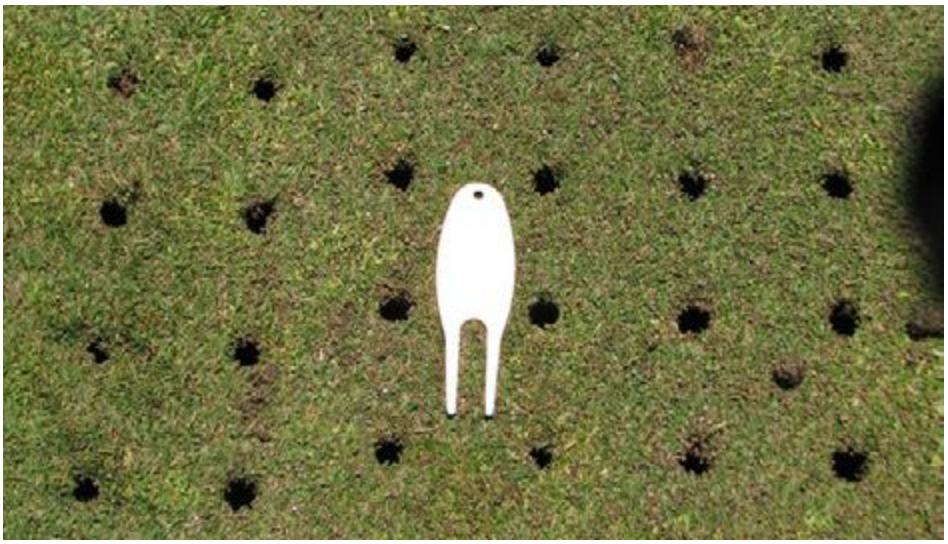
Easing the Pain of Core Aeration

Ten tips for quicker recovery.

BY PATRICK GROSS

Improperly adjusted aeration equipment can lead to tearing of the turf, damage to the root system, and prolonged recovery.

Core aerating putting greens is a lot like going to the dentist. We know it is necessary a few times each year, but we hope the experience is as quick and painless as possible. Although core aeration temporarily diminishes putting quality, the short-lived pain results in a long-term gain for turf health by reducing thatch and organic matter levels, relieving soil compaction, increasing soil oxygen levels, and stimulating healthy root growth. Golfers begrudgingly understand these benefits but wonder why it sometimes takes so long for putting greens to recover. Core aerating greens will always result in some disruption, but there are steps that can be taken to help the greens recover as quickly as possible.



Making a clean aeration hole will expedite turf recovery. The goal is to make a clean, surgical cut so that the turf heals rapidly and redirects its energy to producing new roots and leaves to fill the voids.

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The use of handheld blowers is a useful technique to clear aeration cores and debris from the green in preparation for sand topdressing.

Push brooms are one of many methods used to fill aeration holes with sand while causing less damage and abrasion to the turf.

There are dozens of methods superintendents use to aerate greens, the most popular being ½-inch-diameter hollow tines, commonly referred to as conventional coring, but there are also small, pencil-sized hollow tines, high-pressure injection of water and/or sand, large-diameter drills, and many others involving tines, knives, or blades of varying shapes and sizes. Each procedure has its own benefits, and it should be up to the superintendent to decide which method is best based on the prevailing climate, conditions, and aeration goals for a particular golf facility. For the purpose of this article, only the standard practice of core aeration using ½-inch-diameter hollow tines or larger will be discussed, along with 10 useful tips to get the maximum benefit from the procedure and restore smooth putting surfaces as quickly as possible.

1. Proper timing — This is probably the single greatest factor affecting the success of the procedure and the time necessary for recovery. Core aeration needs to be done when the turf is healthy and actively growing so greens will heal and recover as quickly as possible. From an operational standpoint, most golf facilities determine aeration dates based on a calendar so tournaments and events may be planned at least a year in advance. From an agronomic perspective, it is best to schedule core aeration based on a temperature model because soil temperature has the most influence on turf growth rate and the ability of the holes to recover quickly. For cool-season grasses like creeping bentgrass and *Poa annua*, core aeration is best performed in the spring and fall when soil temperatures are consistently above 55°F and preferably between 60°F and 65°F. For warm-season grasses such as bermudagrass and seashore paspalum, core aeration is best performed in late spring and throughout the summer when soil temperatures are above 75°F. Although it is nearly impossible to predict the weather one year in advance, historical weather records along with personal experience are helpful in determining the proper timing for core aeration. Attempting to aerate during the off-season or outside recommended temperatures can have a very negative effect on surface quality and significantly delays recovery. This is a common pitfall in northern and high-elevation climates, where the golfing season is short. As many golf facilities have experienced, attempting to aerate in the late fall when the soil is too cold runs the risk that the greens may not recover until the following May or June, depending on winter and spring conditions.

2. Fertilize three to five days before aeration — Stimulating turf growth a few days prior to aeration helps holes heal more rapidly once aeration is completed. It is best to use a soluble nitrogen source (e.g., urea, ammonium sulfate, calcium nitrate, potassium nitrate) that is readily available to the plant. Apply at a rate of ½ pound nitrogen per 1,000 square feet, followed by watering the material into the turf.

3. Irrigate to provide adequate soil moisture — The greens should be irrigated one to two nights prior to aeration to bring the volumetric soil water content into the range of approximately 30 percent for the upper few inches of the rootzone, or deeper if using longer aeration tines. Proper moisture content is not only important for healthy turf growth, it serves as a lubricant for the coring tines and helps to resist soil heaving and tearing of the turf. Excessive moisture should be avoided as it can result in wheel rutting by the aeration equipment and muddy conditions as soil cores are brought to the surface. Conversely, very dry conditions can result in shock and damage to turfgrass roots and contribute to a poor-quality aeration hole that is slow to recover.

4. Make a clean aeration hole — Proper equipment setup and an inventory of several new sets of hollow tines are essential for making clean holes. This will expedite recovery. The goal is to make a clean, surgical cut so that the turf heals rapidly and redirects

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Frequent irrigation and supplemental hand watering throughout the day for several days are typically necessary to stimulate turf recovery and prevent aeration holes from drying out too quickly.

its energy to producing new roots and leaves to fill the voids. Worn and jagged coring tines tear the turf and contribute to desiccation along hole edges, which slows recovery. The equipment should be checked and tested at least a week in advance to verify that adjustment and timing of the machine are correct and to insure that a clean vertical hole is created. Aeration tines wear down rapidly and may only last for two to three greens. The superintendent and mechanic should monitor the equipment closely throughout the aeration process so that the coring tines can be changed promptly.

5. Topdress with dry sand on a clean, dry surface — In an ideal world, the application of dry topdressing sand on a clean, dry turf surface helps the material to fill the holes as completely as possible. After the aeration cores are removed from the surface, a blower or high-pressure hose-end nozzle should be used to clear any remaining debris from the surface before applying dry topdressing sand. Dry sand moves into holes more readily, while moist sand tends to clump at the top of the aeration hole. The latter is referred to as bridging, and it requires more dragging to completely fill holes with sand. Rain or heavy dew on the day of aeration can disrupt the process and may require extra brushing, dragging, and irrigation to incorporate sand. Oftentimes, just letting the topdressing sand sit on the surface of the green for an hour or more provides enough drying so that the sand can be easily incorporated into aeration holes.

6. Fill the aeration holes completely to the surface — Partially filled aeration holes result in a bumpy surface and reduce the overall effectiveness of core aeration. The holes are going to fill up with something, and it will be more thatch and organic matter unless sand can be applied to completely fill the column. It is important to carefully set the metering device on the topdressing machine and monitor the mechanism throughout the process so that the proper amount of sand is applied to each green. Even when done properly, it is typical for sand to settle within the holes after a couple of days, leaving small depressions on the putting surface. Prepare to make a second application of sand at a lighter rate within three to five days to top off the holes and restore surface smoothness.

7. Avoid excessive turf abrasion when incorporating sand into aeration holes — Typically, a steel drag mat, brushes, or brooms are used to push sand into aeration holes. Dragging or brushing should be performed only to the point where sand has filled

Aeration tines can wear down rapidly and may only last two to three greens. Having several extra sets of coring tines and checking the equipment frequently throughout the process helps to ensure that maximum benefit is gained from the aeration process.

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the holes and turfgrass leaves are visible on the surface. Excessive dragging can cause damage and abrasion to the turf and extend recovery time. For this reason, many superintendents are now using blowers to finish moving sand into aeration holes after an initial brushing is completed. Also, it is important to note that the angularity of the sand can contribute to turf abrasion during dragging and brushing operations. It is important to work with the sand supplier and an accredited physical soil testing laboratory prior to aeration and topdressing to insure that the size and shape of sand particles are compatible with the putting green rootzone. A complete list of accredited physical soil testing laboratories can be found at the American Association of Laboratory Accreditation.

The application of dry topdressing sand to a clean, dry turf surface helps the material readily move into aeration holes. If topdressing sand is moist, allowing it to sit on the surface of the green for an hour or more often provides enough drying time.

8. Roll the greens to smooth the surface — The use of a putting green roller after aeration and topdressing helps to eliminate surface irregularities and provide reasonable putting quality. Rolling also improves mowing quality and reduces the potential for mowers to gouge or scalp tufts of grass that have been lifted up during the dragging and brushing process.

9. Let the turf grow through the sand topdressing layer — It defeats the purpose of core aeration and topdressing to put sand down one day and then mow it off the next. This is also a surefire way to ruin mower reels. For better overall turf quality and less damage to equipment, it is best to roll the greens for one to two days following aeration and topdressing and then resume mowing at 0.005 to 0.010 inches higher than the normal cutting height. It is typical for golfers to loudly complain for several days immediately after aeration, and the tendency for superintendents is to immediately resume mowing to clean the greens of any remaining sand. Such tendencies should be avoided by both golfers and superintendents. Trying to restore pristine putting surfaces immediately following aeration and topdressing largely defeats the purpose of either practice. And when putting greens do not get the full benefit of both procedures, the result is more aggressive and/or frequent cultivation treatments needed in the future.

10. Irrigate and fertilize to stimulate turf recovery — The high volume of sand that is incorporated into aeration holes can dry out quickly and induce drought stress on greens, especially in the late afternoon. Frequent irrigation and supplemental hand watering throughout the day for several days are typically necessary to stimulate and accelerate turf recovery. A follow-up application of a soluble fertilizer five to seven days after aeration at a rate of ¼ pound nitrogen per 1,000 square feet further helps speed turf recovery and get the greens back to a smooth, dense, uniform condition.

CONCLUSION

These 10 points to ease the pain of core aeration may seem obvious, but unfortunately they are often overlooked. Like any simple procedure, problems tend to occur when shortcuts are taken. Aerating at the wrong time of year, not completely filling holes with sand, and not paying proper attention to fertilizer and water applications before and after aeration are frequent mistakes. The end result is prolonged recovery, and putting greens will not receive the full benefit of the procedure. Keep in mind that despite meticulous planning, adverse weather can disrupt the process, and it is always a good idea to plan an alternate date for aeration in parts of the country where adverse weather is a concern. While golfers and superintendents never look forward to core aerating greens, following the steps in this article will make the process as painless and quick as possible.

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