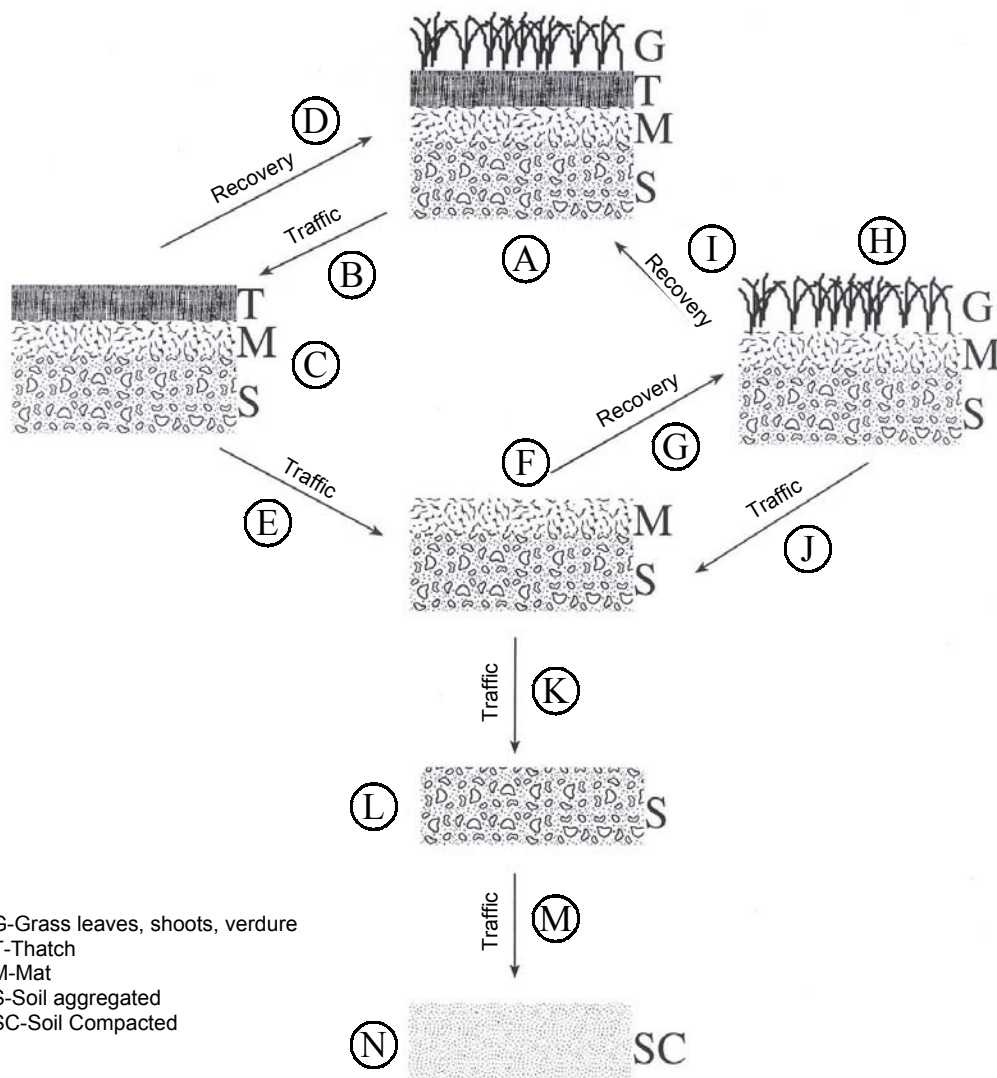


# Grass System Response to Traffic and Recovery

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G-Grass leaves, shoots, verdure  
T-Thatch  
M-Mat  
S-Soil aggregated  
SC-Soil Compacted

## Important Layers of the Athletic Field Profile

**Green Vegetation** – This is the most visible portion of the sport field profile. It is primarily composed of the sheath and blade from the grass plant.

**Thatch** – An intermingled layer of living and dead grass stems, roots, and other organic matter, found between the soil surface and the grass blades. A half to 3/4 inch layer of thatch is beneficial in high traffic areas because it provides cushion and keeps the player separated from direct contact with the soil.

**Mat** – A tightly intermingled layer, composed of living and partially decomposed stem and root material and soil from topdressing or other sources, immediately below the thatch. The mat contains crowns, rhizomes, and surface roots that quickly initiate new shoot growth. The protective layer of thatch is only regenerated as shoots die following a cycle of active shoot growth. Divots smeared with soil are an indication that the mat has been penetrated.

**Soil** – In this scenario soil represents the exposure of the sand, silt, or clay root zone material. Soils high in silt and clay become soft and muddy when wet and are easily compacted. Breaking through the thatch and mat of sand-based fields results in poor stability.

**Compacted Soil** – Continued traffic on bare soils results in aggregate destruction and soil compaction.

## Traffic Scenario

- A.** In the best case scenario there is **100% cover** from grass shoots with **approximately 3/4 inch of thatch**. Below the thatch is approximately a 1-inch mat layer containing crowns and rhizomes mixed with soil, surface roots, and thatch.
- B. Wear affects the grass part of the field system.** At the beginning of a traffic scenario the **grass leaves are worn** by crushing, tearing, and abrasion from foot traffic. Growth slows on injured shoots and eventually there is insufficient leaf elongation to produce grass clippings.
- C.** Continued traffic **removes most of the green leaves and exposes the thatch**.
- D.** Removing traffic at this time will allow leaf regeneration from crowns that are protected in the thatch and mat.
- E.** Continued traffic leads to removal of the thatch and exposure of the mat.
- F.** This is the beginning of **“breakthrough”** since some of the soil contained in the mat is exposed. Note that the soil still contains stable aggregates and soil structure remains sufficient.
- G.** Removing traffic after the thatch is removed still allows for vegetative recovery from the crowns and rhizomes that are in the mat. However, the system does not immediately recover to produce both green vegetation and thatch as described above (A). Thatch does not regenerate itself.
- H.** First the mat layer must **produce new shoots**.
- I.** As recovery continues thatch is produced when shoots mature and die, and that takes time, possibly one growing season (A).
- J.** Traffic that occurs on a system without thatch (H) quickly wears away the green shoots and once again exposes the mat (F).
- K.** As traffic continues the mat is removed and the soil is exposed. **Compaction affects the soil**.
- L. Exposed soil** leads to wet, soft, and muddy conditions.
- M.** Continued traffic leads to breakdown of soil structure.
- N.** Particle **aggregation is destroyed** by the physical grinding and shredding of the soil, especially near the surface. Organic matter decreases since there is no new production of roots, shoots, and thatch. Organic matter is a key binding agent in the process of soil aggregation.