Golf course putting greens show their age

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Just like the rest of us, golf courses show their age -- especially on putting greens, which experience more foot traffic than anywhere else on golf courses. Putting greens, which comprise only about 1.6% of the total area on most courses, require more intensive management than any other part of the course. To keep putting greens in top form, turfgrass experts study ways to provide proper nutrients to the root zone, a critical area for maintaining healthy turf.

Putting greens are dynamic; greens experience chemical, physical, and biological changes that occur over time. Organic matter begins to accumulate and contribute to the deterioration of the root zone soon after turfgrass establishment occurs on sand-based root zones. Chemical properties such as pH and cation exchange capacity (CEC) of the root zone influence availability of essential nutrients and impact turfgrass use, maintenance, and performance. Inadequate or excessive soil nutrient levels can lead to problems in turfgrass health, vigor, and quality.

To better understand nutrient and chemical changes in turfgrass sand-based root zones, Dr. Roch E. Gaussoin and colleagues from the Department of Agronomy and Horticulture at the University of Nebraska-Lincoln, conducted a research study designed to characterize nutrient and chemical properties in putting greens influenced by root-zone mixture and establishment treatment, putting green age, and soil depth. The results of the 3-year research were published in a recent issue of *HortScience*.

Research was conducted at the University of Nebraska's John Seaton

Anderson Turfgrass Research Facility located near Mead, Nebraska. Four experimental putting greens were constructed in sequential years from 1997 to 2000. Treatments included root-zone mixtures of 80:20 (v:v) sand and sphagnum peat and 80:15:5 (v:v:v) sand, sphagnum peat, and soil, and accelerated versus controlled establishment.

In the establishment year, the accelerated treatment received 2.6-, 3.0-, and 2.6-fold more nitrogen, phosphorus, and potassium, respectively, than the controlled treatment. Soil samples were analyzed for nutrient and chemical properties such as pH, cation exchange capacity (CEC), organic matter (OM), total soluble salts (TSS), and 12 nutrients. Researchers found that the 80:20 (sand:peat) root zone was generally not chemically different from the 80:15:5 (sand:peat:soil) for any of the three studies. According to Gaussoin, "establishment treatment had no effect beyond the establishment year except for increased P for greens that received the accelerated establishment treatment."

Organic matter accumulation in the upper region of the putting green root zones studied may have contributed to increased retention of nutrient and chemical properties near the putting green surface, particularly as the putting greens increased in age.

Gaussoin added; "Because root zone had minimal to no effect, replacing some of the peat with soil in the root zone could reduce construction costs and aid in nutrient retention as long as the soil-amended root zone meets USGA specifications." The researchers also concluded that because the additional nutrient inputs were not retained in root zones in this study, increased fertility inputs during the establishment year may not be environmentally responsible.

More information: The complete study and abstract are available on the ASHS Hortscience electronic journal web site: hortsci.ashspublications.org/c … nt/abstract/44/2/452

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