

DEEP AND SHALLOW AERATION:

MIX AND MATCH

By Matthew Trulio



Above: Aer Way PTO-driver unit from Holland Equipment.
Right: Verti-Drain deep-tined aerator at work.



Roger Bossard, head groundskeeper at the New Comiskey Park in Chicago, went “from one end of the aerification spectrum to the other” when the facility opened. The transition, says the third-generation superintendent, was no sweat. He had a plan, and he chose the right equipment to implement it.

“At the old Comiskey, I used a tremendous machine, an Aer Way deep aeration unit from Holland Equipment, because the field was built on clay and silt, and it took a lot of work to get any kind of a percolation rate,” Bossard recalls. “I’d use it eight to 12 times a year, in conjunction with slicing, down to five or six inches and it would shatter the soil down to eight or 10 inches. It was amazing.”

When the new ballpark opened, he started using a Ryan Greensaire. “I changed machines because my needs changed 100 percent,” he explains. “I have a sand-cavity field now, and I don’t have any percolation or compaction problems. I probably aerify twice a year now, down to three or four inches. With soil the profile I have now, aerifying

like I used to would be overkill. The change in the program has been one heck of a switch.”

By any name—aeration, aerification, and cultivation—the keys to success in the process of tilling soil without severely disrupting its surface are site- and problem-specific evaluation and flexibility. The challenge, for the sports field manager or golf course superintendent, is choosing the right tool or tool combination for the job.

“Think about the particular conditions you’re trying to treat on the site,” advises Dr. Jim Murphy of Rutgers University’s Extension and Crop Science Department. “What problems are you trying to manage—surface compaction, sub-surface compaction, thatch? Target certain pieces of equipment to address those issues.”

Reasons To Believe

Murphy is a true believer in the necessity of regular cultivation for sports fields and golf courses, particularly greens and tees. The most commonly cited reason for aeration is compaction.

Compaction not only hampers drainage and infiltration, while decreasing root development, but in sports fields it can also create rock-hard, unsafe field conditions.

There are a number of other good reasons for regular aeration, Murphy notes, including disrupting layers in the soil and thatch control.

“With hollow tines, where you’re actually removing cores, you can help alleviate thatch,” says Murphy. “Aeration can also stimulate and rejuvenate turf because you’re severing stolons and rhizomes, which causes buds to generate new shoots. And with deep tine aeration, you can help stimulate a deep root system. I would consider deep tine aeration anything that goes below four inches. In the last five years, we’ve seen machines that go down five and six inches, and even below the one-foot level [such as the Verti-Drain and the SISIS Airdrain].”

Weighing The Options

Eric Holm, superintendent at Onodaga Golf and Country Club in Fayetteville,

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Aeration

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NY, describes his cultivation program as "traditional." Using a Core Master 12 from Greencare International, the University of Massachusetts turfgrass management program graduate aerates once in the spring and fall, in conjunction with topdressing, to a depth of 3-1/2 inches, although the unit can aerate to greater depths if needed.

Holm based his selection of the unit on several factors. He needed something PTO-driven that would be compatible with his small tractors. It had to be low-maintenance and had to be able to cover large areas quickly. Yet the most important element of the unit, Holms says, is its versatility.

"The machine has several different implements, so it can do a lot of different areas," he says. "With a lot of aerators in the past, that really wasn't conceivable. Versatility is the key. If your machine can react to a number of different situations, the more power to you."

According to Murphy, shallow aeration is most useful in areas with shallow compaction and thatch problems. However, in the case of deep layering prob-

lems, below three inches, something more extensive may be required.

"In golf courses and athletic field areas, shallow aeration does fine on the surface, but doesn't allow you to address the problems that can exist below that three-inch level," says Murphy. "Because of that, a real interest developed in loosening up the soil below the three-inch level."

Deep tine products such as the Verti-Drain, which can aerate down to 16 inches, and shatter the soil as it does, have become popular among turf managers facing deep compaction problems, Murphy notes. "The Verti-Drain is a pretty radical treatment," he says. "It can create some remarkable changes in the soil's physical characteristics."

The Role Of Timing

When to cultivate can be as important as how. Aeration during a hot, dry windy period, for example, could lead to grass plant desiccation. Ideally, Murphy notes, aeration should be performed while there is some active growth in the turf, so it can recover from any injury caused in the process.

Unfortunately, most superintendents have more than the seasons to con-

sider when scheduling cultivation. Tournaments, games, and events often play havoc with a turf manager's aeration schedule.

"A lot of people in this business are forced to aerate at times they'd rather not," reveals Jim Ferrin, superintendent of Brookside Country Club in Stockton, CA. "For us, it seems like we're always aerating during Poa annua time. We have new sand-based bentgrass greens, and we didn't want to create large holes that would lead to a Poa problem."

Ferrin's solution was to choose a Toro HydroJect 3000. The unique machine uses tiny streams of water under high pressure to punch holes and fracture the soil down to at least six inches, according to Ferrin, with minimal surface disturbance. Another water injection-type aerator, the Ryan Liquidator, will soon be introduced by Ransomes America Corporation.

"The water injection aerator is different in the sense that it's not a surface cultivator," Murphy explains. "It doesn't adversely disrupt the playing surface, but it cultivates below the surface and provides some compaction relief. It's niche, I think, is in mid-season aeration."

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Cultivation Strategies: Mix And Match

The blending of different techniques, according to the Rutgers professor, is one of the most exciting elements of aerification made possible because of advances in aerator manufacturing technology. There a number of versatile machines on the market that utilize hollow and solid tines, and have adjustable spacing, speed, depth control, and more.

"This enables the turf manager to adjust his program according to the time of year," says Murphy. "I can definitely see people using hollow tines during one portion of the year, and solid tines during another. It's very desirable to 'mix and match' aeration practices based on the particular problems a turf manager faces."

When it comes to mid-season aeration with either solid or hollow tines, Murphy recommends a "spot-treatment" approach. He suggests aerating only those areas that are affected, such as a localized dry spot on a football field or the corner of a golf green, rather than the entire area. The approach, he says, is similar to that of Integrated Pest Management (IPM) for insects and diseases, where one treats only those areas hampered by the problem, instead of using a "blanket" approach.

Considerable research has been done to determine the amount of compaction caused by aeration. Repeated, long-term aeration to a single depth has been found to create a layer of compacted soil at that depth. Yet the cultivation cure, Murphy insists, is not worse than the compaction disease.

"Creating a compaction zone below the soil surface is certainly a 'real' problem, but generally only for courses or sports fields that are 10 years old or more," he explains. "It would be unlikely for someone to cultivate enough to create that problem on a newer facility. I've had a chance to look at some older putting greens, and there is definitely a compaction layer there at three inches. Ultimately, repeated, aggressive aeration of a given area over a number of years will create a layer, but the problem is long-term."

While Murphy adds that the problem may be unavoidable "down the road," there are certain practices turf managers can use to delay it, such as varying the depth of aeration and using smaller diameter tines. Another strategy he frequently suggests is aerating when the soil is somewhat dry, as dry soil

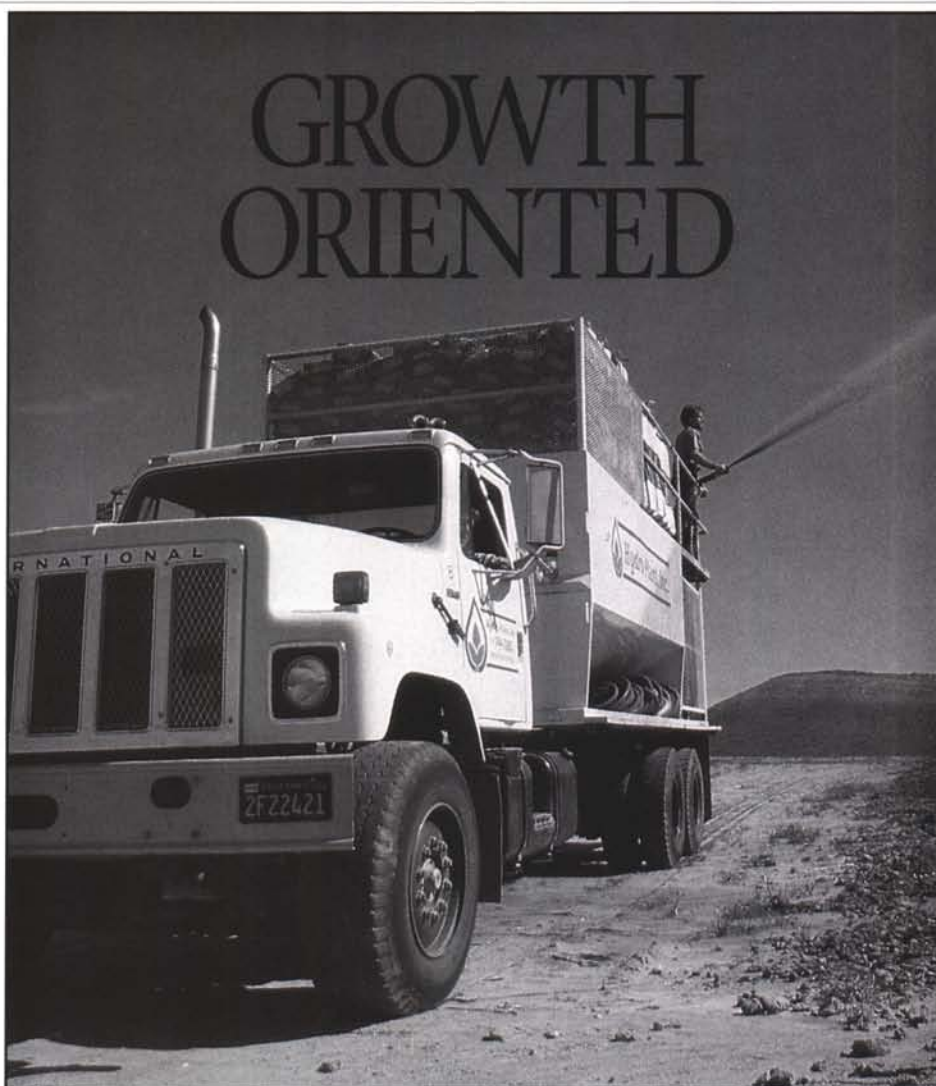
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does not compact as easily as wet soil.

"Of course, that strategy is only useful with pretty healthy turf," he says. "It would be a disaster to try that with turf that is wilting."

No aeration strategy is ever "finished," he notes. Constant observation and adjustment is vital to the long-term success of the cultivation program. Flexibility is paramount.

"Reevaluate your aeration program as time passes, because it will cause changes in the soil conditions," says Murphy. "What worked the first few times may not always work. You may have to make a shift in depth or tines, or even back off the frequency. You have to constantly reevaluate, and make adjustments along the way." □



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