THE BOTTOM LINE IS, THIS TECHNOLOGY SAVES MONEY BY VIRTUALLY ELIMINATING CHANGE ORDERS IN CONSTRUCTION. AS A RESULT, COMPUTER MAPPING IS THE FUTURE OF MAINTENANCE AND CONSTRUCTION. THAT'S THE DIRECTION LARRY RODGERS OF LARRY RODGERS DESIGN HERE SEES THE FUTURE. THEY OFFER ADVANTAGES COMPANY DESIGNS FOR NEW AND EXISTING COURSES.
Boehm: Much to learn in bio-ecology

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sound chemistry — whether it's synthetic or from a natural origin — and to better understand and increase the use of biologicals."

Composts add nutrients and micro-organisms to soil that have been shown to control or counter pathogens, he said. The focus is on research at OSU and other universities is understanding how and why diseases are suppressed.

"We know that if you increase the nitrogen level on turf you can suppress dollar spot nearly 60 percent," Boehm said. "But there are still lots of issues. Is the nitrogen in the form we are applying it directly toxic to the pathogen? Or is the nitrogen giving the plant the ability to outgrow the pathogen? Or is the nitrogen somehow changing the physiology of the host, thereby making it less susceptible?"

"Those are all very valid questions that we'd like to address."

From a plant pathologist's perspective, he said, mechanisms of biocontrol are:

• competition between the biological control agent, or the organism that is suppressing the pathogen for space or nutrients;
• antibiotic production, since the biological control agent produces antibiotics that are toxic to the pathogen;
• hyperparasitism, wherein the biocontrol agent uses the pathogen as a food base or energy source; and
• induced resistance — "an area," Boehm said, "we don't understand very well, but the presence of these beneficial organisms affects the physiology, or biochemical change in the plant that renders the plant resistant." He likened this to spraying Crenshaw bentgrass, which is prone to dollar spot, with a chemical and finding it is resistant to dollar spot.

Boehm released some findings from a compost study that is in its second year.

Asking what a single application of compost does to the turf, he said it gives the turf "a huge swell in growth and clipping yield. Depending on what kind of compost you use, that lasts anywhere from six to 10 weeks. If an epidemic occurs during that period of enhanced nitrogen fertility, we see a significant decrease in the amount of dollar spot. If, however, like last summer, we make our compost application in May — even though we get nice fertility and greenup effect on the turf ... we did not see any appreciable effect on disease management."

The OSU professor hopes to discover the effect of continued use of compost dressing incorporated in spring and fall, along with spring and fall aeration, over a four-year period.

He mentioned studies at Cornell University by Dr. Eric Nelson, in which compost top dressing has suppressed pythium root diseases in sand putting greens.

In one of his own projects, Boehm has established bentgrass greens to compare compost and peat in the root-zone mixes.

"It's a pretty striking difference when you look below the ground," he said, adding that, while using take-all patch as a test pathogen, he found that compost was good, peat was not.

Speaking of the U.S. Golf Association Green Section's greens construction specifications, Boehm said he would like to see, over the next several years, a section incorporated on the pros and cons of altering the organic matter in the root-zone mix from a biological and microbial standpoint.

"It might take another 20 years before we're ready to do that," he admitted, adding, "We are isolating lots of organisms, adding new organisms, challenging the systems in the field and in the greenhouse, and trying to get a better handle on microbial populations that affect disease suppression."