



Growing Turf Under Shaded Conditions

Excessive shade is one of the most commonly encountered barriers to achieving a vigorous and attractive lawn. In order to grow turf under shaded conditions, it is necessary to understand both the detrimental effects of shade as well as cultural practices that can be used to minimize those effects.

Although buildings and other structures may shade turf, trees are generally the most common cause of shade. The most obvious impact of shade is a reduction in the amount of light available to the turf. Grasses, like all green plants, convert light energy into carbohydrates via a process known as photosynthesis. These carbohydrates serve as the building blocks and energy source for plant growth and development. Thus, if a plant does not receive enough sunlight to manufacture sufficient 'food' (carbohydrates), its vigor and growth will be reduced.

In addition to reducing the total amount of light available, tree shade also severely limits the amount of useful light reaching the turf. All wavelengths of light are not equally effective in photosynthesis. Green plants absorb (and use for carbohydrate production) primarily orange, red, and blue light while reflecting mainly green and yellow (not very effective in photosynthesis). Therefore, the majority of light reaching shaded turf is likely to be light that has filtered through the tree canopy and is low in those wavelengths most valuable in photosynthesis and carbohydrate production.

Aside from altering the light reaching the turf, trees also produce surface roots that compete with the grass for nutrients and water. This competition further inhibits the grasses' ability to grow and maintain a desirable condition. Exclusion of rainfall by tree canopies can dispose shaded turf to drought stress, a situation that is often overlooked when assessing shade effects. Increased relative humidity and decreased air circulation in wooded areas favors the development of turfgrass diseases such as powdery mildew and encourages moss and algae problems.

Given the adverse conditions produced by excessive shade, it is no surprise that maintaining quality turf under shaded conditions is a difficult proposition. Fortunately, cultural strategies exist which can reduce the detrimental effects of tree shade.

Tree Management -- Since trees are the primary cause of shade, intelligent tree management practices are essential to minimize shade problems. Consider removing trees that do not contribute meaningfully to the landscape design. Pruning tree limbs below eight to ten feet can often substantially improve the amount of morning and afternoon sunlight reaching the turf. In addition, selective thinning of the tree canopy itself will allow more photosynthetically useful light to reach the turf. Shallow rooted trees such as willow, maple, cottonwood, sweetgum, etc. should be avoided if possible in order to minimize nutrient and water deficits due to root competition.

A program of tree fertilization can be initiated to provide for the tree's requirements thus reducing competition with the turf for available nutrients. Fertilization may be accomplished using injection equipment beneath the



tree canopy.

Tree management practices such as pruning, thinning, and fertilization can be harmful to a tree if carried out improperly. Consultation with a certified arborist is advisable before undertaking work on valuable trees.

Shade Tolerant Turfgrasses - When establishing turf under shaded conditions, species and cultivars possessing good shade tolerance should be chosen. The fine-leaved fescues (hard fescue, chewings fescue, creeping red fescue) as a group are generally well adapted to shaded conditions. Although widely used throughout the northeastern U. S., only a limited number of Kentucky bluegrass cultivars possess adequate shade tolerance to provide a quality turf under heavy shade. These tolerant cultivars include, Bensun, Birka, Brisol, Eclipse, Glade, Nuggett, and Touchdown. Most species of tall fescue also exhibit moderate to good shade tolerance. Rough bluegrass is quite tolerant of shade, but its use is limited to moist, fertile soils not subjected to heat, drought, or traffic.

Turfgrass Management -- In order to provide increased leaf tissue for photosynthesis, mowing height should be maintained as high as practical in shaded areas (2.5 - 3 inches). Timely removal of leaves and grass clippings also improves the supply of sunlight to the turf.

Nitrogen fertilization is usually reduced in shade compared to turf grown in full sun in order to avoid stimulating growth that further reduces the plant's carbohydrate levels.

Watering should be practiced infrequently to minimize disease potential. Deep watering (to a depth of 6 inches) is desirable to encourage deep rooting of the turf.

In summary, competition for light, water, and nutrients are the principal reasons for poor turf under shaded conditions. Any actions which can minimize this competition may improve turf quality. It is important to realize that situations exist where there is simply too much shade to support adequate turfgrass growth. In these cases, an attractive shade tolerant ground cover or alternative landscaping should be considered.

Adapted from "Lawns – Growing Turf Under Shaded Conditions" by Dr. Richard J. Cooper, Turfgrass Specialist, Department of Plant and Soil Sciences, University of Massachusetts, Amherst, MA 01003-0099.

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