

Yarn #9 [March/April 2008]

Bad guy gasses / part 1

The second leading cause of green failure is a lack of available oxygen/air to our roots in our root zone system.

BAD GUY GASSES = LACK OF OXYGEN/AIR

[Organic matter in the top 1 to 2 inches or our root zone is the #1 cause of green failure / See Boardroom May/June 2007]

In previous articles we have discussed the sealing of our greens by organic matter in the top one to two inches and how and why we need to aerify to reduce this organic matter in some cases and to just keep our greens open and breathing in other cases. The industry has always assumed that if there were enough air pores [room at the inn] to house the roots and the microbes than there would be an adequate supply of oxygen/air available to both the roots and microbes.

Webster's Dictionary describes air as: The elastic, invisible mixture of gases [chiefly nitrogen and oxygen, as well as hydrogen, carbon dioxide, argon, neon, helium, etc.] that surrounds the earth; atmosphere.

Webster's Dictionary describes oxygen as: A colorless, odorless, tasteless, gaseous chemical element that occurs free in the atmosphere, forming one fifth of its volume, and in combination in water, sandstone, limestone, etc.; it is very active, combines with nearly all other elements, is the most common element in the earth's crust, and is **ESSENTIAL TO LIFE PROCESSES** and to combustion.

Over the last fifteen years we here at ISTRC have seen physical properties of greens that were ideal for supporting turf and should have provided an excellent putting surface, yet the greens struggled. These golf courses that have physical properties in their greens, that although not ideal, are good enough to produce a healthy plant and a good putting surface spend hundreds of hours and thousands of dollars to improve conditions and in many cases all to no avail.

Fourteen years ago while doing research in the south west I was working with a very competent superintendent who was in charge of a 27 hole facility. Over a four year period we had done enough research on his different air movement greens to know what the ideal physical properties needed to be for each classification of green [high air movement, low air movement, and those in-between]. We had the physical properties to where they were in harmony with the micro-climates they had to exist in.

However there was one green that no matter what we did or tried to do it did not respond. When chemicals were applied there was a zero response to whatever product that was applied. We aerified **and** we went without aerifying [the green remained unresponsive]. We tried every conceivable type of irrigation from deep watering to syringing and still no response. The green had so many tests run on it for disease that it became legendary among soil labs that do soil chemistry testing.

After four frustrating years we noticed one day that the main drain exiting the green went into the water hazard that fronted the green and it occurred to us that maybe that drain was holding water which was backing up under the green. We went to the approach area in front of the green [between the green and the water hazard] dug up the drain tile and cut it in half. The most foul smelling water one can imagine burst out of that drain tile and continued to flow for well over an hour. Within a week the green was healthy, and has stayed responsive and healthy now for over 10 years

The water that was backed up under that green and that had become anaerobic was producing gasses, that because of the complexity of the mixture of different gasses I will only refer to as **BAD GUY GASSES**. Those bad guy gasses emitting from our drain tiles had to go somewhere and that somewhere was up into our air pores where our roots and microbes were trying to live.

Over the years I have yet to find anyone who can give me quantitative numbers in regards to the gasses that need to be present in our root zones air pores so that our grass plants can breathe and function as Mother Nature intended. I *have* come to understand that an imbalance of nitrogen, oxygen, as well as

hydrogen, carbon dioxide, argon, neon, helium, and other gasses can and will cause our turf to shut down and in many cases to die completely.

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