

Managing Soil Compaction

Soil compaction is result of many actions both by man and nature, and much like insects, disease or weeds, soil compaction must be managed. Foot and wheel traffic are the two main causes of compaction. Sports fields, parks, home lawns and golf courses all experience varying levels of compaction and each year millions of dollars are spent trying alleviate the compaction.

Compaction occurs when soil particles are compressed together by excessive foot and wheel traffic. Compaction is accelerated with wet soils as the amount of pore space within the soil is decreased. Since soil and water particles are solid than air, the air is usually pushed out of the soil structure. When air is absent, the bulk density of the soil increases. Grounds maintenance personnel are under pressure to get work done, and athletic activities are scheduled whether the conditions are wet or dry. Soils take a pounding when soils are wet and it is no surprise when problems arise months and years later from compacted soils.

When soil is compacted and the optimum ratio of water to soil particles and air is distorted plant health is compromised. Compacted soils: have limited oxygen supply for roots, have less water holding capacity, allow less water to infiltrate (potentially causing increased surface erosion), limit microbial activity, decreases nutrient uptake and increases the time needed for soils to dry out.

Although compacted cannot be totally avoided, there are actions that can be taken to alleviate and reduce the amount of compaction on the typical sports field, golf course or home lawn.

- **Reduce foot and wheel traffic.** Golf courses divert cart traffic to different areas of the fairway daily to reduce compaction and wear of the turf. Practice different areas of the football and soccer fields daily to reduce wear spots and compaction.
- **Avoid wet soils.** This is easier said than done. Bearing strength decreases with wetter soils. Avoid excessive foot and wheel traffic on wetter soils.
- **Increase organic matter content.** Organic matter opens up the soil, creating more pore space, and creating a greater cushion. Mulch when possible to put back organic matter into the soil
- **Aerate.** Core aeration opens up the soil to moderately alleviate compaction. The efficacy can be increased by topdressing sand or an organic matter of some kind. For severely compacted soils, deep core aeration that extends 8 to 10 inches into the soil is highly recommended. Topdressing after deep tine aeration is very effective in stimulating root growth and increasing water infiltration.
- **Correct drainage problems.** Allowing water to properly drain can help soils to drain faster, thus allowing the soils to dry and be less prone to compaction. Aside from compaction issues in wet soils, allowing soils to drain faster corrects a host of problems as well.