



Growing grass in shade

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Growing grass in shade is a challenge for many homeowners. A number of factors make it difficult to keep shaded grass healthy: there's not enough light for normal plant growth, shade-related diseases more easily affect grass plants that are already weakened from lack of light, and grass must compete with tree roots for water and nutrients. Competition with tree roots is particularly a problem where compacted or poorly drained soils cause shallow rooting or where the trees are naturally shallow rooted, such as silver maple.

To successfully grow grass in the shade, you'll need to use different management practices from those you would use to grow turf in full sun. This publication outlines recommended management strategies and suggests alternatives for areas where grass just won't grow.

Selecting grass species

Turfgrass selection is the most important factor in maintaining a healthy lawn. Planting the right species can mean the difference between a lawn that thrives and one that languishes or dies despite your best care. For example, Kentucky bluegrass, a popular species, grows poorly in shaded areas. Fine fescues are well adapted to shade but cannot tolerate heavy traffic. Supina and rough bluegrass perform well in dense shade, but only if planted in moist areas.

One key to maintaining turf in shaded conditions is to select a seed mixture that combines several shade-tolerant species and uses two to four varieties of each species. Some species survive because they grow acceptably at low light levels while others sur-

vive because they have better disease resistance. Combining species and varieties helps to ensure that no one disease or climatic event will wipe out the entire stand.

The best seed mixture for your site depends on the amount of moisture available. Table 1 lists suggested seed ratios for dry and moist areas; table 2 describes the characteristics of each species.

Most sod is a blend of Kentucky bluegrass varieties and is not suitable for shaded sites. If using sod, look for sod containing both Kentucky bluegrass and supina bluegrass or fine fescues for shaded sites.

For details on how to care for new seedings, refer to Extension publication *Lawn Establishment and Renovation* (A3434).

Table 1. Suggested seed mixtures for shaded sites.

Dry shaded sites	Moist shaded sites
≥ 50% fine fescues ≤ 40% Kentucky bluegrass ≤ 15% perennial ryegrass	≥ 20% rough bluegrass ≥ 10% supina bluegrass ≤ 40% fine fescues ≤ 40% Kentucky bluegrass ≤ 15% perennial ryegrass

Symbols ≥ = greater than or equal to; ≤ = less than or equal to

Table 2. Relative shade tolerance and characteristics of turfgrass species.

Common name	Botanical name	Shade tolerance	Characteristics
Fine fescues			
Creeping red fescue	<i>Festuca rubra</i>	Excellent	Fine fescues are highly recommended. They perform best in dry, shaded sites although they can be used in moist, shady sites. They do not tolerate traffic and are slow to fill in bare areas.
Hard fescue	<i>Festuca longifolia</i>	Excellent	
Chewings fescue	<i>Festuca rubra</i> v. <i>commutata</i>	Excellent	
Tall fescue	<i>Festuca arundinacea</i>	Good to excellent	Seldom recommended for home lawns due to coarse leaf texture.
Bluegrasses			
Supina bluegrass ^a	<i>Poa supina</i>	Excellent	Rough and supina bluegrass should be planted in moist sites only. Both species fill in bare areas quickly. Supina bluegrass should be cut to 2½ inches or it will become thin and thatchy. Kentucky bluegrass is a poor choice for densely shaded sites. Some cultivars are marketed as shade tolerant (America, Chateau, Explorer, Glade, Nuglade, Princeton 105, and SR 2000 ^b). These varieties perform better than other Kentucky bluegrass cultivars and are less susceptible to powdery mildew. However, they are still less shade tolerant than fine fescue, rough bluegrass, and supina bluegrass.
Rough bluegrass	<i>Poa trivialis</i>	Good	
Kentucky bluegrass	<i>Poa pratensis</i>	Poor	
Creeping bentgrass	<i>Agrostis palustris</i>	Good	Not recommended for use in lawns due to intensive management requirements and invasiveness.
Perennial ryegrass	<i>Lolium perenne</i>	Fair	Quick to germinate. Will prevent other grasses from establishing if used at rates above 15–25% in seed mixes.

^aSupina bluegrass has management needs that differ somewhat from those of other shade grasses. For details, refer to Extension publication Supina Bluegrass for Lawns, Golf Courses, and Athletic Fields (A3759).

^bThis list of shade-tolerant cultivars is based on data from the 1995–2000 Kentucky Bluegrass National Turfgrass Evaluation Program 1997 results. All cultivars were commercially available in 2001.

Caring for established lawns

Fertilizing

Turf grown in the shade requires fewer nutrients than turf grown in full sun. Apply no more than 2 lb nitrogen per 1,000 ft² per year to turf in the shade. This is about half the typical rate for turf in full sun. Higher rates of fertilizer will weaken the turf or go unused by the plants. Refer to table 3 for recommended fertilization dates and rates.

Use a fertilizer that has 25–50% of the nitrogen listed as slow release, slowly available, or water insoluble to extend the availability of nitrogen between applications.

The fertilizer grade or analysis is designated on the front of the bag by three numbers that are always listed in the same order: nitrogen, phosphorus, and potassium. Examples of common turf fertilizer analyses are 26-4-12, 32-3-4, and 15-2-3. These have a high proportion of nitrogen because that is the nutrient usually needed most by the turf. Phosphorus, represented by the middle number, is usually needed only in small amounts, if at all.

Have the soil tested every 3 years to determine if additional phosphorus or potassium is required. For advice on how to take representative soil samples and where to send them for analysis, contact your county Extension agent or see Extension publication *Sampling Lawn and Garden Soils for Soil Testing* (A2166).

When establishing a new lawn in the shade or when a soil test indicates phosphorus levels are low, use a starter fertilizer (such as 13-25-12) that contains a high percentage of phosphorus. If potassium levels are low, use a fertilizer that has a ratio of potassium to nitrogen that is between 1:1 and 2:1. One example is 26-4-12, although usually any fertilizer sold as a “winterizer” or “late season” turf fertilizer will do.

The amount of fertilizer you’ll need to purchase will depend on the analysis. For a fertilizer that contains about 25% nitrogen (such as 26-4-12), one 50 lb bag will treat 12,500 ft² if applied at a rate of 1 lb nitrogen per 1,000 ft².

The fertilizer spreader settings suggested on the bag by manufacturers are for 0.9–1.0 lb nitrogen per 1,000 ft². For detailed information

on calculating and applying fertilizer, refer to Extension publications *Lawn Fertilization* (A2303) or *Calibrating and Using Lawn Fertilizers and Lime Spreaders* (A2306).

Trees should be fertilized separately from turf. Apply fertilizer for trees deep into the soil, below the turf roots. For further information on fertilizing trees, see Extension publication *Caring for Your Established Shade Trees* (A1817).

Mowing and traffic

The recommended cutting height for most grass growing in the shade is 3–4 inches. This is slightly higher than the recommended height of 2½–3½ inches for grass grown in full sun. For lawns with shady and sunny areas, set the mower to 3–3½ inches to accommodate both. Supina bluegrass is the exception to the higher mowing height recommendation—in shady sites it should be cut to 2½ inches.

Cutting grass shorter than the recommended height weakens the plant by leaving less leaf tissue available for photosynthesis. This is particularly important for grass grown in the shade because they already have relatively few leaves.

When mowing grass, it’s best to remove no more than one third of the leaf at a time. For shaded grass, mow when it’s 4–5 inches tall. Removing more than one-third of the leaf causes root shock which temporarily stops root growth and weakens the plant.

If possible, limit the amount of traffic on heavily shaded grass as it is slow to recover from physical damage. The 3–4 inch mowing height also helps protect the plant’s growing point by leaving more leaf tissue, reducing the damage caused by traffic.

Table 3. Suggested fertilization periods and rates for Wisconsin lawns grown in shade.

Maint. level	Fertilizer application dates	“Holiday schedule”	Rates (lb/1,000 sq ft)
Low	mid- to late October	Halloween	½
Medium	late May/early June	Memorial Day	½
	early to mid-July	Fourth of July	½ ^a
	early September	Labor Day	½
High	late May/early June	Memorial Day	½
	early to mid-July	Fourth of July	½ ^b
	early September	Labor Day	½
	mid- to late October	Halloween	½

^aSkip this application if 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.

Growth regulators

Plant growth regulators can significantly improve the quality of grass grown in the shade. They work by slowing leaf elongation, which leaves more food available for root growth. Compare the dark, lush foliage and dense roots of the treated plants to the pale, thin foliage and scant roots of the untreated plants.



Trinexapac-ethyl, an effective growth regulator, is available to professional lawn care and landscape companies.

Irrigating

Lawns that contain supina bluegrass or rough bluegrass should receive 1 inch of water per week unless the soil is still moist. Fine fescues, Kentucky bluegrasses, and perennial ryegrass will usually need only $\frac{1}{2}$ inch of water per week in shady areas.

The soil type will affect how much water is needed. Sandy soils hold less water than loam and clay soils and will need to be irrigated more frequently. Use less water (about $\frac{1}{2}$ inch per application) on sandy soils, as these cannot hold as much water as other soils.

A deep soaking is better for plants than frequent, light irrigations. Frequent watering encourages shallow rooting of both grass and trees, making them more susceptible to drought stress.

To determine how long to leave the sprinkler in place, set coffee cans under the sprinkler and time how long it takes for them to fill to the recommended amount. Most sprinklers take about 2 hours to apply 1 inch of water.

Water in the morning to give the grass a chance to dry during the day. Irrigating in the late afternoon or early evening prolongs the period of leaf wetness which increases the possibility of disease.

Diseases

Even if sunlight is sufficient for growth, shaded turf may still die or be weakened by one of several diseases. Shade moderates temperature extremes, reduces wind movement, and increases relative humidity. It also increases the length of time leaf surfaces remain wet from dew, rain, or irrigation. These conditions favor the growth of many fungi that cause turf diseases. For all turf disease problems, the best long-term solutions are to plant shade-tolerant turfgrasses and to change the environment by pruning trees to increase light and air movement.

Powdery mildew is one of the most common diseases of turf in shade. The whitish, powdery growth of the fungus is easily seen on affected leaves. The fungus lives only on the surface of the leaf and can easily be rubbed off. Powdery mildew does not kill the turfgrass directly, but heavy infections can

completely block light from the plant, causing it to die. Kentucky bluegrass is more susceptible than other grass species. Some fungicides are labeled for control of powdery mildew but are not worth applying because the powdery mildew will come back within 7–28 days. Avoid watering in the evening.

Microdochium patch, also called pink snow mold, is another common disease of shaded areas. The fungus grows best in cool, moist conditions and can occur throughout the growing season in Wisconsin. The mycelium of this fungus occasionally form small mats within the turf that have an off-white to slightly orange cast, especially around the edges. Severe infections will kill the turf. Fungicides may be used, but the best option is the same as for all diseases in the shade: prune trees to allow more light and air movement.

Other diseases that may affect turf grown in the shade include leafspot (also called Helminth or Helminthosporium), rust, and many others.

For turf disease diagnosis and control recommendations, refer to Extension publication *Turf Diseases of the Great Lakes Region* (A3187). Or send a sample to the Turfgrass Disease Diagnostic Lab at the O.J. Noer Research and Educational Facility, 3101 Highway M, Verona, WI, 53593-9537; phone: 608-845-2535. There is a charge for diagnosis; call for pricing information.

Moss

Moss indicates unfavorable growing conditions for grasses. Moss does not crowd out lawn grasses, but grows in areas where grass has died. Excess shade and poor fertility are the most common causes of moss in lawns. Before you can successfully establish turfgrass in mossy areas, you'll need to change

Alternatives to grass

Some areas are just not conducive for growing grass: there may not be enough light, too many tree roots may be growing near the surface, or too much foot traffic may be killing grass plants. Whatever the cause, it may be better to consider alternatives to grass in such areas than to continue trying to establish a lawn. For high-traffic areas, use shredded bark or small stones. For other areas, consider planting shade-tolerant groundcovers. The chart below lists plants that grow well in the shade.

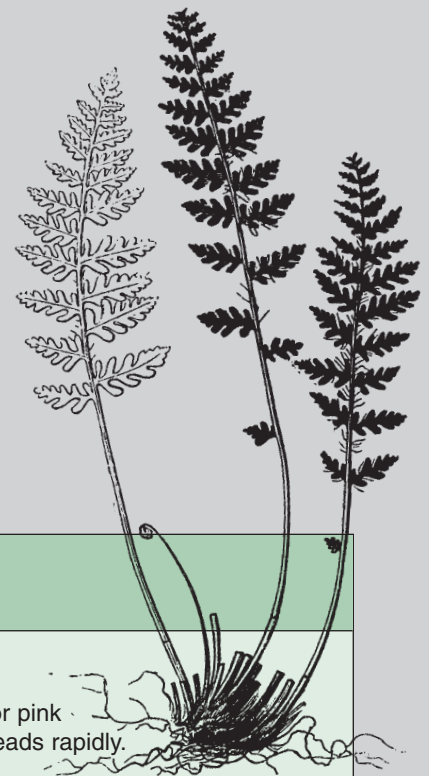


Table 4. Shade-tolerant groundcovers.

Common and botanical names	Height (inches)	Characteristics
Evergreen groundcovers		
Bugleweed (<i>Ajuga reptans</i>)	4–6	Moist soil; blue, white, purple, or pink flowers in spring; creeping; spreads rapidly.
English ivy ‘Bulgaria,’ ‘Hebron,’ and ‘Thorndale’ (<i>Hedera helix</i>)	6	Not hardy in northern Wisconsin; protect from winter wind and sun; creeping, climbing vine; spreads rapidly.
European wildginger (<i>Asarum europeum</i>)	6	Rich soil; round, evergreen leaves.
Japanese pachysandra (<i>Pachysandra terminalis</i>)	6–8	Moist soil; not fully hardy in northern Wisconsin; shelter from winter wind and sun; upright spreading.
Periwinkle (<i>Vinca minor</i>)	3–6	Moist, rich soil; blue or white flowers in May; creeping.
Purpleleaf wintercreeper (<i>Euonymus fortunei</i> ‘Coloratus’)	12–18	Not fully hardy in northern Wisconsin; shelter from winter wind and sun; leaves turn purple in winter; spreading.
Deciduous groundcovers		
Barren strawberry (<i>Waldstenia ternata</i>)	4–6	Prefers partial shade; herbaceous ^a ; yellow flowers in spring; creeping.
Canada wildginger (<i>Asarum canadense</i>)	6	Needs rich soil; very cold hardy; large, heart-shaped, herbaceous leaves; spreading; native to Wisconsin.
Dwarf bushhoneysuckle (<i>Diervilla lonicera</i>)	36	Very cold hardy; tolerates full shade and dry soil; new growth is bronze colored; small yellow flowers in early summer; suckers.
Fern (many species)	8–48	Needs moist rich soil; herbaceous; spreading; some species native to Wisconsin.
Hosta cultivars (<i>Hosta</i>)	6–36	Needs moist, rich soil; very cold hardy; green, blue, gold, or variegated herbaceous leaves; white or lavender flowers.
Lily of the Valley (<i>Convallaria majalis</i>)	6–8	Moist soil; very cold hardy; dark green herbaceous foliage; small, fragrant white flowers; spreading.
Spotted deadnettle (<i>Lamium maculatum</i>)	6–8	Needs moist soil; not hardy in northern Wisconsin; variegated herbaceous foliage; pink or white flowers in June.
Sweet woodruff (<i>Galium odoratum</i>)	6	Needs moist, rich soil; herbaceous; fragrant foliage; white flowers in spring; spreads.

^aStems and leaves of herbaceous groundcovers die back in winter and regrow in spring.

the environment to provide sufficient light, and proper moisture and fertility for turf growth.

Remove moss by raking or by applying a chemical to kill it. A few small patches of moss may be pulled out of the ground by hand or by raking. For large areas, a chemical treatment may be more efficient. Liquid dishwashing soap is effective at killing moss with little harm to the turf. Use 4 ounces in 2 gallons of water for every 1000 ft² of turf area and apply until runoff. Using higher amounts of this mixture will kill the grass. Wait several days until the moss has turned yellow or brown, then break up the moss in the area with a rake or vertical mower (dethatcher). Remove as much of the moss as possible. Once the soil has been exposed and loosened, the area can be raked smooth and new turfgrass established. Refer to *Lawn Establishment and Renovation* (A3434) for additional information.

Lime is sometimes incorrectly recommended for moss control. If the soil pH is less than 6.0, then lime may help increase the pH and improve conditions for turf growth. Usually the soil pH is adequate in shaded sites and liming will not improve the turf growth substantially. More often the site is too shady or too moist for good turf growth and other corrective measures are needed.

Managing shade trees

Prune trees to increase light and air movement. One way to improve turfgrass growth in shady areas is to prune trees to allow more sunlight through. Remove limbs of deciduous trees to at least 10 feet above the ground. While this advice is usually appropriate for deciduous trees, conifers may lose their appeal when the lower branches are removed.

Pruning will increase the amount of light the grass receives and it will increase air movement, reducing the risk of disease. Pruning is most effective when only a single tree is involved; it may not be as effective when many trees are shading an area.

Use proper pruning techniques to minimize potential tree diseases. Consider hiring a professional to prune large trees, or you may lose the tree to damage or disease caused by improper pruning. For information on pruning techniques, see Extension publication *Caring for Your Established Shade Trees* (A1817).

Remove fallen leaves. The sunny days and cool temperatures of autumn offer ideal growth conditions for turf. If fallen leaves cover grass during this important growth period, the plants will not be able to make and store enough energy to survive the winter. Always remove or mulch mowed fallen tree leaves throughout autumn. If mulch mowing, be sure the leaves are mulched finely enough so they fall into the turf and do not cover the blades of grass.

Protect tree trunks and roots when mowing. Physical damage to tree trunks or roots creates entryways for disease pathogens which may weaken or kill the tree. To prevent damage from mowers or string trimmers, consider mulching around the base of the trunk and over shallow roots. Before mulching, pull the grass out by hand or use a nonselective herbicide such as glyphosate (Roundup or Kleenup) to kill the grass.

References to products in this publication are for your convenience and are not an endorsement or criticism of one product over other similar products. You are responsible for using chemicals according to the manufacturer's current label directions. Follow directions exactly to protect the environment and people from chemical exposure.

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