GROWING TURF IN SHADE

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INTRODUCTION

Turfgrasses, like all plants, need light to grow. However, many turfgrass areas in a landscape may not receive ideal levels of sunlight due to the shading effects of trees, shrubs and buildings. Shaded turfgrass is affected by many pathological, and physiological factors such as (1) reduced light quantity and quality, (2) tree root competition for nutrients and water, (3) a microclimate that favors disease activity, (4) succulent leaf tissue, and (5) reductions in shoot density, root growth, and carbohydrate reserves. (Beard 1965, 1973; Schmidt & Bleser 1967; Wilkinson et.al. 1975)

MANAGEMENT OF SHADED TURFGRASS

Several turfgrass cultural practices can be modified in shaded areas to enhance grass performance. It is recommended that mowing heights be raised as high as possible to provide maximum leaf area for light absorption. Increased mowing heights will also increase the depth of turfgrass rooting and helps to maintain turf density. Water should be applied when necessary meaning that it is not desirable to stress the already weakened turf by underwatering but it is also not desirable to keep the area continuously wet because this will promote disease activity. Excessive N fertilization should be avoided because N applications encourage shoot growth over root growth which will place further stress on carbohydrate reserves. Excessive N can also increase tissue succulence which increases disease susceptibility and decreases the ability of turf to withstand environmental stress. Traffic should be minimized in shaded areas because wear tolerance is reduced. Fungicides and herbicides may also be necessary when disease or weed problems become severe. Under very low light levels it may not be possible to establish a suitable ground cover with any turfgrass species. In these situations an evergreen or deciduous ground cover may be more suitable and in extreme shade bark, woodchips, or inert material such as pumice, rock or gravel may be needed.

MODIFICATION OF SHADE ENVIRONMENTS

A number of researchers have shown that it is possible to modify the shade environment to improve conditions for turfgrass growth (Dernoeden, 1986; Duble, 1985; Smith & Rieke, 1986; Wilkinson, 1974). Selectively pruning limbs within the tree canopy can increase the sunlight reaching the turf. Selective pruning is particularly effective with trees which have a dense canopy such as maples and oaks. The lower limbs of trees should be removed to a height of 3m. This will allow direct sunlight to reach the turf during the early morning and late afternoon. Shrubs in a shaded area can prevent wind movement and increase air stratification. The lack of air movement in shaded area increases relative humidity which can increase disease activity. Therefore, when possible dense shrub plantings should be thinned in relation to the prevailing winds to improve air movement.

Shade and ornamental trees that are deep rooting and have open canopies should be selected. Before establishing turf under trees, tree feeder roots should be pruned to a depth of 10cm. When establishing cool-season grasses under deciduous trees fall planting and the lower end of the recommended seeding rate should be used. This allows for the longest period of sunlight reaching the young turf.

SHADE-TOLERANT TURFGRASSES

A ranking of the relative shade tolerances of the major cool-season turfgrasses is presented in Table 1. Differences between cultivars within cool-season turfgrass species have also been reported (Smalley, 1981; Wood, 1969; Wu et al., 1985). A listing of some reported shade-tolerant varieties within each species are presented in Table 2.

Table 1. Relative shade tolerance of cool-season turfgrasses.

Tolerance	Species
Excellent	Fine fescues
Good	Creeping bentgrass
	Colonial bentgrass
	Roughstalk bluegrass
	Tall fescue
Fair	Perennial ryegrass
Poor	Kentucky bluegrass

Adapted from Carrow and Petrovic, 1992

Table 2. Shade tolerant cultivars

Species					
Fine fescue	Colonial bent	Roughstalk bluegrass	Tall fescue	Perennial ryegrass	Kentucky bluegrass
Hard fescue	All*	Laser	Apache	Elka	A-34
Aurora		Sabre	Arid	Gator	Glade
Reliant			Falcon	Cowboy	Fylking
Spartan			Jaguar	Palmer	Eclipse
SR-3000			Mustang	Pennant	Midnight
			Olympic	Repell	Nugget

Chewings		Pacer	Birdie II	Bristol
fescue		Rebel	Birka	Center
	Rebel II		Adelphi	
Enjoy		Trident		America
Shadow				Mystic
Victory				Ram I
Red				
fescue				
Flyer				
Fortress				
Pennlawn	*no variatal comparisons available			

Adapted from DiPaola, 1990

By mixing several turfgrass species many shade disease problems can be reduced. Mixed stands help check disease outbreaks that would quickly move through monostands. Using mixtures will also improve the overall turfgrass quality in a landscape, containing shaded areas, because the species most suited for a particular environment will predominate.

The Fine fescues mix well with Kentucky bluegrass and provide a good shade–tolerant mixture under the growing conditions present in Michigan. A good mixture would contain 70:30 Kentucky bluegrass:Fine fescue by weight or in areas with higher levels of shade a 60:40 ratio of these two species could be used.

CONCLUSIONS

A number of management options have been presented which will help in establishing and maintaining turfgrass in the shade. However, the best way to manage turfgrass in shaded areas is to utilize shade tolerant cultivars and include these cultivars in mixtures and blends because ultimately this is the best way to deal with varying environmental conditions in any landscape.

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