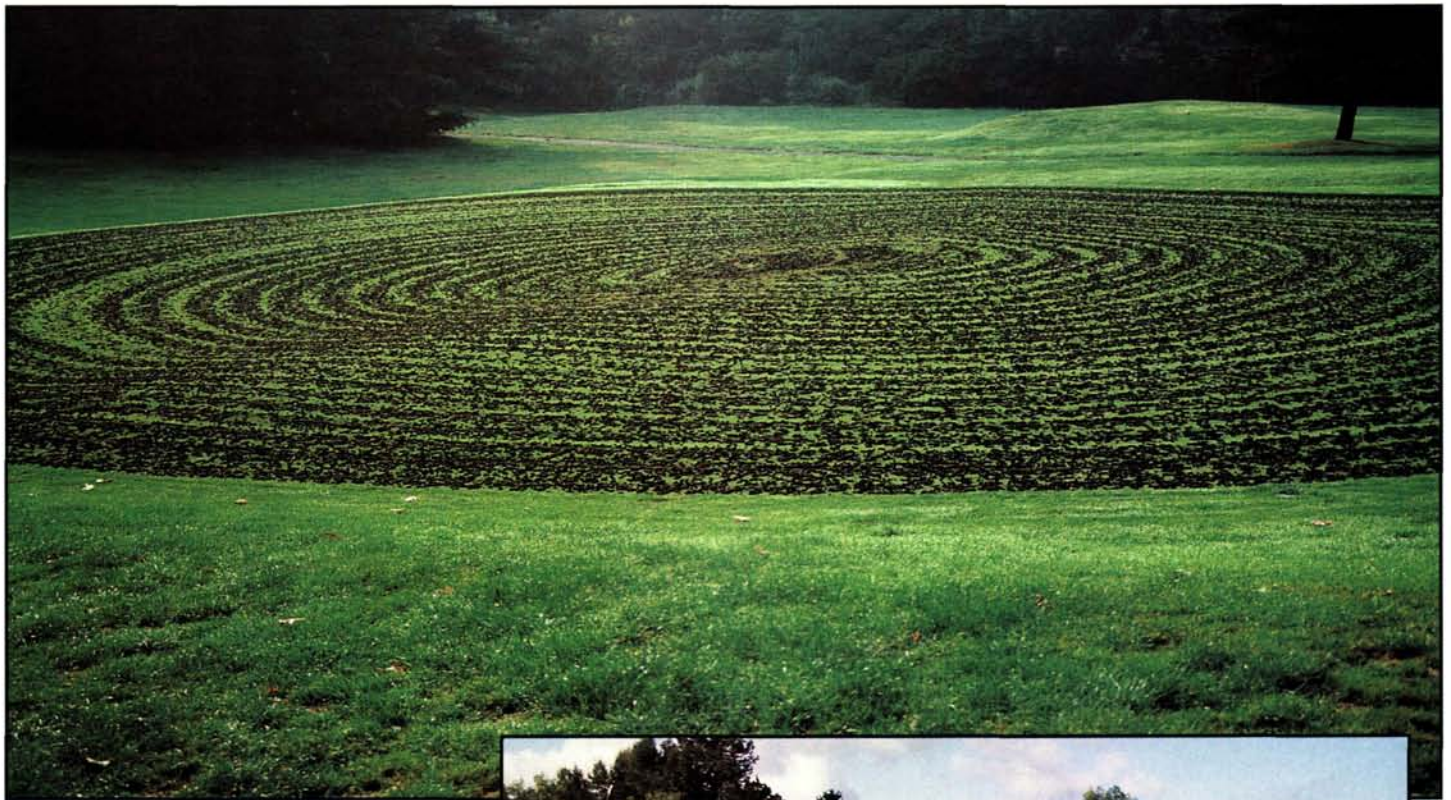


CORE AERATION BY THE NUMBERS

Explaining the need for aeration is often easier if you use specific numbers.

by CHRIS HARTWIGER and PATRICK O'BRIEN



CORE AERATION is one of the “dirty words” of turfgrass maintenance. Give a veteran superintendent a dollar for every time he has heard, “Why do you punch holes in our greens just when they start to look good?” and he would be a wealthy man. Unfortunately, today’s players are even less tolerant of core aeration. This attitude has resulted in less frequent or smaller-tine core aeration. To further complicate matters, many golf courses have planted high-density bentgrasses that require additional aeration to maintain healthy growth.

The old phrase “pay me now or pay me later” rings true with core aeration. There are many golf courses in the Southeast that have neglected core aeration and probably will face serious problems during a severe summer. This article provides a novel method on how to schedule an effective core aeration program.

Why Aerify?

An important purpose of core aeration is the physical removal of un-



Core aeration is often perceived as the “dirty job” of golf course maintenance, but it serves a critical purpose for the long-term health of the turf.

wanted organic matter from the upper portion of the rootzone. Solid tine, deep solid tine, and water injection aeration are other important forms of aeration,

but they will not be addressed in this article.

When core aeration is neglected, the upper portion of the profile can be

an inhospitable place for plant roots to grow. The pore space in a dense organic layer is dominated by small, water-filled capillary pores, while the large air-filled macropores are lacking. Oxygen is necessary for the plant to carry out respiration, which is the conversion of stored food to energy. Respiration takes place in the roots and, therefore, good air exchange in the upper soil profile is vital to plant survival.

How Much is Enough?

One of the most difficult parts of scheduling an aeration program is to determine how much aeration is adequate to manage the organic layer in the upper portion of the profile. There is no accepted rule of thumb for what percentage of surface area should be impacted each year, but it is safe to say there are more greens that have been aerified too little as opposed to too much.

In our experience, golf courses with successful, mature greens have been on a core aeration program where 15-20% of the surface area has been impacted each year. Note that this 15-20% goal does not specify tine size, hole spacing, or frequency.

Setting Up Your Program

The amount of surface area impacted is a direct result of tine size, tine spacing, and frequency. Impacting 15-30% of the surface area each year is a reasonable goal for mature, well-maintained greens in the Southeast. If aeration has been neglected, a more aggressive program may be warranted. Refer to Table 1 to see the effect of tine size and spacing on surface area impact.

The table demonstrates that changing from a 1/4" tine to a 1/2" tine increases the surface area impacted by four times. Using a 5/8" tine instead of a 1/2" tine increases the surface area impacted by approximately 50%. Changing spacing from 2" x 2" to 1" x 2" with 3/8" tines increases surface area impacted by 100%!

The last two rows in Table 1 detailing the effectiveness of the Graden vertical mower will be of particular interest to many superintendents and Green Committees. After looking at how much this machine impacts the surface, it should come as no surprise that many golf courses have incorporated it as a key component in their program.

Double aeration (aerifying in two different directions) is another trend we are seeing in the Southeast. Double

aeration may take twice as long and use nearly twice as much sand, but it does not take twice as long for the holes to heal.

By the Numbers

We have found that when dealing with course officials, it is easier to focus on a specific number (e.g., impacting 20% of surface area) instead of bogging them down with the details of hole spacing, tine size, etc. Once your golf course commits to a specific aeration goal, you can offer them choices on how to reach the goal.

Core aeration is one of the most important preventative maintenance practices used on putting greens. Modify the recommendations in this report to your specific situation and make common sense adjustments as needed. Core aerify by the numbers and your greens will enjoy the benefits.

CHRIS HARTWIGER, *agronomist*, and PATRICK O'BRIEN, *director*, make common sense of turfgrass management in the USGA Green Section Southeast Region.



Explaining the need for regular aeration is often easier if you use specific numbers when selling the aeration program to the Green Committee and golfers.

Tine Size Diameter (inches)	Spacing (inches)	Number of Holes per Square Foot	Surface Area Impacted by One Tine (square inches)	Percent Surface Area Impacted	Number of Aerifications Needed to Reach 20% of Surface Area Impacted
1/4	1 x 1	144	0.049	4.91%	4.1
1/4	1 x 2	72	0.049	2.45%	8.1
1/4	2 x 2	36	0.049	1.23%	16.3
3/8	1 x 1	144	0.110	11.04%	1.8
3/8	1 x 2	72	0.110	5.52%	3.6
3/8	2 x 2	36	0.110	2.76%	7.2
1/2	1 x 1	144	0.196	19.63%	1.0
1/2	1 x 2	72	0.196	9.82%	2.0
1/2	2 x 2	36	0.196	4.91%	4.1
5/8	1 x 1	144	0.307	30.68%	0.7
5/8	1 x 2	72	0.307	15.34%	1.3
5/8	2 x 2	36	0.307	7.67%	2.6
Dethatching Machine* 3/64" Blades	1 x 1	NA	NA	14.10%	1.4
Dethatching Machine* 5/64" Blades	1 x 1	NA	NA	7.8%	2.6

*Graden vertical mower