

Bigger Roots Combat Turf's Challenges

As we discussed last month, golfers often judge a superintendent's turfgrass management skills by what they see on the surface of the course — but superintendents know they've got to train, nurture and treat the health of underground root systems to keep blades playable.

Dr. Christina Wells, associate professor in the Department of Environmental Horticulture at Clemson University and plant physiologist, helps me explain what superintendents should consider when determining root management needs that improve plant health.

"In a situation where a lot of the nutrition is being provided for the plant, like on a golf course, it makes more sense to use sugars for energy to drive high rates of uptake," said Dr. Wells. "There's really no reason to grow more roots because it's not necessary. The plant doesn't need to explore to find nutrients when they are right there."

Sugars, which are derived from photosynthesis, play a big role in root development. Below ground, they provide the carbon and energy for continued root growth, as well as powering the mechanisms of nutrient uptake.

Root systems are larger when the photosynthate supplies from the turfgrass leaves increase. The carbon is freed up to other areas



BY KATHIE KALMOWITZ, PH.D.

of the plant, such as the roots. Properly balancing that carbon use is important to helping the plant fight disease, withstand stress, and recover faster if a stress event occurs.

Root health implications for the turf manager

There isn't one answer to what a healthy root system looks like. It really depends on the turf manager's point of view. Why should deeper roots mean a healthier plant? In fact, especially on a golf course, many practices by superintendents promote smaller root systems. Turf is watered and fertilized frequently, and mowed almost daily. With water and nutrients in abundance, and added stress to the plant, roots do not often grow deep.

"If your turf management goal is consistent, dark green turf with no dead or diseased patches — you can achieve that with a minimal root system," said Dr. Wells.

However, as we have seen in the past few summers the perfect growing conditions are becoming harder to find.

"Superintendents faced with re-

strictions on irrigation or the amount of nitrogen they can put on their turf should focus on promoting a bigger root system for a healthier plant," she said. "It's all about the constraints and turf management goals. A healthy root system is whichever one gets superintendents to their management goals."

Understanding how turfgrass functions below the surface can help superintendents more effectively work through multiple agronomic options and select solutions that are essential to keeping turf healthy, and players and course management happy.

Research from BASF Professional Turf & Ornamentals indicates that Intrinsic brand fungicides (active ingredient: pyraclostrobin) can be a helpful tool for superintendents seeking to manage a broad spectrum of diseases and support plant health, including deep roots and stress tolerance.

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Kathie Kalmowitz, Ph.D., is a Technical Specialist for BASF Professional Turf & Ornamentals.

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