

The Anatomy of a Golf Green

By Dave Doherty

When starting *the International Sports Turf Research Center* 20 years ago, many experts and knowledgeable people in the sports turf industry were telling me the work I was undertaking was a waste of time and money.

Why? Because the physical properties of sports turf were too complex and there were too many variables to ever come up with quantitative numbers that would have meaning or benefit to the sports turfs industry.

Fortunately, those experts were wrong.

Learning to understand the physical properties of sports turf from working in my lab turned out to be very simple. The two most important things in a sports turf mix are solids and pores.

Pores, which are the spacing between the solids, come in different sizes depending on the size and quantity of the solids. Gravity pulls water from the larger pores leaving them to hold oxygen and other gasses. The pull of gravity is not strong enough to pull water / moisture from the smaller pores leaving them to hold water / moisture.

Simply put:

- Larger pores contain oxygen and other gasses
- Smaller pores hold moisture
- Solids supply stability.

Plant roots do not live in solids and they do not live in water. Therefore, the roots of our grass plants can only live in the larger pores, which have the capability of containing the oxygen and other gasses that our plants need. The smaller pores contain moisture, which our plants need to cool themselves.

Now... the \$64,000,000,000 question: How many air pores do we need in a root zone to maintain a healthy grass plant?

Ideally we would have a ratio of 1 X 1 of air pores to water pores but in most cases that is not possible. The number of air pores we need is dependent upon the number of roots we have that need oxygen. The newer grasses, because they have a denser canopy and a denser root system, require more oxygen than the grasses of 20 years ago.

One of the questions most asked today in the golf industry during this recession and tough times concerns aerifying: Do we really have to do disruptive aerifying in the spring and fall, when maybe we could skip a disruptive aerifying and have some additional outings to bring in much needed revenue?

And another most asked question: Can we regrass and not totally rebuild?
Before either of these can be answered, we need to know the physically properties and especially the ratio of air to water pores.

Recently while explaining the physical properties of golf greens to the green committee, board of directors and some prominent members of a golf course, and explaining what they had in their greens and where they were deficient, we engaged in a discussion about what the physical properties of their greens should be and could be, and how greens age and the major causes of green failure.

Not one of the 32 people made a move to leave the meeting, which after three hours instead of the one-hour we had planned, came to a very positive conclusion.

The attendees received the information, **based on science that** they needed to address the issues that they were being confronted with at their golf club. A meeting for the rest of the members, to explain the club's options to solve their issues, followed.

But my point is: Once the attendees understood the air to water ratios and the function of each, they were able to think clearly and objectively about what the club should do to resolve the issues with their golf greens.

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