

2002 RUTGERS Turfgrass Proceedings



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This publication includes lecture notes of papers presented at the 2002 New Jersey Turfgrass Expo. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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CULTURAL MANAGEMENT SOLUTIONS FOR SHADE PROBLEMS ON TURF

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Management solutions for turf problems can involve a number of practices that can typically be grouped into four broad categories including (i) the use of adapted turfgrass species and varieties, (ii) maintenance of soil quality (health), (iii) practice of sound mowing principles, and (iv) judicious use of irrigation. Other approaches can also be adopted in a management plan; however, the effectiveness or cost of these approaches often provides diminishing returns and can limit adoption for many businesses.

THE SHADE PROBLEM

Many cool season turfs perform well with intermittent (partial) shade; however, turf performance can suffer once full exposure to sunlight becomes less than 4 to 5 hours per day. An understanding of the turfgrass species and varieties being grown as well as the specific cultural management techniques being used are necessary to improve turf growth and shoot density in shaded environments.

Species Adaptation to Shade

Fines fescues are the preferred cool season turfgrass species for sites that have intensely shaded environments and are not excessively damp. The fine fescues are a group of turfgrass species that include hard fescue, Chewings fescue, and strong creeping red fescue. Many varieties of each species are available. Three of the best performing hard fescue varieties are Berkshire, Minotaur, and Chariot. Shadow II, Ambassador, and Longfellow II are three varieties of Chewings fescue that typically perform well. Cindy Lou and Jasper II are two of the best performing varieties of strong creeping red fescue.

Tall fescue is a species known for its heat and drought tolerance, but it is often overlooked for its

tolerance to moderate shade. Three of the better varieties of tall fescue include Plantation, Millennium, and Rembrandt. Kentucky bluegrass is difficult to establish especially in the shade, therefore sodding will be the most effective method to establish bluegrass in moderate shade. Varieties reputed to tolerant to modest shade include Able I, America, Bristol, Eclipse, Glade, Ram I, 1757, Touchdown, and Warren's A-34.

Perennial ryegrass is not adapted to shaded environments. Although perennial ryegrass will emerge rapidly from seed, it will not persist under moderate to intense shading during the summer. Therefore, use of perennial ryegrass in shaded environments will require annual autumn overseeding to maintain some turf cover from the autumn to early spring period.

Establishment in Shade

Late summer or early autumn is the best time to establish or overseed a site. This will provide the new plants with the longest period of direct sunlight (time between leaf fall and initiation of new leaves in the spring). Immediate removal of fallen tree leaves is especially important for good seedling or sod establishment in these locations. Irrigation will be needed during dry autumn weather to ensure that establishment of the new plants occurs before trees initiate new leaves in the spring.

Mowing Principles

The mowing height should be no less than 2 to 2.5 inches, otherwise the turfgrass plants will not have enough leaf area for photosynthesis (carbohydrate production). Take precautions (train personnel) to minimize damage of shaded turf from traffic. For example avoid mowing at high speeds and using ag-

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gressive turns that can tear leaves and uproot plants. Recognize the turf growing in a shaded environment will be more susceptible to wear injury because of the greater succulence of tissue in reduce light. Once the turf is damaged, it will be slow to recover from traffic injury because of the low photosynthetic capacity in the shade.

Irrigation Management

Irrigation, if practiced, should apply water deep into the soil and only when needed to avoid keeping the turf canopy from being persistently damp. Irrigation should wet the upper 6 inches of the soil profile. Applying water only when needed will reduce the environmental conditions needed by foliar disease pathogens.

Match the rate of irrigation to the infiltration rate of the soil. This will improve efficiency of irrigation and minimize the time that water is present on leaves. Recognize that light, frequent irrigation under trees is more likely than infrequent irrigation to stimulate surface root activity of the trees, and thereby increase root competition with turfgrass plants.

Fertilization

Late summer and early autumn is the most effective scheduling of fertilization because it provides

plant nutrition during the longest period of direct sunlight (leaf fall to initiation of new tree leaves in spring). Avoid excessive nitrogen fertilization, particularly in the spring, because excessive nitrogen will increase carbohydrate depletion as well as plant succulence in the shade. Use deep-root feeding of trees rather than surface fertilization. Surface fertilization of trees is likely to provide too much nitrogen for the turf and it may not be properly timed for the turf. Surface root fertilization of trees is especially undesirable for low nitrogen fertility grasses like fine fescues because it results in over-fertilization of the fine fescue turf.

Modification of the Shaded Environment

The shaded environment can be modified in many situations making it more suitable for turf growth. Pruning of lower limbs, especially for isolated trees, will improve light exposure on the turf under the tree canopy. For large groups of trees, selective removal of limbs in the canopy of trees will allow more diffuse sunlight to reach the turf below. Removal of dense shrub barriers may be useful in some cases. This will permit better circulation of air and drying of leaf surfaces of plants in the understory of trees. Drier leaves may reduce the severity foliar diseases on understory plants. Pruning of shallow tree roots may be needed in cases where elimination of tree root competition will allow shallower rooted plants to grow more vigorously without added inputs.