

Sports Field Aerification: Can you afford *not* to do it?

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Aerify, aerify, aerify and when you're done, aerify some more. This is the mantra we've heard for the last 20 years and longer. But what does aerification really do for the turf and for the soil? How does it help sports turf? Is there a "best" method? Is there a "best time" to aerify? Can I afford aerification? Can I afford not to aerify? These are the questions I hope to answer.

Aerification is one of the most important cultural activities you can do for turfgrass management and sports turf in particular. Let's look at what we are really asked to do for the sake of sports and how aerification can help. You, as sports turf managers, have to take care of a living, breathing (respiring), growing entity that is 35 times shorter than a six foot human and hundreds of times lighter than a 200 pound human and make it not only survive, but thrive, while being played on, tromped on, overused and abused in many ways.

We want our sports fields to play safely, look great and perform well under a variety of environmental conditions. If you can do all of the previously mentioned under these conditions, you are a genius. Before you get too disappointed and depressed, however, there are some answers, some techniques you can use to help you win the battle. While I can't address all the issues in this article, we can address one of the most important – aerification.

Aerification Basics

What does aerification really do? Essentially, aerification breaks up soil aggregates that have become severely compacted. Aggregates are soil particles that have adhered forming larger clumps or peds. A well-aggregated loamy soil, for example, will consist of 50% pore space and 50% solids. Through compaction, successive periods of wetting and drying and the chemical processes of soil particles, these aggregates become harder and denser, limiting the ability of water and roots to penetrate them and extract needed nutrients. These compacted aggregates

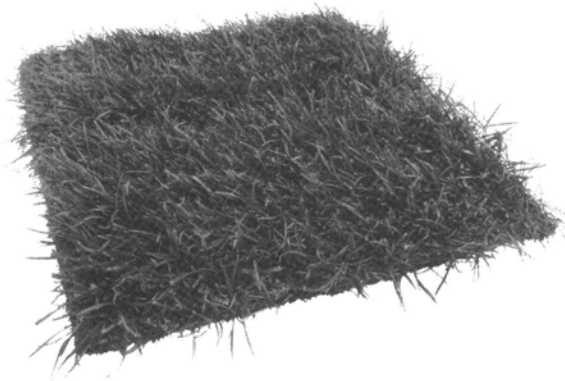
also hinder the ability of the roots to penetrate deeper into the soil where adequate nutrients and moisture may exist. So what does aerification really do?

- Relieves compaction
- Improves water infiltration
- Promotes deeper rooting
- Improves nutrient availability & uptake
- Improves toxic gas exchange
- Improves drying of the soil

Aerification also has additional benefits related to the overall health of the turf. Aerifying can be used to modify the root zone soils. By picking up or harvesting the cores during core aerification and then topdressing with a coarser material such as sand or a sand/peat mixture, you can improve the texture of the root zone soil so it is not as prone to compaction in the first place. Aerifying and topdressing or dragging in the cores can help control the thatch layer. Finally, aerification can provide one of the best seedbeds for overseeding purposes.

Impediments to a Solid Plan

With all the advantages of aerification for the development of healthy turfgrass, it's hard to imagine someone not having an aggressive aerification plan. But what about the disadvantages – there actually are some. The biggest, of



course, is the cost. The cost of equipment purchases, labour and time. But don't let this deter you. Equipment can be purchased, leased or rented, or the entire service can be contracted. Aerification is such an important practice it cannot be ignored if you want to have healthy turfgrass. Another disadvantage is that aerification can bring weed seeds to the surface and promote their germination. Finally, if done at the wrong time of the year, aerification can cause desiccation to the turfgrass around the hole and cause surface disruption which could impede play.

Sports turf management presents unique challenges in that most sports are played more intensively in pockets or concentrated areas of the field. For example,



in baseball the area in front of the pitcher's mound and the outfield position locations get more use. In football, it's the area between the hash marks and the sidelines that gets the most concentrated use and in soccer and lacrosse, it's the goal mouth. This is both a blessing and a curse. A curse is the fact that: 1) These areas are super compacted, 2) They cannot be moved from week to week in most cases, and, 3) They are overused so finding time to promote good turf growth is limited.

The blessing is that these areas are relatively small in size so what may seem like a daunting task can actually take less time and budget dollars to complete than originally anticipated. In other words, you can concentrate your efforts on the areas that need your attention the most.

Aerification Methods

Core aerification is the process by which actual cores or plugs of turf and soil are pulled up and brought to the surface. This is by far the most beneficial type of aerification for the turf. By doing this you actually decrease the bulk density of the soil. You can then drag or break up the cores allowing the soil to refill the holes in a less compacted state. You can also pick up the cores and topdress with sand (masonry sand works very well for this and is readily available but it is wise to have your soil and sand tested to determine compatibility).

The downside to core aerification is the surface disruption and the time it takes for dragging, topdressing and cleaning up but, once again, concentrating on small areas can go relatively quickly. Also, choosing smaller tine sizes can minimize the disruption; however, it will also minimize the beneficial effects you are trying to achieve. The other downside is that the surface disruption can affect play and surface stability, especially in sand based soils, so timing is very critical. Do not core aerify within two weeks of major events on your field. This will give time for the turfgrass to heal and the surface to stabilize.

Solid tine aerification simply pokes holes into the soil. This can be beneficial when there is a need to aerify during the playing season. For example, you may want to aerify after a game or event that has been played in wet conditions and you

need to loosen the surface to aid in gas exchange or water infiltration (be sure to allow time for the soil to adequately dry before aerifying). The surface disruption is much less and there is no need to clean up with solid tines. Solid tines are available in many different sizes depending upon the situation at hand. One caution, though, is that because you don't actually remove cores from the soil, repeated solid tine aerification can cause compaction at the hole depth and some evidence even suggests that glazing of the sides of the holes can inhibit water infiltration, particularly when soil moisture is high.

Water injection aerification is another valuable tool at your disposal. In this method, water is injected into the soil at 600 mph (5,000 psi). Each burst of water leaves a surface hole of less than 1/4" but can affect up to a 3" diameter of soil below the surface. Water injection aerification causes virtually no surface disruption and can even be used prior to sporting events. Water injection is used



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quite extensively in the southern portions of the United States to alleviate localized dry spots or hydrophobic soils. When managing cool season turfgrasses, water injection aerification is an excellent way to aerify during the summer months when other types of aerification may damage your turf.

Aerification Equipment

There is a plethora of aerification equipment on the market today. The type you choose will depend upon what you want to accomplish, how much ground you need to aerify, what your budget will withstand and what your current soil and turfgrass conditions are today.

Drum or towing type aerifiers are relatively inexpensive and cover a large amount of ground in a short period of time. They are available in either a pull type or three-point hitch mounted. They do an

adequate job in large open areas where the soil is not too compacted but several passes may be needed to get the spacing you want. Depth of aerification is highly dependent on soil moisture and type. Also, since the tines are mounted on a drum or roller, they have a tendency to tear the turf and disrupt the soil much more than other types.

Reciprocating aerifiers are designed so the tine enters the soil vertically. This leaves a much cleaner hole and the down pressure guarantees a uniform depth. Reciprocating aerifiers come in many sizes from walking units to large 80-inch units pulled behind tractors. Reciprocating units have a wide variety of tine sizes; some are designed to aerify as deep as 12". Walking reciprocating aerifiers do an excellent job on the smaller areas discussed earlier. They are very maneuverable, relatively inexpensive, have many tine options and are self-contained so you don't need another piece of equipment to pull them with.

Finally, there are drill type aerifiers that

use carbide tipped bits to drill a hole into the soil up to 12" deep and 1" in diameter. There are even attachments that can automatically fill the holes with topdressing material after they have been drilled. Drill type aerifiers are very expensive but there are many companies that provide this service on a contract basis.

Aerification Timing

Proper timing of aerification is important to achieve the desired results. I will address timing both in terms of the weather and in terms of which sport is played on the field. Obviously weather plays an important part in the quality of aerification. Aerifying during periods of heat and/or drought stress can negatively impact your results, especially with cool season turfgrasses. You will further stress the turf and recovery can take longer. There is also a chance of turfgrass desic-

cation around each hole. This does not mean you can not or should not aerify in the summer but it does mean you should monitor the weather closely and if you see a period when weather conditions improve, plan your aerification. You should also consider using smaller tines. Periods of drought or heat stress are also a good time to consider water injection aerification.

Late fall or early winter can also present aerification challenges. Leaving open holes can cause turf desiccation around them. On the other hand, if you drag in the cores and/or topdress, the desiccation is minimized and subsequent freeze and thaw cycles of winter can actually help loosen the soil further. Late fall aerification is often performed on football fields after the season has ended because any desiccation that may occur over winter will heal prior to the next season.

Soil moisture also plays a part in determining when to aerify. The soil should be moderately wet but not at full field capacity. If it is too wet, the cores will not break up easily and more glazing can occur. On the other hand, if the soil is too dry, the cores will break up easier but hole depth may vary and the turfgrass around the hole will be more prone to desiccation. Experience with your own soil types will be your best teacher.

Scheduling aerification with regard to sports or events on your sports fields is another challenge. For those of you fortunate enough to have separate fields for each different sport this issue is much easier. For those managing multiple-use fields, finding a time to aerify can be extremely challenging.

In general, aerifying immediately after the season or after periods of heavy use is

the best. For football and soccer, this means late fall in most parts of the country. For the spring sports of baseball and softball, this means late spring. If you have special events such as concerts, picnics or large tournaments on your fields, aerifying immediately afterward is also helpful.

Finally, with regard to timing, how many times should you aerify? This is the thousand-dollar question. Once is better than not at all. Twice is better than once and so on. Remember, however, it is not uncommon to aerify the worst areas of a sports field five or six times each year.

Aerification Strategy

Commit to a three-year aerification program to achieve maximum results. This program should be well thought out and in writing. Write a separate plan for each of your sport fields. Consider game and practice schedules (as well as when the preferred time to aerify would be) and what areas of the field you want to aerify.

Following is an aerification plan for a typical high school football field. The field is cool season turfgrass used for 18 home games and some practices in the fall and practices in the spring and late summer.

- *November (after last game)*
Aerify entire field, drag cores, seed, topdress and fertilize
- *Late April (after spring practice)*
Aerify entire field, drag cores, seed, topdress and fertilize
- *Mid May*
Aerify between hash marks, sidelines and painted end zones, drag cores, topdress

- *Early to Mid June*
Aerify only bad areas, drag cores, topdress
- *Early July (weather permitting)*
Aerify only bad areas, drag cores, topdress

Can I or Can I Not Afford to Aerify?

I firmly believe you can not afford not to aerify. It is such a powerful tool in your arsenal of weapons against field use and abuse that aerification must be a part of your overall turf management strategy. Be creative, though. If you have to rent an aerifier, do only the necessary areas. Many golf courses are willing to let schools borrow equipment because their children may go to school there. Contracting aerification services is a way to get aerification done without owning equipment.

Develop a plan of action to improve your sports fields with aerification and take that plan through the budgeting process to obtain equipment dollars. Above all, strive to make your sports fields better and safer through active turfgrass management. ♦

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