USGA
Green Section
RESEARCH YOU SHOULD KNOW
May 3, 2019

Recycling aeration cores may yield positive agronomic benefits while reducing the costs associated with purchasing sand.

RESEARCHERS COMPARE
REMOVING AERATION CORES WITH CORE RECYCLING

BY BRIAN WHITLARK | AGRONOMIST, WEST REGION

- A USGA-funded study at Iowa State University is comparing core removal after aeration with breaking up the aeration cores and recycling the sand.
- Three different treatments for handling aeration cores were studied: complete removal, recycling with a core recycling machine and recycling by verticutting the cores after aeration.
- No differences were found in organic matter content between the three treatments. However, this data was generated from only one year and one aeration event.
- Preliminary findings indicate no negative effects of core recycling when compared to core removal for creeping bentgrass greens.

Sand costs vary widely and for some, sand and trucking costs exceed $100 per ton. In Hawaii, costs are often more than $200 per ton. The amount of sand required to fill core aeration holes on putting greens will range from 50-100 tons over an 18-hole golf course, which can lead to considerable sand costs. Additionally, some courses struggle to find sand that is locally available and sand that closely matches the physical characteristics of the existing rootzone material.

Traditionally, superintendents have removed cores from putting green core aeration and filled the holes with purchased sand to manage organic matter content and soil physical properties in the upper rootzone profile. However, some courses have challenged this philosophy and are recycling aeration cores by breaking them up and reincorporating the material back into the aeration holes. This can significantly reduce the costs associated with purchasing sand. The growing popularity of such practices encouraged researchers at Iowa State University to begin a study comparing the traditional method of core removal to core recycling.

In August 2018, a USGA-funded study was initiated on a creeping bentgrass putting green built according to USGA recommendations at the Iowa State University Horticulture Research Station in Ames, Iowa. The green was core aerated with 0.75-inch diameter hollow tines on a 2-inch by 2-inch spacing to a 3-inch depth. Afterwards, three different treatments were performed: complete removal of cores and new sand used to fill the aeration holes, cores were broken apart with the Wiedenmann Core Recycler and used to fill the aeration holes, and cores were broken apart with vertical mowing and used to fill the aeration holes. Sand matching the physical characteristics of the existing rootzone was applied to fill the aeration holes for all treatments.

After aeration, there were weekly evaluations of bentgrass recovery, volumetric water content, surface firmness, green speed and physical soil characteristics such as organic matter content, infiltration rate, and total porosity. Although the results are preliminary and based on one aeration in the first year of study, the data are encouraging for those looking to recycle aeration cores and reduce sand costs. No differences were found in organic matter content between the three treatments. In addition, soil moisture content and water infiltration rates were similar among the three treatments.

This study will be repeated in 2019 to evaluate the impact of each treatment on agronomic performance and to assess costs associated with each method. An economic model will be developed to demonstrate the difference in sand costs and potential labor savings that may be achieved by recycling aeration cores.

The long-term concerns with recycling aeration cores are the accumulation of fine soil particles – i.e., an increase in water-holding pores – and organic matter in the aeration zone. The preliminary results are encouraging, but it is important to recognize more work is needed to examine the long-term effects of this practice. Stay tuned for more updates on this research from Iowa State University as new data is collected on soil physical characteristics and other performance indicators.