

Problem solving on turfgrass fields

■ The successful management of turf subjected to high traffic requires the application of certain fundamental cultural practices. As the demand for facility quality goes up, the respective demand for turf quality also increases. At these times, cultural practices and resource input go beyond the basics.

Traffic—Turfgrass consists of three traffic components. They are compaction, wear and shear. **Wear** is the tissue injury from pressure, tearing and scuffing. **Shear** causes soil and root displacement and the dislodging of the verdure.

Compaction is a subtle effect of traffic. Traffic causes an increase in soil bulk density, soil lateral strength, total water holding capacity and lateral rooting. It causes a decrease in soil aeration, infiltration, soil temperature (compacted soils are cold and wet), root depth, and total turf roots.

Playability—Sports traffic reduces turf cover. Once this happens, playability is reduced, with a decrease in traction or footing. Traffic also causes erratic ball bounce and roll, and poor uniformity of playing characteristics.

Field safety—In the effect of reducing turf cover, sports traffic decreases impact absorption and footing, while creating a non-uniform surface. In 1984, there were more than 98,000 football injuries reported by hospital emergency rooms. No one knows how many could have been prevented by a good playing field, but their certainly were many that could be blamed on a poor one.

Species selection—Traffic tolerance of turfgrass species varies a great deal, including an often wide variability within species. Where they have been adapted, the new perennial ryegrasses have superior durability and the Kentucky bluegrasses have good ability to recover from injury. The elite tall fescues are still considered to have a coarse texture, but have proved to be the more durable species in selected climates.

Fertilizers—Traffic, durability, playability, aesthetics, recovery, ability and field safety require high vigor in turf. To get that vigor, plant nutrient requirements are high. A common recommendation for nitrogen in one pound of actual N per



Aeration can make all the difference in the world—like at Camden Yards.

1000 sq. ft. per each month of growing season. This is probably the highest practical rate for most fine turfs. The other nutrients most needed on turf are phosphorous, potassium and iron. Potassium is an important ingredient, particularly on sand and modified rootzones. Potassium applications equal to the rate and frequency of N are usually recommended.

On well-drained (eg., sandy) soils, the sports turf will require as much potassium as nitrogen.

When the soil temperature is high enough for root and rhizome growth, the total nutrition available to the plant should be high. The recommended soil pH for high traffic turf is about 6.5. At that pH level, most nutrients present in the soil will be available to the turf. If pH is too high or too low, the appropriate adjustments would be made to the soil.

Irrigation—As "quality demands" of high traffic turf increase, more attention is given to irrigation. Water stress from

drought, summer heat, or wind can be devastating to this kind of turf. Even in areas where irrigation is not common, an irrigation system will be necessary to produce a sports field capable of supporting high traffic.

Aeration—High traffic turf soils are subject to severe compaction. Hollow tine coring is the most effective technique for compaction relief of sports fields. Solid tine aeration and water jetting are used.

Because core aeration is slow, labor intensive and messy, there are practical limits as to the frequency. On loams or heavier soil, coring should be done after every fourth or fifth football game, or eight baseball or soccer games.

In youth soccer, where there may be eight games per day, it may only be practical to aerate once each month. Sandy soils need aeration to keep the surface from sealing.

Topdressing—If the field is to be topdressed, it is usually done after aerating, with hollow tines, to add a loose soil to the effective rootzone, and to help maintain a true playing surface.

Mowing—Mowing is the most common practice and must be done on nearly all turf installations. The frequency of mowing is determined by removing less than one-third of the blade length at any one time.

For example, if the mower is set to 1.0 inches, the grass would be mowed before it is 1.5 inches tall. If that takes a week, that is the proper frequency. Mower height should be measured from a hard level surface to the top of the bedknife on a reel mower and to the bottom of the blade of a rotary.

Patterns of lines, squares, and cross-hatching can be made with a skillful use of the mower. When done well, patterns leave a good impression with players and spectators, and help instill pride in the facility.

Thatch—Thatch is a layer of undecomposed organic matter. Thatch can prevent water and fertilizer from going into the soil and may also stop oxygen exchange in the rootzone, which would result in shallow roots and weak turf.

Thatch on high traffic turf is a valuable impact absorbing safety pad, and mass for wear resistance. Undesirable on most turf, thatch is an asset on high traffic turf. The players do a more than adequate job of preventing the thatch from becoming excessive.

—Steve Cockerham, Ph.D., University of California, Riverside, in "Turfgrass Topics."
(Photo by Erik Kvalsvik)