

THE FUNGUS AMONG US

As one of the undisputed stars in the small, weird world of plant pathology, Dr. Bruce Clarke preaches common sense to superintendents. BY PAT JONES

For a quiet sort who admittedly spends far too much time pondering the submolecular intricacies of microscopic fungal pathogens, Dr. Bruce Clarke is essentially a rock star among the happy few who study the art and science of greenkeeping.

Like it or not, the reputation of most golf course superintendents comes down to their ability to effectively battle nasty, unpredictable and often job-killing pathogens. The seemingly mystical skill of understanding, anticipating and controlling these evil distant cousins of supermarket mushrooms is where the rubber meets the road at many high-end facilities. And Clarke has made it his life's work to do just that at Rutgers University.

He's a lifelong Jersey guy, born and bred in Englewood. Clarke thanks his dad's frustrated fixation with his less-than-perfect lawn for his eventual career path.

"My father became an amateur agronomist because he always had problems with his lawn – particularly with insects – and his curiosity rubbed off on me. I was always trying to find insects and diseases on the lawn."

After high school, Clarke headed off to nearby Rutgers with a vague idea of studying urban agriculture and ended up getting his bachelor's degree in forest management before deciding that turf was more interesting (he'd caddied some when he was a kid). He went on to earn his master's and doctorate in plant pathology under the legendary Dr. Reed Funk and joined the faculty, splitting his time between diagnostics for both turf and ornamentals. "It opened my eyes to all types of diseases."

In 1990, he became entirely focused on turf and by 1993 he became director of the Center for Turfgrass Science. He also was named a Ralph Geiger Endowed Chair in Turfgrass Science. That puzzled me, so I asked him about Geiger. Clarke became

animated: "He wasn't a turf guy at all! He was an avid golfer and businessman with a real desire to help students who wanted to be superintendents. I'd met him 20 years ago and he took a liking to the program and contributed significant money to turf scholarships. He died in 1991 and donated a million dollars in his will and gave us about two million dollars total over the years. So, we endowed the chair and named our education center after him. Pretty amazing guy...and the rare golfer who really understands





Dr. Bruce Clarke earned his master's and doctorate degrees in plant pathology at Rutgers, where he works today, under Dr. C. Reed Funk.

who and what makes the game so enjoyable.”

Like Geiger, Clarke is also a rare breed: a turf researcher with a pragmatic streak a mile wide and a commitment to still getting his hands dirty and helping superintendents solve everyday problems. We got in touch to find out more about his views on the industry, the state of turf education and what advice he doles out to students and superintendents after decades of helping turfheads in New Jersey and around the world successfully manage diseases.

I always seem to bump into you at conferences, meetings and airports. Describe your typical month (travel, speaking, teaching and research).

It's an exciting job and there is no “typical.” In the winter, I do a lot of travel. I probably give 80 talks a year with about half around New Jersey and half national and international. There just aren't that many turf pathologists, so there's a tremendous opportunity to go out and spread the word.

I actually really enjoy traveling, meeting new people and listening to golf course superintendents and learning about their problems. I also teach in the two-year golf management program and do a lot of my writing in the off-season. In the spring, the research program gears up; plus, I teach undergrad turf pathology/pest science with Dr. Albrecht Koppenhoffer (a Rutgers' turf insect specialist). I do quite a bit of extension and diagnostics work with (Rutgers' turf management instructor) Rich Buckley in our lab. I answer lots of calls and e-mails from superintendents all over the nation. They tend to associate you with the last article they read or the last talk I've given. I

What research needs to be done to support golf/turf managers?

The way that the business has evolved over 30 years, what's needed is more study of the influence of management practices on disease and, specifically, how they interact. Too much early work was observational. There was lots of conjecture instead of factorial research studies looking at multiple factors. The most recent example is anthracnose. Prior to our work, there were lots of misconceptions. A lot of what was being reported was observational and anecdotal and not based on real research. There was also a lot of extrapolation from similar diseases which wasn't accurate. I started working with Jim Murphy in 2002 looking at

What practices/tools have really changed the face of golf course maintenance during your time?

That's almost a better question for our agronomist, Jim Murphy, but I have a few ideas. Lightweight mowing – or anything mechanical that reduces stress – and improved aerification are probably near the top of the list. Mainly it's been an overall evolution. Sprayer technology, nozzle types, tank-mixing practices...our whole approach to application is so much better. And, of course, the fungicides we have now are much better materials than we had before. They're safer for the environment, the applicator and the turf itself. There's a much higher margin of

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probably get 10 queries a month from all over the world. I just had one today from Newfoundland – I think it was take-all patch.

How have your views on disease changed, if at all, over the years?

Basically, the more I learn the more I realize I didn't know. My training was really in ornamentals and it took me a few years to get comfortable giving recommendations to superintendents. The diseases are the same, but they express themselves very differently. Dr. C. Reed Funk and (Rutgers' extension specialist) Dr. Jim Murphy really helped. Having a situation where a pathologist like me can work directly with an agronomist like Murphy is just tremendous.

Golf turf is the most specialized crop I've ever worked on – maybe one of the most specialized there is. So, over the years, the main way my view has changed is that I've learned how much isn't known.

Also, I hopefully now know far more practical information on the broad scope of turfgrass management and cultural practices. When it comes to disease, the big picture is really what it's about – the entire mix of management practices. You can't separate the disease from the rest of what you're doing.

nitrogen, irrigation, cultural practices – the whole gamut. What we found was the superintendent's ability to control was based on their ability to get a handle on the practices versus using fungicides alone. The bottom line is that there are no simple answers.

It always comes back to common sense. How are we maintaining the greens and how does that impact disease? Fertility, mowing practices, topdressing, irrigation – it's not rocket science if you use good, practical agronomic common sense. Don't starve the plant, use regular sand topdressing, do some rolling – it's kind of fun because you're confirming what they intuitively already know from their experiences.

Is funding tough to get these days?

We've been fortunate to get funding for most of what we wanted to do, like developing best management practices. When I first started, summer patch was the big deal. Then it was grey leaf spot. Now it's been anthracnose. To a large extent, the research agenda is driven by trying to jump on a problem before it gets completely out of hand. Luckily, we get great support from the local superintendents' associations, the university and the government.

safety. Mercury and cadmium worked, but they were pretty tough on the environment. They were sledgehammer treatments. Today, it takes more finesse.

Some think that chemical companies drive research at the university level and may have undue influence on the results that get released. True or false?

That's really not true at all. In fact, the fungicide evaluation programs that many of us do around the country are critical to the recommendations they eventually make, but they get no input into the process. Besides, those product evaluation programs are really peripheral to our nuts-and-bolts research. Actually, there's no fungicide manufacturer money in our anthracnose study. We're mainly looking at management-related issues and breeding resistant grasses.

The fungicide money really doesn't drive our research. It allows us to evaluate the products and gives us some additional monies to pay graduate students and things like that, which don't have anything to do with the evaluations.

So there's no “pay-for-play” going on?

The minute a pathologist is perceived as being

influenced by the chemical companies, he or she has lost their credibility. They've had it. It really behooves them to make it very clear that they're unbiased. I certainly keep track of the products that are out there, but I don't pay attention to price, brand...any of it. All I care about is whether it works and how we can make it work best.

It seemed like there was a little bit of a revolving door for a while with researchers jumping to private industry. What do you think about that?

Private industry was raiding the brain trust of the universities for a decade or so and they got

very well-qualified people out of the process. It probably improved their competence. I don't have a problem with that. Now a university researcher who works on retainer from a company...that would clearly be a conflict of interest.

Some pathologists are known for going after certain active ingredients they don't like. What's your take?

Look, I would never say anything that I don't believe in, but I take great care not to trash a product. I've seen others do that and I don't see the virtue in that. I tell superintendents if it works or not and then I move on.

How do students today compare to those of a decade (or more) ago?

The undergrads and two-year students are every bit as good and just as motivated, but they're wired differently. They've grown up with video games and computers and they're more visual. You have to be more entertaining to catch their imaginations and keep their interest. You have to reflect that in your teaching style. Straight lectures don't cut it. It's a challenge. I'm not setting off fireworks at the podium or anything like that, but you have to grab their attention.

Some schools say their enrollment numbers in undergrad programs are dropping. How are things at Rutgers?

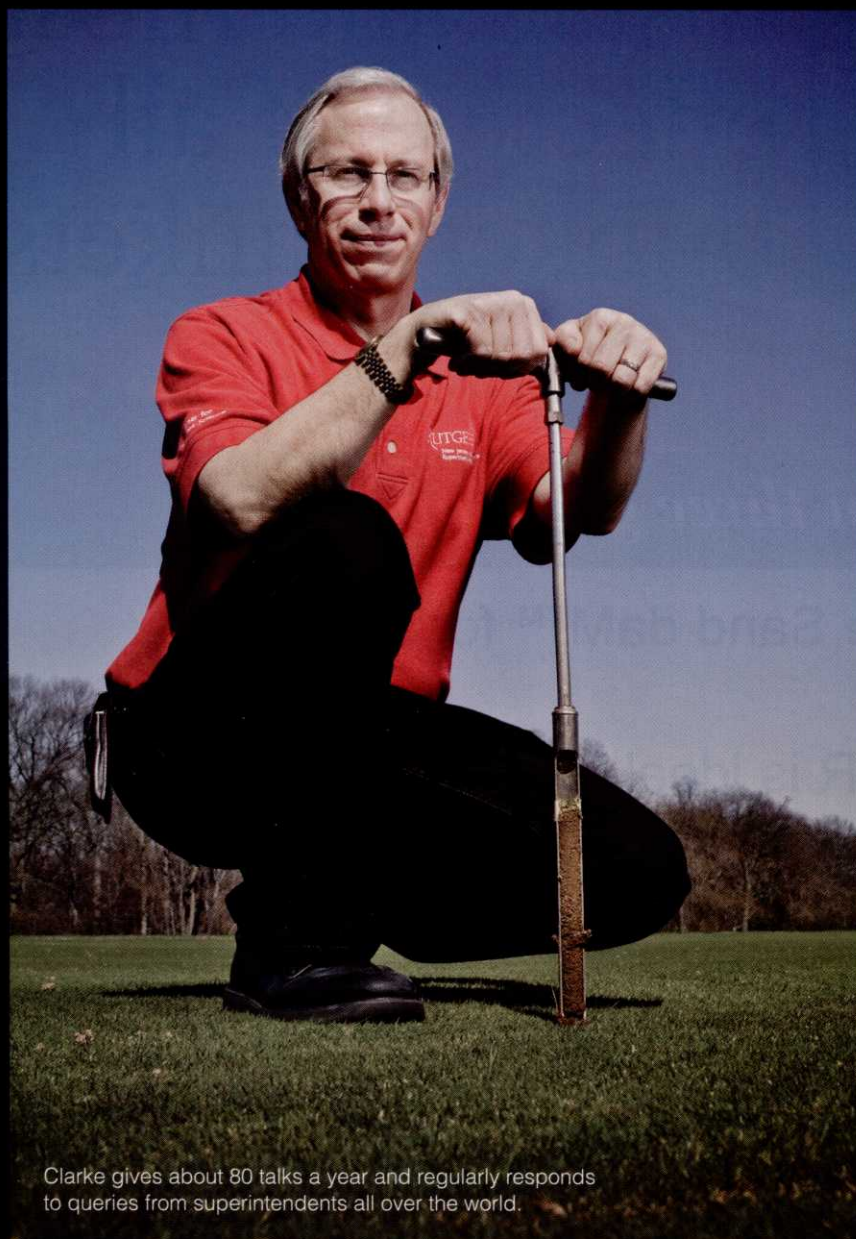
The undergrad group here has always been pretty small and it's difficult to get in, so it's not a huge problem for us. Our philosophy always has been to train quality over quantity. We have seen a change over the last decade in that it used to be primarily kids studying for a career in golf. Now that's only about 30 percent. There's been growing interest in sports field management, landscaping, sod farming and private industry. It's definitely changed as the word has gotten out that golf employment is tougher and there are good options elsewhere.

OK, what's the one piece of agronomic advice you always offer to superintendents?

It probably boils down to reducing stress on the grass. Hey, I'm a realist – there's going to be stress. But I also believe most of the disease pressure we deal with is stress-related. It sounds cliché, but it's true. Fungicides are great, but they're like make-up that covers over a lot of imperfections and pimples on the skin. Big-picture management and overall turf health is where it's at.

Final thoughts?

I feel really lucky. I love coming to work – my wife thinks I'm nuts to get so excited about grass – but it's a real thrill to work with great superintendents and a great staff here at Rutgers. The greatest joy is the partnership we have with the turf industry here in New Jersey and around the country. I'm always amazed at the way superintendents really want to help each other and our program. They can't seem to do enough to help Rutgers – money, volunteer time, feedback – whatever it takes. The least we can do to say thanks is to try our best to help them do a better job. GCI



Clarke gives about 80 talks a year and regularly responds to queries from superintendents all over the world.