Selecting and Managing Lawn Grasses for Shade

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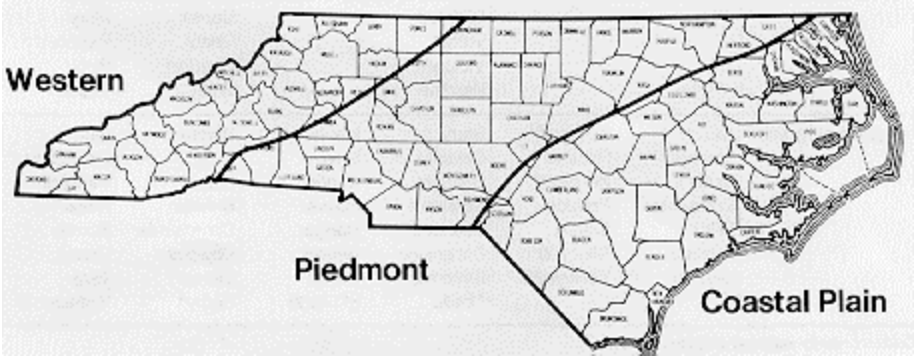
Turfgrass, trees, and shrubs are desired in most landscapes because they are attractive and useful. Unfortunately, growing turfgrasses in the presence of trees and shrubs can be a formidable task because each plant group competes with the other for the light, water, and nutrients that are essential for survival and growth. The desired effects of trees sometimes make it difficult to grow turf. When trees and shrubs are used to provide screening and privacy, the reduced wind movement and sunlight often increase the chance for disease. Even so, homeowners can take steps to improve the performance of a lawn growing in shade.



Problems Associated with Shade

Tree leaves can substantially reduce the amount and quality of sunlight reaching the turfgrass. Food reserves of plants growing in very dense shade are typically drained, resulting in weak plants. Shade varies with the season, the characteristics of the trees, and where they are located on the lawn. Maples, oaks, and beeches are examples of trees with dense canopies that intercept most of the light. Some evergreens such as firs and spruces have very dense canopies but affect small areas of turf because of their narrow canopy. Pines, poplars, ashes, and birches produce a more open shade than maples and oaks. Areas with an understory, or with trees close together, cast very dense shade. Leafless deciduous hardwood trees can block out nearly 50 percent of the sunlight in the winter, whereas the same trees in full leaf can block nearly 95 percent of summer sunlight.

Shrubs and shallow-rooted trees such as willows, maples, and beeches compete strongly with turfgrasses for nutrients and water. In clay soil, most of the shade trees' feeder roots grow in the upper 8 inches where turfgrass roots grow. Competition extends past the trees' drip zone, since roots can grow a considerable distance beyond this point. Reduced amounts of light, nutrients, and water produce succulent, weak turfgrass plants. They are slow to establish and are susceptible to insects, disease, and environmental stress. They are less able to withstand traffic than plants grown in full sunlight.

Environmental conditions associated with shade favor some diseases. Poor wind movement and reduced sunlight moderate the temperature and increase the relative humidity in shady areas. As a result, foliage remains wet for extended periods. Although dew forms less frequently in shaded than sunny locations, it lasts longer because the trees hinder drying. Wet foliage encourages disease development, and thus it is important to select disease-tolerant turfgrasses. **Return to Main Index**

Strategies for Managing Lawn Grasses in the Shade

Modifying the Environment. Turfgrasses will not grow in very heavy shade or under dense leaf cover. If an area gets less than 50 percent open sunlight or less than 4 hours of sunlight per day,

it is much too shady for turfgrass to grow well. Consider removing selected trees, especially if existing trees are too close together and removing them will not detract from the landscape design. Use ground covers such as English ivy, ajuga, liriope, and pachysandra as well as pine bark and needles, crushed stone, and woodchips as an alternative to turf when shade is excessive. These ground covers are more attractive than a thin, dead lawn. For more information, refer to Extension Service publication AG-75, Ground Covers for North Carolina, available from your county Cooperative Extension Service Center. A turffree zone at least 2 to 4 feet in diameter around a tree can improve the growth rate of small plantings by minimizing competition between tree and turf roots for nutrients and water.

Removing tree limbs up to a height of 6 feet and cutting out unnecessary undergrowth will enhance wind movement and reduce the potential for disease. Selective pruning of the tree's crown will open the canopy and allow more light to reach the turfgrass. Removing dead and diseased limbs can enhance the health and appearance of the tree if pruning is done selectively and with care. Avoid severe pruning.

Tree-root pruning also aids in lawn performance, but care must be taken not to injure desirable trees. Maples, beeches, oaks, and certain evergreens are very sensitive to extensive root pruning. Roots should be cut cleanly, and no more than 40 percent of the functioning roots should be removed at one time. Supplemental irrigation and fertilization help reduce the harmful effects of root pruning.

The depth of shade within the dripline of a tree can result in soil erosion, exposing surface roots. Willows, elms, and maples are notorious for their surface roots. One temporary solution is to cover these surface roots with 3 to 4 inches of mixed topsoil and organic matter. Shade-tolerant ground covers can be established in these areas to give a pleasing appearance and minimize mowing problems.

Proper tree selection and placement can help minimize turf loss. Trees with dense canopies, shallow root systems, or both, such as willows, poplars, ashes, and certain maples, should be avoided in favor of more desirable species such as oaks, sycamores, and elms. Contact your county Cooperative Extension Service Center for a list of the shade trees that perform best in your location.

Grass Selection. Using shade-tolerant cultivars is important when growing turfgrass in partial shade. Mixtures of tall fescue in combination with shade-tolerant cultivars of Kentucky bluegrass (80 percent and 20 percent by weight, respectively) are the best choices in most locations where cool-season grasses can be grown. (See Table 1) The addition of a fine fescue, specifically cultivars of hard fescue, is beneficial in areas that will receive little maintenance. A mixture of 80 percent tall fescue, 10 percent Kentucky bluegrass, and 10 percent hard fescue by weight seeded at 6 pounds per thousand square feet is recommended. Other fine fescues, such as certain cultivars of creeping red and chewings fescues that perform well under low light intensities in other states, are thinned by disease in North Carolina. Perennial ryegrass and Sabre rough bluegrass (Pea tnvialis) have also performed poorly in shade trials in North Carolina.

Do not permit leaves to accumulate on the new lawn. As leaves fall, they become layered and create a mat that blocks light, air, and water movement. Remove leaves frequently until the grass is established. Some seedlings may be torn out by the rake; however, more seedlings will be lost if the leaves remain.

In general, warm-season grasses often suffer more winter injury in shaded areas than in open, sunny locations. St. Augustinegrass is the most shade-tolerant of the warm-season grasses, followed closely by zoysiagrass. Both Emerald and Meyer varieties of zoysiagrass are more widely used in North Carolina because they tolerate cold better than St. Augustinegrass. Centipedegrass and bahiagrass perform well under light pine-tree shade but are not as shade tolerant as St. Augustinegrass and zoysiagrass. Bermudagrass is the least shade tolerant of the turfgrasses and should not be considered for use in shady areas. Table 1 and table 2 list shadetolerant grasses and grass mixtures. Figure 1 shows the boundaries of the three areas of adaptation in the state.

Cultural Practices. Keep in mind that shade-tolerant grasses prefer sunny locations. Lawns grown in the shade must be managed more carefully because they are often weaker than turf grown in full sun. Cultural practices must be altered to help ensure survival and enhance performance. Mow grasses at the top of their recommended mowing height range to promote deep rooting and to leave as much foliage as possible to manufacture food for the plant. (See Table 1)

Lawn grasses grown in the shade should generally be fertilized at the same time as turf grown in the sun, but at a lighter rate. (See Table 3) Lawn fertilization is not harmful to trees and shrubs and may actually be beneficial. Fertilizers associated with turf, such as 12~-8 and 16~-8, can help to meet the requirements of trees and shrubs, thus preventing a nutrient deficiency. (Nutrient status can be confirmed by submitting a soil sample to the NCDA Soil Testing Laboratory in Raleigh.) If the trees require more nutrients than can be supplied by the turfgrass fertilizer, apply additional fertilizer by soil injection or drill coring to reduce the amount of area affected and minimize the potential for turf injury or loss. Keep track of the total amount of fertilizer applied to a given area so the total recommended amount for any plant is not exceeded. Overfertilization may occur if different people are responsible for the trees, shrubs, and lawn.

Irrigate the lawn deeply and infrequently to encourage deep rooting of trees and lawn grasses, reduce soil compaction, and minimize the time that the foliage is wet. Wet foliage promotes disease development.

Remove accumulating leaves frequently from a young lawn. The tender seedlings cannot stand long periods without adequate air, light, and water. Once the lawn is established, and if the mat is not too thick, the leaves can be mulched with a lawn mower. The mulch will decay and add organic matter to the soil. However, if the cover is too heavy, it is best to remove the leaves.

Weed Control. Mosses (small green plants with leaves arising from all sides of a central axis) are very competitive in cool, moist, shaded locations-for example, on the north side of buildings and in wooded areas. Conditions favoring the growth of mosses are low fertility, poorly drained soil, acidity, frequently wet soil, soil compaction, excessive thatch, or a combination of these

factors that lead to thin, weak turf. Physical or chemical removal provides temporary control unless growing conditions are improved. Moss can be controlled with copper or ferrous sulfate sprayed at 5 ounces per thousand square feet in 4 gallons of water. Applying concentrated amounts (10 ounces per thousand square feet) of ferrous ammonium sulfate when the moss is damp offers another means of control. Applying 5 to 10 pounds of ground limestone per thousand square feet before reseeding helps to inactivate the copper sulfate, which may be toxic to seedlings. Physical removal of the moss by raking may be needed to allow for recovery.

Because crabgrass and goosegrass seed usually need high light intensity to germinate, preemergence herbicides are not required in heavily shaded areas. Be careful when applying broadleaf weed controls because some herbicides can injure trees and shrubs by root uptake or spray drift. Read and follow all label directions carefully.

Disease Control. Powdery mildew, brown patch, leafspot, and melting out are the major turfgrass diseases associated with shade. Powdery mildew is particularly severe on Kentucky bluegrass; however, most shadeadapted cultivars exhibit good tolerance to this disease. Brown patch is often associated with tall fescue, whereas leaf spot and melting out are associated with Me fescue, St. Augustinegrass, and Kentucky bluegrass. (See Cooperative Extension Service publications AG-360, Diseases of Warm-Season Grasses, and AG-361, Diseases of Cool-Season Grasses, for a description of the symptoms of these diseases and suggested management practices for minimizing development and damage.) Planting improved, shade-adaptable lawn grasses and using good cultural practices can help reduce damage from diseases. A blend or mixture of improved, adapted coolseason grasses, rather than a single cultivar, can help reduce the potential of turf loss from disease.

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Table 1. Principal Lawn Grasses Grown in North Carolina in Shaded Conditions

Lawn Grass	Shade Tolerance	Seeding Rate (lb seed per 1,00.0 sq ft)	Cutting Height (inches)	Region of Adaptation'
Kentucky bluegrass2	Good	1.5	2 to 2.5	W, P
50% Kentucky bluegrass and 50%fine fescues	Good	1.5+1.5	2 to 2.5	W. P
10-20% Kentucky bluegrass and 80-90% tall fescue	Good	1+5	3 to 4	W. P
10% Kentucky bluegrass, 80% tall fescue,	Good	1+5+1	3 to 4	W. P

and 10% fine fescue				
Tall fescue	Good	6	3 to 4	W. P. CP'
St. Augustine grass	Excellent	-4	2.5 to 3.0	P. CP
Centipedegrass	Fair	0.25 to 0.5	1.0	P. CP
Zoysiagrass	Fair	-4	1.0 to 1.5	P. CP

1. W = western P = Piedmont CP = coastal plain.
2. Adapted to western and Piedmont regions but performs best at higher elevations.
3. Marginal performance expected in the coastal plain. Good air drainage and low traffic is necessary for persistence.
4. St. Augustinegrass and centipedegrass are usually planted vegetatively (plugged, sprigged, or sodded).

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Table 2. Shade-Tolerant Cultivars

Kentucky Bluegrass	Tall Fescue	Fine Fescue	St. Augustinegrass	Zoysiagrass	Centipedegrass
A-34	Adventure	Aurora hard	Raleigh	Belair	Common
America	Apache	Biljart hard		Cashmere	
Bristol	Arid	Reliant hard		Emerald	
Columbia	Bonanza	Scaldis hard		Meyer	
Enmundi	Falcon	Spartan hard			
Glade	Finelawn I	Waldina hard			
Georgetown	Houndog	Highlight			
Midnight	Jaguar	chewings			
Mystic	Kentucky	Jamestown			
Nugget	31	chewings			
Ram I	Mustang	Pennlawn			
Sydsport	Olympic	creeping red			
	Rebel				
	Rebel II				
	Trident				
	5GL				

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Table 3. Suggested Maintance Fertillization for Lawns

Lawn Grass	Monthly Application Rate(lb N/1,000 sq ft)[1]												Total Lb N/1,00 sq ft/year
	J	F	M	A	M	J	J	A	S	O	N	D	
Kentucky Bluegrass		1/2							1		1		21/2
Kentucky Bluegrass + fine fescue		1/2							1		1		21/2
Kentucky Bluegrass + tall fescue		1/2							1		1		21/2
Tall fescue		1/2							1		1		21/2
St. Augustinegrass					1/2	1/2		1/2	1/2				2
Centipedegrass[2]						1/2							1/2
Zoysiagrass				1/2		1/2		1/2					1/2

[1]Mulitply by 43.5 to convert to a per-acre basis. Follow table suggestions in the absence of soil test recommendations to the contrary. Use a complete (N-P-K) turf-grade fertillizer with a 3-1-2 or 4-1-2 analyais (for example, 12-4-8 of 16-4-8) in which one-fourth to one-half of the nitrogen is slowly available.
Dates suggested are for the central piedmont. For the west, dates may be one to two weeks latter in the spring and earlier in the fall. For the east, they may be one to two weeks earlier in the spring and later in the fall. [2]Centipedegrass should be fertilized very lightly after establishment. An additional fertilization in August may enhance performance in coastal locations. Do not apply any phosphorus unless suggested by soil test results.

Intergrated Pest Management

The Sensible Approach to Lawn Care.

Many pest problems can cause your turf to look bad-diseases, weeds, insects and animals. If you are really unlucky, you may have all of them at one time.

So what do you do? Use a pesticide? Or make changes in cultural practices? Both methods, and some others as well, may be needed. The balanced use of all available methods is called INTEGRATED PEST MANAGEMENT (IPM).

The idea is simple. It urges the use of all available prevention and control methods to keep pests from reaching damaging levels. The goal is to produce a good turf and minimize the influence of pesticides on man, the environment, and turf.

IPM methods include:

1. Use of best adapted grasses.
2. Proper use of cultural practices such as watering, mowing, and fertilization.
3. Proper selection and use of pesticides when necessary.

Early detection and prevention, or both, will minimize pest damage, saving time, effort, and money. Should a problem occur, determine the cause or causes, then choose the safest, most effective control or controls available.

When chemical control is necessary, select the proper pesticide, follow label directions, and apply when the pest is most susceptible. Treat only those areas in need. Regard pesticides as only one of many tools available in lawn care.

To learn more about integrated pest management, pest identification, lawn care, and proper use of pesticides, contact your county Cooperative Extension Center.

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