

Hollow-tine vs. deep-tine aeration

Editor's note: Please send your turfgrass questions to our Management Forum panel for a quick response. Call Curt Harler at 440/238-4556; fax him at 440/238-4116 or email him: curt@curtharler.com

Q I'm a superintendent in Illinois. For years we've been told the only way to aerate in Spring and Fall was using hollow-tines (and that it isn't effective unless you remove the plugs). But in the last few years, we've seen a push to use solid, deep-tine aerators. Since all the buzz about this goes against everything we've been taught for years, I'm wondering if this push to deep-tine aeration is driven by research or marketing?

Can you tell me what research there is to support this concept. I don't want to start using this discover five years from now that I've made a mistake. What are the effects on the soil? — Illinois

Dave Kopec, turf specialist at the University of Arizona replies:

Deep-tine aeration was not designed as a replacement for standard core aerification. It simply is used for other soil/turf purposes. The standard core aerification process we all use is well suited for:

1. relieving shallow or surface compaction (less than 3 inches, or at the surface).
2. mixing soil with thatch, for helping the breakdown of thatch when the soil cores are returned to the turf as a mulch.
3. Breaking through a interface layer (two or more soil texture types) that are close to the surface (3.5 inches or less). This can occur if sod is installed.

Deep-tine aerification is used for the following conditions:

1. When you need to break through soil layers or hard pan layers that a hollow-tine or side-discharge core tine cannot penetrate. Solid tines are often used here because of the rigidity required to perform the operation (since they are longer they can penetrate to greater depth). While deep tines do come in side-discharge options, you have to

have a relatively uniform and friable soil for the tool to work best.

2. When you want to provide deep drainage where it is otherwise slow, limited or nonexistent. This is critical if the water quality of the irrigation source is salty, which may eventually cause high salt levels around the turfgrass roots. Deep tines can be used here quite well. Some units will "poke a hole" down 10 inches or more in soil. Over 95% of the working root zone of turfgrasses is going to be at 10 inches or less. So I don't think that compaction at the bottom of a 10-in. deep tine is really an issue. Besides, many machines twist and kick at the bottom of the penetration stroke, which really opens up things way down!

3. Narrow solid tines (shallow 1/4-in.) are okay to use on greens to promote surface drainage and alleviate localized dry spot type symptoms. They usually heal (cover) quickly, and the process can be performed when regular hollow tining is too disruptive, or the recuperative time from hollow tining would be unacceptable. The same tines can be used on highly trafficked collar and exit points from greens and tee boxes.

4. Both cases 1 and 2 above can use solid tines. You can use hollow or side-discharge tines when you want to bring cores to the surface (for the same reasons mentioned above that you would use standard aerification). The advantage now, is that you can take a "deeper" core.

Other words of advice:

Always look at the several soil samples to see why you are aerifying. Use a 3.0 soil core with a sharp edge, and sample in several places. If it is not satisfactory, sample with a sharp spade. The picture you find will be worth a thousand words. Then you can decide on what exactly the problem is, and if you should go with a solid or core removal type tine.