

## Deep Root Zone Modification In Fall For Better Putting Greens In Summer

By Paul Jacobs, agronomist, Northeast Region | October 20, 2017



*Drill-and-fill aeration is one of several options that can improve a putting green root zone profile beyond the capabilities of conventional core aeration.*

**D**eep root zone modification of soil-based putting greens can provide significant, long-lasting benefits and mid to late fall can be a great time to do the work. Conventional core aeration practices typically affect the upper 3 to 4 inches of the root zone profile and may not fully address internal drainage issues. Over time, conventional core aeration performed at the same depth can also leave the underlying soil compacted. Implementing a program that targets deeper portions of the root zone profile can improve internal drainage, turf rooting and overall putting green performance. Putting greens with drainage systems tend to benefit the most from deep root zone modification.

Several options exist for deep root zone modification and each has its unique benefits. While one technique may be highly beneficial in one situation, it may not be the best choice for others. Consider the following options to supplement your conventional cultivation practices:

**Drill and fill** – This process drills holes up to 12 inches deep into a putting green on 6-inch centers, removing soil and backfilling each hole with sand to create deep sand columns in the root zone profile. The process can be labor intensive, but it infuses a significant amount of sand deep into the root zone profile that provides long-lasting benefits.

- Ideal applications – Putting greens with poor internal drainage – e.g., soil-based putting greens.

Deep-tine aeration – Most commonly this process is performed with solid tines that can penetrate up to 10 inches deep. Solid tines do not remove material but they fracture, loosen and alleviate compaction in subsoils that are not reached by conventional core aeration. Deep-tine aeration generally requires no cleanup and surface disruption is minimal.

- Ideal applications – Relieving compaction in all soil types. Perform deep-tine aeration during late fall to create open columns for drainage during freeze and thaw cycles.

Sand injection – Machines can use high-pressure water to inject sand into a putting green root zone profile. The sand channels created by this process often mimic the shape of a water droplet – i.e., narrow near the top and wider at the bottom. This method does not infuse sand as deeply as drill and fill, but it is faster and much less disruptive to the playing surface. Performing sand injection immediately after deep-tine aeration will help infuse sand deeper into the profile; however, no material is removed from the profile during sand injection.

- Ideal applications – Putting greens with excess organic matter in the upper 2-6 inches of the soil profile and soil-based putting greens with a shallow – i.e., 1- to 3-inch deep – modified root zone.

Each of these practices can improve putting green performance when used in the right situation, but they are not replacements for conventional core aeration. However, implementing one of the above practices can improve drainage and alleviate compaction deep within your putting greens. For more information about which option is best for your facility, contact your regional [USGA agronomist](#).

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