Effects of Traffic on Turfgrasses

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Vehicular and foot traffic on turfgrasses can result in major damage to turf sites, especially on high use recreational areas. Traffic problems are of four general types: soil compaction, wear, rutting or soil displacement, and divoting. Soil compaction and wear are considered the most important problems and will receive the most attention in this chapter.

Soil compaction is defined as the pressing together of soil particles, resulting in a more dense soil mass with less pore space. Wear is the injury to a turfgrass from pressure, scuffing, or tearing directly on the turfgrass tissues. The term traffic is more general in nature and includes both wear and soil compaction stresses. However, some authors have used “wear” as an inclusive term for wear and soil compaction. This terminology is unfortunate since “wear” is a direct plant injury and does not directly influence soil properties. In this review, the term traffic will be used to cover wear and soil compaction stresses where both are present.

Rutting or soil displacement is the displacement of soil particles due to pressure, which results in a rut or depression. Obviously, compaction and wear can result at the same time, but the major immediate problem would be an uneven turfgrass surface. Divots are pieces of turf removed by the action of a golf club, polo mallet or other such object striking the sod.

All four types of traffic could occur at the same time but one form is normally the predominant stress at any one point in time. With sandy soils or soils below field capacity in moisture content, wear is the dominant injury. Soil compaction often becomes a major traffic problem on soils high in silt and clay and when heavy loads are applied. Rutting occurs primarily when excessive loads are applied to a soil above field capacity in moisture content. With a thatchy turf, divoting could be a problem.

On intense use recreational sites, these stresses are most evident and a high degree of expertise is required to maintain an acceptable quality turfgrass sward. On the other extreme, a home lawn with little traffic may exhibit few,