maintenance	Late May, early July*, early September, early October**

*Skip this application if the weather is hot and dry, unless the area is irrigated.

**Skip this application if you leave your clippings on the lawn.

Applying fertilizer at the right times of year is crucial to encourage good turf growth and health. The best way to remember when to fertilize is to use the holiday schedule: Memorial Day, July 4th, and Labor Day. This isn't as much fertilization as it sounds. Most turf requires largely nitrogen fertilizer and very little phosphorus or potassium. The nitrogen is mostly used for leaf growth, which gets mowed off regularly. This is part of the turf ecosystem; without rapid leaf production and removal, turf becomes thin and allows weeds to invade. Turfgrasses readily use the nitrogen applied, which avoids potential environmental contamination.

In general, any fertilizer containing 30 to 50% slow-release nitrogen will be suitable for lawns.

- Organic nutrients release nitrogen extremely slowly, so there won't be a rapid response if the turf is trying to recover from damage or if a quick green color is desired. See chapter 17, Organic Gardening.
- Synthetic fertilizers have been shown to have no better or worse impact on water quality than organic sources. Some synthetic fertilizers are water-soluble and release nitrogen quickly, while others release nitrogen slowly.

Using compost will add organic matter while supplying adequate nutrients so fertilization will not be required. Apply ⅛ to ¼ inches of high-quality compost in the spring and fall.

Irrigation and drought management

Most lawns need about 1 inch of water each week, which can come from either rainfall or irrigation. This varies, however, based on the turfgrass species present and the environmental conditions.

Turfgrasses can survive long periods of drought (up to two months) by going **dormant**—letting their leaves die. This is fairly common across the Midwest in nonirrigated lawns. When the temperatures cool and the rains return, turfgrasses quickly grow new leaves and green up.

- If a lawn is irrigated, don't stop during the middle of a drought only to let the turf go dormant again, as this uses precious energy stored in the turf plant.
- Keep unnecessary traffic off dormant turf.
- Never apply a fertilizer or pesticide to a dormant turf—it will be unable to use the fertilizer or process the pesticide correctly.

Kentucky bluegrass approaching 8 weeks of dormancy should be lightly irrigated to keep the plant crowns alive. Once consistent rains return, the plants will slowly green up and resume normal growth. Note that other turfgrass species, including perennial ryegrass, fine fescue, and tall fescue, cannot go dormant and will die once their leaves turn brown. Though fine fescue and tall fescue cannot go dormant, both species (especially tall fescue) are considered drought-tolerant and will remain actively growing during periods of moderate drought.

If drought stress is apparent—through "footprinting" or turf browning—irrigate the lawn deeply and infrequently. In other words, irrigate only once or twice per week for longer periods of time rather than for a short period of time every day. Check the output of the sprinkler or irrigation system by collecting water in coffee cans or other containers for a set period of time, such as 30 minutes, to know how long to irrigate to supply one inch.

Core aeration

Core aeration benefits a lawn in many ways, including alleviating soil compaction, increasing oxygen flow to the roots, and reducing the thatch layer. Where soil compaction or excessive thatch exists, core aerate once or twice per year (fall is best) until the problems have abated. Core aerators are available to rent at many lawn and garden centers. Aerate newly sodded lawns once or twice per year for the first several years to encourage the sod to integrate with the soil underneath.

Topdressing with compost

Compost topdressing is sometimes used on lawns to increase organic matter in the soil and improve plant health but is not generally required for healthy lawns. Compost should be applied lightly and relatively frequently, as large amounts of compost applied at once will smother the lawn. Applying compost after core aeration can be an effective way to incorporate the compost into the soil. See chapter 3, Composting.

Lawn renovation

If a lawn looks rough, it may not need to be completely reestablished. Make sure the recommended mowing, fertilizing, and irrigation practices are being followed. These three things can help fix many poor lawns.

Lawns with thin turf can be overseeded. Core aerate the turf, apply a desirable turfgrass seed, and either core aerate again or break up the cores with a vertical mower (also known as a dethatcher and available as a rental). The area can also be overseeded with a slit-seeder. If numerous broadleaf weeds are present, apply a broadleaf herbicide several weeks prior to overseeding.

To overseed small bare areas of soil, mix seed with some soil and sprinkle it on the area. Mulch with grass clippings, straw, or other suitable material. Keep the area irrigated and free from traffic until the grass is established.

If excessive traffic or animals have damaged turf, remove the clumps of ripped up vegetation, smooth the soil, and overseed.

Growing grass in the shade

Turfgrass often performs poorly in the shade due to one or more of the following reasons:

- Insufficient light for photosynthesis and normal growth.
- Increased susceptibility to diseases.
- Tree root competition for water and nutrients.

Turfgrasses require a minimum of 4 to 6 hours of direct sunlight daily for best growth. Anything less and the plants have difficulty producing enough food. Tree shade also affects light quality, so the turf grows weak and spindly, making it easier for foot traffic to kill it. Creeping Charlie, violets, moss, and algae often invade shaded areas as the turf dies.

A shaded site often means moderate temperatures, reduced air movement, and extended wetness on grass leaves, which favors the development of fungal diseases. Weak turf is very susceptible to fungal infection.

In well-drained sites, tree root competition for water and nutrients can cause severe thinning or turf death. Surface roots can displace turf, but root pruning is not recommended as it can injure or kill a tree.

Despite these problems, grass can be grown in somewhat shady sites. Depending on the severity of the situation and the degree of turf quality desired, one or more of the following options may be needed.

Change the general turf management.

- Mow the grass at the higher end of the proper mowing range to maintain greater leaf surface area to absorb sunlight and provide more cushioning under traffic.
- Use less fertilizer than on the rest of the lawn. Apply on the same schedule, but use half the rate.
- Avoid excessive traffic. The turf is already weak and unable to grow back vigorously after damage.

Reestablish the turf using a more shade-adapted grass.

- Fine fescues (creeping red, Chewings, and hard) are fairly shade-tolerant and do well in dry soils.
- Plant rough bluegrass (*Poa trivialis*) or supina bluegrass (*P. supina*) in shaded sites where the soil is moist. Note that these two grasses can spread to other parts of the lawn.

Prune trees and shrubs. Any tree branches lower than 10 feet should be removed to increase early morning and late afternoon light and to increase airflow. Entire trees may need to be removed if there are multiple trees.

Remove the turf. If all else fails, remove the grass and plant shade-adapted groundcovers or other plants. Another option is to fill the area with wood mulch.

Using pesticides

Although a healthy, dense lawn can often be maintained without the use of herbicides, fungicides, or insecticides, in many cases pesticides provide the most efficient means to manage pests. This is especially true with regards to weed control, and herbicides make up the vast majority of lawn pesticide applications in Wisconsin.

Insecticides in Wisconsin are most commonly applied to manage white grubs, which feed on turfgrass roots. If white grub damage has not been observed in a lawn in the past, preventative applications are probably not needed.

Fungicides are rarely required on Wisconsin lawns because most fungal turfgrass diseases found here don't kill the plants, which often recover once environmental conditions change.

Note that pesticides should only be used when necessary, and that you should read the pesticide label carefully prior to use. Failure to follow the directions listed on the pesticide label is a violation of federal law.

Conclusion

A properly maintained lawn offers curb appeal, environmental benefits, and a safe place for kids and pets to play. While lawns vary in maintenance requirements, no lawn is maintenance-free. Mowing and fertilizing are the two most important practices for maintaining a lawn. A lawn cut at the proper height and frequency with a sharp blade will set the stage for a healthy lawn. Regular fertilization, whether with organic or synthetic options, will help keep the grass growing to outcompete weeds.

Understand the grass options for wet and dry shade, and keep in mind that some levels of shade are too intense for any grass. Often factors like too much shade or a compacted soil prevent the lawn from achieving its full potential. Address soil compaction by annual core aeration in the fall or by adding compost to build up the root zone over time. With proper establishment and care, a healthy lawn is within every gardener's reach.

Resources

Wisconsin Horticulture publications are available at hort.extension.wisc.edu.

FAQs

How do I keep the grass from dying where my dog has urinated?

The high salt content in the dog's urine is killing the lawn in spots. Dumping a bucket of water to dilute the urine immediately after is one solution. Training the dog to pee in a non-turf area is probably more effective, or walk the dog outside of the yard.

My soil is poor quality and compacted. What can I do?

Try core aerating every fall and topdress in the spring and fall with compost.

What can I do about dandelions, clover, and creeping Charlie?

Apply a broadleaf herbicide in late fall after the first frost. Fertilize the lawn as least twice a year to keep the grass thick and discourage weeds. Creeping Charlie, also known as ground ivy, is usually a sign of too much shade.

How can I get rid of crabgrass in my lawn?

Apply a pre-emergent herbicide in the spring when the forsythia is in full bloom, when the soil temperature is between 50 and 55° F. Keep your grass healthy to reduce future outbreaks.

Lawns, practice exam questions

1. **Which grass species is the least suitable for the average Wisconsin home lawn?**
   a. Kentucky bluegrass
   b. Fine fescue
   c. Zoysia
   d. Perennial ryegrass
2. **Which does NOT describe core aeration?**
   a. Can be followed with an application of compost
   b. May help correct soil compaction
   c. Is best done in mid-summer
   d. Helps break apart the thatch layer
3. **Leaving grass clippings on the lawn when mowing:**
   a. Builds the thatch layer
   b. Increases phosphorous run off
   c. Is equal to one fertilizer application
   d. Promotes development of powdery mildew
4. **When growing grass in the shade you should:**
   a. Double fertilizer application rates
   b. Overseed with warm season grass varieties
   c. Prune nearby trees and shrubs to increase light and air flow
   d. Cut the grass shorter than normal
5. **Pre-emergent herbicides are effectively applied to lawns for crabgrass control:**
   a. Before crabgrass seeds germinate
   b. Anytime crabgrass is actively growing
   c. When crabgrass just begins to set seed
   d. Late fall, in order to prepare for spring
6. **When selecting a turfgrass for a shade area, what cultivar is best for Wisconsin?**
   a. Bluegrass
   b. Fine fescues
   c. Bentgrass
   d. Bermudagrass
7. **Recommended weekly mowing height and water requirements necessary for good lawn growth are:**
   a. Mow at a height of ½–1″ and provide ½″ of water
   b. Mow at a height of 1–1 ½″ and provide ¾″ of water
   c. Mow at a height of 2½–3″ and provide 1″ of water
   d. None of the above
8. **Which species is an undesirable grass for a Wisconsin lawn?**
   a. Kentucky bluegrass
   b. Fine fescues
   c. Bentgrass
   d. Perennial ryegrass
9. **When deciding whether or not to water your Wisconsin lawn, which statement is FALSE?**
   a. In many cases, lawn watering is unnecessary, except maybe when planning on hosting a garden party
   b. Frequent irrigation may discourage deeper root growth
   c. Fertilizing with a high K product during a period of drought will reduce water stress
   d. It is generally best to water your lawn early in the morning
10. **Which method is the least effective to control moles in a home lawn?**
    a. Fumigation of tunnel with a gas cartridge
    b. Poisoned peanuts and grains used as baits
    c. Reduce grub populations in the lawn
    d. Trapping

Answer key
1. (c) 2. (c) 3. (c) 4. (c) 5. (a) 6. (b) 7. (c) 8. (c) 9. (c) 10. (b)