
GROWING TURF UNDER SHADED CONDITIONS

In order to grow turf under shaded or partially shaded conditions, it is necessary to understand both the detrimental effects of shade as well as cultural practices which can be used to minimize those effects.

REDUCTION OF LIGHT

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 the 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), 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 useful for 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 which has filtered through the tree canopy and is low in those wavelengths most valuable for photosynthesis and carbohydrate production.

ROOT COMPETITION

Aside from altering the light reaching the turf, trees also produce surface roots which compete with the grass for nutrients and water. This competition further inhibits the grasses' ability to grow, and a turf of desirable quality can be very difficult to maintain. Exclusion of rainfall by tree canopies can dispose shaded turf to drought stress, a situation which is often overlooked when assessing shade effects. Increased relative humidity and decreased air circulation in sheltered areas favor the development of turfgrass diseases such as powdery mildew and also 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. Decline of turf growing under trees may occur gradually over a number of years. As trees grow, their canopies become wider, thicker and denser, and their roots increase in mass and spread. Consider removing trees and shrubs which do not contribute meaningfully to the landscape design. Pruning tree limbs which grow at heights below eight to ten feet can often substantially improve the amount of morning and afternoon sunlight reaching the turf. Also, selective thinning of the tree canopy itself will allow more photosynthetically useful light to penetrate to the turf. Planting of shallow-rooted trees such as willow, silver maple, cottonwood, sweetgum, etc. should be

avoided if possible in order to reduce nutrient and water deficits due to root competition and to avoid future impediments to mowing.

A program of tree fertilization can be initiated to provide for the tree's requirements thus reducing competition with the turf for available nutrients.

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 selected. The fine-leaf fescues (hard fescue, Chewings fescue, creeping red fescue) as a group are generally better adapted to shaded conditions. Creeping red fescue is the most shade tolerant of these. 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.

Rough bluegrass, *Poa trivialis*, is quite tolerant of shade, but its use is limited to moist, fertile soils not subjected to heat, drought, or traffic. *Poa trivialis* does not mix well with other turfgrasses, however. If chosen for a specific location, it should be planted by itself.

TURFGRASS MANAGEMENT PRACTICES

In order to provide increased leaf tissue for photosynthesis, mowing height should be maintained as high as practical in shaded areas (2.5 - 3.5 inches). Timely removal of fallen tree leaves and other debris also improves the supply of sunlight to the turf. A general guideline for nitrogen fertilization is to reduce the rate by half in shade (compared to turf grown in full sun) in order to avoid stimulating growth that further taxes the plant's carbohydrate levels. Watering should be practiced infrequently to minimize disease potential. Infrequent but deep watering (to a depth of 6 inches) is desirable to encourage deep rooting of the turf.

Thin lawns may need to be overseeded every year or every other year to maintain a dense turf. New seedings or overseedings in this case are best done in early to mid-spring, as soon as soil temperatures reach 50°F, rather than in late summer-early autumn. In the spring more sunlight is able to reach the ground through bare tree canopies, or through canopies with very young leaves, than later in the season when leaves are fully expanded. 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 may be a more appropriate choice.

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