USGA Green Section Record REGIONAL UPDATE

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Fungicides, especially those with PGR side effects and long soil residual, applied to weak roots may exacerbate recovery when the primary stress is not a fungus.

THE CASE OF THE DISAPPEARING ROOTS BY STEVE KAMMERER, PH.D., SENIOR CONSULTING AGRONOMIST, SOUTHEAST REGION

On golf courses, especially in climates where freezing of the soil rarely occurs, nematodes are pervasive and often innocuous. The same can be said for many fungi and there are a relatively minor few that can be pathogenic enough to cause turfgrass issues. In the case of fungi and <u>nematodes</u>, environmental or manmade stress is almost always necessary for symptoms to occur. Despite these facts, applying various growthstimulating, stress-mitigation and control products is often sold as the quickest path to a beneficial response without looking at modification of cultural practices or addressing fertility issues to alleviate the stress.

Unfortunately, it can be very difficult to gauge whether a particular product is providing effective control if courses are making multiple applications of a multitude of products each week. When more products are applied at an increasing frequency or increasing rates to weak grass, the result may be the opposite of what is desired and lead to the conclusion that more applications and products are needed. To add to the complication, without an untreated check and so many products being applied, if the grass does recover, how would it be known which of the products were beneficial?

Spray programs on golf courses have grown to be incredibly complex and expensive in the past five to 10 years even though the grasses have remained mostly the same. In my travels, I see some golf courses utilizing a judicious integrated pest management approach for golf course putting greens that have great surfaces and very good roots with just a few fungicide applications on top of basic fertility programs. I also see courses spending a significant amount of their budget on putting green applications of fungicides, multiple fertilizer mixtures and nematicides throughout the year – some have great putting greens, and some have not-so-great greens. In the end, I don't see a clear correlation between total spend on products and putting green health and quality.

Nematodes

Around 2016 to 2017, several new nematicides were registered and found great acceptance in the golf course market. Where parasitic nematodes were especially problematic – not just in nematode counts per 100 cubic centimeters of soil, but also in poor root quality and efficiency – the initial response from these products was beneficial and often readily apparent. Prior to this point, and after the loss of fenamiphos, golf courses used cultural practices to mitigate nematode damage. Now, in just four to five years, many of these golf courses have seen problematic nematode counts go up and root quality go down despite the continued use of these relatively new nematicides – even with increased rates and frequency of applications via spot treating.

Diseases

Recommendations are shifting to increased fungicide spraying for root diseases rather than exploring why the nematicide applications may not be performing or the justification for their continued use. Is it possible that continuing applications of nematicides are affecting diseases and their incidence? Are extensive and expensive fungicide programs needed to produce high-quality roots and putting greens regardless of stresses, nematodes and nematicide applications? This is a difficult question to answer as these two pests are not mutually exclusive. A <u>Ph.D. research project</u> conducted at the University of Florida indicated that low-virulence pathogens can become more pathogenic in the presence of high populations of one nematode but maybe not another. In this same study, it was found that natural turfgrass root exudates associated with high populations of another parasitic nematode reduced growth of another species of this same root pathogen. According to the results of this research, plant-parasitic nematodes may induce plant resistance to *Pythium spp*.

It would be great if every nematicide controlled just the nematode pests and not the beneficial nematodes, or if every fungicide controlled just the pathogenic fungi and nothing else. Unfortunately, the more chemicals that are applied, <u>the</u> <u>more likely the soil microbiology will change</u>. Could these changes cause one potential pathogen like *Gauemannomyces* to increase? Spraying lots of fungicides to address a worsening nematode problem can certainly have short- and longterm consequences. For information on the USGA's Course Consulting Service Contact the Green Section Staff.

Learn More



Things to consider

So, when your greens start looking "not right", before you go running to fire up the sprayer, collect some information first:

- What have you sprayed over the last two to four weeks?
- Did the symptoms you're observing now occur in concert with these applications or due to a weather or stress event?
- Take multiple samples and send them off for disease diagnosis, preferably to a university lab.
- Take samples of both soil and roots and send them to the University of Florida nematology lab for soil and root mist extraction assay testing. Root knot nematodes will not be accurately diagnosed from soil samples alone.
- <u>Monitor your roots</u> for depth, appearance and density.

The appeal of a "silver bullet" spray application is understandable. Everyone likes a quick, easy solution. However, much can be learned by monitoring surface and root health before and after any actions. This will help you prevent or more quickly address any recurring problems whether they be nematodes, diseases, or cultural issues. It may also save you from spraying something that is <u>causing more problems</u> than it's solving.

Through our <u>Course Consulting Service</u>, the USGA Green Section is working with individual courses on how to maximize the efficiency of your spray program while reducing the potential for unintended consequences. C<u>ontact a regional USGA agronomist</u> for more information.



SOUTHEAST REGION AGRONOMISTS:

Chris Hartwiger, Director, USGA Course Consulting Service, <u>chartwiger@usga.org</u> Steve Kammerer, Ph.D., Senior Consulting Agronomist, <u>skammerer@usga.org</u> Information on the USGA's Course Consulting Service Contact the Green Section Staff