

Bacterial etiolation and decline of creeping bentgrass greens

Paul Giordano is a Ph.D. candidate in turfgrass pathology at Michigan State University and the topic of his dissertation research is bacterial etiolation and decline of creeping bentgrass greens. Paul can be reached at giorda13@msu.edu.

Q What is the correct name of the disease you have been investigating?

We use the name bacterial etiolation and decline to describe the disease caused by *Acidovorax avenae* subsp. *avenae* to distinguish this disease from other bacterial diseases in turf.

Q How widespread is the disease?

Since 2009 we have isolated *Acidovorax avenae* subsp. *avenae* associated with etiolation and decline of creeping bentgrass samples from 30 golf courses in 13 states. Most of the courses with the disease are in or around the Transition zone or Mid-Atlantic states.

We have only isolated the pathogen from putting green turf and from plants in the *Agrostis* genus. Creeping bentgrass is by far the most common turfgrass species infested, but we have isolated *Acidovorax avenae* subsp. *avenae* from colonial and velvet bentgrass as well.

The disease can be widespread on a particular golf course, affecting many greens, or sometimes more localized to one or a couple problematic greens.

A common trait among the golf courses with bacterial etiolation and decline is that many are high budget and intensely managed. Often the disease is observed during or immediately after the greens have gone through intense tournament preparation for an important golf event.

Q Describe the etiolation and decline phases of the disease.

Etiolation of leaves is the first symptom of the disease and occurs during warm days and cool nights in late spring or early summer. Etiolated leaves are several times longer than other leaves in the canopy and are noticeably yellow or pale green. The etiolation phase of the disease is more of a cosmetic problem that can result in an uneven playing surface.

When summer temperatures reach around 86° F for several consecutive days, and warm nights with high relative humidity are prevalent, the decline phase begins in areas where etiolated turf was observed. The decline phase will kill grass plants and result in a noticeably thin stand. Up close, the infected plants appear spindly, necrotic and seem to “melt” away as the disease progresses.

With the onset of hot weather, the decline phase can happen relatively quickly, and seems to be worse in cleanup passes and other high traffic areas where the turfgrass is stressed.

Q What steps can be taken to minimize damage from the decline phase of the disease?

First, reduce any and all added stress on the plants. In a few cases superintendents have skipped mowing for a few days and saw symptoms retreat. Do all the common sense steps to reduce stress such as increase mowing height, lay off aggressive cultivation, and give the plants a break.

Bacterial diseases are notoriously hard to control in plants, and no antibiotics are labeled for use on turf. That said, based on our trials and that of colleagues around the country, there

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does not appear to be a silver bullet to control the disease remedially.

A couple of things we have observed on golf courses and in our trials are applications of trinexapac-ethyl seem to make the etiolation symptoms worse. Additionally, ammonium sulfate applications also seem to enhance etiolation. We have much to learn about why this seems to be happening, but for now, in cases where bacterial etiolation is present, we suggest that a superintendent not apply trinexapac-ethyl or ammonium sulfate until etiolation symptoms subside.

Q Anything else to add?

Not all etiolation is created equal. By that I mean etiolation of turfgrass can have many causes. In some cases the etiolation is caused by *Acidovorax avenae* subsp. *avenae* or *Xanthomonas translucens*, but not in all cases. We have received samples in our lab with obvious chlorosis and abnormal growth and etiolation, but showed no sign of bacterial infection whatsoever. Just because a superintendent observes etiolated leaves, it doesn't necessarily mean the cause is a bacterium. A diagnostic confirmation of bacterial infection should come from your local turfgrass pathologist.



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