

Soil Compaction

Now Is the Time to Fight It

Turf managers that handle athletic fields can prevent soil compaction with a maintenance plan including timed aerification, proper fertilization, mowing, watering and pesticide use.

by W. W. Sanderson



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It is time to spring into action against "athlete's foot." This is a suitable nickname for soil compaction of athletic fields resulting from heavy use, and is a leading cause of football players' knee injuries. The hard turf crust also hinders absorption of water, air and fertilizer.

Turf managers that handle athletic fields can prevent soil compaction by a maintenance game plan beginning with aerification in spring at least four months before pre-season drills start. In addition, the field must be aerified at least once in mid-summer and again in fall after the gridiron season ends.

Surprisingly, despite spiraling costs, a football stadium and three multi-use practice fields can be maintained for slightly more than \$20,000 annually. Properly maintained fields pay off with deep-rooted and tightly knit grass, which is resistant to wear, and firm to a player's footing. Surfaces are smooth and resilient enough to minimize injuries.

Severely compacted fields, a common occurrence when maintenance is restricted to cut costs, require more intensive programs. Badly compacted fields must be aerified monthly from early spring until three weeks before the first football game. Do not resume aerification until after the football campaign since loosened turf would be torn out more readily.

A field normally can be aerified in one-half day with a Ryan Tracaire or similar automatic equipment pulled by tractor. Aerifiers have hollow tines that remove soil cores and form tiny reservoirs where

air, water or fertilizer can collect. Pass over the field twice with an aerifier to achieve maximum results. Ground pressure ultimately closes core holes.

Let soil cores lay on the ground until partially dry. Then drag the field with a chain-link fence drag or a steel mat. Dragging will break up cores, help fill in low spots in the field, and bury crown (growing points) of the grass.

A mass of new white-colored grass roots will be visible in core holes two weeks after aerification. This helps develop a wear-resistant turf capable of withstanding heavy use. Aerification also assures a "cushioned" surface and improves infiltration to help level the field.

You can further increase playing surface resiliency, protect crowns from being damaged by football cleats and improve soil structure by top-dressing the field with peat or other organic matter. This allows soil and peat to be mixed easily during dragging and expedites breakdown of organic matter.

If there are barren spots in spring, overseed them before every home game. Cleat action will then work seed into the soil.

However, overseeding or sodding provides best results when conducted just ahead of the grasses most favorable growing period. For southern grasses this means spring. But bluegrass, fescue and bentgrass should be sodded right after the last football game.

Fertilization is another key to the field's playing condition. Fertilize at least in spring and early fall immediately after aerification to encourage penetration deep into the root zone. Spring fertilization helps grass break dormancy faster and fall applications nourish grass throughout the football season. A third application can be applied in mid-October.

Put down three to six pounds of actual nitrogen per 1,000 square feet annually no matter how many times you fertilize. Select a fertilizer high in nitrogen, low in phosphorous and medium in potassium. Suggested fertilizer analysis include 30-3-10, 18-5-9 and 22-5-8. The analysis obviously can vary depending upon soil, weather or usage conditions.

Heavy spring fertilization is suggested in the south. Heavier fall applications are favored in the north to help cool-season grasses mask over the brown.

Granular fertilizers with slow-release nitrogen sources minimize grass leaf burn (dehydration) and assure long-term feeding. Soluble forms force rapid greening and are ideal when cold temperatures limit fertilizer responsiveness. Always water after each application to avoid foliage burn.

Spring is the time to apply lime if the pH factor shows acidity below 6.0. Soil samples can be sent to county extension agents to get pH readings. The pH expresses soil acidity or alkalinity with values 7 or below falling into the acid range.

Grass grows best in slightly acid soils and lime is seldom needed in the Midwest. In contrast, soils in the south and New England, often need lime. Usually one application of 50 pounds of lime per 1,000 square feet is sufficient.

Avoid tendencies to overwater. It is better to underwater than to water too much. Saturation shortens roots and shallow-rooted grass plants are torn out easily during games or practice. Fields should be slightly dry on gamedays to allow for rain, provide fast surfaces and minimize turf damage.

Check moisture content with a soil probe after watering. Soil should be moist at least six inches deep. Don't rewater until the reservoir has been depleted. In summer, when cool-season grasses go dormant, water only if turf shows signs of wilting. Water it when grass blades turn a bluish color and begin rolling up.

No task is more mundane than mowing, but an athletic field can be damaged by improper cutting. Mow frequently enough that you never cut more than one-half the leaf per cutting. Higher mowing generally favors deeper roots, provides drought tolerance and permits fewer weeds.

Fescue and bluegrasses can be cut at 2 or 2½ inches. Southern grasses, including Bermuda and zoysia, can be cut one-half to three-fourths inches high. The ideal time to mow — especially during summer



An athletic field normally can be aerified in one-half day with automatic equipment pulled by a tractor. It restores a soft springiness to previously compacted ground by removing soil cores so air, water and fertilizer can penetrate the rootzones.

— is late afternoon when grass is dry and humidity is lower.

Pesticide application rounds out any solid athletic maintenance program. The three groups of pesticides normally used include herbicides for weed control, fungicides to fight disease and pesticides.

Crabgrass, foxtail and other annual grasses can be controlled in early spring by applying pre-emergent chemicals before germination. The application can be granular or liquid. If you fail to kill dormant crabgrass seedlings, put down two applications of a selective post-emergent (organic arsenicals) five to seven days apart. Applications will vary depending upon local conditions.

Another option is to co-exist with crabgrass until early fall by letting grass grow higher to block out sunlight needed by weeds. Infrequent watering also discourages additional crabgrass sprouting. Broadleaf weeds such as dandelions

are best treated in early to mid-summer.

Chinch bugs, grubs and sod webworms can damage turf. Leafhoppers are no threat to grass but distract players by getting in their eyes, noses and mouths. Insects can be controlled by chemicals. Apply the chemicals beyond visibly damaged areas because insects extend operations around margins of damaged turf.

Chemicals used against grubs or other below-surface insects must be applied to the surface and watered in to be effective. For above-ground insects, including chinch bugs, water the field before applying chemicals. Don't mow or water for three days and then spray again in a few weeks.

A preventive application of fungicides keeps disease in check. For example, on leaf spot in bluegrass, four applications annually can virtually eliminate damage. Preventive, rather than curative programs, are less time-consuming and costly in the long run. □