

CUTT

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The Emperor's Soil: The Naked Truth

The turf industry is obsessed with soil. Millions of research dollars are spent each year to explore the physical and chemical aspects of soil. For example, the United States Golf Association (USGA) has spent millions simply on understanding and refining specifications for putting green construction.

The search for the “right” soil, sand or amendment has spurred many new industries. Sand companies, organic and inorganic amendment companies, blenders, and testing labs have all flourished in this soil-obsessed world.

Nailed by Specs

USGA specs are used as a guide to “ensure” success, but they can easily double as a hammer with which to nail blame should greens fail. In general, it is widely agreed that the specs focus on drainage with little regard for chemical properties.

The increased number of sand-based rootzones has raised questions on proper fertility that are understood by researching soil chemistry. Private soil chemical testing companies have a network of consultants that promote testing, interpret the numbers and make recommendations.

Though soil chemical analyses often are informative and accurate, consultants sometimes complicate the data with their interpretations, or opinions, in an effort to help turf managers better understand the research. By

putting “spin,” as it’s referred to in political parlance, on the data, leaps of faith are taken without supportive research that calibrates plant response to soil nutrient level.

Favoring the Emperor

When I ask turf managers what they know about certain agronomic practices and chemical treatments, they often regurgitate what they have been told by consultants—though they don’t understand the information. When this happens I am reminded of the story entitled “The Emperor’s New Suit” by Hans Christian Andersen. In the story, written in 1837, two swindlers persuade an emperor with an obsession for fine clothing that “they could manufacture the finest cloth to be imagined, but the clothes made of their material possessed the

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I often feel like that young child, saying: "I don't understand the soil test information." As I inquire further, I find a cult-like theology of soil testing, with no basis in turfgrass science.

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Microbial populations during sand-based construction increase and diversify until turf is established, then they stabilize. Beyond this we know very little.

wonderful quality of being invisible to any man who was unfit for his office or unpardonably stupid."

Well, of course, no one wants to be out of favor with the emperor, who has bought into the scam, so everyone in the kingdom pretends to see the magnificent suit worn by their ruler. Eventually, an innocent child says, "But he has nothing on at all," and that comment leads everyone, including the emperor, to see the truth.

I often feel like that young child, saying: "I don't understand the soil test information." As I inquire further, I find a cult-like theology of soil testing, with no basis in turfgrass science. Many of the soil tests that confuse me often require additions of nutrients, principally calcium and potassium. Furthermore, I am surprised at how many times I see specious fertilizer recommendations from persons aligned with fertilizer companies based on the feed-the-soil approach.

One would think that the golf turf industry has an epidemic of calcium- and potassium-deficient soils. In spite of research showing that most soils with a pH above 6.5 do not need calcium and findings saying that applied potassium has no measurable effect on soil, turf managers continue to apply them. I can only assume these nutrients are being applied because the private soil-testing industry is promoting their application. I can find little or no independent uni-

versity research that supports the widespread application of these nutrients; in fact most studies argue against their application in most cases.

Soil Health

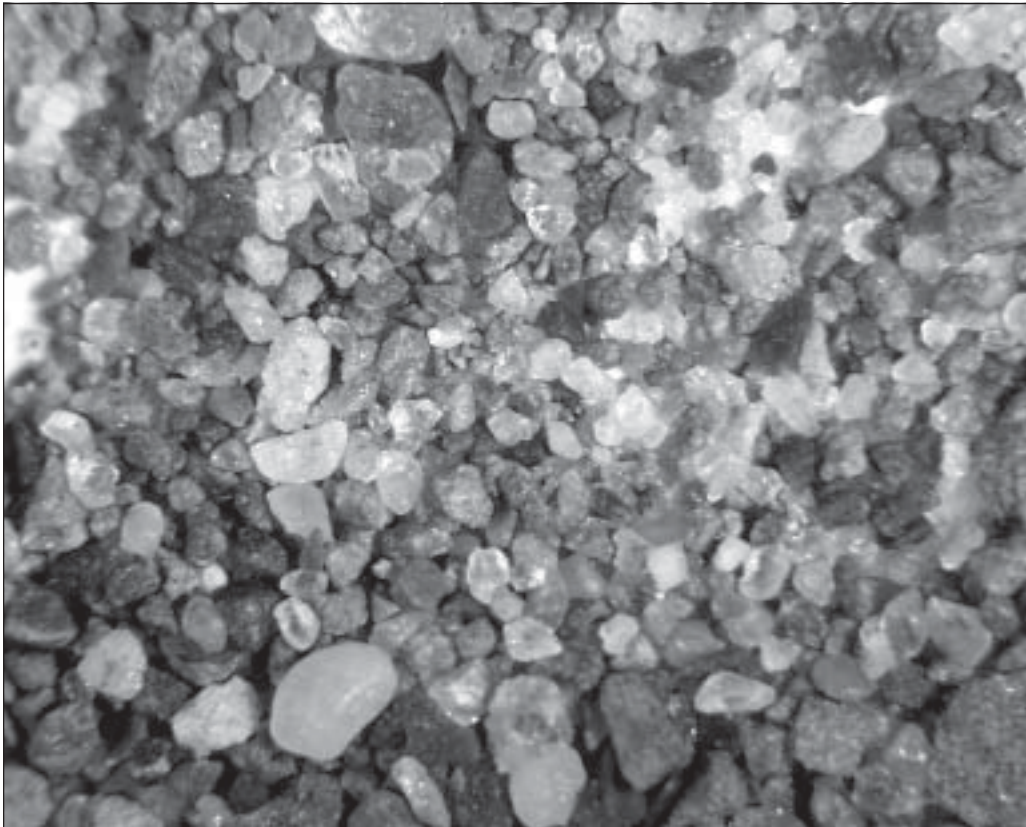
Apart from the physical and chemical aspects of soil, the biological aspects remain a black box. However, the concept of proper soil biology or soil health is emerging in the industry. I hear it touted in organic farming circles and in turf regions where pesticide restrictions are under consideration. Finding methods for manipulating soil microbial activity to create a healthy soil is "all the rage" in turf management systems.

My critical nature shapes my initial thoughts of skepticism. I explore the concept and find that we have been studying soil biology for many years in turf science. For example, several USGA-funded turfgrass research studies found no meaningful effect of pesticides on soil microbial activity. Microbial populations during sand-based construction increase and diversify until turf is established, then they stabilize. Beyond this we know very little.

The "emperor" factor in the soil health movement is the promotion of products or practices to manipulate soil microbes. Organic agriculture will accomplish this by incorporating large amounts of compost (a large source of microbes and microbe food [carbon]). This is

Sand-based rootzones can be created by straight sand top-dressing.






Sand derives its cation exchange capacity almost exclusively from organic matter.

all well and good except for two items: one, we barely understand what we are manipulating; and two, with the soil covered with turf it is difficult to get the compost applied at high levels, even if we knew what it would do.

Similar to soil chemical testing, I often see soil biological test results. Again, the numbers derived from the microbial assessments are solid. It is the interpretation of the results that defies reason. Leading microbiologists can hardly assess 5 percent of all the microbes in

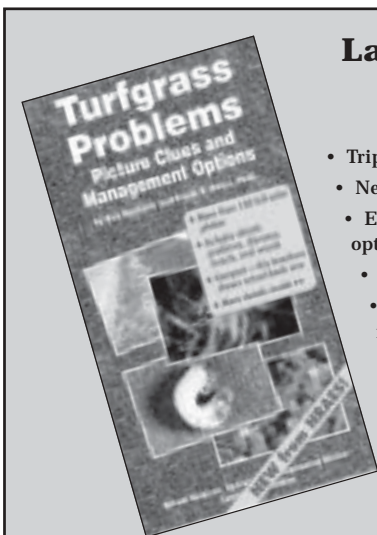
the soil. How can we in the scientific community claim to manipulate soil biology when we barely understand what is going on in the first place?

In the end this is a cautionary tale. I must be careful not to let my skepticism blind me to important innovations. At the same time, turf managers need to open their eyes to see if the empirical evidence they're presented with is the naked truth. 

Frank S. Rossi, Ph.D.

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