TURF PAVERS: WEAR PROTECTION WITH AWARENESS OF SPECIAL CARE

By Robert C. Shearman, Turf Specialist, Department of Horticulture, University of Nebraska

Turfs exposed to vehicular traffic are subject to wear injury and compaction stress. The severity of turfgrass injury in heavily trafficked conditions depends upon the traffic type and intensity, turfgrass species or cultivar used, environmental conditions, and the cultural practices employed. Turf managers should select wear and compaction tolerant grasses and employ cultural practices that enhance the ability of turfs to grow under these conditions. In addition to these aspects, physical factors that protect the turfgrass plant from wear and compaction injury may also be used to help turf persist in heavily trafficked areas.

Paver complexes (i.e. concrete, brick, and plastic materials) have been designed as physical support systems for turf growing in areas such as parking lots, firelanes, and golf car paths, where traffic stress may be a problem. Paver complexes are designed to allow the turfgrass plant to grow in void areas while the crown or growing point of the plant are protected from traffic injury by placement below the paver surface or by waffle-like protrusions on the paver surface.

One of these turfgrass-paver complexes was tested at the University of Nebraska Turfgrass Research Facility located at Mead, Nebraska. The paver complex was tested to determine its influence on turfgrass establishment, quality, wear tolerance, and recuperative potential. Information of this nature is needed to help turf managers better understand the advantages and disadvantages of using such a system in heavily trafficked areas.

Six turfgrass species were included in this study: (1) Manhattan perennial ryegrass, (2) Merion Kentucky bluegrass, (3) Kentucky 31 tall fescue, (4) Dawson creeping red fescue, (5) Highlight chewings fescue, and (6) Fairway crested wheat-grass. These species were selected because they were commonly used in Nebraska and they covered a range of wear tolerant and intolerant species. The grasses were established in two areas, one with the paver system and an adjacent area planted in soil (Sharpsburg silty-clay loam). Once the turfs were established, they were mowed weekly at 3.0 inches; watered to prevent drought stress; and fertilized with three pounds of nitrogen (45-0-0) per 1,000 sq. ft. per growing season.

Some of the relative effects of the grass-paver complex on establishment, winter survival, and turf quality are indicated in Table 1. The grass paver complex adversely affected turf quality for Manhattan and Merion but enhanced the quality rating for Fairway crested wheatgrass. The reduced turf quality rating for Merion was primarily due to its slow establishment rate in the paver complex compared to that in the non-paver area. Merion and Fairway established more slowly in the paver complex than the soil area; while Manhattan, Kentucky 31, Dawson and Highlight established equally as well in either area.

Winter survival of susceptible grasses was adversely affected by the grass paver complex during the seedling year. The six species were establsihed in September, 1976. During the following winter, snow cover was lacking and temperatures were ex-

Turf pavers ready for topsoil and seeding in cart path.

tremely low. As a result, Manhattan perennial ryegrass and Kentucky 31 tall fescue were injured by direct low temperature injury in both the paver and non-paver areas, but injury was greatest in the grass-paver complex. Turf managers should be aware of this as a potential problem. Selecting cold tolerant species and cultivars and avoiding late fall plantings should help minimize potential problems from low temperature and desiccation injury.

Wear treatments were applied, using an 18-horsepower Cushman truckster. Each turf was subjected to 600 trips with the truckster over a four hour period. Subsequent wear injury and recuperative rates were evaluated (Table 2). Wear injury from the 600 trips was quite severe, particularly on grasses such as chewings fescue and crested wheatgrass which are wear intolerant species. The grass-paver complex improved turfgrass wear tolerance and recuperative potential for all the turfgrasses except for Merion Kentucky bluegrass. The paver system was most beneficial in helping grasses that were very susceptible to wear injury (i.e. Fairway crested wheatgrass, chewings fescue, and creeping red fescue), but it was even beneficial to those that were fairly wear tolerant. Loss in turfgrass quality (density and uniformity) associated with the paver complex was offset by its improvement in turfgrass wear tolerance and recuperative rate.

Turfgrass-paver complexes can play a beneficial role in maintaining turfgrasses that are exposed to intense traffic, particularly in areas like overflow parking, driveways, cartpaths, walkways, and firelanes. Placement of paver systems, regardless of type or construction, is extremely important. The paver must be situated so that the crown of the turfgrass plant is protected from injury. If the paver system is improperly placed, its purpose is defeated and no improvement in wear tolerance or recuperative rate will be obtained.

Turfgrass-paver complexes are not without management difficulties. Thatch accumulation and its removal could be a problem. Turf managers should select turfgrasses that have a minimum thatching tendency and use cultural practices that reduce thatch accumulation. Snow removal on paver complexes with surface protrusions can be a problem; however, float devices for the snowplow blade minimize the problem. Oil and gas spills can be a problem in parking areas, and repair of damaged areas may be necessary. Increased soil temperatures were thought to be a problem in paver complexes. However, in this study no differences were noted in soil temperatures beneath turfs growing in the paver and non-paver areas. Mowing was not a problem in either area and turfs used similar amounts of water. **WTT**

Table 1. Relative effects of paver complex on establishment, winter survival and turf quality.[1]

Turfgrass Species	Rate of Establishment	Percent Ground Cover	Winter Survival	Turf Quality
Manhattan perennial ryegrass	0	0	-	-
Merion Kentucky bluegrass	-	-	0	-
Kentucky 31 tall fescue	0	0	-	0
Dawson creeping red fescue	0	0	0	0
Highlight chewings fescue	0	0	0	0
Fairway crested wheatgrass	-	-	0	+

[1]Ratings based on + = better than, - = poorer than, and 0 = no different than turfs in the non-paved area.

Table 2. Relative effects of paver complex on wear tolerance and recuperative rate.[1]

Turfgrass Species	Wear Tolerance	Recuperative Rate
Manhattan perennial ryegrass	+	0
Merion Kentucky bluegrass	0	+
Kentucky 31 tall fescue	+	+
Dawson creeping red fescue	+	++
Highlight chewings fescue	++	++
Fairway crested wheatgrass	++	++

[1]Ratings based on + = better than, - = poorer than, and 0 = no different than turfs in the non-paved area.