USGA
Green Section Record
REGIONAL UPDATE
March 6, 2020

Healthy roots are the key to healthy turf. Assessing root health on a regular basis will help you maintain high-quality playing conditions throughout the year.

GOT ROOTS?

ASSESSING ROOT QUALITY AND EFFICIENCY

BY STEVE KAMMERER, PH.D. | REGIONAL DIRECTOR, SOUTHEAST REGION

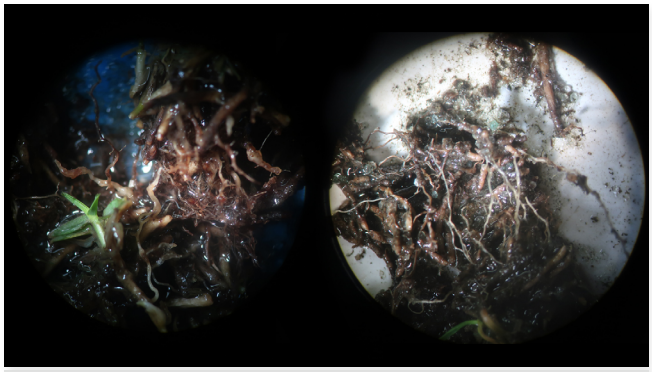
Throughout the Southeast, and especially Florida, I am seeing more and more issues with roots and root health. Roots are what helps carry turfgrass through stress periods. When looking at living roots, especially on putting greens, some important things to consider and record are:

Root appearance – Are roots uniform in diameter or are they malformed and swollen? Are they white to yellow or brown to black? Do they have feeder roots or are the feeder roots small nubs?

Root length – Are the living white roots long or are they concentrated in the top one-half inch of thatch and soil? Ideally, there should be several long roots in a small core sample.

Root density – Are the living roots dense underneath the turfgrass core sample or are they sporadic and confined to the organic matter layer?

When conducting a root evaluation, a quick glance at a sample taken with a soil profiler or cup cutter can be deceptive. Oftentimes, I can pull a profile and roots are visible to a depth of 2 inches or deeper. However, when I lightly wash the soil off and tease away the dead roots and debris, there is little living root mass remaining. By assigning numerical ratings between 1 and 5 for the categories root appearance,



Roots on the left are short, shallow, discolored, distorted and operating at around 50% efficiency. The healthier roots on the right are operating at around 85% efficiency.

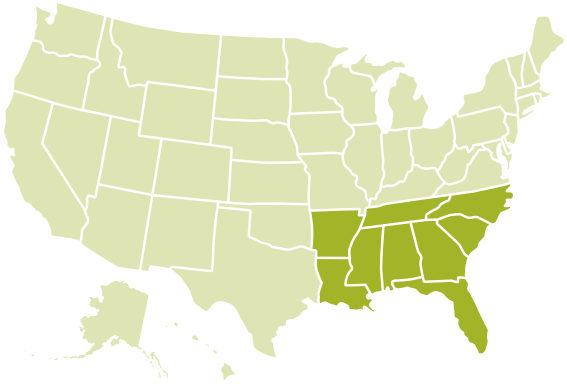
root length and root density, a rough estimation of efficiency can be determined. Add the rating for each category and divide that number by 15, the maximum possible total rating. Next, multiply that number by 100 to estimate the percentage of root efficiency. It is important that there are definitive, visual attributes when arriving at each category rating. This requires several samples and careful methodology to quantify the root quality. Samples should be taken from your most healthy greens, rather than your weakest greens, to arrive at a good scale. Testing should also be done two to four times throughout the year.

Why does measuring root health matter? When roots are weak, they are not operating at 100% efficiency. Roots deemed to be operating around 50% efficiency will require twice the amount of nitrogen and water to deliver performance comparable to healthy roots. Fungicides, insecticides and other products that depend on root uptake will also be less effective. Fertilizer and pesticide that is not taken up by the roots is more likely to leach out of the rootzone with rain or irrigation. Lastly, turfgrass with weak roots will provide soft conditions that lead to more ball marks on greens and poor playability throughout the course. Identifying and comparing root health helps determine if any additional efforts or issues need to be addressed, especially in the spring and early fall. Poor root health going into the fall might be the difference between healthy turf that plays well in winter or experiencing turfgrass loss.

USGA agronomists can help sample and assess your roots and then work with you to formulate an agronomic plan that promotes root health. There are many issues that can negatively impact roots so it takes scouting, regular assessments and planning to track results and generate improvement that can enhance turfgrass quality, performance and playability.

For information on the USGA's Course Consulting Service Contact the Green Section Staff.

Learn More



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